Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
Battery Monitor Module Performance	P058A	The battery monitor module performance diagnostic is required to diagnose if the IBS sensor has any internal faults. The IBS checks a list of performance parameters as part of this diagnostic: reference voltage, voltage calibration check, current claibration check, NVM static data checksum, NVM dynamic data checksum, page 0 checksum, and wakeup timer check. Once all checks are completed in IBS the result is transmitted to BCM where appropriate DTC will be reported to DFIR. This diagnostic occurs once upon LIN wakeup, and the result is transmitted to BCM within 6 seconds.	IBS Sensor Internal Fault is TRUE (Internal IBS diagnostic)	= CeEM_e_IBS_DiagFail ed	All of the following conditions are met: System 12V Battery Voltage is above threshold IBS NormalCommEnable is TRUE Battery Monitor Module Performance Diagnostic Enable is TRUE No Active Lost Communication with Intelligent Battery Sensor Module DTC No Active Battery Sensor Signal Message Counter Incorrect DTC	 > 11.00 volts (with hysteresis disable < 10.00) = TRUE = CbTRUE = U01B000 = U04B100 	6 seconds	Type B, 2 Trips

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
Battery Monitor Module Current Monitoring Performance	P058B	The Battery Monitor Module Current Performance diagnostic is required to ensure there is not an open circuit fault at the shunt resistor. This diagnostic is performed within IBS and status is communicated to BCM where results are reported to DFIR IBS monitors the shunt resistor for open circuit while asleep and record historical result. This result is sent to BCM upon LIN wakeup. The BCM receives the historical result and reports to DIFR within 1 second of LIN wakeup. The continuous portion of this diagnostic does not run while the historical portion is running. The internal IBS diagnostic for the continuous portion uses 4 fails out of 5 samples at a rate of 16 second per sample.	IBS has open shunt condition, Battery Current Rationality Diagnostic Determination equals Diagnostic Failed (Internal IBS diagnostic)	= CeEM_e_IBS_DiagFail ed	All of the following conditoins are met: System 12V Battery Voltage is above threshold IBS NormalCommEnable is TRUE IBS Current Performance Diagnostic Enable is TRUE IBS Current Performance Continuous Diagnostic Enable is TRUE No Active Lost Communication with Intelligent Battery Sensor Module DTC No Active Battery Sensor Signal Message Counter Incorrect DTC Battery Current Rationality Historical Diagnostic Enable is FALSE	 > 11.00 volts (with hysteresis disable < 10.00) = TRUE = CbTRUE = CbTRUE = U01B00 = U04B100 = FALSE 	80 seconds (4 fails out of 5 samples at 16 seconds per sample)	Type B, 2 Trips
			IBS has open shunt condition: Battery Current Rationality Diagnostic Determination equals Diagnostic Failed	= CeEM_e_IBS_DiagFail	All of the following conditions are met: System 12V Battery Voltage is above threshold	> 11.00 volts (with	1 second	

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
			(Internal IBS diagnostic)	ed	IBS NormalCommEnable is TRUE IBS Current Performance Diagnostic Enable is TRUE IBS Current Performance Historical Diagnostic Enable is TRUE No Active Lost Communication with Intelligent Battery Sensor Module DTC No Active Battery Sensor Signal Message Counter Incorrect DTC	hysteresis disable < 10.00) = TRUE = CbTRUE = CbTRUE = U01B000 = U04B100		

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
Battery Monitor Module Temperature Monitoring Performance	P058C	Description The battery monitor module temperature monitoring performance is required to diagnose if the difference between IBS NTC raw temperature and IBS ASIC raw temperature is within a rational threshold. This diagnostic is performed in BCM by comparing the difference between NTC and ASIC temperature values sent by IBS with a calibratable threshold. IBS records up to 24 temperature samples at a rate of 1 set of sample per 30min while LIN is off. These 24 sets of samples are used in historical diagnostic, which occurs immediately after LIN wakeup. The historical diagnostic only runs once per LIN wakeup, while the continuous diagnostic runs repeatedly. BCM uses a X of Y strategy for both types of diagnostics.	Absolute difference between ASIC Raw Temperature and NTC Raw Temperature is above threshold	> 10.00 degrees Celsius	All of the following conditions are met: System 12V Battery Voltage is above threshold IBS NormalCommEnable is TRUE Outside Air Temperature is within range IBS Temperature Performance Diagnostic Enable is TRUE IBS Temperature Performance Continuous Diagnostic Enable is TRUE No Active Lost Communication with Intelligent Battery Sensor Module DTC No Active Battery Sensor Signal Message Counter Incorrect DTC	 > 11.00 volts (with hysteresis disable < 10.00) = TRUE > -30.00 degrees Celsius AND < 50.00 degrees Celsius = CbTRUE = CbTRUE = U01B000 = U04B100 	8 seconds out of a 10 seconds window	Ilium. Type B, 2 Trips
					No Active IBS Temperature Out of Range DTCs	= P058E00, P058F00, P16DE00, P16DF00		

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
			Absolute difference between ASIC Raw Temperature and NTC Raw Temperature is above threshold	> 10.00 degrees Celsius	All of the following conditions are met: System 12V Battery Voltage is above threshold	> 11.00 volts (with hysteresis disable < 10.00)	8 seconds out of a 10 seconds window	
					IBS NormalCommEnable is TRUE	= TRUE		
					Outside Air Temperature is within range	> -30.00 degrees Celsius AND < 50.00 degrees Celsius		
					IBS Temperature Performance Diagnostic Enable is TRUE	= CbTRUE		
					IBS Temperature Performance Historical Diagnostic Enable is TRUE	= CbTRUE		
					No Active Lost Communication with Intelligent Battery Sensor Module DTC	= U01B000		
					No Active Battery Sensor Signal Message Counter Incorrect DTC	= U04B100		
					Historical Temperature Data Down Count is in range	>0 _AMn		

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
					No Active IBS Temperature Out of Range DTCs	<= 24 = P058E00, P058F00, P16DE00, P16DF00		

Component/ F System C	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
Battery Monitor Module Voltage Monitoring Performance	>058D	The Battery Monitor Module Voltage Performance diagnostic is required to diagnose if the IBS Battery Voltage Sensor is accurately sensing the 12V Battery Voltage. The IBS battery voltage high resolution will be transmitted via LIN message from the sensor indicating what its internal sensor is reading for voltage. This voltage is compared with BCM's internal voltage reading (12V System Voltage). If the difference between the two voltages is greater than a calibratable threshold, then the fail counter will increment. Due to the high fluctuation of voltage during cranking event, this diagnostic is disabled from beginning of crank to a calibratable time delay after the end of crank. This diagnostic uses an X of Y strategy.	Absolute difference between Battery Monitor Module Voltage and BCM System Voltage is above threshold	>5.00 Volts	All of the following conditions are met: System 12V Battery Voltage is above threshold IBS NormalCommEnable is TRUE Battery Monitor Module Voltage Performance Diagnostic Enable is TRUE No Active Lost Communication with Intelligent Battery Sensor Module DTC No Active Battery Sensor Signal Message Counter Incorrect DTC No Active Battery Voltage Out of Range DTCs Powertrain Crank Active is FALSE Post-Crank Time Delay bas elapsed	 > 11.00 volts (with hysteresis disable < 10.00) = TRUE = CbTRUE = U01B000 = U04B100 = P16D400, P16D500 = FALSE > 5,000.00 seconds 	8 seconds out of a 10 seconds window	Type B, 2 Trips

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
Battery Monitor Module Temperature High	P058E	The Battery Monitor Module Temperature Out of Range High diagnostic is required to diagnose if the IBS ASIC Raw Temperature is above selected threshold value. This diagnostic is performed in BCM by comparing raw ASIC temperature values sent by IBS with a calibratable threshold. IBS records up to 24 temperature samples at a rate of 1 sample per 30min while LIN is off. These 24 samples are used in historical diagnostic, which occurs immediately after LIN wakeup. The historical diagnostic only runs once per LIN wakeup, while the continuous diagnostic runs repeatedly. BCM uses a X of Y strategy for both types of diagnostics.	Battery Monitor Module ASIC Temperature above threshold	> 120.00 degrees Celsius	All of the following conditions are met: System 12V Battery Voltage is above threshold IBS NormalCommEnable is TRUE Outside Air Temperature is within range IBS Temperature High Diagnostic Enable is TRUE IBS Temperature High Continuous Diagnostic Enable is TRUE No Active Lost Communication with Intelligent Battery Sensor Module DTC No Active Battery Sensor Signal Message Counter Incorrect DTC	<pre>> 11.00 volts (with hysteresis disable < 10.00) = TRUE > -30.00 degrees Celsius AND < 50.00 degrees Celsius = CbTRUE = CbTRUE = U01B000 = U04B100</pre>	4 seconds out of a 5 seconds window	Type B, 2 Trips
			ASIC Temperature above threshold	> 120.00 degrees Celsius	All of the following conditions are met: System 12V Battery Voltage is above threshold	> 11.00 volts (with hysteresis disable <	4 seconds out of a 5 seconds window	

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
					IBS NormalCommEnable is TRUE Outside Air Temperature is in range	10.00) = TRUE > -30.00 degrees Celsius AND < 50.00 degrees Celsius		
					IBS Temperature High Diagnostic Enable is TRUE IBS Temperature High	=CbTRUE		
					Historical Diagnostic Enable is TRUE No Active Lost Communication with Intelligent Battery Sensor Module DTC	= CbTRUE = U01B000		
					No Active Battery Sensor Signal Message Counter Incorrect DTC	= U04B100		
					Historical Temperature Data Down Count is in range	>0 AND <= 24		

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
Battery Monitor Module Temperature Low	P058F	The Battery Monitor Module Temperature Out of Range Low diagnostic is required to diagnose if the IBS ASIC Raw Temperature is above selected threshold value. This diagnostic is performed in BCM by comparing raw ASIC temperature values sent by IBS with a calibratable threshold. IBS records up to 24 temperature samples at a rate of 1 sample per 30min while LIN is off. These 24 samples are used in historical diagnostic, which occurs immediately after LIN wakeup. The historical diagnostic only runs once per LIN wakeup, while the continuous diagnostic runs repeatedly. BCM uses a X of Y strategy for both types of diagnostics.	Battery Monitor Module ASIC Temperature below threshold	<-43.00 degrees Celsius	All of the following conditions are met: System 12V Battery Voltage is above threshold IBS NormalCommEnable is TRUE Outside Air Temperature is within range IBS Temperature Low Diagnostic Enable is TRUE IBS Temperature Low Continuous Diagnostic Enable is TRUE No Active Lost Communication with Intelligent Battery Sensor Module DTC No Active Battery Sensor Signal Message Counter Incorrect DTC	 > 11.00 volts (with hysteresis disable < 10.00) = TRUE > -30.00 degrees Celsius AND < 50.00 degrees Celsius = CbTRUE = CbTRUE = U01B000 = U04B100 	4 seconds out of a 5 seconds window	Type B, 2 Trips
			Battery Monitor Module ASIC Temperature below threshold	<-43.00 degrees Celsius	All of the following conditions are met: System 12V Battery Voltage is above threshold	> 11.00 volts (with hysteresis disable <	4 seconds out of a 5 seconds window	

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
					IBS NormalCommEnable is TRUE Outside Air Temperature is in range	10.00) = TRUE > -30.00 degrees Celsius AND < 50.00 degrees Celsius		
					IBS Temperature Low Diagnostic Enable is TRUE	=CbTRUE		
					IBS Temperature Low Historical Diagnostic Enable is TRUE	= CbTRUE		
					No Active Lost Communication with Intelligent Battery Sensor Module DTC	= U01B000		
					No Active Battery Sensor Signal Message Counter Incorrect DTC	= U04B100		
					Historical Temperature Data Down Count is in range	>0 AND <= 24		

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
Driver Mode Select Switch A Circuit Low	P05D1	This DTC will detect an OBD-compliant analog switch bank 1 input that is too low (out-of-range low).	Analog Mode Switch low voltage threshold	< 1.0030 V	VehicleSwitchBankl Diagnostic Enable calibration is TRUE VehicleSwitchBankl Circuit Diagnostic Enable calibration is TRUE VehicleSwitchBankl Circuit Out-Of-Range Low Diagnostic Enable calibration is TRUE	= CbTRUE = CbTRUE = CbTRUE	4 seconds out of a 5 seconds window	Type B, 2 Trips

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
Driver Mode Select Switch A Circuit High	P05D2	This DTC will detect an OBD-compliant analog switch bank 1 input that is too high (out-of- range high).	Analog Mode Switch high voltage threshold	> 4.7410 V	VehicleSwitchBankl Diagnostic Enable calibration is TRUE VehicleSwitchBankl Circuit Diagnostic Enable calibration is TRUE VehicleSwitchBankl Circuit Out-Of-Range High Diagnostic Enable calibration is TRUE If Smart VSB Present is TRUE , then foillowing conditions are included RunCrankRelay is TRUE for IGN ON Delay Time	= CbTRUE = CbTRUE = CbTRUE = CbFALSE = 100.00 (ms)	4 seconds out of a 5 seconds window	Type B, 2 Trips

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
Driver Mode Select Switch A Range/ Performance	P05D3	This DTC will detect an OBD-compliant analog switch bank 1 input that is invalid within its performance range (in- range deadband).	Analog Mode Switch indeterminate (deadband) regions for 8-state analog resistor ladder	1.0030 < sensed voltage < 1.1030 2.7390 < sensed voltage < 2.7960 3.8800 < sensed voltage < 3.9370 4.6410 < sensed voltage < 6.00 7.00 < sensed voltage < 6.00	VehicleSwitchBankl Diagnostic Enable calibration is TRUE VehicleSwitchBankl Circuit Diagnostic Enable calibration is TRUE VehicleSwitchBankl Circuit Performance Diagnostic Enable calibration is TRUE	= CbTRUE = CbTRUE	4 seconds out of a 5 seconds window	Type B, 2 Trips

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
Control F Module Read Only Memory (ROM)	P0601	This DTC will be stored if the calibration check sum is incorrect or the flash memory detects an uncorrectable error via the Error Correcting Code.	The Primary Processor's calculated checksum does not match the stored checksum value. Covers all software and calibrations.	1 failure if the fault is detected during the first pass. 5 failures if the fault occurs after the first pass is complete.			Diagnostic runs continuously in the background.	Type B, 2 Trips
			The Primary Processor's Error Correcting Code hardware in the flash memory detects an error. Covers all software and calibrations.	254 failures detected via Error Correcting Code			Diagnostic runs continuously via the flash hardware.	
				In all cases, the failure count is cleared when controller shuts down				

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
Control I Module Long Term Memory Reset	P0603	This DTC detects an invalid NVM which includes a Static NVM, Perserved NVM, ECC ROM in NVM Flash Region, and Perserved NVM during shut down.	Static NVM region error detected during initialization		Static NVM fault on default diagnostic enable is CbTRUE Allow blank BINVDN must be CbFALSE	= CbTRUE = CbFALSE	Diagnostic runs at controller power up.	Type B, 2 Trips
			Cumulative NVM region error detected during initialization		Cumulative NVM fault on default diagnostic enable is CbTRUE Allow blank BINVDN must be CbFALSE	= CbTRUE = CbFALSE	Diagnostic runs at controller power up.	
			SSAR NVM region error detected during initialization.		SSAR NVM fault on default diagnostic enable is CbTRUE	= CbTRUE	Diagnostic runs at controller power up.	
					be CbFALSE	= CbFALSE		

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
Control F Module RAM Failure	P0604	Indicates that the control module has detected a RAM fault. This includes read/ write failures such as a Primary Processor System RAM Fault, Primary Processor Cache RAM Fault, and Primary Processor	Indicates that the primary processor is unable to correctly read data from or write data to system RAM. Detects data read does not match data written >=	254 counts			Will finish first memory scan within 30 seconds at all engine conditions - diagnostic runs continuously (background loop)	Type B, 2 Trips
		diagnostic runs continuously.	Indicates that the primary processor is unable to correctly read data from or write data to cached RAM. Detects data read does not match data written >=	254 counts			Will finish first memory scan within 30 seconds at all engine conditions - diagnostic runs continuously (background loop)	
			Indicates that the primary processor is unable to correctly read data from or write data to TPU RAM. Detects data read does not match data written >=	3 counts			Will finish first memory scan within 30 seconds at all engine conditions - diagnostic runs continuously (background loop)	

Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
P0606	Indicates that the control module has detected an internal processor integrity fault. These include diagnostics done on the SPI Communication as well as a host of diagnostics for the primary processor.2 fails in a row in the 	Test is Enabled: CbTRUE (If CbFALSE, this test is disabled)	25 ms	Type B, 2 Trips			
		2 fails in a row in the MAIN processor's configuration register masks versus known good data			Test is Enabled: CbTRUE (If 0, this test is disabled)	12.5 to 25 ms	
		Checks number of stack over/under flow since last powerup reset >=	5.00		Test is Enabled: CbTRUE (If 0, this test is disabled)	variable, depends on length of time to corrupt stack	
		Test 1 Voltage Test 2 Voltage	> 0.09V < -0.09V > 1.97V < 1.79V	Arbitrated Battery Voltage	Test is Enabled: CbTRUE (If 0, this test is disabled) > 7.00 V	16 / 20 counts or 822 milliseconds continuous; 50 ms/count in the	
		Test 3 Voltage Test 4 Voltage	> 3.22 V < 3.04 V > 5.09 V			ECM main processor	
	Fault Code	Fault CodeMonitor Strategy DescriptionP0606Indicates that the control module has detected an internal processor integrity fault. These include diagnostics done on the SPI Communication as well as a host of diagnostics for the primary processor.	Fault CodeMonitor Strategy DescriptionMalfunction CriteriaP0606Indicates that the control module has detected an internal processor integrity fault. These include diagnostics done on the SPI Communication as well as a host of diagnostics for the primary processor.2 fails in a row in the MAIN processor's ALU check2 fails in a row in the MAIN processor's configuration register masks versus known good data2 fails in a row in the MAIN processor's configuration register masks versus known good dataChecks number of stack over/under flow since last powerup reset >=Test 1 VoltageTest 1 VoltageTest 3 VoltageTest 4 VoltageTest 4 Voltage	Fault CodeMonitor Strategy DescriptionMalfunction CriteriaThreshold ValueP0606Indicates that the control module has detected an internal processor integrity fault. These include diagnostics done on the SPI Communication as well as a host of diagnostics for the primary processor.2 fails in a row in the MAIN processor's ALU check2 fails in a row in the MAIN processor's Configuration register masks versus known good dataChecks number of stack over/under flow since last powerup reset >=5.00Test 1 Voltage> 0.09 V < -0.09 V	Fault CodeMonitor Strategy DescriptionMalfunction CriteriaThreshold ValueSecondary ParametersP0606Indicates that the control module has detected an internal processor integrity fault. These include diagnostics done on the SPI Communication as well as a host of diagnostics for the primary processor.2 fails in a row in the MAIN processor's ALU check2 fails in a row in the MAIN processor's configuration register masks versus known good data2 fails in a row in the MAIN processor's configuration register masks versus known good data5.00Image: Communication checkProcessorChecks number of stack over/under flow since last powerup reset >=5.00Image: Communication checkProcessorTest 1 Voltage> 0.09 V < -0.09 V Processor is portuble 	Fault CodeMonitor Strategy DescriptionMalfunction CriteriaThreshold ValueSecondary ParametersEnable ConditionsP0606 P0606Indicates that the control module has detected an internal processor integrity fault. These include diagnostics done on the SPI Communication2 fails in a row in the MAIN processor's ALU checkImage: Communication complexity configuration register masks versus known good dataImage: Communication complexity configuration register masks versus known good dataImage: Communication complexity complexityImage: Communication complexity configuration register masks versus known good dataImage: Communication complexity complexityImage: Communication complexity configuration register masks versus known good dataImage: Communication complexity complexityImage: Communication complexity communication complexity <td< td=""><td>Fault Code Monitor Strategy Description Malfunction Criteria Threshold Value Secondary Parameters Enable Conditions Time Required P0606 Indicates that the detected an internal processor integrity diagnostics done on the SPI Communication as well as a host of diagnostics for the primary processor. 2 fails in a row in the MAIN processor's as well as a host of diagnostics for the primary processor. 2 fails in a row in the MAIN processor's configuration register masks versus known good data 2 fails in a row in the MAIN processor's configuration register masks versus known good data 2 fails in a row in the MAIN processor's configuration register masks versus known good data Test is Enabled: Checks number of stack over/under flow since last powerup reset >= Test is Conopy < < -0.09 V < < -0.00 V</td> Test is Caabled: CbTRUE (If 0, this test is disabled) 16 / 20 counts or 822 milliseconds continuous; 50 miscount in the ECM main processor Test 4 Voltage > 5.09 V < < 4.91V</td<>	Fault Code Monitor Strategy Description Malfunction Criteria Threshold Value Secondary Parameters Enable Conditions Time Required P0606 Indicates that the detected an internal processor integrity diagnostics done on the SPI Communication as well as a host of diagnostics for the primary processor. 2 fails in a row in the MAIN processor's as well as a host of diagnostics for the primary processor. 2 fails in a row in the MAIN processor's configuration register masks versus known good data 2 fails in a row in the MAIN processor's configuration register masks versus known good data 2 fails in a row in the MAIN processor's configuration register masks versus known good data Test is Enabled: Checks number of stack over/under flow since last powerup reset >= Test is Conopy < < -0.09 V < < -0.00 V

Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
P0607	Indicates that the control module has detected an internal processor integrity performance.	Checks for ECC (error correcting code) circuit test errors reported by the hardware for flash memory. Increments counter during controller initialization if ECC error occured since last controller initialization. Counter >=	3 (results in MIL), 5 (results in MIL and remedial action)		Test is enabled: CbTRUE . (If 0, this test is disabled)	variable, depends on length of time to access flash with corrupted memory	Type B, 2 Trips
		Checks for ECC (error correcting code) circuit test errors reported by the hardware for RAM memory circuit. Increments counter during controller initialization if ECC error occured since last controller initialization. Counter >=	3 (results in MIL), 5 (results in MIL and remedial action)		Test is enabled: CbTRUE . (If 0, this test is disabled)	variable, depends on length of time to write flash to RAMvariable, depends on length of time to write flash to RAM	
		Safety critical software is not executed in proper order OR Monitor Task counter exceeds max count threshold (See Enable Conditions for which tasks rates are enabled) 2.5ms: 3.125ms:	 >=5 incorrect task counts OR > 60 max task count >=4 incorrect task counts OR > 48 max task count 		Test is Enabled: (If CbFALSE, this test is disabled) 2.5ms: CbFALSE 3.125ms: CbFALSE 5ms: CbFALSE 5ms: CbFALSE 10ms: CbFALSE 20ms: CbFALSE 25ms: CbFALSE 25ms: CbFALSE 50ms: CbFALSE 50ms: CbFALSE 100ms: CbFALSE 100ms: CbFALSE	Counts: 2.5ms: 8/10 3.125ms: 8/10 5ms: 8/10 6.25ms: 8/10 10ms: 8/10 20ms: 8/10 25ms: 8/10 25ms: 8/10 40ms: 4/5 50ms: 4/5 80ms: 2/3 100ms: 2/3 250ms: 2/3	
F	∙ault >ode >0607	Autt Monitor strategy Description 20607 Indicates that the control module has detected an internal processor integrity performance.	Autr Manual choice criteria 20607 Indicates that the control module has detected an internal processor integrity performance. Checks for ECC (error correcting code) circuit test errors reported by the hardware for flash memory. Increments counter during controller initialization. Counter >= Checks for ECC (error correcting code) circuit test errors reported by the hardware for flash memory. Increments counter during controller initialization. Counter >= Checks for ECC (error correcting code) circuit test errors reported by the hardware for RAM memory circuit. Increments counter during controller initialization if ECC error occured since last controller initialization. Counter >= Safety critical software is not executed in proper order OR Monitor Task counter exceeds max count threshold (See Enable Conditions for which tasks rates are enabled) 2.5ms: 3.125ms: 5ms:	aut Maturication Criteria Infreshold Value 20607 Indicates that the control module has detected an internal processor integrity performance. Checks for ECC (error correcting code) circuit test errors reported by the hardware for flash memory. Increments counter during controller initialization. If ECC error occured since last controller initialization. Counter >= 3 (results in MIL), 5 (results in MIL, and remedial action) 20607 Checks for ECC (error correcting code) circuit test errors reported by the hardware for RAM memory circuit. Increments counter during controller initialization if ECC error occured since last controller initialization. Counter >= 3 (results in MIL), 5 (results in MIL, and remedial action) 20607 Safety critical software is not executed in proper order OR Monitor Task counter exceeds max count threshold (See Enable Conditions for which tasks rates are enabled) 3 (results in MIL), 5 (results in MIL, and remedial action) 2.5ms: >=5 incorrect task counts OR > 60 max task count >=5 incorrect task counts OR > 60 max task count 3.125ms: >=4 incorrect task counts OR > 48 max task count >=4 incorrect task counts OR > 48 max task count	aut bode Monitor strategy (maintence) maintence Threshold value Secondary Parameters 20607 Indicates that the control module has detected an internal processor integrity performance. Checks for ECC (error correcting code) circuit test errors reported by the hardware for flash memory. Increments controller initialization. Counter >= 3 (results in MIL), 5 (results in	autor Monitor Strategy Description maintechn Criteria Intesting Value Secondary Parameters Enable Conditions 20607 Indicates that the control module has detected an internal processor integrity performance. Checks for ECC (error correcting code) circuit test errors reported by the memory. Increments counter during controller initialization. Counter >= 3 (results in MIL, and remedial action) Test is enabled: ChTRUE. Checks for ECC (error correcting code) circuit test errors reported by the nemory. Increments counter during controller initialization. Counter >= 3 (results in MIL,), 5 (results in MIL, and remedial action) Test is enabled: ChTRUE. Checks for ECC (error correcting code) circuit test errors reported by the hardware for RAM memory circuit. Increments counter during controller initialization. Counter >= 3 (results in MIL,), 5 (results in MIL and remedial action) Test is enabled: ChTRUE. Checks for ECC (error correcting code) circuit test errors reported by the hardware for RAM memory circuit. Increment scounter during controller initialization. Counter >= 3 (fesults in MIL, and remedial action) Test is Enabled: (If 0, this test is disabled) 3 Stepse controller initialization. Counter >= Safety critical software is not executed in proper order Safety critical software is not executed in proper order Safety critical software is not executed in proper order >=5 incorrect task counts OR > 60max task count 25ms: CbFALSE 50ms: CbFALSE 25ms: CbFALSE 50ms: CbFALSE 25ms: CbFALSE 50ms: CbFALSE	aut monitor strategy maintcon Criteria intension value secondary Parameters enables intension intension 20607 Indicates that the control module has detected an intensia detected an intensia detected an intensia detected an intensia Checks for EC (error occurding code) circuit is at errors reported by the hardware for flash intension duting controller intellization. Counter intellization: Secondary Parameters Testis enabled: CbTRUE. (If 0, this test is disabled) interpt 0 frame to access flash with controller intellization. Counter intellization: Variable, test or controller interpt 0 frame to access flash with controller intellization. Counter intellization interpt of time to access flash with controller intellization. Counter intellization interpt of time to access flash with controller intellization interpt of time to access flash with controller intellization. Counter intellization interpt of time to access flash with controller intellization interpt of time to access flash with controller intellization. Counter intellization interpt of time to access flash with controller intellization. Counter intellization interpt of time to access flash with controller intellization interpt of time to access flash with controller intellization. Counter intellization interpt of time to access flash with controller intellization. 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Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
				counts OR > 30 max task count			processor	
			6.25ms:	>=2 incorrect task counts OR > 24 max task count				
			10ms:	>=2 incorrect task counts OR > 15 max task count				
			12.5ms:	>=1 incorrect task counts OR > 12 max task count				
			20ms:	>=1 incorrect task counts OR > 9 max task count				
			25ms:	>= 1 incorrect task counts OR > 6 max task count				
			40ms:	>= 1 incorrect task counts OR > 9 max task count				
			50ms:	>=1 incorrect task counts OR > 6 max task count				
			80ms:	>=1 incorrect task counts OR > 12 max task count				
			100ms:	>=2 incorrect task counts OR > 9 max task count				
			250ms:	>=1 incorrect task counts OR > 6 max task count				

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
Powertrain Internal Control Madula	P062F	This DTC detects a NVM long term performance. There are	HWIO reports that writing to NVM (at shutdown) will not succeed				Diagnostic runs at controller power up.	Type B, 2 Trips
Module EEPROM Error		two types of diagnostics that run during controller power up. One for HWIO reports that writing to NVM (at shutdown) will not succeed, and the other HWIO reports the assembly calibration integrity check has failed.	HWIO reports the assembly calibration integrity check has failed				Diagnostic runs at controller power up.	

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
5 Volt Reference #3 Circuit	P0697	Detects a continuous or intermittent short on the 5 volt reference circuit #3 by monitoring the reference percent Vref3 and failing the diagnostic when the percent Vref3 is too low or if the delta between the filtered percent Vref3 and non-filtered percent Vref3 is too large. This diagnostic only runs when battery voltage is high enough.	BCM percent Vref3 < or BCM percent Vref3 > or the difference between BCM filtered percent Vref3 and percent Vref3 >	78.13% Vref3 89.49 % Vref3 7.0000 % Vref3	Diagnostic enabled	= CbTRUE	0.8 seconds out of a 1 seconds window or 200.00 sec continuous	Type B, 2 Trips

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
Battery Monitor Module Temperature Erratic	P100C	The Battery Monitor Module Temperature Erratic diagnostic is required to diagnose if the IBS ASIC Raw Temperature sensor is erratic, caused by sudden short to ground or short to high. This diagnostic is performed in BCM by adding the absolute raw ASIC temperature values sent by IBS over a period of time and comparing with a calibratable threshold. This diagnostic uses the X of Y strategy.	Sum of the absolute difference between 10.00 ASIC Raw Temperature samples is above threshold	> 70.00 degrees Celsius	All of the following conditions are met: System 12V Battery Voltage is above threshold IBS NormalCommEnable is TRUE Outside Air Temperature is within range Temperature Erratic Diagnostic Enable is TRUE No Active Lost Communication with Intelligent Battery Sensor Module DTC No Active Battery Sensor Signal Message Counter Incorrect DTC	 > 11.00 volts (with hysteresis disable < 10.00) = TRUE > -30.00 degrees Celsius AND < 50.00 degrees Celsius = CbTRUE = U01B000 = U04B100 	40 seconds out of a 50 seconds window	Type B, 2 Trips

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
Battery Monitor Module Internal Temperature Erratic	P100D	The Battery Monitor Module Internal Temperature Erratic diagnostic is required to diagnose if the IBS NTC Raw Temperature sensor is erratic, caused by sudden short to ground or short to high. This diagnostic is performed in BCM by adding the absolute raw NTC temperature values sent by IBS over a period of time and comparing with a calibratable threshold. This diagnostic uses the X of Y strategy.	Sum of the absolute difference between 10.00 NTC Raw Temperature samples is above threshold	> 70.00 degrees Celsius	All of the following conditions are met: System 12V Battery Voltage is above threshold IBS NormalCommEnable is TRUE Outside Air Temperature is within range Temperature Circuit Erratic Diagnostic Enable is TRUE No Active Lost Communication with Intelligent Battery Sensor Module DTC No Active Battery Sensor Signal Message Counter Incorrect DTC	 > 11.00 volts (with hysteresis disable < 10.00) = TRUE > -30.00 degrees Celsius AND < 50.00 degrees Celsius = CbTRUE = U01B000 = U04B100 	40 seconds out of a 50 seconds window	Type B, 2 Trips

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
System Battery Monitor Module Circuit Voltage Low	P16D4	Description The Battery Monitor Module Circuit Low Voltage diagnostic is performed within intelligent battery sensor and is required to diagnose if the Sensor Voltage is out of range low. Once diagnostic determination is reached in IBS, the status is communicated to BCM where results are reported to DIFR. IBS monitors the battery voltage while asleep and record historical result. This result is sent to BCM upon LIN wakeup. The BCM receives the historical result and reports to DIFR within 1 second of LIN wakeup. The continuous portion of this diagnostic does not run while the historical portion is running. The internal	Battery Monitor Module Circuit Voltage below threshold (Internal IBS Diagnostic)	< 3 Volts	All of the following conditions are met: System 12V Battery Voltage is above threshold IBS NormalCommEnable is TRUE Battery Voltage Out of Range Low Diagnostic Enable is TRUE Battery Voltage Out of Range Low Continuous Diagnostic Enable is TRUE No Active Lost Communication with Intelligent Battery Sensor Module DTC No Active Battery Sensor Signal Message Counter	<pre>> 11.00 volts (with hysteresis disable < 10.00) = TRUE = CbTRUE = CbTRUE = U01B000</pre>	0.25 seconds (200 fails out of 250 samples at 0.001 second loop rate)	Ilium. Type B, 2 Trips
		IBS diagnostic for the continuous portion uses 200 fails out of 250 samples at a rate of 0.001 second per sample. The diagnostic result is port to PCM			Incorrect DTC Battery Voltage Out of Range Low Historical Diagnostic Enable is FALSE	= U04B100 = FALSE		
		result is sent to BCM continuously once per 0.25 seconds.	Battery Monitor Module Circuit Voltage below threshold (Internal IBS Diagnostic)	< 3 Volts	All of the following conditions are met: System 12V Battery Voltage is above threshold	> 11.00 volts (with	1 second	

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
					IBS NormalCommEnable is TRUE Battery Voltage Out of Range Low Diagnostic Enable is TRUE Battery Voltage Out of Range Low Historical Diagnostic Enable is TRUE No Active Lost Communication with Intelligent Battery Sensor Module DTC No Active Battery Sensor Signal Message Counter Incorrect DTC	hysteresis disable < 10.00) = TRUE = CbTRUE = U01B000 = U04B100		

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
Battery Monitor Module Circuit Voltage High	P16D5	Description The Battery Monitor Module Circuit High Voltage diagnostic is performed within intelligent battery sensor and is required to diagnose if the Sensor Voltage is out of range high. Once diagnostics determination is reached in IBS, the status is communicated to BCM where results are reported to DIFR. IBS monitors the battery voltage while asleep and record historical result. This result is sent to BCM upon LIN wakeup. The BCM receives the historical result and reports to DIFR within 1 second of LIN wakeup.	Battery Monitor Module Circuit Voltage above threshold (Internal IBS Diagnostic)	> 26 Volts	All of the following conditions are met: System 12V Battery Voltage is above threshold IBS NormalCommEnable is TRUE Battery Voltage Out of Range High Diagnostic Enable is TRUE Battery Voltage Out of Range High Continuous Diagnostic Enable is TRUE No Active Lost Communication with Intelligent Battery	 > 11.00 volts (with hysteresis disable < 10.00) = TRUE = CbTRUE = CbTRUE = U01B000 	0.25 seconds (200 fails out of 250 samples at 0.001 second loop rate)	Ilium. Type B, 2 Trips
		The continuous portion of this diagnostic does not run while the historical portion is running. The internal IBS diagnostic for the continuous portion uses 200 fails out of 250 samples at a rate of 0.001 second per sample. The diagnostic result is sent to BCM continuously once per	Battery Monitor Module		Sensor Module DTC No Active Battery Sensor Signal Message Counter Incorrect DTC Battery Voltage Out of Range High Historical Diagnostic Enable is FALSE	= U04B100 = FALSE	1 second	
		0.25 seconds.	Circuit Voltage above threshold (Internal IBS Diagnostic)	> 26 Volts	conditions are met: System 12V Battery Voltage is above threshold	> 11.00 volts (with		

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
					IBS NormalCommEnable is TRUE Battery Voltage Out of Range High Diagnostic Enable is TRUE Battery Voltage Out of Range High Historical Diagnostic Enable is TRUE No Active Lost Communication with Intelligent Battery Sensor Module DTC No Active Battery Sensor Signal Message Counter Incorrect DTC	hysteresis disable < 10.00) = TRUE = CbTRUE = CbTRUE = U01B000 = U04B100		

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
Battery Monitor Module Current Low	P16D6	The Battery Monitor Module Current Out of Range Low diagnostic is performed within intelligent battery sensor and is required to diagnose if the sensor current is out of range low. Once diagnostic determination is reached in IBS, the status is communicated to BCM where results are reported to DIFR. IBS monitors the battery current while asleep and record historical result. This result is sent to BCM upon LIN wakeup. The BCM receives the historical result and reports to DIFR within 1 second of LIN wakeup. The continuous portion of this diagnostic does not run while the historical portion is running. The internal IBS diagnostic for the continuous portion uses 200 fails out of 250 samples at a rate of 0.001 second per sample. The diagnostic	Battery Monitor Module Current below threshold (Internal IBS diagnostic)	< -1400 Amps	All of the following conditions are met: System 12V Battery Voltage is above threshold IBS NormalCommEnable is TRUE IBS Current Out of Range Low Diagnostic Enable is TRUE IBS Current Out of Range Low Continuous Diagnostic Enable is TRUE No Active Lost Communication with Intelligent Battery Sensor Module DTC No Active Battery Sensor Signal Message Counter Incorrect DTC Shunt Voltage Out of Range Low Historical Diagnostic Enable is FALSE	<pre>> 11.00 volts (with hysteresis disable < 10.00) = TRUE = CbTRUE = CbTRUE = U01B000 = U04B100 = FALSE</pre>	0.25 seconds (200 fails out of 250 samples at 0.001 second loop rate)	Type B, 2 Trips
		continuously once per 0.25 seconds.	Battery Monitor Module Current below threshold (Internal IBS diagnostic)	< -1400 Amps	All of the following conditions are met: System 12V Battery Voltage is above threshold	> 11.00 volts (with	1 second	

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
					IBS NormalCommEnable is TRUE IBS Current Out of Range Low Diagnostic Enable is TRUE IBS Current Out of Range Low Historical Diagnostic Enable is TRUE No Active Lost Communication with Intelligent Battery Sensor Module DTC No Active Battery Sensor Signal Message Counter Incorrect DTC	hysteresis disable < 10.00) = TRUE = CbTRUE = CbTRUE = U01B000 = U04B100		

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
System Battery Monitor Module Current High	P16DD	Description The Battery Monitor Module Current Out of Range High diagnostic is performed within intelligent battery sensor and is required to diagnose if the sensor current is out of range high. Once diagnostic determination is reached in IBS, the status is communicated to BCM where results are reported to DIFR. IBS monitors the battery current while asleep and record historical result. This result is sent to BCM upon LIN wakeup. The BCM receives the historical result and reports to DIFR within 1 second of LIN wakeup. The continuous portion of this diagnostic does not run while the historical portion is running. The internal IBS diagnostic for the continuous portion uses 200 fails out of 250 samples at a rate of 0.001 second per	Battery Monitor Module Current above threshold (Internal IBS diagnostic)	> 1400 Amps	All of the following conditions are met: System 12V Battery Voltage is above threshold IBS NormalCommEnable is TRUE IBS Current Out of Range High Diagnostic Enable is TRUE IBS Current Out of Range High Continuous Diagnostic Enable is TRUE No Active Lost Communication with Intelligent Battery Sensor Module DTC No Active Battery Sensor Signal Message Counter Incorrect DTC Shunt Voltage Out of Range High Historical Diagnostic Enable is	<pre>> 11.00 volts (with hysteresis disable < 10.00) = TRUE = CbTRUE = CbTRUE = U01B000 = U04B100</pre>	0.25 seconds (200 fails out of 250 samples at 0.001 second loop rate)	Ilium. Type B, 2 Trips
		sample. The diagnostic result is sent to BCM	-		FALSE			
		continuously once per 0.25 seconds.	Battery Monitor Module Current above threshold (Internal IBS diagnostic)	> 1400 Amps	All of the following conditions are met: System 12V Battery Voltage is above threshold	> 11.00 volts (with	1 second	

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
					IBS NormalCommEnable is TRUE IBS Current Out of Range High Diagnostic Enable is TRUE IBS Current Out of Range High Historical Diagnostic Enable is TRUE No Active Lost Communication with Intelligent Battery Sensor Module DTC No Active Battery Sensor Signal Message Counter Incorrect DTC	hysteresis disable < 10.00) = TRUE = CbTRUE = CbTRUE = U01B000 = U04B100		

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
Battery Monitor Module Internal Temperature Circuit Low	P16DE	The Battery Monitor Module Internal Temperature Out of Range High diagnostic is required to diagnose if the IBS NTC Raw Temperature is above selected threshold value. This diagnostic is performed in BCM by comparing raw NTC temperature values sent by IBS with a calibratable threshold. IBS records up to 24 temperature samples at a rate of 1 sample per 30min while LIN is off. These 24 samples are used in historical diagnostic, which occurs immediately after LIN wakeup. The historical diagnostic only runs once per LIN wakeup, while the continuous diagnostic runs repeatedly. BCM uses a X of Y strategy for both types of diagnostics.	Battery Monitor Module NTC Temperature above threshold	> 120.00 degrees Celsius > 120.00 degrees	All of the following conditions are met: System 12V Battery Voltage is above threshold IBS NormalCommEnable is TRUE Outside Air Temperature is within range Temperature Circuit Low Diagnostic Enable is TRUE Temperature Circuit Low Continuous Diagnostic Enable is TRUE No Active Lost Communication with Intelligent Battery Sensor Module DTC No Active Battery Sensor Signal Message Counter Incorrect DTC	<pre>> 11.00 volts (with hysteresis disable < 10.00) = TRUE > -30.00 degrees Celsius AND < 50.00 degrees Celsius = CbTRUE = CbTRUE = U01B000 = U04B100</pre>	4 seconds out of a 5 seconds window	Type B, 2 Trips
			threshold	Celsius	System 12V Battery Voltage is above threshold	> 11.00 volts (with	window	

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
					IBS NormalCommEnable is TRUE Outside Air Temperature is in range	hysteresis disable < 10.00) = TRUE > -30.00 degrees Celsius AND < 50.00 degrees Celsius		
					Temperature Circuit Low Diagnostic Enable is TRUE Temperature Circuit Low Historical Diagnostic Enable is TRUE	= CbTRUE = CbTRUE		
					No Active Lost Communication with Intelligent Battery Sensor Module DTC No Active Battery Sensor Signal Message Counter Incorrect DTC Historical Temperature Data Down Count is in range	= U01B000 = U04B100 > 0 AND <= 24		
<u> </u>								

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
Battery Monitor Module Internal Temperature Circuit High	P16DF	The Battery Monitor Module Internal Temperature Out of Range High diagnostic is required to diagnose if the IBS NTC Raw Temperature is above selected threshold value. This diagnostic is performed in BCM by comparing raw NTC temperature values sent by IBS with a calibratable threshold. IBS records up to 24 temperature samples at a rate of 1 sample per 30min while LIN is off. These 24 samples are used in historical diagnostic, which occurs immediately after LIN wakeup. The historical diagnostic only runs once per LIN wakeup, while the continuous diagnostic runs repeatedly. BCM uses a X of Y strategy for both types of diagnostics.	Battery Monitor Module NTC Temperature below threshold	<-43.00 degrees Celsius	All of the following conditions are met: System 12V Battery Voltage is above threshold IBS NormalCommEnable is TRUE Outside Air Temperature is within range Temperature Circuit High Diagnostic Enable is TRUE Temperature Circuit High Continuous Diagnostic Enable is TRUE No Active Lost Communication with Intelligent Battery Sensor Module DTC No Active Battery Sensor Signal Message Counter Incorrect DTC	<pre>> 11.00 volts (with hysteresis disable < 10.00) = TRUE > -30.00 degrees Celsius AND < 50.00 degrees Celsius = CbTRUE = CbTRUE = U01B000 = U04B100</pre>	4 seconds out of a 5 seconds window	Type B, 2 Trips
			NTC Temperature below threshold	<-43.00 degrees Celsius	conditions are met: System 12V Battery Voltage is above		a 5 seconds window	

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
-					threshold IBS NormalCommEnable is TRUE Outside Air Temperature is within	> 11.00 volts (with hysteresis disable < 10.00) = TRUE		
					range	> -30.00 degrees Celsius AND < 50.00 degrees Celsius		
					Temperature Circuit High Diagnostic Enable is TRUE	= CbTRUE		
					Temperature Circuit High Historical Diagnostic Enable is TRUE	=CbTRUE		
					No Active Lost Communication with Intelligent Battery Sensor Module DTC	= U01B000		
					No Active Battery Sensor Signal Message Counter Incorrect DTC	= U04B100		
					Historical Temperature Data Down Count is in range	>0 AND <= 24		
Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
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Battery Monitor Module Random Access Memory (RAM) Error	P16E1	The battery Monitor Module performance (RAM) error diagnostic is required to diagnose if the IBS sensor has any internal RAM faults. This diagnostic is performed within IBS and the status is transmitted to BCM where results are reported to DFIR. This diagnostic takes approximately 10 seconds to complete upon LIN wakeup, and is only run once per wakeup. The result is immediately transmitted to BCM after.	IBS Sensor Internal RAM Fault detected: IBS Internal Fault RAM Determination equals DiagFailed (internal IBS diagnostic)	= CeEM_e_IBS_DiagFail ed	All of the following conditions are met: System 12V Battery Voltage is above threshold IBS LIN Normal Communication Enable is TRUE Battery Monitor Module RAM Error Diagnostic Enable is TRUE No Active Lost Communication with Intelligent Battery Sensor Module DTC No Active Battery Sensor Signal Message Counter Incorrect DTC	 > 11.00 volts (with hysteresis disable < 10.00) = TRUE = CbTRUE = U01B000 = U04B100 	10 seconds	Type B, 2 Trips

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
Battery Monitor Module Random Access Memory (ROM) Error	P16E2	The battery Monitor Module performance (ROM) error diagnostic is required to diagnose if the IBS sensor has any internal ROM faults. This diagnostic is performed within IBS and the status is transmitted to BCM where results are reported to DFIR.This diagnostic takes approximately 60 seconds to complete upon LIN wakeup, and is only run once per wakeup. The result is immediately transmitted to BCM after.	IBS Sensor Internal ROM Fault detected: IBS Internal Fault RAM Determination equals DiagFailed (internal IBS diagnostic)	= CeEM_e_IBS_DiagFail ed	All of the following conditions are met: System 12V Battery Voltage is above threshold IBS NormalCommEnable is TRUE Battery Monitor Module ROM Error Diagnostic Enable is TRUE No Active Lost Communication with Intelligent Battery Sensor Module DTC No Active Battery Sensor Signal Message Counter Incorrect DTC	 > 11.00 volts (with hysteresis disable < 10.00) = TRUE = CbTRUE = U01B000 = U04B100 	60 seconds	Type B, 2 Trips

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
Battery Monitor Module Data Incompatible Diagnostic	P16E3	The Battery Monitor Module Data Incompatible diagnostic is required to diagnose if the IBS is using the correct configuration information being transmitted by the Host controller to it. The IBS reads and transmits the configuration values it has loaded internally back to the host controller for verification. The historical test evaluates the IBS configuration return values to check if they are equal to the host controller's values. The diagnostic is executed once per host controller wakeup and checks only the first transmitted LIN message containing the IBS return configuration message. The continuous test compares the IBS configuration return values to those sent by BCM and uses X of Y maturation strategy to determine diagnostic state.	Any of the following criteria are met: IBS Config Return Battery Type is NOT equal to Vehicle Battery Type Configuration Battery Nominal Return C20 is above threshold IBS Config Return Battery Cal #1 U40% is above threshold IBS Config Return Battery Cal #2 U80% is above threshold IfSOC Bounding Limit Configuration check is TRUE then following conditions are included SOC Bounding Limit Hr3 Difference is above the threshold SOC Bounding Limit Hr8 Difference is above the threshold SOC Bounding Limit Hr8 Difference is above the threshold	NOT equal to Vehicle Battery Type Configuration CeEPM_ADV_BATT TECH_FLOODED >5.00 >0.50 >0.50 = CbTRUE >0.01 >0.01	All of the following conditions are met: System 12V Battery Voltage is above threshold IBS NormalCommEnable is TRUE IBS Configuration Diagnostic Continuous Enable is TRUE Battery Monitor Module Data Incompatible Determination Historical Diagnostic Enable is FALSE No Active Lost Communication with Intelligent Battery Sensor Module DTC No Active Battery Sensor Signal Message Counter Incorrect DTC	<pre>> 11.00 volts (with hysteresis disable < 10.00) = TRUE = CbTRUE = FALSE = U01B000 = U04B100</pre>	5 seconds out of a 6 seconds window	Type B, 2 Trips
			Any of the following criteria are met IBS Config Return		All of the following conditions are met: System 12V Battery Voltage is above		1 second	

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
			Battery Type is NOT equal to Vehicle Battery Type Configuration Battery Nominal Return C20 is above threshold IBS Config Return Battery Cal #1 U40% is above threshold IBS Config Return Battery Cal #2 U80% is above threshold IfSOC Bounding Limit Configuration check is TRUE then following conditions are included SOC Bounding Limit Hr8 Difference is above the threshold SOC Bounding Limit Hr8 Difference is above the threshold SOC Bounding Limit Hr8 Difference is above the threshold	NOT equal to Vehicle Battery Type Configuration CeEPM_ADV_BATT_ TECH_FLOODED >5.00 >0.50 >0.50 = CbTRUE >0.01 >0.01	threshold IBS NormalCommEnable is TRUE IBS Configuration Diagnostic Historical Enable is TRUE No Active Lost Communication with Intelligent Battery Sensor Module DTC No Active Battery Sensor Signal Message Counter Incorrect DTC	 > 11.00 volts (with hysteresis disable < 10.00) = TRUE = CbTRUE = U01B000 = U04B100 		

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
Control Module Wake-Up Not Detected	P16FD	Detects when a control module did not wake- up at time scheduled by the wake-up alarm at shutdown.	Real Time Clock has exceeded expected wake- up time as defined by alarms scheduled at shutdown	>= 1 failure to meet scheduled controller wake-up	Control Module wake-up not detected Diagnostic Enable calibration is CbTRUE	= CbTRUE	Variable, dependent on scheduled controller wake- up times at shutdown	Type B, 2 Trips

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
Control Module Power Off Timer Performance	P262B	This DTC determines if the hardware timer does not initialize or count properly. There are two tests to ensure proper functioning of the timer: Count Up Test (CUT) and Range Test (RaTe). Count Up Test (CUT): Verifies that the HWIO timer is counting up with the proper increment.	Count Up Test: Time difference between the current value and the previous value of the timer	> 1.50 seconds			Count Up Test: 4 failures out of 20 samples 1 sec / sample Continuous while run/crank is not active and until controller sleep occurs	Type B, 2 Trips
		Range Test (RaTe): When the run/crank is not active both the hardware and mirror timers are started. The timers are compared when module shutdown is initiated or run/crank becomes active.	Range Test: The variation of the HWIO timer and mirror timer is	> 0.25%.			Range Test: Once or twice per trip, performed when controller shutdown is initiated or run/ crank becomes active	

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
P3186 (Internal Control Module Security Peripheral Performance)	P3186	This DTC indicates the security peripheral has experienced an internal fault indicating that MAC verification results are unreliable.	MAC verification has falsely passed a configurable number of times.	3.00	Calibration enable	= CbTRUE Boolean		Type A, 1 Trips

Control Module Communicati on CAN 9 OffU0078This DTC monitors for a CAN 9 bus off conditionBus off failures equals or exceeds>=6.00 counts in a sliding window of 50 samplesGeneral Enable Criteria: Time since power-up reset, running reset, recovery from under/over voltage conditionDiagnostic runs in 10 ms loopType 2 TOffJoint	Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
Image: CAN channel is requesting full communications Normal CAN transmission on Bus is enabled Normal CAN transmission on Bus is enabled Image: CAN channel is requesting full communications Normal CAN transmission on Bus is enabled >11.00 Volts Image: CAN channel is requesting full communications States voltage >11.00 Volts Image: Communications Controller is an OBD controller >11.00 Volts Image: Communications Controller type: Controller type: Image: Communication Communication Image: Communication Communication <=18.00 Volts	Control Module Communicati on CAN 9 Off	U0078	This DTC monitors for a CAN 9 bus off condition	Bus off failures equals or exceeds	>=6.00 counts in a sliding window of 50 samples	General Enable Criteria: Time since power-up reset, running reset, recovery from under/over voltage condition All below criteria have been met for CAN channel is requesting full communications Normal CAN transmission on Bus is enabled Accessory mode to off mode not pending Battery voltage Controller is an OBD controller Or Battery Voltage Controller type: OBD Controller If power mode = Run/Propulsion/Start: Power Mode is run If power mode = Accessory: Off key cycle diagnostics are enabled	>=5,000 milliseconds >=3,000 milliseconds >11.00 Volts <=18.00 Volts CbFALSE (CbTRUE	Diagnostic runs in 10 ms loop	Type B, 2 Trips

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
					Controller is an OBD controller			
					Controller shutdown is not impending			
					Power Mode is not run/ crank			
					Battery voltage	>=11.00 Volts		

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
Lost Communicati on With	U01B0	This DTC monitors for a loss of communication with the	Message is not received from device for		General Enable Criteria: Diagnostic is enabled	CbTRUE (CbTRUE	LIN bus communication executes in	Type B, 2 Trips
Battery Monitor Module		Battery Monitor Module on the LIN bus.	IBSAmpHrChrg_Rsp_PD U	>=12,500.00 milliseconds	I IN channel is enabled	indicates enabled)	250ms loop.	
Module			IBSAmpHrDisChrg_Rsp_ PDU	>=12,500.00 milliseconds	LIN module is initialized	indicates enabled)		
			IBSBattCrnkData_Rsp_P DU	>=12,500.00 milliseconds	Slave is calibrated as present	CbTRUE (CbTRUE indicates present)		
		IBSBattLINOffData_Rsp_ PDU	>=12,500.00 milliseconds	Time since power-up reset, running reset, recovery from under/over	. ,			
			IBSBattStatusData_Rsp_ PDU	>=12,500.00 milliseconds	voltage condition All below criteria have	>=5,000 milliseconds		
			IBSCfgWakeupData_Rsp _PDU	>=12,500.00 milliseconds	been met for Accessory mode to off	>=3,000 milliseconds		
			IB8CurrentFOMData_Rsp _PDU	>=12,500.00 milliseconds	mode not pending Battery voltage	>11.00 Volts		
			IBSDiagDet_Rsp_PDU	>=10,625.00 milliseconds	Controller is an OBD controller Or			
			IB8MeasuredTemp_Rsp_ PDU	>=10,700.00 milliseconds	Battery Voltage	<=18.00 Volts		
			IBSMinCrnkData_Rsp_P DU	>=12,500.00 milliseconds	OBD Controller			
			IBSMVISOFData_Rsp_P DU	>=10,700.00 milliseconds	Run/Propulsion/Start:			
			IBSSOCData_Rsp_PDU	>=12,500.00 milliseconds	Power Mode is run If power mode =			
			IBSVoltageFOMData_Rsp	>=12,500.00	Accessory:			

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
			_PDU	milliseconds	Off key cycle diagnostics are enabled Or Controller is an OBD controller Controller shutdown is not impending Power Mode is not run/ crank Battery voltage	CbFALSE (CbTRUE indicates enabled)		

Component/ Fa System Co	ault ode	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
Invalid Data Received From ECM/ PCM	0401	This DTC monitors for an error in communication with the ECM.	Any of the Alive Rolling Counts, Protection Values, Checksum Values, or Cyclic Redundancy Check signal values listed below are incorrect for: SD19P_ARC: SrlDat19_Prtctd: SD18P_ARC: VSANDP_ARC: VehSpdAvgNDrvn_Prtctd: VSADP_ARC: VehSpdAvgDrvn_Prtctd: SD21P_ARC: SriDat21_Prtctd: SriDat26_Prtctd:	 8 fail counts out of 10 sample counts 14 fail counts out of 18 sample counts 8 fail counts out of 10 sample counts 14 fail counts out of 18 sample counts 8 fail counts out of 10 sample counts 14 fail counts out of 18 sample counts 8 fail counts out of 18 sample counts 8 fail counts out of 10 sample counts 8 fail counts out of 10 sample counts 14 fail counts out of 18 sample counts 14 fail counts out of 18 sample counts 14 fail counts out of 18 sample counts 14 fail counts out of 10 sample counts 15 fail counts out of 16 sample counts 8 fail counts out of 	Time since power-up reset, running reset, recovery from under/over voltage condition All the following conditions are met for Partial Network is active Power Mode Battery Voltage	>= 5,000 milliseconds >= 3,000 milliseconds = Run >11.00 Volts	Executes in 10ms loop.	Type B, 2 Trips

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
			SD22P_ARC:	10 sample counts				
			SrlDat22_Prtctd:	14 fail counts out of 18 sample counts				
			SD23P_ARC:	15 fail counts out of 16 sample counts				
			SrlDat23_Prtctd:	15 fail counts out of 16 sample counts				
			SD25P_ARC:	8 fail counts out of 10 sample counts				
			SrlDat25_Prtctd:	14 fail counts out of 18 sample counts				

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
Invalid Data Received From Transmissio n Control Module	U0402	This DTC monitors for an error in communication with the TCM.	Any of the Alive Rolling Counts, Protection Values, Checksum Values, or Cyclic Redundancy Check signal values listed below are incorrect for: TEGP_ARC: TrnsEstGr_Prtctd:	15 fail counts out of 16 sample counts 15 fail counts out of 16 sample counts	Time since power-up reset, running reset, recovery from under/over voltage condition All the following conditions are met for Partial Network is active Power Mode Battery Voltage	>= 5,000 milliseconds >= 3,000 milliseconds = Run >11.00 Volts	Executes in 10ms loop.	Type B, 2 Trips

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
Invalid Data Received From Brake System Control Module	U0418	This DTC monitors for an error in communication with the BSCM.	Any of the Alive Rolling Counts, Protection Values, Checksum Values, or Cyclic Redundancy Check signal values listed below are incorrect for: SD14P_ARC: SrlDat14_Prtctd: SD15P_ARC: SrlDat15_Prtctd: SD16P_ARC: SrlDat16_Prtctd:	 15 fail counts out of 16 sample counts 8 fail counts out of 10 sample counts 14 fail counts out of 18 sample counts 	Time since power-up reset, running reset, recovery from under/over voltage condition All the following conditions are met for Partial Network is active Power Mode Battery Voltage	>= 5,000 milliseconds >= 3,000 milliseconds = Run >11.00 Volts	Executes in 10ms loop.	Type B, 2 Trips

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
Invalid Data Received From Gateway A	U0447	This DTC monitors for an error in communication with the CGM.	Any of the Alive Rolling Counts, Protection Values, Checksum Values, or Cyclic Redundancy Check signal values listed below are incorrect for: BSPMP_ARC: BkupSysPwrMode_Prtctd:	15 fail counts out of 16 sample counts 15 fail counts out of 16 sample counts	Time since power-up reset, running reset, recovery from under/over voltage condition All the following conditions are met for Partial Network is active Power Mode Battery Voltage	>= 5,000 milliseconds >= 3,000 milliseconds = Run >11.00 Volts	Executes in 10ms loop.	Type B, 2 Trips

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
Invalid Data Received From Battery Monitor Module	U04B1	This DTC monitors for an internal error or error in communication with the Battery Monitor Signal	Any of the Alive Rolling Counts signal values listed below are incorrect for:AmpHrsChrgdARC:AmpHrsDischrgdARC:BatCrnkDatARC:BatLINOffDatARC:GgWkupDatARC:IBSCurrOORAndRatIFOM ARC:IBSDiagDetARC:MinCrnkgDatARC:MVIAndSOFDatARC:BatSOCDatARC:	 8 fail counts out of 10 sample counts 	Time since power-up reset, running reset, recovery from under/over voltage condition All the following conditions are met for Partial Network is active Power Mode Battery Voltage	>= 5,000 milliseconds >= 3,000 milliseconds = Run >11.00 Volts	Fastest periodic communication rate to Battery Monitor Module on LIN bus executes at 250ms.	Type B, 2 Trips

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
			IBSVItgFOMARC:	8 fail counts out of 10 sample counts				

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
Body Control Module Local Interconnect Network 9	U152D	This DTC monitors for a loss of communication on the LIN bus.	All Slaves calibrated as present on this LIN bus are reporting Loss of Communication.		General Enable Criteria: Diagnostic is enabled	CbTRUE (CbTRUE indicates enabled)	LIN bus communication executes in 250ms loop.	Type B, 2 Trips
					LIN channel is enabled LIN module is initialized	CbTRUE (CbTRUE indicates enabled)		
					Time since power-up reset, running reset, recovery from under/over voltage condition	>=5.000 milliseconds		
					All below criteria have been met for	>=3,000 milliseconds		
					Accessory mode to off mode not pending			
					Controller is an OBD	>11.00 Volts		
					Battery Voltage	<=18.00 Volts		
					Controller type: OBD Controller			
					If power mode = Run/ Crank:			
					Power Mode is run			
					If power mode = Accessory:			
					Off key cycle diagnostics are enabled	CbFALSE (CbTRUE		

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
					Or Controller is an OBD controller Controller shutdown is not impending Power Mode is not run/ crank Battery voltage	indicates enabled)		

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
Component/ System Lost Communicati on with Brake System Control Module 1 on CAN Bus 2	Fault Code U1610	Monitor Strategy Description	Malfunction Criteria Message is not received from controller for Message \$03B Message \$27B Message \$369 Message \$3A8 Message \$5CD	Threshold Value >10,025.00 milliseconds >7,250.00 milliseconds >10,625.00 milliseconds >12,500.00 milliseconds	Secondary Parameters General Enable Criteria: Time since power-up reset, running reset, recovery from under/over voltage condition All below criteria have been met for If message is on Bus A: U0073 not active If message is on Bus B: U0074 not active If message is on Bus S: U0076 not active If message is on Bus 9: U0078 not active CAN channel is requesting full communications Normal CAN transmission on Bus is enabled If bus type is Sensor Bus, sensor bus relay is on Accessory mode to off mode not nonding	Enable Conditions	Time Required Diagnostic runs in 10 ms loop	MIL Ilium. 2 Trips
					mode not pending Battery voltage Controller is an OBD controller Or Battery Voltage	>11.00 Volts <=18.00 Volts		

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
					Controller type: OBD Controller If power mode = Run/Propulsion/Start: Power Mode is run If power mode = Accessory: Off key cycle diagnostics are enabled Or Controller is an OBD controller Controller shutdown is not impending Power Mode is not run/ crank Battery voltage	CbFALSE (CbTRUE indicates enabled)		

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
Lost Communicati	U1611	This DTC monitors for a Lost Communication	Message is not received from controller for		General Enable Criteria:		Diagnostic runs in 10 ms loop	Type A, 1 Trips
Engine		Module on CAN Bus 2	Message \$514	>12.500.00	reset, running reset.			
Control		error as determined by		milliseconds	recovery from under/over			
Module on		the BCM.		40.000.50	voltage condition	>=5,000 milliseconds		
CAN BUS 2			Message \$0E2	>10,062.50 milliseconds	All below criteria have			
					been met for	>=3,000 milliseconds		
			Message \$516	>12,500.00				
				milliseconds	If message is on Bus A: U0073 not active			
			Message \$268	>10,250.00 milliseconds	If message is on Bus B.			
					U0074 not active			
			Message \$02F	>10,031.25				
				milliseconds	If message is on Bus S:			
			Message \$064	>10,031.25				
			U	milliseconds	If message is on Bus 9: U0078 not active			
			Message \$262	>10,250.00				
				milliseconds	CAN channel is			
			Message \$266	>10.250.00	communications			
				milliseconds				
			Magaza ¢267	. 10.250.00	Normal CAN transmission			
			Message \$207	milliseconds	OII DUS IS EIIADIEU			
					If bus type is Sensor Bus,			
			Message \$2D1	>10,250.00	sensor bus relay is on			
				milliseconds	Accessory mode to off			
			Message \$2D3	>10,250.00	mode not pending			
				milliseconds	Pottony voltage	>11.00 Volts		
			Message \$36F	>10.625.00	Dallery vollage			
				milliseconds	Controller is an OBD controller			
			Message \$521	>12,500.00	Or	<=18.00 Volts		
				milliseconds	Battery Voltage			

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
			Message \$5CE	>12,500.00 milliseconds	Controller type: OBD Controller			
			Message \$2DA	>10,250.00 milliseconds	If power mode = Run/Propulsion/Start:			
			Message \$5EB	>12,500.00 milliseconds	Power Mode is run			
					If power mode = Accessory:			
					Off key cycle diagnostics are enabled Or Controller is an OBD controller	CbFALSE (CbTRUE indicates enabled)		
					Controller shutdown is not impending			
					Power Mode is not run/ crank	- 11.00\/olto		
					Battery voltage	>=11.00 voits		

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
Lost Communicati	U1627	This DTC monitors for a loss of	Message is not received from controller for		General Enable Criteria:		Diagnostic runs in 10 ms loop	Type B, 2 Trips
on with Central		Communication with	Message \$2D0	> 10 250 00	Time since power-up			
Gateway		Module.	Message #200	milliseconds	recovery from under/over			
Module on					voltage condition	>=5,000 milliseconds		
CAN Bus 9			Message \$370	> 10,625.00	All bolow critoria boyo			
				miniseconus	been met for	>=3.000 milliseconds		
			Message \$5CC	> 12,500.00		-,		
				milliseconds	If message is on Bus A: U0073 not active			
			Message \$5D7	> 12,500.00	If magazage is on Rue R:			
				miniseconus	U0074 not active			
			Message \$04B	> 10,025.00				
				milliseconds	If message is on Bus S: U0076 not active			
			Message \$700	> 12,500.00	If magazara is an Rua Or			
				miniseconas	U0078 not active			
			Message \$585	> 12,500.00				
				milliseconds	CAN channel is			
			Message \$4F3	> 12 500 00	requesting full			
			Message #1 0	milliseconds	communications			
					Normal CAN transmission			
			Message \$5F8	> 12,500.00	on Bus is enabled			
				miniseconus	If bus type is Sensor Bus.			
			Message \$3C2	> 12,500.00	sensor bus relay is on			
				milliseconds	A second my mode to off			
			Message \$3C3	> 12 500 00	Accessory mode to off			
				milliseconds	niede not ponding	>11.00 Volts		
					Battery voltage			
			Message \$3C4	> 12,500.00 milliseconds	Controller is an OBD			
					controller			
					Or	<=18.00 Volts		
					Battery Voltage			

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
					Controller type: OBD Controller If power mode = Run/Propulsion/Start: Power Mode is run If power mode = Accessory: Off key cycle diagnostics are enabled Or Controller is an OBD controller Controller shutdown is not impending Power Mode is not run/ crank Battery voltage	CbFALSE (CbTRUE indicates enabled)		

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
Lost Communicati on with Transmissio n Control Module on CAN Bus 2	U1643	This DTC monitors for a loss of communication with the Transmission Control Module.	Message is not received from controller for Message \$032 Message \$049	>10,031.25 milliseconds >10,031.25 milliseconds	General Enable Criteria: Time since power-up reset, running reset, recovery from under/over voltage condition All below criteria have been met for If message is on Bus A: U0073 not active If message is on Bus B: U0074 not active If message is on Bus S: U0076 not active If message is on Bus 9: U0078 not active CAN channel is requesting full communications Normal CAN transmission on Bus is enabled If bus type is Sensor Bus, sensor bus relay is on Accessory mode to off mode not pending Battery voltage Controller is an OBD controller Or Battery Voltage	>=5,000 milliseconds >=3,000 milliseconds >11.00 Volts <=18.00 Volts	Diagnostic runs in 10 ms loop	Type B, 2 Trips

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
					Controller type: OBD Controller If power mode = Run/Propulsion/Start: Power Mode is run If power mode = Accessory: Off key cycle diagnostics are enabled Or Controller is an OBD controller shutdown is not impending Power Mode is not run/ crank Battery voltage	CbFALSE (CbTRUE indicates enabled)		

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
Component/ System	Fault Code U1818	Monitor Strategy Description	Malfunction Criteria Message is not received from controller for Message \$2C3	Threshold Value	Secondary Parameters General Enable Criteria: Time since power-up reset, running reset, recovery from under/over voltage condition All below criteria have been met for If message is on Bus A: U0073 not active If message is on Bus B: U0074 not active If message is on Bus S: U0076 not active If message is on Bus 9: U0078 not active CAN channel is requesting full communications Normal CAN transmission on Bus is enabled If bus type is Sensor Bus, sensor bus relay is on Accessory mode to off mode not pending Battery voltage	Enable Conditions	Time Required	MIL Ilium. 2 Trips
					Controller is an OBD controller Or Battery Voltage	<=18.00 Volts		

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
					Controller type: OBD Controller If power mode = Run/Propulsion/Start: Power Mode is run If power mode = Accessory: Off key cycle diagnostics are enabled Or Controller is an OBD controller Controller shutdown is not impending Power Mode is not run/ crank Battery voltage	CbFALSE (CbTRUE indicates enabled)		

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
Key Table Not Provisioned / Authoritative Counter At Maximum	U1960	This DTC indicates that the ECU security peripheral key slots are not provisioned OR ECU message authenticatioon Authoritative Counters are at MAX value	During controller initialization: IF (Any Security Peripheral Key Slot reports as Empty) -OR- (Any Authoritative Counter is at MAX value) During controller operation: IF (A Security Peripheral Key Slot reports as Empty) -OR- (An Authoritative Counter is at MAX value)		Calibration enable	= CbTRUE Boolean		Type A, 1 Trips

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
U1961 (Security Peripheral Performance)	U1961	This DTC indicates that the ECU security peripheral has reported that it has failed.	The ECU security peripheral reports that the security peripheral hardware has failed.		Calibration enable	= CbTRUE Boolean		Type A, 1 Trips

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
U1962 (Unable to Authenticate Serial Data Message)	U1962	This DTC indicates that serial data message authentication on any key slot has failed a configurable number of times this key cycle.	Message authentication on a single key slot has failed a configurable number of times.	60	Calibration enable	= CbTRUE Boolean		Type A, 1 Trips

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
Control Module Input Power Circuit A/B Correlation	U3018	This diagnostic verifies that both (A and B) control module input power voltage sensors (when there are two) are neither inappropriately high nor low. It compares the sensed control module voltage A with sensed control module voltage B. If the absolute value of the difference between voltage A and B is greater than the failure threshold for sufficient time, the diagnostic will fail.	Difference between 12V Battery Power Circuit A and 12V Battery Power Circuit B	> 4.00	PowerA - Power B Correlation monitoring enable = TRUE Battery Present is CbTRUE Starter Motor NOT Engaged	CbTRUE CbTRUE = FALSE	4 seconds out of a 5 seconds window	Type B, 2 Trips

Component/System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value(s)	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
Bus-Off detected on	U007500	This fault is set if Communication CAN Bus 1	Bus Off Event on CAN Bus 1	= TRUE	U007500_ENABLE	= "enabled"	2.0 sector pass	Туре В
Communication CAN Bus 1		enters the Bus-Off state	FOR	>= 5.0 seconds			5.0 sec for fail	2 Trips
					Vehicle Supply Voltage	>= k_Battery Voltage Low Threshold (7V)		
					Any participating Partial Network	= Active		
					FOR	>= k_Control Module Communication Bus Off		
2 0 1 1 1 1						Power Mode Time		
Bus-Off detected on	0007300	This fault is set if Communication CAN Bus 2	Bus Off Event on CAN Bus 2		U007300_ENABLE	= "enabled"	2.0 sector pass	Type B
Communication CAN Bus 2		lenters the Bus-On state	FOR	>= 5.0 seconds	Vahiala Supply Valtage	- k Pottony Voltago Low Throshold (7)()	5.0 sector fail	z mps
						>= K_Battery Voltage Low Threshold (7V)		
					Any participating Partial Network			
					FOR	>- k. Control Module Communication Bus Off		
						Power Mode Time		
Bus-Off detected on	U007400	This fault is set if Communication CAN Bus 3	Bus Off Event on CAN Bus 3	= TRUE	U007400_ENABLE	= "enabled"	2.0 sector pass	Туре В
Communication CAN Bus 3		enters the Bus-Off state	FOR	>= 5.0 seconds			5.0 sec for fail	2 Trips
					Vehicle Supply Voltage	>= k_Battery Voltage Low Threshold (7V)		
					Any participating Partial Network	= Active		
					FOR	>= k_Control Module Communication Bus Off		
						Power Mode Time		
Bus-Off detected on	U007B00	This fault is set if Communication CAN Bus 5	Bus Off Event on CAN Bus 5	= TRUE	U007B00_ENABLE	= "enabled"	2.0 sector pass	Туре В
Communication CAN Bus 5		enters the Bus-Off state	FOR	>= 5.0 seconds			5.0 sec for fail	2 Trips
					Vehicle Supply Voltage	>= k_Battery Voltage Low Threshold (7V)		
					Any participating Partial Network	= Active		
					FOR	>= K_Control Module Communication Bus Off		
Bus-Off detected on	11007800	This fault is set if Communication CAN Bus 9	Bus Off Event on CAN Bus 9			- "enabled"	2.0 sector pass	Type B
Communication CAN Bus 9	0007000	enters the Bus-Off state	FOR	>= 5.0 seconds			5.0 sec for fail	2 Trips
					Vehicle Supply Voltage	>= k Battery Voltage Low Threshold (7V)		
					Any participating Partial Network	= Active		
					FOR	>= k_Control Module Communication Bus Off		
						Power Mode Time		
Lost Communication with DEFC	U010E00	This monitoring shall check a supervised message	Supervised message not received	= TRUE	UOIOEOO.ENABLE	= "enabled"	6.5 sec	Туре В
Detected		from the DEFC for communication status. If the	FOR	>= 2.5 x nominal periodic rate				2 Trips
		CGM has not received the message per the	WHERE		Vehicle Supply Voltage	>= k_Battery Voltage Low Threshold (7V)		
		malfunction criteria and threshold values and	nominal periodic rate	= 1 second				
		subject to the secondary parameters and enable	with an additional delay	= 4 seconds	Any participating Partial Network	= Active		
		conditions, then this fault shall be set.			FOR	>= k_Lost Communication Power Mode Time		
	11044000			триг				Truch
Lost Communication with	0011000	I his monitoring shall check a supervised message	Supervised message not received			= "enabled"	6.5 SEC	Type B
ECF_MC Detected		the CCM has not received the message next he		>= 2.5 x nominal periodic rate	Vahiala Supply Valtage	- k Pottony Voltago Low Threshold (7)()		∠ mps
		malfunction criteria and threshold voluce and	nominal periodic rate	- 1 second	venicie Supply voltage			
		subject to the secondary parameters and enable	with an additional delay	- 4 seconds	Any participating Partial Network	= Active		
		conditions, then this fault shall be set			FOR	>= k Lost Communication Power Mode Time		

Component/System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value(s)	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
Lost Communication with	U011100	This monitoring shall check a supervised message	Supervised message not received	= TRUE	UOIIIOO.ENABLE	= "enabled"	6.5 sec	Туре В
BSM_MH Detected		from the BSM_MH for communication status. If	FOR	>= 2.5 x nominal periodic rate				2 Trips
		the CGM has not received the message per the	WHERE		Vehicle Supply Voltage	>= k_Battery Voltage Low Threshold (7V)		
		malfunction criteria and threshold values and	nominal periodic rate	= 1 second				
		subject to the secondary parameters and enable	with an additional delay	= 4 seconds	Any participating Partial Network	= Active		
		conditions, then this fault shall be set.			FOR	>= k_Lost Communication Power Mode Time		
Lost Communication with BCM	U014000	This monitoring shall check a supervised message	Supervised message not received	= TRUE	U014000_ENABLE	= "enabled"	6.5 sec	Туре В
Detected		from the BCM for communication status. If the	FOR	>= 2.5 x nominal periodic rate				2 Trips
		CGM has not received the message per the	WHERE		Vehicle Supply Voltage	>= k_Battery Voltage Low Threshold (7V)		
		malfunction criteria and threshold values and	nominal periodic rate	= 1 second				
		subject to the secondary parameters and enable	with an additional delay	= 4 seconds	Any participating Partial Network	= Active		
		conditions, then this fault shall be set.			FOR	>= k_Lost Communication Power Mode Time		
Lost Communication with	U016400	This monitoring shall check a supervised message	Supervised message not received	= TRUE	U016400_ENABLE	= "enabled"	6.5 sec	Туре В
HVAC_? Detected		from the HVAC_? for communication status. If the	FOR	>= 2.5 x nominal periodic rate				2 Trips
		CGM has not received the message per the	WHERE		Vehicle Supply Voltage	>= k_Battery Voltage Low Threshold (7V)		
		malfunction criteria and threshold values and	nominal periodic rate	= 1 second				
		subject to the secondary parameters and enable	with an additional delay	= 4 seconds	Any participating Partial Network	= Active		
		conditions, then this fault shall be set.			FOR	>= k_Lost Communication Power Mode Time		
Lost Communication with LIBI	UO1BFOO	This monitoring shall check a supervised message	Supervised message not received	= TRUE	UOIBFOO.ENABLE	= "enabled"	6.5 sec	Туре В
Detected		from the LIBI for communication status. If the	FOR	>= 2.5 x nominal periodic rate				2 Trips
		CGM has not received the message per the	WHERE		Vehicle Supply Voltage	>= k_Battery Voltage Low Threshold (7V)		
		malfunction criteria and threshold values and	nominal periodic rate	= 1 second				
		subject to the secondary parameters and enable	with an additional delay	= 4 seconds	Any participating Partial Network	= Active		
		conditions, then this fault shall be set.			FOR	>= k_Lost Communication Power Mode Time		
Lost Communication with VICM	U160D00	This monitoring shall check a supervised message	Supervised message not received	= TRUE	U160D00_ENABLE	= "enabled"	6.5 sec	Туре В
Detected on CAN2		from the VICM for communication status on CAN	FOR	>= 2.5 x nominal periodic rate				2 Trips
		channel 2. If the CGM has not received the	WHERE		Vehicle Supply Voltage	>= k_Battery Voltage Low Threshold (7V)		
		message per the malfunction criteria and	nominal periodic rate	= 1 second				
		threshold values and subject to the secondary	with an additional delay	= 4 seconds	Any participating Partial Network	= Active		
		parameters and enable conditions, then this fault			FOR	>= k_Lost Communication Power Mode Time		
		shall be set.						
Lost Communication with BSM	U160E00	This monitoring shall check a supervised message	Supervised message not received	= TRUE	U160E00_ENABLE	= "enabled"	6.5 sec	Туре В
Detected on CAN3		from the BSM for communication status on CAN	FOR	>= 2.5 x nominal periodic rate				2 Trips
		channel 3. If the CGM has not received the	WHERE		Vehicle Supply Voltage	>= k_Battery Voltage Low Threshold (7V)		
		message per the malfunction criteria and	nominal periodic rate	= 1 second				
		threshold values and subject to the secondary	with an additional delay	= 4 seconds	Any participating Partial Network	= Active		
		parameters and enable conditions, then this fault			FOR	>= k_Lost Communication Power Mode Time		
Lost Communication with EBCM	U161000	This monitoring shall check a supervised message	Supervised message not received	= TRUE	U161000_ENABLE	= "enabled"	6.5 sec	Туре В
Detected on CAN2		from the EBCM for communication status on CAN	FOR	>= 2.5 x nominal periodic rate				2 Trips
		channel 2. If the CGM has not received the	WHERE		Vehicle Supply Voltage	>= k_Battery Voltage Low Threshold (7V)		
		message per the malfunction criteria and	nominal periodic rate	= 1 second				
		threshold values and subject to the secondary	with an additional delay	= 4 seconds	Any participating Partial Network	= Active		
		parameters and enable conditions, then this fault			FOR	>= k_Lost Communication Power Mode Time		
		shall be set.						
Component/System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value(s)	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
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Lost Communication with ECM	U161100	This monitoring shall check a supervised message	Supervised message not received	= TRUE	U161100_ENABLE	= "enabled"	6.5 sec	Туре В
Detected on CAN2		from the ECM for communication status on CAN	FOR	>= 2.5 x nominal periodic rate				2 Trips
		channel 2. If the CGM has not received the	WHERE		Vehicle Supply Voltage	>= k_Battery Voltage Low Threshold (7V)		
		message per the malfunction criteria and	nominal periodic rate	= 1 second				
		threshold values and subject to the secondary	with an additional delay	= 4 seconds	Any participating Partial Network	= Active		
		parameters and enable conditions, then this fault			FOR	>= k_Lost Communication Power Mode Time		
		shall be set.						
Lost Communication with	U161200	This monitoring shall check a supervised message	Supervised message not received	= TRUE	U161200_ENABLE	= "enabled"	6.5 sec	Туре В
ECP_X1Detected on CAN2		from the ECP_X1for communication status on	FOR	>= 2.5 x nominal periodic rate				2 Trips
		CAN channel 2. If the CGM has not received the	WHERE		Vehicle Supply Voltage	>= k_Battery Voltage Low Threshold (7V)		
		message per the malfunction criteria and	nominal periodic rate	= 1 second				
		threshold values and subject to the secondary	with an additional delay	= 4 seconds	Any participating Partial Network	= Active		
		parameters and enable conditions, then this fault			FOR	>= k_Lost Communication Power Mode Time		
		shall be set.						
Lost Communication with	U161300	This monitoring shall check a supervised message	Supervised message not received	= TRUE	U161300_ENABLE	= "enabled"	6.5 sec	Туре В
ECP_X1Detected on CAN3		from the ECP_X1for communication status on	FOR	>= 2.5 x nominal periodic rate				2 Trips
		CAN channel 3. If the CGM has not received the	WHERE		Vehicle Supply Voltage	>= k_Battery Voltage Low Threshold (7V)		
		message per the malfunction criteria and	nominal periodic rate	= 1 second				
		threshold values and subject to the secondary	with an additional delay	= 4 seconds	Any participating Partial Network			
		parameters and enable conditions, then this fault			FOR	>= k_Lost Communication Power Mode Time		
	11400500	shall be set.						
Lost Communication with VICM	0163500	This monitoring shall check a supervised message	Supervised message not received		U163500_ENABLE	= "enabled"	6.5 sec	Туре В
Detected on CAN9		from the VICM for communication status on CAN	FOR	>= 2.5 x nominal periodic rate				2 Trips
		channel 9. If the CGM has not received the		4	Venicie Supply Voltage	>= K_Battery Voltage Low Threshold (7V)		
		message per the malfunction criteria and	nominal periodic rate	= 1 second	Any portion of a Dortiol Notwork	A stille		
		threshold values and subject to the secondary	with an additional delay	= 4 seconds	Any participating Partial Network	= Active		
		parameters and enable conditions, then this fault			FOR	>= K_LOSt Communication Power Mode Time		
Lost Communication with EPCM	1162000	Shall be set.	Supervised message net received			- "opoblod"	6.5.000	
Detected on CAN3	0103900	from the EBCM for communication status on CAN		$>-2.5 \times nominal periodic rate$			0.5 Sec	2 Trips
Delected on CANS		channel 3. If the CCM has not received the			Vehicle Supply Voltage	- k Battery Voltage Low Threshold (7)		2 11105
		message per the malfunction criteria and	nominal periodic rate	- 1 second				
		threshold values and subject to the secondary	with an additional delay		Any participating Partial Network			
		narameters and enable conditions, then this fault				>= k Lost Communication Power Mode Time		
		shall be set						
Lost Communication with SIB	U163C00	This monitoring shall check a supervised message	Supervised message not received	= TRUF	U163C00 ENABLE	= "enabled"	6.5 sec	Type B
Detected on CAN1	0100000	from the SIB for communication status on CAN	FOR	$>= 2.5 \times nominal periodic rate$			0.0 000	2 Trips
		channel 1. If the CGM has not received the	WHERE		Vehicle Supply Voltage	>= k Battery Voltage I ow Threshold (7V)		
		message per the malfunction criteria and	nominal periodic rate	= 1 second				
		threshold values and subject to the secondary	with an additional delay	= 4 seconds	Any participating Partial Network	= Active		
		parameters and enable conditions, then this fault			FOR	>= k Lost Communication Power Mode Time		
		shall be set.				_		
Lost Communication with TCM	U164300	This monitoring shall check a supervised message	Supervised message not received	= TRUE	U164300_ENABLE	= "enabled"	6.5 sec	Туре В
Detected on CAN2		from the TCM for communication status on CAN	FOR	>= 2.5 x nominal periodic rate				2 Trips
		channel 2. If the CGM has not received the	WHERE		Vehicle Supply Voltage	>= k_Battery Voltage Low Threshold (7V)		
		message per the malfunction criteria and	nominal periodic rate	= 1 second				
		threshold values and subject to the secondary	with an additional delay	= 4 seconds	Any participating Partial Network	= Active		
		parameters and enable conditions, then this fault			FOR	>= k_Lost Communication Power Mode Time		
		shall be set.						

Component/System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value(s)	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
Lost Communication with CSM	U164E00	This monitoring shall check a supervised message	Supervised message not received	= TRUE	U164E00_ENABLE	= "enabled"	6.5 sec	Туре В
Detected on CAN5		from the CSM for communication status on CAN	FOR	>= 2.5 x nominal periodic rate				2 Trips
		channel 5. If the CGM has not received the	WHERE		Vehicle Supply Voltage	>= k_Battery Voltage Low Threshold (7V)		
		message per the malfunction criteria and	nominal periodic rate	= 1 second				
		threshold values and subject to the secondary	with an additional delay	= 4 seconds	Any participating Partial Network	= Active		
		parameters and enable conditions, then this fault			FOR	>= k_Lost Communication Power Mode Time		
		shall be set.						
Lost Communication with VECM	U165B00	This monitoring shall check a supervised message	Supervised message not received	= TRUE	U165B00_ENABLE	= "enabled"	6.5 sec	Туре В
Detected on CAN2		from the VECM for communication status on CAN	FOR	>= 2.5 x nominal periodic rate				2 Trips
		channel 2. If the CGM has not received the	WHERE		Vehicle Supply Voltage	>= k_Battery Voltage Low Threshold (7V)		
		message per the malfunction criteria and	nominal periodic rate	= 1 second				
		threshold values and subject to the secondary	with an additional delay	= 4 seconds	Any participating Partial Network	= Active		
		parameters and enable conditions, then this fault			FOR	>= k_Lost Communication Power Mode Time		
		shall be set.						
Lost Communication with VECM	U165C00	This monitoring shall check a supervised message	Supervised message not received	= TRUE	U165C00_ENABLE	= "enabled"	6.5 sec	Туре В
Detected on CAN9		from the VECM for communication status on CAN	FOR	>= 2.5 x nominal periodic rate				2 Trips
		channel 9. If the CGM has not received the	WHERE		Vehicle Supply Voltage	>= k_Battery Voltage Low Threshold (7V)		
		message per the malfunction criteria and	nominal periodic rate	= 1 second				
		threshold values and subject to the secondary	with an additional delay	= 4 seconds	Any participating Partial Network	= Active		
		parameters and enable conditions, then this fault			FOR	>= k_Lost Communication Power Mode Time		
		shall be set.						
Lost Communication with ECM	U181800	This monitoring shall check a supervised message	Supervised message not received	= TRUE	U181800_ENABLE	= "enabled"	6.5 sec	Туре В
Detected on CAN3		from the ICCM for communication status. If the	FOR	>= 2.5 x nominal periodic rate				2 Trips
		CGM has not received the message per the	WHERE		Vehicle Supply Voltage	>= k_Battery Voltage Low Threshold (7V)		
		malfunction criteria and threshold values and	nominal periodic rate	= 1 second				
		subject to the secondary parameters and enable	with an additional delay	= 4 seconds	Any participating Partial Network	= Active		
		conditions, then this fault shall be set.			FOR	>= k_Lost Communication Power Mode Time		
Key Table Not Provisioned	U196000	Upon start up, if the key table has not been	All key slots are provisioned	= False	In Vehicle Message Authentication Supported	= True	250 msec	Туре В
		provisioned, this fault is set. If the table is, or	OR					2 Trips
		becomes, provisioned, it is cleared.	Receipt of ERC_KEY_EMPTY from security		Vehicle Supply Voltage	>= k_Battery Voltage Low Threshold (7V)		
			peripheral					
Security Peripheral Performance	U196100	This diagnostic monitors the security peripheral	Security peripheral has internal fault	= True	Vehicle Supply Voltage	>= k_Battery Voltage Low Threshold (7V)	Immediate upon	Туре В
		and if the security peripheral indicates a fault or					fault. 50 msec	2 Trips
		the key table is not provisioned, then this fault is			Any participating Partial Network	= Active	task interval.	
		set. Otherwise, it is cleared.			FOR	>=5 seconds		
Serial Data Message	U196200	This diagnostic monitors for serial data message	Serial data authentication failure		In Vehicle Message Authentication Supported	= True	Depends on	Туре В
Authentication Failure		authentication failures. If X (default = 3) failures	instances on a key slot	>=			calibration	2 Trips
		occur on a particular key slot, the fault is set. If X-		K_ERRH_C_FailedAuthentication	n Vehicle Supply Voltage	>= k_Battery Voltage Low Threshold (7V)	setting (count of	
		1 messages on a failed key slot authenticate, the		Counter for the slot			authentication	
		fault is cleared.			U196100 is set	= False	errors).	
					Any participating Partial Notwork			
BCM Invalid Data	11042200	This diagnostic monitors for serial data messages	BCM serial data - MAC or ARC - failure			- "enabled"	Depends on	Type B
	5072200	from the BCM with safety security protection or	linstances	>=XofY			calibration	2 Trips
		continuous operation failures. An adjustable			Vehicle Supply Voltage	$>= k$ Battery Voltage I ow Threshold (7\/)	setting (count of	2 11103
		debounce strategy (ex X of V) is used					bound	
					Any participating Partial Network	= Active	messages)	
					FOR	>=5 seconds		
	l							

CEM back Instrumental problem interpretation in the instrumentation is present in the instrumentation is presen	Component/System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value(s)	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
Image: space of the s	ECM Invalid Data	U040100	This diagnostic monitors for serial data messages	ECM serial data - MAC or ARC - failure		U040100_ENABLE	= "enabled"	Depends on	Туре В
Image: space of the space o			from the ECM with safety, security, protection or	instances	>=XofY			calibration	2 Trips
Second strategy (sk, XX /*) is used. Second strategy (sk, XX /*) is used. Any periodicity physical Memory is used. No. 5 seconds Anote is used. - 5 seconds Includic - 5			continuous operation failures. An adjustable			Vehicle Supply Voltage	>= k_Battery Voltage Low Threshold (7V)	setting (count of	
colActive<			debounce strategy (ex. X of Y) is used.					invalid	
TCAI invalid Data Up6400 The diagraphic monitors for social data messages from the TCA white data was samply (at. Xel Y) is used. TCAI marked data messages invaluences TCAI m						Any participating Partial Network	= Active	messages).	
CEX Invalid Data CDM (and) This diagnosis monitor for earliel data readage CDM (and) data - AACor ARC - taure Vex OV Verified Supply Valuage Active Describe Cold						FOR	>=5 seconds		
Prom the LWWith allow, 34 under 1, 50 with allow, 34 with all	TCM Invalid Data	U040200	This diagnostic monitors for serial data messages	TCM serial data - MAC or ARC - failure		U040200_ENABLE	= "enabled"	Depends on	Туре В
Control Subjects Control Subjects<			from the TCM with safety, security, protection or	instances	>=XofY) (a biala Osma ha) (a ba an	b. Detters Malters Leve Threads and (7) ()	calibration	2 Trips
Image: second status (ger. A. U.) y a used. Become second status (ger. A. U.) y a used. Any carticipating Partial Network (CR PAR) Any participating Partial Network (CR PAR			continuous operation failures. An adjustable			Venicie Supply Voltage	>= K_Battery Voltage Low Threshold (7V)	setting (count of	
condc			debounce strategy (ex. X of Y) is used.			Any participating Partial Natwork		Invalid	
BSCMInvalid Data UG41800 This diagnostic members for setal data message. BCM Merit data - MAC or ARC - failure reminuus operation failures. An adjustable debutes at rategy (ex. Xof Y) is used. Point Diagnostic advances Point Diagnostic advances <th< td=""><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td>messages).</td><td></td></th<>								messages).	
Contract Contr	BSCM Invalid Data	110/1200	This diagnostic monitors for sorial data massages	BSCM serial data - MAC or ABC - failure			= "enabled"	Doponds on	Tupo B
Image: specific products operation failures. An adjustable continuous operation failures failures. An adjustable continuous operation failures. An adjustable contine failures. An adjustable continuous operation failures. An adjus	Dociminivalid Data	0041800	from the BSCM with safety security protection or	instances	>-XofX			calibration	2 Trips
bit in the problem bit in the pr			continuous operation failures. An adjustable			Vehicle Supply Voltage	>= k Battery Voltage Low Threshold (7V)	setting (count of	2 1103
Any participating Parial Network point Antion point Any participating Parial Network point Antion point Antion point Any participating Parial Network point Antion point Antion point Any participating Parial Network point Antion point A			debounce strategy (ex. X of Y) is used					invalid	
Image: Control Indication Self Learn Not opposite indicates when the self learn Point is disgnassic indicates when the self learn Point is disgnassic indicates when the self learn Point P						Any participating Partial Network	= Active	messages).	
ECUIDentification Self Learn Not U197700 This diagnostic indicates when the self learn execution not completed = TRUE K_CGM Self Learn Did Not Execute Diagnostic Enable = True Monitored at task interval of 2 Trips Completed vehicle Supply Voltage = K_Battery Votage Low Threshold (7V) Soft earn Not Execute Diagnostic Enable = True Monitored at task interval of 2 Trips ECUIDentification Self Learn Null U198800 This diagnostic indicates when the ECU Identification List NVM Corruption Invalid ECUIDentification List NVM Corruption Diagnostic Enable = CGM Self Learn Invalid Diagnostic Enable = True Monitored at task interval of 2 Trips ECUIDentification List Not More Participating Partial Network reacting Partial Network = Active = Acti						FOR	>=5 seconds	incoorageo).	
Completed execution has not completed. execution has not completed. execution has not completed. enable	ECU Identification Self Learn Not	U197700	This diagnostic indicates when the self learn	Self learn execution not completed	= TRUE	k CGM Self Learn Did Not Execute Diagnostic		Monitored at	Туре В
Image: Substrate Image: Substrate Sobe: Substrate Sobe: Substrate Sobe: Substrate Sobe: Sobe	Completed		execution has not completed.			Enable	= True	task interval of	2 Trips
Image: series of the series								50 msec.	
Image: series of the series						Vehicle Supply Voltage	>= k_Battery Voltage Low Threshold (7V)		
Image: series of the series									
Image: sec: sec: sec: sec: sec: sec: sec: se						Any participating Partial Network	= Active		
Image: constraint of the constr						FOR	>= k_CGM Self Learn Did Not Execute Power		
ECUIDENTIFICATION Self Learn U198800 This diagnostic indicates when the ECU learn line tasbecome corrupted or the learnification List hasbecome corrupted but he diagnostic Eault OR VIN does not match. EAU ECUID ACTION CORRUPT AND ACTION CO							Mode Time		
Invalid Identification List has become corrupted or the VIN does not match. Diagnostic Fault Or VIN does not match. = Active Vehicle Supply Voltage >= k_Battery Voltage Low Threshold (7V) 100 msec. 100 msec. <td>ECUIdentification Self Learn</td> <td>U198B00</td> <td>This diagnostic indicates when the ECU</td> <td>ECU Identification List NVM Corruption</td> <td></td> <td>k_CGM Self Learn Invalid Diagnostic Enable</td> <td>= True</td> <td>Monitored at</td> <td>Туре В</td>	ECUIdentification Self Learn	U198B00	This diagnostic indicates when the ECU	ECU Identification List NVM Corruption		k_CGM Self Learn Invalid Diagnostic Enable	= True	Monitored at	Туре В
VIN does not match. OR VIN Mismatch Fault OR VIN Mismatch Fault Active Active Active Active Active Active Active Active >=k_CGM Self Learn Invalid Power Mode Time Image: Control Module General has completed but the diagnostic address list cannot be restored from NVM. Diagnostic address list cannot be restored from NVM TruE U35B900_ENABLE vehicle Supply Voltage ="enabled" At star-up (ignition of to propulsion) Type B Internal Control Module Random Access Memory (RAM) P060400 This DTC is set when a RAM ECCfailure is detected. This is run upon start-up. RAM ECC failure detected = TRUE None. Immediately cannot be restored from NVM. Immediately upon start-up when fault Type B Internal Control Module Read Only Memory (ROM) P060500 This DTC is set when a ROM ECC failure is detected. This is run upon start-up. RMECC failure detected = TRUE None. Immediately cannot be restored from NVM. Type B Internal Control Module Read Only Memory (ROM) P060500 This DTC is set when a ROM ECC failure is detected. This is run upon start-up. RMECC failure detected = TRUE None. Immediately cannot be restored from NVM. Type B Internal Control Module Read Only Memory (ROM) P060500 This DTC is set when a ROM ECC failure is detected. This is run upon start-up.	Invalid		Identification List has become corrupted or the	Diagnostic Fault	= Active			task interval of	2 Trips
Image: series and series			VIN does not match.	OR		Vehicle Supply Voltage	>= k_Battery Voltage Low Threshold (7V)	100 msec.	
Any participating Partial Network = Active FOR = Active FOR = Active >= k_CGM Self Leam Invalid Power Mode Time Image: Time Self Leam Invalid Power Mode				VIN Mismatch Fault	= Active				
Control Module General Memory Failure U358900 The CGM shall mature this DTC when Self-Learn has completed but the diagnostic address list cannot be restored from NVM. Diagnostic address list cannot be restored from NVM Diagnostic address list cannot be restored from NVM U358900_ENABLE whice Supply Voltage = "enabled" At start-up (ignition off to run or propulsion) Type B Internal Control Module Random Access Memory (RAM) P060400 This DTC is set when a RAM ECC failure is detected. This is run upon start-up. RAM ECC failure detected = TRUE None. Immediately when fault Type B 2 Trips Internal Control Module Reado P06500 This DTC is set when a RAM ECC failure is detected. This is run upon start-up. RAM ECC failure detected = TRUE None. Immediately when fault Trype B 2 Trips Only Memory (ROM) P06500 This DTC is set when a ROM ECC failure is detected. This is run upon start-up. ROM ECC failure detected = TRUE None. Immediately when fault Trype B 2 Trips Only Memory (ROM) P06500 This DTC is set when a ROM ECC failure is detected. This is run upon start-up. ROM ECC failure detected = TRUE None. Immediately when fault Trips 2 Trips Zirips Zirips Zirips Zirips Zirips						Any participating Partial Network			
Control Module General 033B900 The Cold shall mature this DTC wene Seri-Learn Diagnostic address list cannot be restored Type B Memory Failure has completed but the diagnostic address list cannot be restored from NVM. = TRUE Vehicle Supply Voltage >= k_Battery Voltage Low Threshold (7V) Immediately true of tr				Discuss of a state of the second state of the			>= k_CGM Self Learn Invalid Power Mode Time	At stant sur	Torre D
Internal Control Module Random P060400 This DTC is set when a RAM ECC failure is detected. This is run upon start-up. RAM ECC failure detected = TRUE None. Immediately Immediately Type B Internal Control Module Random P060400 This DTC is set when a RAM ECC failure is detected. This is run upon start-up. RAM ECC failure detected = TRUE None. Immediately Immediately Type B Internal Control Module Random P060500 This DTC is set when a ROM ECC failure is detected. This is run upon start-up. ROM ECC failure detected = TRUE None. Immediately Immediately Type B Internal Control Module Read Only Memory (ROM) P060500 This DTC is set when a ROM ECC failure detected = TRUE None. Immediately Immediately Type B Upon start-up detected. This is run upon start-up. ROM ECC failure detected = TRUE None. Immediately Type B Upon start-up detected. This is run upon start-up. ROM ECC failure detected = TRUE None. Immediately Type B Upon start-up upon start-up upon start-up Upon start-up Upon start-up Trips	Control Module General	0328900	The CGM shall mature this DTC when Self-Learn			U35B900_ENABLE	= enabled	At start-up	Type B
Internal Control Module Random Access Memory (RAM) P060400 This DTC is set when a RAM ECC failure is detected. This is run upon start-up. RAM ECC failure detected TUE None. Immediately access Immediately access Immediately between a RAM ECC failure is detected. This is run upon start-up. RAM ECC failure detected TUE None. Immediately access Immediately between a RAM ECC failure is detected. This is run upon start-up. Type B Internal Control Module Read Only Memory (ROM) P06500 This DTC is set when a ROM ECC failure is detected. This is run upon start-up. ROM ECC failure detected TUE None. Immediately access Immediately upon start-up when fault Type B Only Memory (ROM) Pole Officier This is run upon start-up. ROM ECC failure detected TUE None. Immediately upon start-up when fault Type B			cappet he restored from NV/M			Vahiela Supply Valtage	> - k Battory Voltage Low Threshold (7)()	(ignition on to	2 11105
Internal Control Module Random Access Memory (RAM) P060400 This DTC is set when a RAM ECC failure is detected. This is run upon start-up. RAM ECC failure detected for the fault detected. This is run upon start-up. RAM ECC failure is detected. This is run upon start-up. RAM ECC failure detected for the fault detected. This is run upon start-up. RAM ECC failure detected for the fault detected. This is run upon start-up. RAM ECC failure is detected. This is run upon start-up. RAM ECC failure detected for the fault detected. This is run upon start-up. RAM ECC failure detected for the fault detected. This is run upon start-up. RAM ECC failure detected for the fault detected. This is run upon start-up. RAM ECC failure detected for the fault detected. This is run upon start-up. RAM ECC failure detected for the fault detected for the fault upon start-up. RAM ECC failure detected for the fault detected. This is run upon start-up. RAM ECC failure detected for the fault upon start-up. RAM ECC failure detected for the fault detected for the fault upon start-up. RAM ECC failure detected for the fault upon start-up. RAM ECC failure detected for the fault detected for the fault upon start-up. RAM ECC failure detected for the fault upon start-up. RAM ECC failure detected for the fault upon start-up. RAM ECC failure detected for the fault upon start-up. RAM ECC failure detected for the fault upon start-up. RAM ECC failure detected for the fault upon start-up. RAM ECC failure detected for the fault upon start-up. RAM ECC failure detected for the fault upon start-up upon start-up upon start-up. RAM ECC failure detected for the fault upon start-up upon start-up. RAM ECC failure detected for the fault upon start-up upon start-up upon start-up. RAM ECC failure detected for the fault upon start-up up							S=K_Battery Voltage Low Threshold (7V)	nropulsion)	
Access Memory (RAM) detected. This is run upon start-up. detected is run upon start-up. 2 Trips Internal Control Module Read Only Memory (ROM) ON Memory (ROM) ON Memory (ROM) ON MECC failure is run upon start-up. 2 Trips detected. This is run upon start-up. 2 Trips Memory (ROM) ON Memory (ROM) ON MECC failure is run upon start-up. 2 Trips detected. This is run upon start-up. 2 Trips Detected Detected Detecte	Internal Control Module Random	P060400	This DTC is set when a RAM ECC failure is	RAM ECC failure detected		None			Type B
Internal Control Module Read Only Memory (ROM) P060500 This DTC is set when a ROMECC failure is detected. ROM ECC failure detected = TRUE None. Immediately upon start-up. Type B 2 Trips	Access Memory (RAM)		detected. This is run upon start-up.					upon start-up	2 Trips
Internal Control Module Read Only Memory (ROM)P060500This DTC is set when a ROM ECC failure is detected. This is run upon start-up.ROM ECC failure detected and the control Module Read betected of the control Module Read betected. This is run upon start-up.ROM ECC failure detected and the control Module Read betected of the control Module Read betected. This is run upon start-up.ROM ECC failure detected and the control Module Read betected. This is run upon start-up.ROM ECC failure detected and the control Module Read betected.None.Immediately and the control Module Read betected.Type B a Trips	,							when fault	
Internal Control Module Read Only Memory (ROM) P060500 This DTC is set when a ROM ECC failure is detected. This is run upon start-up. ROM ECC failure detected = TRUE None. Immediately upon start-up when fault								detected.	
Only Memory (ROM) detected. This is run upon start-up. 2 Trips when fault	Internal Control Module Read	P060500	This DTC is set when a ROM ECC failure is	ROM ECC failure detected	= TRUE	None.		Immediately	Туре В
when fault	Only Memory (ROM)		detected. This is run upon start-up.					upon start-up	2 Trips
								when fault	
detected.								detected.	
Vehicle Identification Number - U2C9100 At the beginning of each ignition cycle, confirm Any character in the VIN = {0x00 - 0x29, 0x40, 0x49, 0x4F, U2C9100_ENABLE = "enabled" Type B	Vehicle Identification Number -	U2C9100	At the beginning of each ignition cycle, confirm	Any character in the VIN	= {0x00 - 0x29, 0x40, 0x49, 0x4F,	U2C9100_ENABLE	= "enabled"	Immediately	Туре В
Not Programmed that the VIN contains valid characters. 0x51, 0x5B - OxFF} upon start-up 2 Trips	Not Programmed		that the VIN contains valid characters.		0x51, 0x5B - OxFF}			upon start-up	2 Trips
when fault								when fault	
detected.								detected.	

Component/System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value(s)	Secondary Parameters	Enable Conditions	Time Required	MIL Ilium.
Vehicle Identification Number - Invalid, Incompatible or Mismatches Published VIN	C054600	At the beginning of each ignition cycle, confirm that the VIN has been programmed and matches what is sent on CAN9.	All characters in the VIN	= VIN signal sent via CAN 9	C054600_ENABLE	= "enabled"	Immediately upon start-up when fault	Type B 2 Trips

System/ Component	Fault Code	Variant	Failure Word	Monitoring Strategy Description	Malfunction Criteria	Malfunction Criteria Threshold Value	Secondary Parameters	Enable Condition	Time Required	Frequency of Checks	MIL Illumination
Brake Booster Internal Power Driver				1							
Brake Booster Internal Power Driver	C0595	AII	RBBLM_BridgeDriverError	This monitoring checks if the B6 Bridge Driver ASIC does not answer properly to the uC test	B6 Bridge Driver ASIC is not fault free during the initial test	= True	Ignition state ON	= True	Immediately	Once	Type A, 1 Trip
RangerPenormance		All	RBBLM_BridgeDriverMonError	This monitoring checks the operation mode of the	B6 bridae driver ASIC is not fault free during the operation mode	= True	lanition state ON	= True	Immediately	Continuous	Type A, 1 Trip
				Be bridge driver Asic.	ASIC is not in valid operation mode	= True					
					MOSFET Short circuit failure bit is set	= True		Terr			
		All	RBLM_BridgeDriverNotAvailable	operational state continuously.	(Motor is not available for too long time due to reinitialization	= True	Ignition state ON	= Irue	0-1 [s]	Continuous	Type A, T Trip
					AND	0.41-1					
					OR	= 0.1 [SI					
		All	RBBLM_BridgeDriverShortCircuitDetectionError	This monitoring checks if the voltage drops at	Voltace across the unactuated MOSFET	> -0.21 [VI	Ianition state ON	= True	Immediately	Once	Type A, 1 Trip
				actuated mOSPETTS too high.			Durino initialization	= True			
Brake Booster Motor "A"	C0582	All	RBBLM_BridgeShortedPhase	This monitoring checks if the measured voltage on	Measured voltace at idle	<> 1.65 M	Ianition state ON	= True	Immediately	Once	Type A, 1 Trip
Range/Performance				an idle MOSFE I is not in mid-level.			Durino initialization	= True]
		All	RBBLM_BridgeSwitchiniterror	Driver can be controlled and actuated properly.	OR	< 80 [%1	AND	= Irue	5[s]	Once	Type A, 1 Trip
					Ratio between BMS MON to LJB6 when BMS RVP is switched on OR	< 80 [%1	Failsafe logic test is finished	= True			
					BMS MON voltage when BMS is switched off OR	> 3.5 [VI					
					BMS MON voltage when BMS RVP is switched off OR	> True V]					
					Ratio between BRS MON to UB RD INT when BRS switched on OR	< 80 [%1					
					Ratio between BRS MON to LJB6 when BRS RVP is switched on OR	< 80 [%1					
					BRS MON voltage when BRS is switched off OR	>3.5 [VI					
Brake Booster Temperature					BRS MON voltage when BRS RVP is switched off	>3.5 [V]					
Sensor A											
Brake Booster Temperature Sensor "A" Circuit High	P25C7	All	RBBLM_TemperatureB6Channel1LineHigh	This monitoring checks if the BLM Temperature Signal 1 is shorted to Supply.	Temperature Sensor 1 signal voltage value AND For a consecutive number of times	> 3.27 [V] = 5	Ignition state ON	= True	0.600 [s]	Continuous	Type B, 2 Trips
Brake Booster Temperature Sensor "A" Circuit Low	P25C6	All	RBBLM_TemperatureB6Channel1LineLow	This monitoring checks if the BLM Temperature Signal 1 is shorted to Ground.	Temperature Sensor 1 signal voltage value AND	< 0.2 [VI	Ignition state ON	= True	0.600 [s]	Continuous	Type B, 2 Trips
Brake Booster Temperature				1	For a consecutive number of times	<u> </u>					
Serisor B	00574		DDDI M Terrer DDDD er vild let liet		Tamanakan Ostana Ostana lankan arkar	0.44.04	Lastra data Ol		0.000 (+1	0	T == 0 0
Sensor "B" Circuit High	C057A	All	KbbLM_1emperatureboChannel2Linenign	Signal 2 is shorted to Supply.	AND For a consecutive number of times	= 5		= Irbe	0.600 [S]	Continuous	Trips
Brake Booster Temperature	C0579	All	RBBLM_TemperatureB6Channel2LineLow	This monitoring checks if the BLM Temperature	Temperature Sensor 2 signal voltage value	< 0.03 [V]	Ignition state ON	= True	0.600 [s]	Continuous	Type B, 2
Sensor 'B' Circuit Low				Signal 2 is shorted to Ground.	AND For a consecutive number of times	=5					Inps
Brake Master Cylinder Pressure Sensor											
Brake Master Cylinder	C2A15	All	RBPressSent2LineHigh	This monitoring checks if the DS 10 pressure	Novalid SENT messages received for time	>0.1 [si	Ignition state ON	= True	0-1 [s]	Continuous	Type A, 1 Trip
Pressure Sensor Communication Failure				sensor SENT line is shorted to supply or SENT line is open.	AND Digital level of SENT line is high	= True] .
		All	RBPressSent2LineLow	This monitoring checks if the DS 10 pressure sensor SENT line is shorted to ground or the	Novalid SENT messaces received for time AND	>0.1 [si	Ianition state ON	= True	0-1 [s]	Continuous	Type A, 1 Trip
		All	RBPressSent2Transmission	sensor supply is interrupted. This monitoring checks if there is transmission lerror on SENT line.	Digital level of SENT line is low Transmission error on SENT line	= True = True	Ignition state ON	= True	0-1 [s]	Continuous	Type A, 1 Trip
Brake Master Cylinder	C0572	All	RBPressSent2OutOfRangeHigh	This monitoring checks if pressure value	Pressure value	= 30000 [kPa]	Ignition state ON	= True	0.960 [s]	Continuous	Type A, 1 Trip
Pressure Sensor Out of Rance High				measured by DS 10 pressure sensor is at its maximum value.							
Brake Master Cylinder	C0571	All	RBPressSent2OutOfRangeLow	This monitoring checks if pressure value	Pressure value	= -1480 [kPa]	Ignition state ON	= True	0.960 [s]	Continuous	Type A, 1 Trip
Pressure Sensor Out of Rance Low			-	measured by DS10 pressure sensor is at its minimum value.							1
Brake Master Cylinder	C0574	All	AcmPs_OffsetSC	This monitoring checks if the offset value of	Offset value	> 12 fbarl	lanition state ON	= True	Immediately	Continuous	Type A, 1 Trip
Pressure Sensor Performance				pressure sensor 1 is correct.			AND Brake Pedal is released	= True			1
							AND Acceleration	> 0 fm/s ⁴ 21			
							AND Vehicle speed	> 4 47 Imobi			1
							AND No active preserve build up by IDB-evetern	True			1
		AII	RBPressSent2SensorInternal	This monitoring checks if the DS 10 pressure	Pressure sensor detects a failure	= True	Ignition state ON	= True	0-1 [s]	Continuous	Type A, 1 Trip
Desite Desite Desite of		<u> </u>	l	protocol.		l		l			
A											

System/	Fault	Variant	Failure Word	Monitoring Strategy Description	Malfunction Criteria	Malfunction Criteria Threshold	Secondary Parameters	Enable Condition	Time Required	Frequency of	MIL
Component	Code					Value				Checks	Illumination
Brake Master Cylinder Pistor	C05CC	All	Bsm_Pts10ffset	This monitoring checks if the offset of channel 1 of	Push rod stroke offset	> 1.1 [mm]	Ignition state ON	= True	0-1 [s]	Continuous	Type A, 1 Trip
Position Sensor "A" Circuit Range/Performance				the Pedal Travel Sensor is out of defined range.	OR Push rod stroke offset	< -1.5 [mm]	AND PTS	= fault free			
							AND				
							AND	= completely released			
							Hvdraulic Intervention EPS ACC	= No intervention			
							Vehicle velocity	> Standstill (4.47 mph)			
							AND	- 0 Im/o ^A 21			
		All	RBLiPSISentSensorInternal	This monitoring checks if there is transmission	LiPS detects a failure	= True	Ignition state ON	= True	0-1 [s]	Continuous	Type A, 1 Trip
	I			error on the SENT line.				L	<u> </u>	L	
Brake Master Cylinder Pistor Position Sensor 1 Circuit High Voltage	C05CA	All	RBLiPSOutOfRangeHigh	This monitoring checks if the LiPS sends an out of range high failure information via the slow channel of the SENT protocol.	Slow channel error code shows an out-of-range high	= True	Ignition state ON	= True	0.960 [s]	Continuous	Type A, 1 Trip
Brake Master Cylinder Pistor	COSCB	All	RBLiPSOutOfRangeLow	This monitoring checks if the LiPS sends an out of	Slow channel error code shows an out-of-range low	= True	Ignition state ON	= True	0.960 [s]	Continuous	Type A 1 Trip
Position Sensor 1 Circuit Low Voltage		<u> </u>		range low failure information via the slow channel of the SENT protocol.						<u> </u>	
Internal Communication	C2A13	All	LipsIDTimeOut	This monitoring checks if the ID of the Linear	ID of the Linear position sensor is not received on time	>1-5 [8]	Ignition state ON	= True	0.500 [s]	Once	Type A, 1 Trip
Fault with Brake Master Cylinder Piston Position		All	RBLiPSISentLineHigh	position sensor is received in time. This monitoring checks if the SENT line is shorted	Novalid SENT messages received for time	>0.1 [si	Ignition state ON	= True	0-1 [s]	Continuous	Type A, 1 Trip
Sensor 1			-	to supply.	AND	-				1	
		All	RBLIPSISentLineLow	This monitoring checks if the SENT line is shorted to ground.	Novalid SENT messages received for time AND	>0.1 [si	Ignition state ON	= True	0-1 [s]	Continuous	Type A, 1 Trip
		A11	PBI iPSISentTransmission	This monitoring checks if there is transmission	Digital level of SENT line is low	= True	Institute on	= True	0.4.1-1	Continuous	Tune A 1 Trin
				error on SENT line.		- Huc		- 1100	0-1[8]	Containabas	type x, r tup
Brake Pedal Position Sensor B											
Desite Martine Collector Distant	00500	A.I.		This was in the day of the day of the day		A Charles			0.400.(+)		
Position Sensor "A/B"	0500		Bsm_PtsConsist	between PTS1 and PTS2 signal is too high.	IPIS1 sional- PIS2 sionali	>1.5 (mmi	Ionition state ON AND	= True	0.120 [s]	Continuous	Type A, 1 Trip
Correlation							Sensor Channel 1 and Channel 2	= initialized			
							Sensor Channel 1 and Channel 2	= fault free			
		All	Bsm_PtsNotZeroStage2	This monitoring checks if the brake pedal and the	Brake input rod stroke	> 3 [mm]	Ignition state ON	= True	240 [s]	Continuous	Type A, 1 Trip
				driver for a defined input and time.	Gas throttle	> 20 [%]	Vehicle speed	>4.47 [mph]			
							AND Accelerator nertal annlier (accelerator nertal status) signal is available and	- True			
							valid	- 1100			
Brake Master Cylinder Pistor	COSCE	All	Bsm Pts2Offset	This monitoring checks if the offset of channel 2 of	Push rod stroke offset	> 1 1 [mm]	Ignition state ON	= True	0-1 [e]	Continuous	Type A 1 Trip
Position Sensor "B" Circuit		ĺ		the Pedal Travel Sensor is out of defined range.	OR	1	AND		0 1 [0]		.,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,
Range/Performance					Push rod stroke offset	< -1.5 [mml	PTS AND	= fault free			
							Brake Pedal	= completely released			
							Hvdraulic Intervention EPS ACC	= No intervention			
							AND Vehicle vehicles	- Stondatill (4.47 mph)			
							AND	Standstin (4.47 mph)			
							Acceleration	> 0 [m/s ^A 21			
Brake Master Cylinder Pistor	COSCD	All	RBLiPS2PwmLineHigh	This monitoring checks if the PWM line is shorted	Permanent line high value detected on LiPS PWM signal line	= True	Ignition state ON	= True	0-2 [s]	Continuous	Type A, 1 Trip
Position Sensor "B" Circuit Voltage High	1			to supply.							
Voltage High											_
Brake Master Cylinder Pistor Position Sensor "B" Circuit Voltage Low	C05CE	All	RBLIPS2PwmLineLow	This monitoring checks if the PWM line is shorted to ground.	Permanent line low value detected on LIPS PWM signal line	= True	Ignition state ON	= True	0-2 [s]	Continuous	Type A, 1 Trip
Internal Communication	C2A14	All	RBI iPS2PwmTransmission	This monitoring checks if there is transmission	PWM frequency	< 900 [Hz]	Ionition state ON	= True	0-2 [8]	Continuous	Type A 1 Trip
Fault with Brake Master		· ·		error at PWM line.	OR			1			
Cylinder Piston Position Sensor 2					PWM frequency OR	> 1120 [Hzl					
					PWMduty	< 8.5 [%]					
					PWMdutv	> 92 [%1					
IBrake Pressure Sensor											
Brake Pressure Sensor	C2A16	All	RBPressSentILineHigh	This monitoring checks if the DS 10 pressure	Novalid SENT messages received for time	>0.1[s]	Ignition state ON	= True	0-1 [s]	Continuous	Type A, 1 Trip
Communication Failure	1			sensor SENT line is shorted to supply or SENT	AND	T					1 1
		All	RBPressSentILineLow	This monitoring checks if the DS 10 pressure	Novalid SENT messages received for time	>0.1 [si	Ignition state ON	= True	0-1 [s]	Continuous	Type A, 1 Trip
	1			sensor SENT line is shorted to ground or the	AND Divide level of SENT line is low	- True					
		All	RBPressSentITransmission	This monitoring checks if there is transmission	Transmission error on SENT line	= True	Ignition state ON	= True	0-1 [s]	Continuous	Type A, 1 Trip
		I	l	error on SENT line.		I		L	<u> </u>	L	1
Brake Pressure Sensor Out	C053F	All	PSCPlungerPressureSensorImplausibleHigh	This monitoring checks difference between the	Difference between the measured pressure and the calculated pressure	> calculated max pressure + 2	5 Ignition state ON	= True	0-2 [s]	Continuous	Type A, 1 Trip
of Range High	1			measured pressure from the plunger pressure		[%] from measured pressure.					
	1			motor torque, angular acceleration and best-case		margin.					
	1			gear efficiency.			AND Motor speed	> 3 (rad/s)			
		All	RBPressSentIOutOIRangeHigh	This monitoring checks if pressure value	Pressure value	= 30000 [kPa]	Ignition state ON	= True	0.960 [s]	Continuous	Type A, 1 Trip
				measured by DS 10 pressure sensor is at its maximum value.				L			

System/ Component	Fault Code	Variant	Failure Word	Monitoring Strategy Description	Malfunction Criteria	Malfunction Criteria Threshold Value	Secondary Parameters	Enable Condition	Time Required	Frequency of Checks	MIL Illumination
Brake Pressure Sensor Ou of Range Low	it C053E	All	RBPressSentlOutOfRangeLow	This monitoring checks if pressure value measured by DS 10 pressure sensor is at its minimum value.	Pressure value	= -1480 [kPa]	Ignition state ON	= True	0.960 [s]	Continuous	Type A, 1 Trip
Brake Pressure Sensor Performance		All	AcmPs_OffsetAC	This monitoring checks if the offset value of pressure sensor 2 is correct.	Offset value	> 12 [bar]	Ignition state ON AND	= True	Immediately	Continuous	Type A, 1 Trip
		All	RBPressSentISensorintemal	This monitoring checks if the DS 10 pressure sensor sends an error code on line 1 via SENT	Pressure sensor detects a failure	= True	Bräke Pédán is released Ignition state ON	= True = True	0.1 [s]	Continuous	Type A, 1 Trip
IBrake System Plunger Mot	tor			proces.							
Brake Booster Motor "A" Over Temperature	C05C2	All	MLI_DTCTorqueLimitation_Replacement	This monitoring checks if Brake System plunger motor temperature is overheated.	Motor torque is limited because of torque limitation (high temperature, or low voltage / current limitation) AND	= True	Ignition state ON AND	= True	Immediately	Continuous	Type A, 1 Trip
					Replenishment cannot finish successfully	= True	Torgue limitation AND Renlenishment Actual Pressure is less than Target Pressure	= True			
		All	MLI High TemperatureLeveH	This monitoring checks if the rotor or ECU temperature is higher than a defined level.	ECU temperature	> 120 F°C1	Ignition state ON AND	= True	Immediately	Continuous	Type A, 1 Trip
		All	MLIHighTemperatureLevel2	This monitoring checks if the rotor or ECU temperature is higher than a defined level.	ECU temperature	> 142 [°C]	Brake Booster Temperature Sensors Ignition state ON AND Brake Booster Temperature Sensors	= fault free = True = fault free	Immediately	Continuous	Type A, 1 Trip
Brake Booster Motor "A"	C0594	All	IPC_BackwardBoundNotFound	This monitoring checks if the plunger can reach	Plunger travel	> Plunger length	Ignition state ON	= True	Immediately	Once	Type A, 1 Trip
Penomance		All	MotorTestFailed	This monitoring checks if motor test detects hardware failure.	Motor test detects HW failure	= True	Ignition state ON AND	= True	0.01 [s]	Cyclically every 20 [s]	Type A, 1 Trip
		All	PSCMotorloadToPressureNotPlausibleFast	This monitoring checks if the motor movement is sufficient according to the expected pressure	J Pressure sensor 2 value AND	> 10 fbarl	Motor is actuated Ignition state ON	= False = True	0.015 [s]	Continuous	Type A, 1 Trip
		All	PSCMotorloadToPressureNotPlausibleSlow	value. This monitoring checks if the motor movement is sufficient according to the expected pressure	_ Calculated pressure - Pressure sensor 2 value Calculated pressure - Pressure sensor 2 value OR	> 40 fbari > 40 fbari	Ignition state ON	= True	0.2 [s]	Continuous	Type A, 1 Trip
				value	Pressure sensor 2 value - Calculated pressure	> 108 fbari					
Brake Booster Motor "A" Phase U-V-W Circuit/Oper	C057F	All	PSCImpedanceOutOIRangeHigh	This monitoring checks the motor coil resistance value.	Measured motor coil resistance	> 0.20358 [Ohm]	Ignition state ON	= True	0.120 [s]	Continuous	Type A, 1 Trip
		All	PSC/mpedanceOutOfRangeLow	This monitoring checks the motor coil resistance value.	Measured motor coil resistance	<0.01258[Ohm]	Ignition state ON	= True	0.120 [s]	Continuous	Type A, 1 Trip
			PSCVoltageCurrentNotPlausible	This monitoring checks if the voltage vector is olausible.	Actual voltage vector - Calculated voltage vector	>1.5[V]	Ignition state ON	= True	0.02 [s]	Continuous	Type A, 1 Trip
Brake Booster Motor "A" Phase U-V-W Current High	C0590	All	RBBLM_Current10ffsetHigh	This monitoring checks if there is a Current Measurement 1 offset high failure at ADC internal shunt 1.	Measured current offset derived from ADC internal shunt	> 38 FA1	Ignition state ON AND Electric motor is not actuated	= True	0.2 [s]	Continuous	Type A, 1 Trip
		All	RBBLM_Current2OffsetHigh	This monitoring checks if there is a Current Measurement 2 offset high failure at ADC internal shunt 2.	Measured current offset derived from ADC internal shunt	> 38 [A]	Ignition state ON AND Electric motor is not actuated	= True	0.2 [s]	Continuous	Type A, 1 Trip
		All	RBBLMOBDCurrentIOORHigh	This monitoring checks if the Current Measurement 1 value at B6 bridge at ADC internal shunt is too high.	Measured current derived from ADC internal shunt	> 200 [A]	Ignition state ON	= True	0.3 [s]	Continuous	Type A, 1 Trip
		All	RBBLM_OBDCurrent2OOR High	This monitoring checks if the Current Measurement 2 value at B6 bridge at ADC internal shunt is too high.	Measured current derived from ADC internal shunt	> 200 [A]	Ignition state ON	= True	0.3 [s]	Continuous	Type A, 1 Trip
Brake Booster Motor "A" Phase U-V-W Current Low	v C0591	AII	RBBLM_Current10ffsetLow	This monitoring checks if there is a Current Measurement 1 offset low failure at ADC internal shunt 1	Measured current offset derived from ADC internal shunt	< -38 [AI	Ignition state ON AND	= True	0.2 [s]	Continuous	Type A, 1 Trip
		All	RBBLM_Current2OffsetLow	This monitoring checks if there is a Current Measurement 2 offset low failure at ADC internal	Measured current offset derived from ADC internal shunt	< -38 FA1	Ingrition state of a s	= True	0.2 [s]	Continuous	Type A, 1 Trip
		All	RBBLM OBDCurrentIOORLow	shunt 2. This monitoring checks if the Current Measurement 1 value at B6 bridge at ADC interna' aburt is too low	Measured current derived from ADC internal shunt	< -200 [A]	Electric motor is not actuated Ignition state ON	= True = True	0.3 [s]	Continuous	Type A, 1 Trip
		All	RBBLM OBDCurrent2OORLow	This monitoring checks if the Current Measurement 2 value at B6 bridge at ADC interna	Measured current derived from ADC internal shunt	< -200 [A]	Ignition state ON	= True	0.3 [s]	Continuous	Type A, 1 Trip
IBrake System Plunger Mot Position Sensor	tor			shunt is too low.							
Brake Booster Motor "A"		All	RBBLM RotorCosOutOrRangeHigh	This monitoring checks if the RPS cosine signal is	Raw Cos ADC Value (Cos+ or Cos-)	>4075	Ignition state ON	= True	0.150 [s]	Continuous	Type A. 1 Trip
Position Sensor Circuit Hig	jh .		BBBI M. BotorSieQuiOB opposition	out of range high.	Remuelless volue at the ADC is ease of Sis plus lise menitories	- 0.050 M	Institute state ON	- True	0.01.[e]	Continuous	Tune A. 1 Trie
			KBEM_K00/3in/Otk/Kaigenigin	out of range high.	OR Raw voltage value at the ADC in case of Sin minus line monitoring OR	> 2.252 M	Ignition state ON	= 1100	0.01 [5]		type X, T thp
					Calculated sum derived from transmitted bit pattern signal of Sin plus and Sin minus ADC voltage value	> 4327 [Digit]					
		All	RPS_VectorLength_RangeHigh	This monitoring checks if the vector length value of RPS is out of range high.	Calculated vector length sqrt(sin ⁴ 2+cos ⁴ 2)	>1.14	Ignition state ON	= True	0.01 [s]	Continuous	Type A, 1 Trip
Brake Booster Motor "A"		All	RBBLM_RotorCosOutOfRangeLow	This monitoring checks if the RPS cosine signal is	Raw Cos ADC Value (Cos+ or Cos-)	< 10	Ignition state ON	= True	0.150 [s]	Continuous	Type A, 1 Trip
Position Sensor Circuit Lov	N	AII	RBBLM_RotorSinOutOIRangeLow	out of range low. This monitoring checks if the RPS Sine signal is	Raw voltage value at the ADC in case of Sin plus line monitoring	< 1.047 M	Ignition state ON	= True	0.01 [s]	Continuous	Type A, 1 Trip
				out of range low.	OR Raw voltage value at the ADC in case of Sin minus line monitoring OR	< 1.047 M					
					Calculated sum derived from transmitted bit pattern signal of Sin plus and Sin minus ADC voltage value	< 3876 [Digit]			0.0005 (-1]	
			Kro_vectorLength_KangeLow	RPS is out of rance low.	Carculated vector rength sqrt(sin 2+cos 2)	.0.20		- 108	0.0026 [8]		Type A, 1 Trip

System/	Fault	Variant	Failure Word	Monitoring Strategy Description	Malfunction Criteria	Malfrmction Criteria Threshold	Secondary Parameters	Enable Condition	Time Required	Frequency of	MIL
Component	Code					Value			1	Checks	Illumination
Brake Booster Motor "A"	C058A	All	RPS_RPSAngleAccImplausible	This monitoring checks if there are implausible	Absolute difference of filtered and unfiltered motor speed	>711.2 [rad/s]	Ignition state ON	= True	Immediately	Continuous	Type A, 1 Trip
Position Sensor Circuit		·	DD0 1// to 0	anole iumos.			Include and ON				
Kangerrenonnance			KF3_VEloSumaniplausible	vector lenoth and sums sionals is olausible.	Kato of the KFS vector rength and soms signals		Ignition state ON		0.01 [5]		туре А, т тпр
		All	RBBLM_RotorSumsImplausible	This monitoring checks whether one single sensor	Sensor signal line deviation*	> defined formula based on	Ignition state ON	= True	0.0025 [s]	Continuous	Type A, 1 Trip
				signal line deviates from the other three sensor signal lines.		dynamic threshold					
ICAN Bus 2						•	•	÷.			·
Control Modulo	110072	AU	CANON E BURGEE NETWORK 1	This monitoring shocks if the CAN controller is in a	BusOff status has been detected	- True	Institute state ON	- True	0.250 (e)	Continuous	Tuno R 2
Communication CAN Bus 2	00073	<u></u>	CANSM_E_BOSOFF_NETWORK_T	Bus Off state.	Buson status nas been delected	= fide	Ignition state ON	= nde	0.200 [5]	Continuous	Trips
011				l							1
Invalid Data Received From	U0401	All	RBNet_ComScl_ChsSysBrkAxITrgInfo1_Prtctd_MSG_CAN2_EC	This monitoring checks if the Alive Rolling Count	Number of consecutive occasions when the current value of the Alive	>= 10 f+2/steol	Ionition state ON	= True	0-1 [s]	Continuous	Type B, 2
Engine Control Module -			M_AlvCntError	of the message			AND	T			Trips
Alive / Sequence Counter				Chassis System Brake Axle Torque Information 1			(undervoltage)	= Irue			
				Protected) signal group from Engine Control							
			RBNet ComSci ChsSysBrkAxiTrainfo1 Prtctd MSG CAN2 EC	ModulA is rAO.pivod with the RXOActed value This monitoring checks if the Message	Consecutively detected wrong Message Authentication Code values	>= 10 (+2/step)	Ignition state ON	= True	0-1 [8]	Continuous	Type B. 2
			M_MACError	Authentication Code of the message			AND		[0]		Trips
				Chassis System Brake Axle Torque Information 1			Communication related conditions fulfilled (No error passive, no lundervoltage)	= True			
				Protected) signal group from Engine Control							
			RBNet ComSci SriDat19 Prictid MSG CAN2 MACError	Module is received with the excected value.	Consecutively detected wrong Message Authentication Code values	>= 20 (+2/step)	Ignition state ON	= True	0-2 [8]	Continuous	Type B 2
				Authentication Code of the message			AND				Trips
				'SrIDat19_Prtctd_MSG' (Serial Data 19 Protected) signal group from Engine Control Module is			Communication related conditions fulfilled (No error passive, no lundervoltage)	= True			
				received with the expected value.			didervolage)				
		All	RBNet_ComScl_TmsEstGr_Prtctd_MSG_CAN2_ECM_AlvCntErr	This monitoring checks if the Alive Rolling Count	Number of consecutive occasions when the current value of the Alive	>= 20 (+2/step)	Ignition state ON	= True	0-2 [s]	Continuous	Type B, 2
			or	(Transmission Estimated Gear Protected) signal	Rolling Count is the same as the previous value		AND				Inps
				group from Engine Control Module is received with	h		Communication related conditions fulfilled (No error passive, no	= True			
		All	RBNet ComScl StiDat20 Prictid MSG CAN2 MACError	the expected value. This monitoring checks if the Message	Consecutively detected wrong Message Authentication Code values	>= 10 (+2/step)	undervoltage)	= True	0.25[8]	Continuous	Type B 2
		(Authentication Code of the message			AND		0.00 [0]	1	Trips
				"ActAxITrq_Prtctd_MSG" (Actual Axle Torque Protected) from Engine Control Module is received			Communication related conditions fulfilled (No error passive, no	= True			
		All	RBNet_ComScl_TmsEstGr_Prtctd_MSG_CAN2_ECM_MACError	This monitoring checks if the Message	Consecutively detected wrong Message Authentication Code values	>= 20 f+2/steo)	Ignition state ON	= True	0-2 [s]	Continuous	Type B, 2
				Authentication Code of the message			AND	T	1		Trips
				Gear Protected) signal group from Engine Control			(undervoltage)	= Irue			
		All	RBNet_ComScl_SrlDat26_Prtctd_MSG_CAN2_MACError	This monitoring checks if the Message	Consecutively detected wrong Message Authentication Code values	>= 3 (+2/steo)	Ignition state ON	= True	0.3 [s]	Continuous	Type B, 2
				Authentication Code of the message ActAxITrg Prtctd MSG' (Actual Axle Torque			Communication related conditions fulfilled (No error passive, no	= True			Inps
				Protected) from Engine Control Module is received	l		undervoltage)				
		All	RBNet_ComScl_SrlDat19_Prtctd_MSG_CAN2_AlvCntError	This monitoring checks if the Alive Rolling Count of the message 'SrlDat19 Prtctd MSG' (Serial	Number of consecutive occasions when the current value of the Alive Rolling Count is the same as the previous value	>= 20 (+2/step)	Ignition state ON	= True	0-2 [s]	Continuous	Type B, 2 Trips
				Data 19 Protected) from Engine Control Module is			AND				
				received with the expected value.			Communication related conditions fulfilled (No error passive, no	= True			
		All	RBNet_ComScl_SrlDat20_Prtctd_MSG_CAN2_AlvCntError	This monitoring checks if the Alive Rolling Count	Number of consecutive occasions when the current value of the Alive	>= 10 (+2/step)	Ignition state ON	= True	0.25 [s]	Continuous	Type B, 2
				of the message 'SrIDat20_Prtctd_MSG' (Serial	Rolling Count is the same as the previous value		AND				Trips
				received with the expected value.			Communication related conditions fulfilled (No error passive, no	= True			
				This was included in the Alice Delline Ocean		5 (10)/11/2	undervoltage)		0.5.1-1		T D .0
		<u></u>	RBNet_ComSci_ShDatzo_Photo_MSG_CAN2_AWChterror	of the message 'SrlDat26_Prtctd_MSG' (Serial	Rolling Count is the same as the previous value) = 5 (+2/step)	ignition state ON	= nue	0.0 [6]	Continuous	Trips
				Data 26 Protected) signal group from Engine			AND	T			
				value.			undervoltace)	= Irue			
Transmission Control	00402	All	MENet_ComSci_ChSSysBrkAxiTrginto1_Prictd_MSG_CAN2_TC M_AlvCntError	of the message	Number or consecutive occasions when the current value of the Alive Rolling Count is the same as the previous value	>= 10 (+2/step)	Ignition state UN	= true	U-1 [S]	Continuous	Trips
Module - Alive / Sequence	1			ChsSysBrkAxlTrqInfo1_Prtctd_MSG (Chassis			AND				1
Counter Incorrect / Not Updated				System Brake Axle Torque Information 1 Protected) signal group from Transmission Control			Communication related conditions fulfilled (No error passive, no lundervoltage)	= Irue			
	1	All	RBNet_ComScl_ChsSysBrkAxlTrqInfo1_Prtctd_MSG_CAN2_TC	This monitoring checks if the Message	Consecutively detected wrong Message Authentication Code values	>= 10 (+2/step)	Ignition state ON	= True	0-1 [s]	Continuous	Type B, 2
	1		M_MACError	Authentication Code of the message ChsSysBrkAxITroInfo1 Prtctd MSG CAN2			AND Communication related conditions fulfilled (No error passive no	= True			Trips
	1	I _		signal group from Transmission Control Module is	J		undervoltaoe)	J ⁻		l	
		HP1.ZERV	RBNet_ComScl_ELSDInfo_Prtctd_MSG_CAN2_AlvCntError	This monitoring checks if the Alive Rolling Count	Number of consecutive occasions when the current value of the Alive	>= 12 (+2/step)	Ignition state ON	= True	0.12 [s]	Continuous	Type B, 2
				(Electronic Limited Slip Differential Information	Koning Count is the same as the previous value		AND				mps
				Protected) signal group from Transmission Control Module is received with the expected value			Communication related conditions fulfilled (No error passive, no	= True			
		HP1.ZERV	RBNet_ComScl_ELSDInfo_Prtctd_MSG_CAN2_MACError	This monitoring checks if the Alive Rolling Count	Number of consecutive occasions when the current value of the Alive	>= 20 (+2/step)	Ignition state ON	= True	0-2 [s]	Continuous	Type B, 2
				of the message 'TmsEstGr_Prtctd_MSG'	Rolling Count is the same as the previous value						Trips
	1			group from Transmission Control Module is			Communication related conditions fulfilled (No error passive, no	= True			
	1	I		received with the expected value.	J	00/00/000	undervoltace)	-l	0.0/-1		
	1	All	or	I his monitoring checks if the Alive Rolling Count of the message 'TmsEstGr_Prtctd_MSG'	number or consecutive occasions when the current value of the Alive Rolling Count is the same as the previous value	>= 20 (+2/step)	Ignition state UN	= true	u-2 [8]	Continuous	Trips
	1			(Transmission Estimated Gear Protected) signal			AND				1
	1			group from Transmission Control Module is Ireceived with the expected value			Communication related conditions fulfilled (No error passive, no lundervoltage)	= True			
	1	All	RBNet_ComScl_TmsEstGr_Prtctd_MSG_CAN2_TCM_MACError	This monitoring checks if the Message	Consecutively detected wrong Message Authentication Code values	>= 20 (+2/step)	Ignition state ON	= True	0-2 [s]	Continuous	Type B, 2
	1			Authentication Code of the message			AND	- True			Trips
				Gear Protected) signal group from Transmission			undervoltage)				
Invalid Data Researed from 5		A11	BBNet ComPat ChaRusRichalTrated at Briefd 1900 CANIS FO	This monitoring shocks if the Alive Dation Course	Number of encounting econology when the surrent value of the Aller	- 10 (+2/eten)	Institute state ON	- True	0.47-1	Continuous	Time R 2
Motor Power Train Control	00411	~	P_X1_AlvCntError	of the message	Rolling Count is the same as the previous value	2 (T2/SIEP)	ignoon state on		0-1[8]	Continuous	Trips
Module - Alive / Sequence	1			'ChsSysBrkAxITrqInfo1_Prtctd_MSG_CAN2'	I contract of the second se	1	AND	1	1	I	1 1

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System/ Fai Component Con	ult Variant de	Failure Word	Monitoring Strategy Description	Malfunction Criteria	Malfrinction Criteria Threshold Value	Secondary Parameters	Enable Condition	Time Required	d Frequency of Checks	MIL Illumination
Counter Incorrect / Not Updated			(Chassis System Brake Axle Torque Information 1 Protected) signal group from E-Motor Power Train Control Module is received with the expected			Communication related conditions fulfilled (No error passive, no undervoltage)	= True			
	All	RBNet_ComScl_ChsSysBriAxITrqinIo1_Prtctd_MSG_CAN2_E0 P_X1_MACError	C This monitoring checks if the Message Authentication Code of the message (ChssysBrkAtTrgInto]. Preticul, MSC_CAN2' (Chassis System Brake Axte Torque Information 1 Protected) signal group from E-Motor Power Train Control Module is received with the expected	Consecutively detected wrong Message Authentication Code values	>= 10 f+2/steo)	Ignition state ON AND Communication related conditions fulfilled (No error passive, no undervoltage)	= True = True	0-1 [s]	Continuous	Type B, 2 Trips
	All	RBNet_ComScl_SrlDat31_Prtctd_MSG_CAN2_MACError	This monitoring checks if the Message Authentication Code of the message	Consecutively detected wrong Message Authentication Code values	>= 20 f+2/steo)	Ignition state ON AND	= True	0.2 [5]	Continuous	Type B, 2 Trips
	All	RBNet_ComScl_SrlDat31_Prictid_MSG_CAN2_AlvCntError	STIDat3PricemAG (Serial Data 3) Protected signal group from Hybrid/EV Powertrain Control This monitoring checks if the Alive Rolling Count of the message 'STIDat31_Prictd_MSG' (Serial Data 31 Protected) signal group from Hybrid/EV Powertrain Control Module is received with the	Number of consecutive occasions when the current value of the Alive Rolling Count is the same as the previous value	>= 20 (+2/step)	Communication related conditions fulfilled (No error passive, no lignition state ON AND Communication related conditions fulfilled (No error passive, no	= True	0.2 [s]	Continuous	Type B, 2 Trips
			_ expected value.			undervoltase)				
Invalid Data Received From U0- Vehicle Integration Control Module - Alive / Sequence Counter Incorrect / Not	412 All	RBNet_ComScl_SrlDat26_Prtctd_MSG_CAN2_VICM_MACErro	r This monitoring checks if the Message Authentication Code of the message 'SrIDat26_Prototd_MSG' (Serial Data 26 Protected) signal group from Vehicle Interaction Control	Consecutively detected wrono Messase Authentication Code values	>= 3 f+2/steo)	Isnition state ON AND Communication related conditions fulfilled (No error passive, no Iundervoltane)	= True = True	0.3 [8]	Continuous	Type B, 2 Trips
Updated	All	RBNet_ComScl_SrlDat26_Prictd_MSG_CAN2_VICM_AlvCntEr r	ro This monitoring checks if the Alive Rolling Count of the message 'SrlDat26_Prtctd_MSG' (Serial Data 26 Protected) signal group from Vehicle	Number of consecutive occasions when the current value of the Alive Rollinn Count is thp samp as thp nrpvinns valiip	>= 5 (+2/step)	Ignition state ON AND	= True	0.5 [s]	Continuous	Type B, 2 Trips
			exoected value.			undervoltage)	= True			
Invalid Data Received from U09 Hybrid E-Motor Power Train Control Module - Alive/ Sequence Counter Incorrect	593 All	RBNet_ComScl_ChsSysBrkAxiTrqInfo1_Prtctd_MSG_CAN2_E0 P H1 AlvCntError	C This monitoring checks if the Alive Rolling Count of the message ChSSysBrkAXTrqInfo1_Prictd_MSG_CAN2 (Chassis Swstem Ricke Avic Torque Information 1	Number of consecutive occasions when the current value of the Alive Rolling Count is the same as the previous value	>= 10 (+2/step)	Ignition state ON	= True	0.1 [s]	Continuous	Type B, 2 Trips
/ Not Updated			Protected) signal group from Hybrid E-Motor Power Train Control Module is received with the expected value.			AND				
						Communication related conditions fulfilled (No error passive, no undervoltage)	= True			
	All	RBMet_ComSet_ChsSysBirAxtTrqinto1_Prictd_MSG_CAN2_E0 P_H1_MACError	This monitoring checks if the Message Authentication Code of the message CheSysBriAstTreinol _Priced_MSG_CAN2 (Chessis System Brake Axle Torque Information 1 Protected) signal group from thybrid E-Molor Power Train Control Module is received with the expected value.	Consecutively detected wrong Message Authentication Code values	>= 10 (+2/step)	Ignition state ON	= True	0.1 [s]	Continuous	Type B, 2 Trips
						Communication related conditions fulfilled (No error passive, no undervoltage)	= True			
	All	RBMet, ComSel, TrnsEstGr_Pricid_MSG_CAN2_ECP_H1_AivC Error	a This monitoring checks if the Alve Rolling Count of the message TrmEstOr_Proteid_MSC_CAN2' (Transmission Estimated Gear Protected) signal group from Hybrid E-Motor Power Train Control Module is received with the expected value.	Number of coossecutive accasions when the current value of the Alive Rolling Count is the same as the previous value	>= 20 (+2/step)	Ignition state ON AND	= True	0.2 [s]	Continuous	Type B, 2 Trips
						Communication related conditions fulfilled (No error passive, no undervoltage)	= True			
	All	RBMet_ComSd_TrisEstGr_Pricid_MSG_CAN2_ECP_H1_MAC Error	This monitoring checks if the Message Authentication Code of the message TimsEstGr-Prictal, MSC_CAR2 (Transmission Estimated Gear Protected) signal group from Hybrid E-Motor Power Train Control Module is received with the expected value.	Consecutively detected wrong Message Authentication Code values	>= 20 (+2/step)	Ignition state ON	= True	0.2 [8]	Continuous	Type B, 2 Trips
						Communication related conditions fulfilled (No error passive, no undervoltage)	= True			
Lost Communication with U0	140 All	RBNet_ComScl_BdyGenInfo3_Prtctd_MSG_CAN2_Timeout	This monitoring checks if the message	Messaae is not received for time	>=0.1 fsl	Ignition state ON	= True	0.1 [s]	Continuous	Type B, 2
Body Control Module			BdyGenInfo3_Prtctd_MSG' (Body General Information 3 Protected) signal group from Body Control Module is received within the specified			AND Communication related conditions fulfilled (No error passive, no undervoltage)	= True			Trips
	All	RBNet_ComSci_ExtLgtWshWprinfo_Prtctd_MSG_CAN2_Timec t	u This monitoring checks if the message 'ExtLgtWshWprInfo_Prtctd_MSG' signal group	Messaae is not received for time	>= 3 fsl	Ianition state ON AND	= True	3[s]	Continuous	Type B, 2 Trips

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System/ Component	Fault Code	Variant	Failure Word	Monitoring Strategy Description	Malfunction Criteria	Malfrmction Criteria Threshold Value	Secondary Parameters	Enable Condition	Time Require	d Frequency of Checks	MIL Illumination
	-			from Body Control Module is received within the			Communication related conditions fulfilled (No error passive, no	= True			-
		All	RBNet_ComScl_SysPwrMode_Prtctd_MSG_CAN2_Timeout	specified cycle time. This monitoring checks if the message	Message is not received for time	>= 1.25 Fsl	Ignition state ON	= True	1.25 [s]	Continuous	Type B, 2
				'SysPwrMode_Prtctd_MSG' signal group from Body Control Module is received within the			AND Communication related conditions fulfilled (No error passive, no	= True		1	Trips
		I		specified cycle time.			undervoltace)				
		All	RBNet_ComScl_VehOdoDispVal_Prtctd_MSG_CAN2_Timeout	VehOdoDispVal_Prtctd_MSG' signal group from	Message is not received for time	>= 3 151	Ignition state ON AND	= True	3[8]	Continuous	Trips
				Body Control Module is received within the specified cycle time			Communication related conditions fulfilled (No error passive, no lundervoltace)	= True			
		All	RBNet_ComScl_MSG_9092_CAN2_Timeout	This monitoring checks if the message	Message is not received for time	>= 1.25 Fsl	Ignition state ON	= True	1.25 [s]	Continuous	Type B, 2
				received within the specified cycle time.			Communication related conditions fulfilled (No error passive, no	= True			mps
		All	RBNet_ComScl_MSG_9089_CAN2_Timeout	This monitoring checks if the message	Message is not received for time	>= 3 [s]	Ignition state ON	= True	3[s]	Continuous	Type B, 2
				'MSG_'9089' PDU from Body Control Module is			AND Communication related conditions fulfilled (No error passive, no	- True			Trips
		I				01-1	undervoltace)		0/-1		
		All	RBNet_ComScI_MSG_9094_CAN2_Timeout	MSG_'9094' PDU from Body Control Module is	Message is not received for time	>= 3 [S1	Ignition state ON AND	= True	3[8]	Continuous	Trips
				received within the specified cycle time.			Communication related conditions fulfilled (No error passive, no undervoltace)	= True			
		All	RBNet_ComScl_SrlDat6_Prtctd_MSG_CAN2_Timeout	This monitoring checks if the message	Message is not received for time	>= 3 [si	Ignition state ON	= True	3[8]	Continuous	Type B, 2
				Control Module is received within the specified			Communication related conditions fulfilled (No error passive, no	= True			mps
				cycle time.			undervoltace)				
Lost Communication with Central Gateway Module on	U1608	All	RBNet_ComScl_MSG_2018_CAN2_Timeout	This monitoring checks if the message I'MSG_2018' PDU from Central Gateway Module in	Message is not received for time	>= 0.75 [si	Ignition state ON AND	= True	0.75 [s]	Continuous	Type B, 2 Trips
CAN Bus 2				received within the specified cycle time.			Communication related conditions fulfilled (No error passive, no	= True			
		All	RBNet_ComScl_MSG_2022_CAN2_Timeout	This monitoring checks if the message	Message is not received for time	>= 3 [si	Ignition state ON	= True	3[s]	Continuous	Type B, 2
				'MSG_2022' PDU from Central Gateway Module is received within the specified cycle time.	3		AND Communication related conditions fulfilled (No error passive, no	= True			Trips
			22111 0				undervoltage)		2101	0	T D .0
		All	RBNet_ComSci_MSG_2024_CAN2_Timeout	'MSG_2024' PDU from Central Gateway Module is	s	5= 3 151	AND	= True	2[5]	Continuous	Trips
				received within the specified cycle time.			Communication related conditions fulfilled (No error passive, no undervoltage)	= True			
		All	RBNet_ComScl_MSG_2232_CAN2_Timeout	This monitoring checks if the message	Message is not received for time	>= 3 [si	Ignition state ON AND	= True	3[s]	Continuous	Type B, 2 Trips
				received within the specified cycle time.			Communication related conditions fulfilled (No error passive, no	= True			
_							undervoltage)				
Lost Communication with Engine 12v Starter	U1818	All	RBNet_ComScl_EB_MSG_2002_CAN2_Timeout	This monitoring checks if the message I'FB_MSG_2002_CAN2' PDU from EGI5/Engine	Message is not received for time	>= 0.3 [si	Ignition state ON AND	= True	0.3 [s]	Continuous	Type B, 2 Trips
				12v Starter) is received within the specified cycle			Communication related conditions fulfilled (No error passive, no	= True			
				une			undervoltace)				_
Lost Communication with Vehicle Integration Control	U160D	All	RBNet_ComScI_SrIDat26_Prictd_MSG_CAN2_VICM_Timeout	This monitoring checks if the message ['SrIDat26_Prtctd_MSG' signal group from Vehicle	Message is not received for time	>= 0.3 Fsl	Ignition state ON AND	= True	0.3 [s]	Continuous	Type B, 2 Trips
Module				Integration Control Module is received within the specified cycle time			Communication related conditions fulfilled (No error passive, no lundervoltage)	= True			
Lost Communication with	1114614	A!!	BBNot ComPol TracEorCr Bitatel MSC CAN2 ECM Timoput	This monitoring shocks if the message	Managan in not received for time	0.25 (e)	Institute state ON	- True	0.25 (a)	Continuous	Time R 2
Engine Control Module	01011		KBNet_ComSti_Timestol_Pittid_m3G_CAN2_ECM_Timeout	TrnsEstGr_Prtctd_MSG' signal group from	message is not received for time	x= 0.20 [51	AND	= 1100	0.20 [5]	Continuous	Trips
				Engine Control Module is received within the specified cycle time.			Communication related conditions fulfilled (No error passive, no undervoltace)	= True			
		All	RBNet_ComSci_ChsSysBrkAxiTrginfo1_Prtctd_MSG_CAN2_EC	This monitoring checks if the message	Message is not received for time	>=0.1 [si	Ignition state ON	= True	0-1 [s]	Continuous	Type B, 2 Trine
			m_mmcoux	(Chassis System Brake Axle Torque Information 1			Communication related conditions fulfilled (No error passive, no	= True			inpo
				Protected) signal group from Engine Control Module is received within the specified cycle time.			undervoltage)				
		All	RBNet_ComScl_MSG_2105_CAN2_Timeout	This monitoring checks if the message	Message is not received for time	>= 3 fsl	Ignition state ON	= True	3[s]	Continuous	Type B, 2
				received within the specified cycle time.			Communication related conditions fulfilled (No error passive, no	= True			mps
		All	RBNet_ComScl_MSG_2106_CAN2_Timeout	This monitoring checks if the message	Message is not received for time	>= 0.25 [si	Ignition state ON	= True	0.25 [s]	Continuous	Type B, 2
				'MSG_2106' PDU from Engine Control Module is received within the specified cycle time.			AND Communication related conditions fulfilled (No error passive, no	= True			Trips
		A!!	BBNot ComPat MSC 2110 CAN2 Timoout	This manitoring shocks if the message	Meanage is not received for time	1.25 (e)	undervoltage)	- True	1 25 [e]	Continuous	Turne R. 2
			KBNet_ComSti_MSG_2110_CAN2_11medut	'MSG-2110' PDU from Engine Control Module is	message is not received for time	x= 1.20 [51	AND	= 1100	1.20 [3]	Continuous	Trips
				received within the specified cycle time.			Communication related conditions fulfilled (No error passive, no jundervoltage)	= True			
		All	RBNet_ComScl_MSG_2041_CAN2_Timeout	This monitoring checks if the message	Message is not received for time	>= 0.75 [si	Ignition state ON AND	= True	0.75 [s]	Continuous	Type B, 2 Trips
				received within the specified cycle time.			Communication related conditions fulfilled (No error passive, no	= True			
		All	RBNet_ComScl_MSG_2042_CAN2_Timeout	This monitoring checks if the message	Message is not received for time	>= 0.3 fsl	Ignition state ON	= True	0.3 [s]	Continuous	Type B, 2
				'MSG_2042' PDU from Engine Control Module is received within the specified cycle time.			AND Communication related conditions fulfilled (No error passive, no	= True			Trips
		A11	PBNet ComScI MSG 2058 CAN2 Timeout	This monitoring charge if the massage	Massana is not received for time	>= 3 fel	undervoltage)	- True	3[e]	Continuous	Tune B 2
				'MSG_2058' PDU from Engine Control Module is			AND		2(2)		Trips
		L		received within the specified cycle time.			Communication related conditions fulfilled (No error passive, no undervoltage)	= Irue			
		All	RBNet_ComScl_MSG_2104_CAN2_Timeout	This monitoring checks if the message I'MSG 2104' PDU from Engine Control Module is	Message is not received for time	>= 0.3 fsl	Ignition state ON AND	= True	0.3 [s]	Continuous	Type B, 2 Trips
				received within the specified cycle time.			Communication related conditions fulfilled (No error passive, no	= True			
		All	RBNet_ComScl_MSG_2107_CAN2_Timeout	This monitoring checks if the message	Message is not received for time	>= 3 [si	Ignition state ON	= True	3[s]	Continuous	Type B, 2
				"MSG_2107' PDU from Engine Control Module is received within the specified cycle time.			AND Communication related conditions fulfilled (No error passive, no	= True			Trips
1	1	1					undervoltage)	1			

System/	Fault	Variant	Failure Word	Monitoring Strategy Description	Malfunction Criteria	Malfrmction Criteria Threshold	Secondary Parameters	Enable Condition	Time Required	Frequency of	MIL
Component	Code					Value			1	Checks	Illumination
	-	All	RBNet ComScI MSG 2108 CAN2 Timeout	This monitoring checks if the message	Message is not received for time	>= 3 [8]	Ignition state ON	= True	3[s]	Continuous	Type B. 2
				'MSG_2108' PDU from Engine Control Module is			AND			1	Trips
				received within the specified cycle time.			Communication related conditions fulfilled (No error passive, no	= True			1
		All	RBNet ComScl SrlDat18 Prtctd MSG CAN2 Timeout	This monitoring checks if the message	Message is not received for time	>= 0.25 [si	Ignition state ON	= True	0.25 [8]	Continuous	Type B 2
		1		'SrIDat18_Prtctd_MSG' signal group from Engine			AND	1		1	Trips
				Control Module is received within the specified			Communication related conditions fulfilled (No error passive, no	= True			1
			PRIMA COMPANYA REAL NOC CAME THE COM	cycle time.		0.05.6-1	undervoltace)		0.05/-1		
		All	RBNet_ComScI_ShDat19_Prictd_MSG_CAN2_Timeout	I his monitoring checks if the message SrIDat19, Prictid, MSC' signal group from Engine	Message is not received for time	>= 0.25 [SI	AND	= True	0.25 [S]	Continuous	Tripe B, 2
				Control Module is received within the specified			Communication related conditions fulfilled (No error passive, no	= True			11195
				cycle time.]		undervoltace)				
		All	RBNet_ComScl_SrlDat20_Prtctd_MSG_CAN2_Timeout	This monitoring checks if the message	Message is not received for time	>= 0.25 [si	Ignition state ON	= True	0.25 [s]	Continuous	Type B, 2
				Control Module is received within the specified			Communication related conditions fulfilled (No error passive, no	= True			mps
				cycle time.			undervoltace)	_)			
		All	RBNet_ComScl_SrlDat21_Prtctd_MSG_CAN2_Timeout	This monitoring checks if the message	Message is not received for time	>=0.3 [si	Ignition state ON	= True	0.3[s]	Continuous	Type B, 2
				Control Module is received within the specified			Communication related conditions fulfilled (No error passive no	= True			inps
				cycle time.			undervoltace)				
		All	RBNet_ComScl_SrlDat22_Prtctd_MSG_CAN2_Timeout	This monitoring checks if the message	Message is not received for time	>= 0.75 [si	Ignition state ON	= True	0.75 [s]	Continuous	Type B, 2
				"SrIDat22_Prictd_MSG' signal group from Engine Control Module is received within the specified			AND Communication related conditions fulfilled (No error passive, no	- True			Inps
				cycle time.			undervoltace)				
		All	RBNet_ComScl_SrlDat25_Prtctd_MSG_CAN2_Timeout	This monitoring checks if the message	Message is not received for time	>= 3 [si	Ignition state ON	= True	3[s]	Continuous	Type B, 2
				'SrIDat25_Prtctd_MSG' signal group from Engine			AND Communication related conditions fulfilled (No error possible, p.c.	- True			Trips
				cycle time.			undervoltace)	= 110e			
	1	All	RBNet_ComScl_SrlDat26_Prtctd_MSG_CAN2_Timeout	This monitoring checks if the message	Message is not received for time	>= 0.3 [si	Ignition state ON	= True	0.3 [s]	Continuous	Type B, 2
				SrIDat26_Prtctd_MSG' signal group from Engine			AND	- True		1	Trips
				control module is received within the specified			communication related conditions fulfilled (No error passive, no lundervoltace)	= true		1	
	1	All	RBNet_ComScl_SrlDat29_MSG_CAN2_Timeout	This monitoring checks if the message	Message is not received for time	>=0.5 [si	Ignition state ON	= True	05	Continuous	Type B, 2
				'SrIDat29_MSG' signal group from Engine Control			AND	1_			Trips
				Module is received within the specified cycle time.			Communication related conditions fulfilled (No error passive, no	= True			1
							undervoltace)		-	1	
Lost Communication with E	U1617	All	RBNet_ComScl_ChsSysBrkAxlTrqinfo1_Prtctd_MSG_CAN2_EC	This monitoring checks if the message	Message is not received for time	>=0.1[s]	Ignition state ON	= True	0-1 [s]	Continuous	Type B, 2
Motor Power Train Control			P_X1_Timeout	'ChsSysBrkAxITrqInfo1_Prtctd_MSG_CAN2'					1		Trips
Module				(Chassis System Brake Axie Lorque Information 1 Protected) signal group from F-Motor Power Train			AND				
				Control Module is received within the specified			Communication related conditions fulfilled (No error passive, no	= True			
		L		r.vr.IA timA			undervoltage)				
		All	RBNet_ComScl_ShDat31_Prictd_MSG_CAN2_Timeout	I his monitoring checks if the message I SrIDat31 Prictid MSG' signal group from Hybrid	wessage is not received for time	>= 0.25 [SI	AND	= True	0.25 [S]	Continuous	Trips
				Powertrain Control Module is received within the			Communication related conditions fulfilled (No error passive, no	= True			
				specified cycle time.			undervoltage)				
Lost Communication with	111643	HP1 7EPV	PBNet ComSci El SDinfo Prictid MSG CAN2 inmenuit	This monitoring checks if the message	Messana is not received for time	>=0.12 lei	Instition state ON	- True	0.12 [ei	Continuous	Type B 2
Transmission Control	01045			'ELSDInfo_Prtctd_MSG_CAN2' signal group from		1 - 0.12 [31	AND	- 1100	0.12 [01		Trips
Module				Transmission Control Module is received within			Communication related conditions fulfilled (No error passive, no	= True			1
				the specified cycle time.		0.05.6-1	undervoltace)		0.05 (1)		
			RBNet_ComSci_ImsestGr_Prictd_MSG_CAN2_ICM_Imeout	messageTrnsEstGr Prtctd MSG' signal group	Message is not received for time	>= 0.25 [8]	AND	= True	0.25 [5]	Continuous	Trips
				from Transmission Control Module is received			Communication related conditions fulfilled (No error passive, no	= True			
		<u> </u>		within the specified cycle time.	J	·	undervoltace)			—	
		All	RBNet_ComScl_ChsSysBrkAxITrgInto1_Prtctd_MSG_CAN2_TC M_Timeout	CheSveBrkAvITrolofo1 Prictid MSG CAN2	Message is not received for time	>=0.1 [si	Ignition state ON	= True	0-1 [s]	Continuous	Trine
				signal group from Transmission Control Module is			Communication related conditions fulfilled (No error passive, no	= True			inpu
				received within the specified cycle time.			undervoltace)				
		HP1,HP1_VIP	RBNet_ComScl_MSG_2027_CAN2_Timeout	This monitoring checks if the message	Message is not received for time	>=0.12 [si	Ignition state ON	= True	0.12 [s]	Continuous	Type B, 2
		ZERV, VIP25		Module is received within the specified cycle time			Communication related conditions fulfilled (No error passive. no	= True		1	nips
		MY25		, so the second s	J		undervoltace)				
	1	All	RBNet_ComScl_MSG_2091_CAN2_Timeout	This monitoring checks if the message	Message is not received for time	>= 0.75 [si	Ignition state ON	= True	0.75 [s]	Continuous	Type B, 2
				MSG_209T PDU from Transmission Control Module is received within the specified cycle time			AND Communication related conditions fulfilled (No error passive po	= True		1	Trips
				include the specified cycle line.			undervoltace)] _	
		All	RBNet_ComScl_SrlDat48_Prtctd_MSG_CAN2_Timeout	This monitoring checks if the message	Message is not received for time	>= 0.25 [si	Ignition state ON	= True	0.25 [s]	Continuous	Type B, 2
	1			'SrlDat48_Prtctd_MSG' signal group from Transmission Control Module is received within			AND Communication related conditions fulfilled (No error passive as	- True			Trips
				the specified cycle time.			undervoltace)			1	
Loss of communication with	U1668	All	RBNet_ComScl_ChsSysBrkAxlTrqInfo1_Prtctd_MSG_CAN2_EC	This monitoring checks if the message	Message is not received for time	>=0.1 [si	Ignition state ON	= True	0-1 [s]	Continuous	Type B, 2
Hybrid E-Motor Power Train			P_H1_Timeout	ChsSysBrkAxITrqInfo1_Prtctd_MSG_CAN2			AND	1_			Trips
Control Module				(Chassis System Brake Axie Lorque Information 1 Protected) signal group from Hybrid E-Motor			Communication related conditions fulfilled (No error passive, no	= Irue			
				Power Train is received within the specified cycle			undervorlage)				
		L		time.							
		All	RBNet ComScI TrnsEstGr Prtctd MSG CAN2 ECP H1 Timed	This monitoring checks if the message	Message is not received for time	>= 0.25 [si	Ignition state ON	= True	0.25 [s]	Continuous	Type B, 2
	1		ut	Insestor_Pricid_MSG_CAN2 (Transmission Estimated Gear Protected) signal group from			Communication related conditions fulfilled (No error passive no	= True		1	rips
				Hybrid E-Motor Power Train Control Module is			undervoltage)			1	
				received within the specified cvcletime.		L			1	I	_
CANBUS 3	_										
Control Module	U0074	All	CANSM-E_BUSOFF-NETWORK_0	This monitoring checks if the CAN controller is in a	BusOff status has been detected	= True	Ignition state ON	= True	0.250 [s]	Continuous	Type B, 2
Communication CAN Bus 1	1		-	Bus Off state.					1	1	Trips
011	-	·			J	4.05751			4.05.61		1
Body Control Module	00140	A1	remer_comsci_sripate_msig_CAN3_Timeout	I'srlDat9 MSG' signal group from Body Control	message is not received for time	2= 1.20 [SI	AND	- True	1.20 [8]	Continuõus	Trips
	1			Module is received within the specified cycle time.			Communication related conditions fulfilled (No error passive, no	= True		1	1
	1			1	J		undervoltage)			J	
1	1	All	KBNet_ComSci_MSG_5163_CAN3_Timeout	This monitoring checks if the message	message is not received for time	>= 3 [5]	Ignition state ON	= Irue	3[8]	Continuous	type C, No

System/	Fault	Variant	Failure Word	Monitoring Strategy Description	Malfunction Criteria	Malfunction Criteria Threshold	Secondary Parameters	Enable Condition	Time Required	Frequency of	MI
Component	Code			internet of a degy beachpiton		Value			I	Checks	Illumination
	1					1		<u>اا</u>		L	
				Module is received within the specified cycle time.			Communication related conditions fulfilled (No error passive, no	= True	1 /	1	Emissions
Lost Communication with	111609	AII	PBNet ComSci BkupSvePwrMode Prictd MSG CAN3 Timeout	This monitoring checks if the message	Massage is not received for time	>= 0.75 Fel	Innition state ON	- True	0.75 [e]	Continuous	Tune B 2
Central Gateway Module on	01005		KBNet_ComSci_BkupSysFwiMode_Fricid_WSG_CKNS_Timeout	BkupSvsPwrMode Prtctd MSG CAN3' signal	Messagers not received for time	2=0.75 PS	AND	_ ride	0.75[5]		Trips
CAN Bus 2				group from Central Gateway Module is received			Communication related conditions fulfilled (No error passive, no	= True	1 /	1	
				within the specified cycle time.			undervoltaoe)	//	,	J	
		All	RBNet_ComScl_MSG_3017_CAN3_Timeout	This monitoring checks if the message	Message is not received for time	>= 3 fsl	Ignition state ON	= True	3[s]	Continuous	Type B, 2
				MSG_3017 PD0 from Central Gateway Module Is received within the specified cycle time	1		AND Communication related conditions fulfilled (No error passive, no	- True	()	1	inps
				received while the specified cycle time.			undervoltage)	1 100	1 /	1	
		All	RBNet_ComScl_MSG_3018_CAN3_Timeout	This monitoring checks if the message	Message is not received for time	>= 3 [s]	Ignition state ON	= True	3[s]	Continuous	Type B, 2
				'MSG_3018' PDU from Central Gateway Module is			AND	į – 1	()	1	Trips
				received within the specified cycle time.			Communication related conditions fulfilled (No error passive, no	= Irue	()	1	
Lost Communication with E-	· U1815	All	RBNet ComScI MSG 2246 CAN3 Timeout	This monitoring checks if the message	Message is not received for time	>= 0.25 [s]	Ignition state ON	= True	0.25 [s]	Continuous	Type B. 2
Motor Power Train Control	1	80		'MSG_2246' PDU from Central Gateway Module is		1		1	(() ()	1	Trips
Module				received within the specified cycle time.					()	1	1
							AND Communication related conditions fulfilled (No error possive, no	- True	()	1	
							undervoltace)	1 100	1 /	1	
Controller											
						1					-
ABS Valves Supply Voltage	C053B	All	RBVLV_VLVPath1_SupplyFailure	This monitoring checks if the VLV Supply line is	Resistivity of valve oath suooly line	>3 [Ohm]	No brake oedal is pushed	= True	20 [s]	Once	Type A, 1 Trip
Circuit/Open				able to drive an actuation (valve path 1).			Vehicle speed	> 9.32 [mob]	1 /	1	
		All	RBVLV_VLVPath1_VROnTestUndervoltage_FSL	This monitoring checks if the voltage is high	UVR (Valve path supply voltage)	< 4.6 [V]	Ignition state ON	= True	1 [s]	Once	Type A, 1 Trip
				enough for initial valve relay switch-on test.	l						
		All	RBVLV_VLVPath2_VROnTestUndervoltage_FSL	This monitoring checks if the voltage is high	UVR (Valve path supply voltage)	< 4.6 [V]	Ignition state ON	= True	1 [s]	Once	Type A, 1 Trip
				enough for Initial valve relay switch-on test.		1		·			_
Antilock Brake System	C15D5	All	Abs ContControl	This monitoring checks if the ABS is correctly	ABS intervention for time	>= 60 [s]	Ignition state ON	= True	60 [s]	Continuous	Type A. 1 Trip
Active Too Lona	1	1		triggered.		(-)				1	.,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,
	_										
Brake Bleed Not Complete	C15C7	All	PSM_DeviceNotFilledOrNotInstalled	This monitoring checks if the IPB is in assembly	NVM item for 'IPB Assembly Mode' is set	= True	Ignition state ON	= True	Immediately	Once	Type A, 1 Trip
				mode during initialization or diagnosis.			AND Once during init	- True	1 /	1	
	-					1	Once during mit	= 1100			-
Brake Booster Motor "A"	C0582	All	RBBLM_TemperatureB6Plausi	This monitoring checks if the two sensor voltages	(Sum of Temperature Sensor 1 and 2 signal line voltages	> 3.4 [VI	Ignition state ON	= True	0.600 [s]	Continuous	Type A, 1 Trip
Phase U-V-W Circuit				have plausible values.	OR	1		1	1 2	1	
Range/Performance					Sum of Temperature Sensor 1 and 2 signal line voltages)	<3.16 IV1		1	1 /	1	
					Number of times when implausible difference is detected	= 5		1	1 /	1	
Brake Booster Motor	C2A1C	All	RPS_WrongCalibDataVersion	This monitoring checks the consistency between	Inconsistency between RPS calibration data version and SW version	= True	IPB State	= Init phase	Immediately	Once	Type A, 1 Trip
Position Sensor Not Learned	d			the version of the RPS calibration data and the				1	1 /	1	
		AII	PPS NvMPaadEalad	This monitoring checks if the NvM items	Offeet read failure occurred	- True	IPB State	- Init phase	Immediately	0000	Type A 1 Trip
				RPS Offset RPS Rescalling	OR	- 1100		I	I		Type A, T thip
				RPS_CorrAmplitudes and the RPS_Version are	Rescaling read failure occurred	= True		1	1 /	1	
				readable.	OR				()	1	
					Correction Amplitudes read failure occurred	= True		1	1 /	1	
					UR Version read failure occurred	- True		1	1 /	1	
					OR	- 1100			()	1	
					Orthogonality read failure occurred	= True		I	/		
	7		I	I		1	l	-			
Control Module	U3000	All	CAN_E_TIMEOUT	This monitoring checks the CAN Controller's	Time duration with no response from CAN controller	>= 0.080 [si	Ignition state ON	= True	Immediately	Once	Type A, 1 Trip
				response during initialization.			During initialization	= True	1 /	1	
		All	RB_UnsupportedSeriesHW	This monitoring checks if there is a hardware,	Hardware component step ID indicates development state	= True	Ignition state ON	= True	Immediately	Once	Type A, 1 Trip
		1		which is not allowed to be used in series ECU.	AND	1	AND	, · · · · · · · · · · · · · · · · · · ·	(⁻)		
		L			ECU TTNR (Part Number) indicates series readv ECU	= True	During initialization	= True		1	
		All	RBChargePumpPallure	This monitoring checks if the test of the charge	Capacity of charge pump is restricted	= True	Ignition state ON	= True	Immediately	Cyclically every 19	у туре А, 1 Тпр
				pump has detected a failure.	Performance of charge pump is insufficient	= True		1	1 · · · · ·	[5]	
					OR			1	1 /	1	
					Output voltage of charge pump is out of range	= True		ļ		J	
	1	Alí	KBDma I ransterError	I his monitoring checks if there is DMA transfer	I ranster error occurred during DMA transfer	= True	Ignition state UN	= Irue	0.1 [s]	Continuous	Type A, 1 Trip
	1	All	RBEcuBandgap	This monitoring checks if the reference voltage of	ADC reference voltage deviation is detected by comparator	= True	Ignition state ON	= True	0.2 [s]	Continuous	Type A. 1 Trip
	1	1		the ADC is in a proper range.				J			,
	1	All	RbfsIBmsMRGPathTestFail	This monitoring checks if MRG path is working.	(Motor Relav Actuation oath is pulled low	= True	Ignition state ON	= True	0.08 [s]	Once	Type A, 1 Trip
	1	1		1	UK		AND		1 /		
	1	1		1	AND	= riue	raiisare iogic test is running	= 1100	1 /		
					MRG is switched on	= True		1	1 /	1	
		All	RbfsIDecoupleBitTestFails	This monitoring checks if the system chip internal	Internal electrical and hydraulic decouple bits are not reset according to	= True	Ignition state ON	= True	0.08 [s]	Once	Type A, 1 Trip
	1	1		decouple bits are reset within the expected time.	failsafe logic test			1	1)	1	
	1	1		1			AND Esileste logic teet is running	= True	r /	1	
1	1	All	RbfsIEcuBistFailureCtrTestFails	This monitoring checks if erroneous safety logic is	Erroneous safety logic of system IC is detected	= True	Ignition state ON	e	Immediately	Once	Type A. 1 Trip
	1	1		detected.			AND	1	1	1	1.000
1	1	L		J	J	<u> </u>	Failsafe logic test is running	= True	لا		
1	1	All	RbfsIEcuEClockTestFails	This monitoring checks if Clockin monitor works	Erroneous safety logic ofclock-in monitor is detected	= True	Ignition state ON	= True	Immediately	Once	Type A, 1 Trip
	1	1		propeny (test of test).			Failsafe looic test is running	= True	, J	1	
1	1	All	RbfsIEcuEnableEIHighFails	This monitoring checks if the ECU electrical	ECU electrical enable line is shorted to ground	= True	Ignition state ON	= True	Immediately	Once	Type A, 1 Trip
	1	1		enable line can be switched ON by the software.	OR	1	AND	1	(· · · · ·)		1
	1	L			ECU electrical enable line cannot be switched on by the software	= True	Failsafe logic test is running	= True		I	
	1	All	RbfsIEcuEnableEILowFails	This monitoring checks if the ECU electrical	ECU electrical enable line is shorted to sucoly voltage	= True	Ignition state ON	= True	Immediately	Once	Type A, 1 Trip
	1	1		enable line can be switched OFF by the software.	ECU electrical enable line cannot be switched off by the software	= True	Failsafe logic test is running	= True	1 /		
	1	All	RbfsIEcuEnableHyHighFails	This monitoring checks if the ECU internal	ECU hydraulic enable line is shorted to ground	= True	Ignition state ON	= True	Immediately	Once	Type A, 1 Trip
	1	1		hydraulic enable line can be switched ON by the	OR	1	AND	μ · · · · · · · · · · · · · · · · · · ·	(¹)		1
1	1	1		software.	ECU hydraulic enable line cannot be switched on by the software	= True	Failsafe logic test is running	= True	I		1

unterel.	Foult	Voriget	Enilure Word	Menitoring Ptrotom/Departmetics	Molfunction Criteria	Molfrmotion Criteria Threshold	Secondary Baramatera	Eachia Condition	Time Required	Erequency of	MI
stem/	Code	variant	Pallure Word	Monitoring Strategy Description	Mairunction Unteria	Volue	Secondary Parameters	Enable Condition	Time Required	Frequency or	Illumination
mponent	L					l				l	indifination
	_	All	RbfslEcuEnableHvLowFails	This monitoring checks if the ECU internal	ECU hydraulic enable line is shorted to supply voltage	= True	Ignition state ON	= True	Immediately	Once	Type A. 1 Trip
		1		hydraulic enable line can be switched OFF by the	OR		AND	1	1		1
				software.	ECU hydraulic enable line cannot be switched off by the software	= True	Failsafe logic test is running	= True			
		All	RbfslEcuEnContinuousError	This monitoring checks if the enable line is set	Missing low level enable signal of ECU internal hydraulic line is detected for	> 0.05 [s]	Ignition state ON	= True	0.05 [s]	Continuous	Type A, 1 Trip
				properly.	time			1	1	1	1
					OR						
					Missing low level enable signal of ECU internal electrical line is detected for	> 0.05 [s]					
		1			time		· ··· · · ·				-
		All	RbIslEcuEnContinuousError_Asic_2	This monitoring checks if the enable line is set	Missing low level enable signal of ECU internal hydraulic line is detected for	> 0.05 [8]	Ignition state ON	= True	0.05 [s]	Continuous	Type A, 1 Trip
				property (second ASIC).	OR						
					Missing low level angula signal of ECU internal electrical line is detected for	> 0.05 (e)					
					time	2 0.00 [0]					
		All	RbfsIEcuErrpinCounterTestFails	This monitoring checks if the Errorpin event	Error oin event counter does not increment on error oin event	= True	Ignition state ON	= True	Immediately	Once	Type A, 1 Trip
		1		counterworks properly.	OR		AND	1	1	1	
					Safetv logic of the ASIC is not reset orocerly	= True	Failsafe logic test is running	= True	J _		
		All	RbfelEcuFastWdTestFails	This monitoring checks if a missing watchdog	Missing BIST trigger does not switch off hydraulic/electrical path	= True	Ignition state ON	= True	Immediately	Once	Type A, 1 Trip
		1		trioaer causes hvdraulic/electric shutdown.							
		All	RbisiEcuVrOnWhileWdTimeout	This monitoring checks whether the system chip	Valve relav gate is not switched off due to missing watchdog trigger	= Irue	Ignition state ON	= Irue	1 [5]	Once	Type A, 1 Trip
				switches off the gate actuation when it detects a			AND Exilente legis test is supplied	- True			
		All	PhialEcul/(ViaSpiEaile	This monitoring charks if the value relay gate	Valve relay cate is not switched off via SPI	- True	Innition state ON	= True	1 [e]	0000	Tune & 1 Trip
			reside a vivia opriana	actuation is properly switched off via a Serial		- 1100	AND	- 1100	. [3]		iype A, T inp
				Peripheral Interface (SPI) command during the			Failsafe logic test is running	= True			
		All	RbfsIEcuWdStartuptestFails	This monitoring checks the status of the watchdog	Watchdog status differs from the expected status	= True	Ignition state ON	= True	1 [s]	Once	Type A, 1 Trip
		1		at initialization state.			AND	1	1		1
		L					Failsafe logic test is running	= True		l	_
		All	RbfelEcuWdStatusContinuousError	This monitoring checks the status of the	Watchdog status differs from the expected status	= True	Ignition state ON	= True	0.05 [s]	Continuous	Type A, 1 Trip
		L	Defails and one of the second second second	watchdog.	March days status different from the surgest of status	T	lasting and ON		0.05.101	0	
		All	RDIBIECUWaStatusContinuousError_Asic_2	(second ASIC)	watchdog status differs from the expected status	= Irue	Ignition state ON	= Irue	U.U5 [S]	Continuous	Type A, 1 Frip
		AII	PhielEcuWrongBietCmdTaetEaile	This monitoring charks if the watchday BIST state	Watchdog of ASIC is triggered by wrong BIST command uplus	- True	Ignition state ON	- True	Immediatel	Once	Tune & 1 Trin
			resiste controllypistorilu restrialis	Imachine can detect a wrong BIST command	water easy or more is inggered by wrong bron command value		AND		I	Unite	ispert, i trip
				value			Failsafe logic test is running	= True			
		All	RbfsIVrOnFails	This monitoring checks if a switched on valve relay	Hydraulic enable state is low	= True	Ignition state ON	= True	Immediately	Once	Type A. 1 Trip
		1		is reported as off (system chip internal status).	OR		-	1	1	1	
					Feedback of valve relav status is wrong	= True					
		All	RBGTM_RefFrequencyError	This monitoring checks if the GTM time base	Reference freguency detected by GTM	< 3.8 FkHzl	Ignition state ON	= True	0.05 [s]	Continuous	Type A, 1 Trip
				which is used for e.g. WSS works properly.	OR				1		
					Reference freguency detected by GTM	> 4.2 FkHzI					
		All	RBGIM_IbuMonError	I his monitoring checks if the time passed in the	Deviation between time passed in the system timer and in the GTM	> 0.005 [ms]	Ignition state ON	= True	0.05 [s]	Continuous	Type A, 1 Trip
				System timer is equal to the time elapsed in Conoria Timer Medula (CTM) perioheral	peripheral						
		All	BbmicAsicClkInError	This monitoring checks if system ASIC clock input	ASIC internal clock input frequency deviation detected	= True	Ignition state ON	= True	[a] 80.0	Continuous	Type A 1 Trip
		1		frequency deviation is detected.					0.000 (0)		.,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,
		All	RbmicAsicClkInError2ndAsic	This monitoring checks if system ASIC clock input	ASIC internal clock input frequency deviation detected	= True	Ignition state ON	= True	0.08 [s]	Continuous	Type A, 1 Trip
		1		frequency deviation is detected (second ASIC).			-	1	1	1	1
		All	RbmicAsicInitTestError	This monitoring checks if the ASIC can detect the	ASIC could not detect the failure frames	= True	Ignition state ON	= True	Immediately	Once	Type A, 1 Trip
				failure test frames and therefore set corresponding							
		AU	BhmichoideitTeatError2adAaia	This monitoring shocks if the 2nd ASIC one detect	Recent A SIC could not detect the foilure frames	- Teue	Institute state ON	- True	Immodiatelu	0000	Tuno A 1 Trio
			Romonal Calendra Charland	the failure test frames and therefore set		- 1100	AND	- 1100	l		Type N, T The
				corresponding failure flags.			During initialization	= True			
		All	RbmicAsicOscillatorError	This monitoring checks if the internal ASIC	Erroneous ASIC oscillator frequency detected	= True	Ignition state ON	= True	0.2 [s]	Continuous	Type A, 1 Trip
				oscillator works procerly.					j]	
		All	RbmicAsicOscillatorError2ndAsic	This monitoring checks if the internal 2nd ASIC	Erroneous ASIC oscillator frequency detected	= True	Ignition state ON	= True	0.2 [s]	Continuous	Type A, 1 Trip
				oscillator works orocerly.							_
		All	RBMICB6_TransferError	This monitoring checks the SPI communication	Wrong data is sent to ASIC	= Irue	Ignition state ON	= Irue	0.01 [s]	Continuous	Type A, 1 Trip
				with B6 Bridge Driver ASIC.	UK Wrong data is received from ASIC	- True					
		1			OR			1	1		
		1			Defect in SPI line	= True		1	1		
		1			OR	1		1	1		
		L			Incorrect SPI communication because of a defect in ASIC	= True					
		All	RbmicQxMRAuCShortCircuitTestFailure	This monitoring checks if there is short circuit	MRG (Motor Relav Gate) feedback bit	= 0	Ignition state ON	= True	Immediately	Once	Type A, 1 Trip
		1		between Qx pin and MRAuC pin.			AND	1 -			
		1					Valve relav is not vet switched on	= Irue			
		1					And historylic secolds line is switched on	- True	1		
		1					AND	- nue	1		
							During initialization	= True			
		All	RbmicSpiTransferError	This monitoring checks the SPI communication	Wrong data is sent to ASIC	= True	Ignition state ON	= True	0.05 [s]	Continuous	Type A. 1 Trip
		1		between ASIC and the microcontroller.	OR		-	1	1	1	1
					Wrong data is received from ASIC	= True					
		1			OR	1			1		
		1			Defect in SPI line	= True			1		1 1
					OR Defended ADIO	T					
		AU	Physic Poi Transfer Error 2nd Ania	This monitoring shocks the SDI com	Weeke deta is seet to ASIC	- True	Instition state ON	- True	0.05 (a)	Continuous	Tuno A 4 7-1
		AII	Komicapi i idnsfererrorznoAsic	Ibetween 2nd ASIC and the microcontroller	OR	= 1100	Ignition state on	- 1100	0.05 [5]	Continuous	type A, 1 (fip
		1			Wrong data is received from ASIC	= True					
		1			OR			1	1		
		1			Defect in SPI line	= True		1	1		
		1			OR			1	1		1
		I	- · · · · · · · · · · · · · · · · · · ·		Defect in ASIC	= True				J	
		All	RBSUPPLY_U5VOutOfRange	This monitoring checks if U5V is out of range.	U5V undervoltage bit is set	= True	Ignition state ON	= True	0.06 [s]	Continuous	Type A, 1 Trip
		1			UK	T		1	1		
		AII	PREUDDLY UE)/TestEalby:	This manifesian about the AOIO interest in a	USV overvorage bit is set	= True	Institute state ON	- True	0.1.[e]	0000	Time (1 Tr
		All	RESUPPLI_USV1esthallure	I his monitoring checks the ASIC internal test of the LISV voltage regulator	OP vortage regulator test failed	= Irue	Ignition state ON	= Irue	U-1 [S]	Unce	Type A, 1 frip
		1		ine obv volage regulator.	(USV voltage regulator test finished	= False					
		1			AND						1 1
		1			Time passed since the test started)	>=0.1 fsl					

System/ F	ault	Variant	Failure Word	Monitoring Strategy Description	Malfunction Criteria	Malfunction Criteria Threshold	Secondary Parameters	Enable Condition	Time Required	Frequency of	MIL
Component C	ode					Value			1	Checks	Illumination
		All	RBSupplyASICInitFailure	This monitoring checks if the voltage regulator configuration of the ASIC matches the software	Voltage regulator configuration of the ASIC does not match configuration in SW	= True	Ignition state ON	= True	Immediately	Once	Type A, 1 Trip
	1	All	RBSUPPLYIREFOutOfRange	configuration This monitoring checks if the ASIC internal curren I reference is out of range	t System ASIC reference current (used by monitorings and test) deviation is detected by internal comparator	= True	Ignition state ON	= True	0.06 [s]	Continuous	Type A, 1 Trip
		All	RBUB6PlausiMonFailure	This monitoring checks the UB6 to UBB ratio	UBB voltage	>4 M	Ignition state ON	= True	0.2 [s]	Continuous	Type A, 1 Trip
				together with the UBB Voltage.	AND Deviation between LIRE and LIRE voltage	- 25 (9/1	AND Electric motor is not actuated	- True			1
		All	RBUB6SupplyPathFailure	This monitoring checks if there is a hard	UB6 voltage	< 3.22 [VI	Ignition state ON	= True	0.2 [s]	Continuous	Type A, 1 Trip
				undervoltage measured at UBB main supply line.	AND Difference between LIPE and LIP. Mater voltage	- 1.04.04	AND	- True	1		1
					Difference between Obo and Ob motor voltage	2 1.04 [11	AND	- 1100			
				This section is a start with a section of the secti	UD DD INT where		Voltage across BMS (B6 Bridge Main Supply Switch)	= True	0.400 (-)		
	1		RBOBRDINTPlausimonPailure	I drift failure (UB_RD_INT voltage).	AND	< 0.21V1	Ignition state ON	= True	0.160 [8]	Continuous	Type A, T Trip
]	Difference between UBVR and UB RD INT voltace	> 3 M]	J	1
	1	All	RBuCSafetyFault	This monitoring checks if the NMI mechanism is Irunning properly.	uC safety logic detects a failure	= True	Ignition state ON	= True	Immediately	Once	Type A, 1 Trip
		All	RBuCSafetyLogicFault	This monitoring checks if tests of the safety logic	Microcontroller safety logic tests fail	= True	Ignition state ON	= True	Immediately	Once	Type A, 1 Trip
		All	RBuCSupplyError	of uC works as expected. This monitoring checks if the supply voltage of the	UC core voltage deviation is detected by voltage monitor of microcontroller	= True	Ignition state ON	= True	Immediately	Continuous	Type A. 1 Trip
	1	i		microcontroller is out of rance.		· · · · · · · · · · · · · · · · · · ·				J	.,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,
		All	RBVLV_AsicChip1_GENERIC_ConfigFailure	This monitoring checks if the valve driver	Valve driver configuration data read back from ASIC does not match the written data	= True	Ignition state ON	= True	0.015 [s]	Continuous	Type A, 1 Trip
		All	RBVLV_AsicChip2_GENERIC_ConfigFailure	This monitoring checks if the valve driver	Valve driver configuration data read back from ASIC does not match the	= True	Ignition state ON	= True	0.015 [s]	Continuous	Type A, 1 Trip
		AII	PhWdhaeicWdCmdMissing	configuration was successful. This monitoring checks if all Watchdog commands	written data	- True	Ignition state ON	- True	Immediately	Continuous	Type A 1 Trip
	1	í		have been scheduled.	s At least one command number missing during memoring merval	- 1140) (jp2 / (, 1 / inp
		All	RbWdhAsicWdErrorCntLimit	This monitoring checks if there is too many wrong	System ASIC watchdog error counter detects a fixed number of wrong	= 4	Ignition state ON	= True	0.04 [s]	Continuous	Type A, 1 Trip
				ASIC.	watchoog trigger pattern						
		All	RbWdhAsicWdErrorCntStuck	This monitoring checks if the system ASIC watehdea error counter is stuck	System ASIC watchdog error counter is stuck	= True	Ignition state ON	= True	0.03 [s]	Continuous	Type A, 1 Trip
		All	RBWSSGTMMonMuxSigError	This monitoring checks line issues between ASIC	Output signal of the multiplexer and the corresponding wheel speed signal	= True	Ignition state ON	= True	0.1 (S)	Continuous	Type A, 1 Trip
				and uC.	are not identical		AND				1
							Front Left WSS Test is finished as sensor undervoltage fault is not logged	= True			
							(SAE code: C0501)				
							AND Front Right WSS Test is finished as sensor undervoltage fault is not logged	= True			
							(SAE code: C0507)				
							AND Rear Left WSS Test is finished as sensor undervoltage fault is not logged	= True			
							(SAE code: C050D)				
							AND Rear Pinht WSS Test is finished as sensor undervoltage fault is not logged	- True			
							(SAE code: C0513)	- 1100			
							AND Vehicle speed	> 12 42 fmphi			
		All	RBWssTestSystemICFailure	This monitoring checks if System IC test does not	WSS HW Test in System IC failed	= True	Ignition state ON	= True	0.015 [s]	Once	Type A, 1 Trip
	ļ	All.	PRMICEVE OC AsigMalfunction	work due to hardware malfunction.	Overewrent detected on a SW configured CBIO after switching it off	- True	Institute state ON	- True	0.14 (a)	Continuous	Turne A. 1 Trin
	1		KBMICS15_0C_Asilwalidiction	event which cannot be resolved by switching the	Overcarrent detected on a SW conlighted GPTO alter switching it on	= True	AND	- The	0.14[5]		Type A, T Thp
			PRMICEVE OC HWCanfinuradCBIO	affected GPIO.	Overewrent detected on a HIW configured CRIO	- Truo	Initialization finished	= True	0.12.61	Continuous	Turne A 1 Trip
	1		KBMICS13_0C_HWC0IngliedGFIC	configured GPIO overcurrent event which requires	AND	= True	AND	- 1100	0.12 [5]		Type A, T Thp
				a hydraulic shutdown.	Overcurrent bit of the ASIC gets set	= True	Initialization finished	= True		L	
Control Module Processor P	P0606	All	RB_UnsupportedHW	This monitoring checks if the hardware	Device ID of ASIC is in the list of supported device IDs	= False	Ignition state ON	= True	0.03 [s]	Once	Type A, 1 Trip
				components are supported by the software.	OR	Falsa			1		1
					Sonware version ID or ASIC is in the list of supported sonware version IDs	= raise					
					OR						
					OR	= Faise					
					Microcontroller software version ID is in the list of supported SW version IDs	= False					
		All	DMC_ELSD_MPUError	This monitoring checks if any SW variable or	DMC/eLSD TPSW access into restricted RAM and Stack	= True	Ignition state ON	= True	Immediately	Continuous	Type A, 1 Trip
				function tries to access outside the defined limit of	1				1	1	1
		All	RBCPUException	This monitoring checks if there is a microcontroller	A CPU exception occurred	= True	Ignition state ON	= True	Immediately	Continuous	Type A, 1 Trip
	1	I		exception.	J				J.,	J.,)
	1	All	RBOSTaskSchemeError	This monitoring checks that each task is activated and executed within its designated timeslot.	A task is not running within the expected timeslot	= True	Ignition state ON	= True	It depends on the cycle time	Continuous	Type A, 1 Trip
				1					of the faulty		
		AII	PRSVS OSErrorHook	This monitoring checks the error books	A task was started before it has finished its previous run	- True	Ignition state ON	- True	task.	Continuous	Type A 1 Trip
	1	í		(exceptions) occurring in the Operating System.) (jp2 / (, 1 / inp
		All	RBSYS_StackOverUnderFlow	This monitoring checks if the microcontroller stack	Checkword at the beginning or end of stack has been overwritten	= True	Ignition state ON	= True	0.08 [s]	Continuous	Type A, 1 Trip
		All	RBSYS_SYSErrorHook	This monitoring checks if an internal interrupt	Interrupt based fault occurred (e.g. too long interrupt lock)	= True	Ignition state ON	= True	Immediately	Continuous	Type A, 1 Trip
	1	AII	PRSYS Took litter	based system error occurred.	litter limit of IQ (input/output) sensitive part is not hold	- True	Ignition state ON	- True	Immediately _	Continuerro	Tune & 4 Tri-
	1	/		overload.	since and one (alphotoutput) sensitive part is not nero				mineulately		.,per, i inp
		All	RBSYS_TaskOverRun	This monitoring checks if there is an overload	Task did not finish within its cycle time	= True	Ignition state ON	= True	Immediately	Continuous	Type A, 1 Trip
		All	RBVLV_AsicChip1_GENERIC_SVDTTestNotStoppedFailure	This monitoring checks if cyclically test execution	Stop response from hardware does not work or the test is not stopped	= True	Silent valve driver test is running	= True	20 [s]	Cyclically every 20	Type A, 1 Trip
	1			of SVDT in hardware is not stopped.	Presente the between tests and a seture of a large seture to the seture of a large seture to the set	T	Include shale ON		0.00.1-1	Fsl	
	1	All	REVEV_ASICONP1_GENERIC_Synchaiture	microcontroller and the one of the ASIC stav	 Resynchronization between task system of microcontroller and ASIC fails 	= ITUE	Ignition state ON	= Irue	U.U6 [S]	Continuous	Type A, 1 Trip
				synchronized or at least get resynchronized again.						1	
		All	RBVLV_AsicChip2_GENERIC_SVDTTestNotStoppedFailure	This monitoring checks if cyclically test execution	Stop response from hardware does not work or the test is not stopped	= True	Silent valve driver test is running	= True	20 [s]	J Cyclically every 20	Type A, 1 Trip
1	1			of SVDT in hardware is not stopped.						_Fsl	2011 0 1 1 1 1 P

System/	Fault	Variant	Failure Word	Monitoring Strategy Description	Malfunction Criteria	Mallunction Criteria Threshold	Secondary Parameters	Enable Condition	Time Required	Erequency of	MI
Component	Code	1		l		Value			1	Checks	Illumination
										↓	J
		All	RBVLV_AsicChip2_GENERIC_SyncFailure	This monitoring checks that the task system of the	Resynchronization between task system of microcontroller and ASIC fails	= True	Ignition state ON	= True	0.06 [s]	Continuous	Type A, 1 Trip
				microcontroller and the one of the ASIC stay							
				synchronized of at least get lesynchronized again.							
		All	RBVLV_VLVPath1_GENERIC_UvrLeakageCurrentFailure	This monitoring checks for UVR leakage current	Leakage current (UVR leakage current comparator bit is set)	> 0.0063 [AI	Ignition state ON	= True	20 [s]	Cyclically every 20	Type A, 1 Trip
				due to ohmic side circuit by Valve-Coil-Resistance-	OR		AND	1	1	[S]	1
				Measurement (VCRM) inside the HSW.	UVR goes from 0 M to over 1.26 [VI within time	>= 0.06 [si	Execution of the valve coil resistance measurement	= True	00.1-1	0	Track & Trip
		All	RBVLV_VLVPath1_GENERIC_ValveColResistanceMeasurement	This monitoring checks the valve-coil resistance	Driver ASIC internal current source for valve coil resistance measurement	> 0.04 [A] +/- 5% (required	Ignition state UN	= True	20 [5]	Cyclically every 20	Type A, 1 Trip
				Measurement (VCRM) inside the HSW.	part		AND			[9]	
				1			Execution of the valve coil resistance measurement	= True			
		All	RBVLV_VLVPath1_HighOhmicShort2GND_Continuous	This monitoring checks if there is short between	Leakage current between valve relay and ground path (High ohmic short to	> 0.0063 [A]	Ignition state ON	= True	0.185 [s]	Continuous	Type A, 1 Trip
				VRand GND.	ground bit in ASIC is set)		110				1
							AND Valve relay is switched off	= True			
		All	RBVLV_VLVPath1_Short2GND_Continuous	This monitoring checks if there is short between	Leakage current between valve relay and ground path (Short to ground bit	>0.0198 [A]	Ignition state ON	= True	0.025 [s]	Continuous	Type A, 1 Trip
				VRand GND.	in ASIC is set)		[⁻	1	1	1 1	1
							AND	_			
						T	Valve relavis switched off	= True	0.05.01		Taxa A A Tax
			RBVLV_VLVPath1_VRGOnSPIPalls_Continuous	actuation is plausible.	valve relay control bit in ASIC does not match the desired actuation state	= Irue	Ignition state ON	= True	0.05 [s]	Continuous	Type A, 1 Trip
		All	RBVLV_VLVPath1_VROffFails_Continuous	This monitoring checks if the Valve Relay can be	Valve Relay can be switched OFF	= False	Ignition state ON	= True	0.065 [s]	Continuous	Type A, 1 Trip
		I		switched OFF.)			<u> </u>
		All	RBVLV_VLVPath1_VROffFails_FSL	This monitoring checks if the Valve Relay can be	Valve Relay can be switched OFF	= False	Ignition state ON	= True	1 [s]	Once	Type A, 1 Trip
		AU	BB1/UV VUVBeth1 VBOpEeile Centinueur	switched OFF during the initial test.	Value relay ensure the switched on	- Teue	Incition state ON	- True	0.015 (c)	Continuous	Tuno A. 1 Trio
			RBVLV_VLVPatn1_VROnFails_Continuous	switched ON	valve relav cannot be switched on	= Irue	AND	= True	0.015 [5]	Continuous	Type A, 1 Trip
							Valve relav is switched on	= True			
		All	RBVLV_VLVPath1_VROnFails_FSL	This monitoring checks if the Valve Relay can be	Valve relav cannot be switched on	= True	Ignition state ON	= True	1 [s]	Once	Type A, 1 Trip
				switched ON during the initial test.			AND		1		1
		A11	BBV/11/ 1/11/(Dath1 //BCollatyCuitehTestEaile EC)	This monitoring shocks if the Volue Below oon he	Volue Balay and he switched OFF by reducted at calety switch	- Foloo	Valve relay is switched on	- True	1 [0]	0000	Tune A. 1 Trie
			RBVLV_VLVPath1_VRSaletySwitch1estPalls_PSL	switched OFF by redundant safety switch	valve Relay can be switched OFF by redundant safety switch	= Faise	Ignition state ON	= True	1 [8]	Once	Type A, 1 Trip
		All	RBVLV_VLVPath2_GENERIC_UvrLeakageCurrentFailure	This monitoring checks for UVR leakage current	Leakage current (UVR leakage current comparator bit is set)	> 0.0063 [AI	Ignition state ON	= True	20 [s]	Cyclically every 20	Type A, 1 Trip
				due to ohmic side circuit by Valve-Coil-Resistance-	OR		AND)	1	[S]	1 1
		l		Measurement (VCRM) inside the HSW.	UVR goes from 0 M to over 1.26 FV1 within time	>=0.06 [si	Execution of the valve coil resistance measurement	= True	J		1
		All	RBVLV_VLVPath2_GENERIC_ValveCoilResistanceMeasurement Beth Foilure	This monitoring checks the valve-coil resistance	Driver ASIC internal current source for valve coil resistance measurement	> 0.04 [A] +/- 5% (required	Ignition state ON	= True	20 [s]	Cyclically every 20	Type A, 1 Trip
			Fatifalure	Measurement (VCRM) inside the HSW	Gasi		AND			[5]	1
				1			Execution of the valve coil resistance measurement	= True			
		All	RBVLV_VLVPath2_HighOhmicShort2GND_Continuous	This monitoring checks if there is short between	Leakage current between valve relay and ground path (High ohmic short to	> 0.0063 [A]	Ignition state ON	= True	0.185 [s]	Continuous	Type A, 1 Trip
				VRand GND.	ground bit in ASIC is set)				1		1
							AND				1
		AII	RBVLV VLVPath2 Short2GND Continuous	This monitoring checks if there is short between	Leakage current between valve relay and ground path (Short to ground bit	>0.0198 [A]	Innition state ON	= True	0.025 [s]	Continuous	Type A 1 Trip
		1		VRand GND.	in ASIC is set)				0.0000 (0)	1	1.11
							AND	ļ			1
		l					Valve relav is switched off	= True			
		All	RBVLV_VLVPath2_VRGOnSPIFails_Continuous	This monitoring checks if the feedback of VRG	Valve relay control bit in ASIC does not match the desired actuation state	= Irue	Ignition state ON	= True	0.05 [s]	Continuous	Type A, 1 Trip
		All	RBVLV VLVPath2 VROffFails Continuous	This monitoring checks if the Valve Relay can be	Valve Relay can be switched OFF	= False	Ignition state ON	= True	0.065 [s]	Continuous	Type A. 1 Trip
		1		switched OFF.							
		All	RBVLV_VLVPath2_VROffFails_FSL	This monitoring checks if the Valve Relay can be	Valve Relay can be switched OFF	= False	Ignition state ON	= True	1 [s]	Once	Type A, 1 Trip
		·		switched OFF during the initial test.		7		T	0.0451-1		Track & Track
		All	RBVLV_VLVPath2_VROnFalls_Continuous	This monitoring checks if the valve Relay can be	valve relay cannot be switched on	= Irue	AND	= True	0.015 [S]	Continuous	туре А, 1 Тпр
				switched ON.			Valve relav is switched on	= True			
		All	RBVLV_VLVPath2_VROnFails_FSL	This monitoring checks if the Valve Relay can be	Valve relav cannot be switched on	= True	Ignition state ON	= True	1 [s]	Once	Type A, 1 Trip
				switched ON during the initial test.			AND	1			1 1
		A11	BBM V VI VBoth2 VBColobyCuitehTestEsile ESI	This monitoring shocks if the Volue Below oon he	Volue Relay eee he switched OEE hu redundent selety switch	- Foloo	Valve relav is switched on	= True	1 [0]	0000	Turne A. 1 Trin
			RBVEV_VEVFall2_VR3alety3witchTestFalls_F3E	ewitched OEE by redundant eafaty ewitch	valve Kelay can be switched OFF by redundant salety switch	= Faise	Ignition state ON	= ride	1 [9]	Once	Type A, T Thp
		All	RbWdhSwBistConCnt	This monitoring checks if Core 1 and Core 2 SW-	Core 1 and Core 2 SW BIST signatures are different	= True	Ignition state ON	= True	0.01 [s]	Continuous	Type A, 1 Trip
		I		BIST signatures are different.	-)			J
		All	RbWdhTaskMonConCnt	This monitoring checks if the task scheme is	Task scheme error detected	= True	Ignition state ON	= True	0.01 [s]	Continuous	Type A, 1 Trip
		AII	PBWeeEI ModeEail	I proper. This monitoring checks if the current wheel speed	Miematch hatwaan currant WSS mode enflware continuation (stored in a	= True	Ignition state ON	= True	0.2 [8]	0000	Turne & 1 Trin
				sensor configuration is correct via Serial Perioheral	register) and the hardware configuration						764 /
		L		Interface (SPI).							
		All	RBWssFRModeFail	This monitoring checks if the current wheel speed	Mismatch between current WSS mode software configuration (stored in a	= True	Ignition state ON	= True	0.2 [s]	Once	Type A, 1 Trip
				sensor configuration is correct via Serial Peripheral	register) and the hardware configuration					1 1	1 1
		AU	PBWeePI ModeEail	Interface (SPI). This monitoring checks if the current wheel speed	Mismatch between current WSS mode enforcer configuration (stored in a	- True	Ignition state ON	- True	0.2 [8]	0000	Turne & 1 Trin
				sensor configuration is correct via Serial Peripheral	register) and the hardware configuration	- 1100		1	0.0 (0)	Unice	Type A, T Tup
				Interface (SPI).							
		All	RBWssRRModeFail	This monitoring checks if the current wheel speed	Mismatch between current WSS mode software configuration (stored in a	= True	Ignition state ON	= True	0.2 [s]	Once	Type A, 1 Trip
				sensor configuration is correct via Serial Peripheral	register) and the hardware configuration						1
		AII	STM &ewSvetemTimeOut	This monitoring checks if A SW configuration takes	å SW current states stav in initialized state	- True	Ignition state ON	- True	5[e]	Continuous	Tune A 1 Trin
		1		I too long.				1	- (-1)		.,,,e.r.,p
		All	TTM_MPUError	This monitoring checks if a third party software	Restricted area was tried to be accessed by TTM	= True	Ignition state ON	= True	Immediately	Continuous	Type A, 1 Trip
		I	1	access into restricted RAM area is detected.		<u> </u>		l	<u> </u>	Y	
0			TOU UN MERCEN	This section is a share the top of the	No	*	1	T	Terrar d'atat		
Control Mödüle Programming Error	P0602	AU	ECU_HU_MISMATCh	I his monitoring checks if the ECU exchange was	mismatch between the stored and the real LIPS ID	= true	Ignition state ON	= Irue	immediately	Uncê	Type A, 1 Trip
r rogramming Error		All	Factorycalibration	This monitoring checks if the IPB has not been	5th Byte in internal customer data from any of the 5 pieces of calibration	= ASCILD	Ignition state ON	= True	Immediately	Once	Type A 1 Trip
				programmed with calibration data set	block)			
		Brembo	PbcFaultState_20	This monitoring checks if the EPB has the valid	The version of parameters saved in FLASH	= OxFF	Ignition state ON	= True	0.01 [s]	Continuous	Type A, 1 Trip
				parameter set.	OR				1	1	1 1
					The version of parameters saved in FLASH is different from the PBC SW	= Irue			1	1	1 1
		TRW	PbcFaultState 20	This monitoring checks if the EPB has the valid	EPB system has no parameter record or no valid parameter record received	= True	Ignition state ON	= True	0.01 [s]	Continuous	Type A. 1 Trip
		· ¨		parameter set.)	(*)		2. a.u
		TRW	PbcFaultState_21	This monitoring checks if the EPB's parameter has	PBC parameter checksum is incorrect	= True	Ignition state ON	= True	0.01 [s]	Continuous	Type A, 1 Trip
	1	1		the correct checksum value.							

System/	Fault	Variant	Failure Word	Monitoring Strategy Description	Malfunction Criteria	Malfrinction Criteria Threshold	Secondary Parameters	Enable Condition	Time Required	Frequency of	MIL
Component	Code					Value			1	Checks	Illumination
		All	RBWssDynamicConfigurationFailure	This monitoring checks if the configuration of the wheel speed sensor type is possible.	Wheel speed sensor type value (ODR comment: When a new sensor type is added to the software, this number grows. Check this value with the curetower team.)	>35	Ignition state ON	= True	Immediately	Once	Type A, 1 Trip
					OR		AND				
					Wheel speed sensor type value	<0	During initialization	= True			
					NvM access failure	= True					
EBCM Overtemperature	C127E	All	RBI EXSOvertemperature	This monitoring charge if there is an over	Over temperature elization has been detected by system ASIC at external	- True	Institute of the ON	- True	0.06 [e]	Continuous	Turne A 1 Trin
	CIZIE		RBCEXSOVertemperature	temperature at the external power supply line in the direction of LiPS.	LIPS power supply line	= Hue		- 1100	0.00 [5]		Туре Х, Т Пр
Internal Control Module A/D	P060B	All	RBAdcPeripheralFault	This monitoring checks if there are general ADC	ADC operational conversion error detected	= True	Ignition state ON	= True	0.08 [s]	Continuous	Type A, 1 Trip
Processing Performance				errors of the operational conversion.	OR ID error registered	= True					
					Operational scan group has not completed its conversion in time OR	= True					
		All	RBAdcPinTest	This monitoring checks if there are open bonds or	Not all operational results have been written before they are read ADC open bond failure sampling detects failure for a cumulative number of	= False	Ignition state ON	= True	0.08.[s]	Continuous	Type A 1 Trip
				pins.	times		ignition state on	- 1100	0.00 [3]		1,000,000
		All	RBAdcSelftestC5P	This monitoring checks if the converted internal test voltages are in a defined range	Five-point ADC self-test detects failure for a cumulative number of times	>= 3	Ignition state ON	= True	0.07 [s]	Continuous	Type A, 1 Trip
		All	RBuCRegisterFault	This monitoring checks if ADC register bits are set	An ADC register bit is flipped	= True	Ignition state ON	= True	0.08 [s]	Continuous	Type A, 1 Trip
				to the expected values.	OR An ADC register bit is stuck	= True					
										<u> </u>	_
EEPROM Error	P062F	All	NvMLipsIDWriteFailed	This monitoring checks if LiPS-related NvM item can be written.	LiPS-related NvM item cannot be written	= True	Ignition state ON	= True	Immediately	Once	Type A, 1 Trip
		All	RBBLM_ConfigurationError	This monitoring checks if the motor configuration in NvM is valid during the initial test.	Wrong configuration is read by the software from NvM OR	= True	Ignition state ON	= True	0.01 [s]	Once	Type A, 1 Trip
		All	RBNvM WriteCycleExceed	This monitoring checks if there are too many	Unsupported configuration is read by the software from NvM Number of write/erase requests at NvM exceeds a defined number (in case	= True = True	Ignition state ON	= True	0.250 [s]	Continuous	Type A. 1 Trip
				read/write requests.	of the total number of the configured memory blocks)						
					AND Too much write/erase task requested in a defined time frame	> 0.25 Fsl					
						1		1			
Keep Alive Memory (KAM)	P0603	All	AscetExternal_Parameter_Update_Failed	I his monitoring checks if HW Parameters) can be read from EEPROM correctly.	Reading the HW Parameters from EEPROM is not successful	= True	AND	= True	Immediately	Once	Type A, 1 Trip
Error						False	ECU Startup	= True			
		All	BPLM_FrontAxienvimReaderfor	front axle can be read or valid.	OR	= Faise	AND	= Irue	Immediately	Once	Type A, 1 Trip
		l <u> </u>			NVM item is valid	= False	Battery voltage	= 916 [VI		J	-
		All	BPLM_RearAxIeNVMReadError	I his monitoring checks if the NVM item for the rear axle can be read or valid.	NVM item can be read OR	= False	AND	= True	Immediately	Once	Type A, 1 Trip
			NAM STORE STORE		NVM item is valid	= False	Battery voltage	= 916 M		J	
		All	NVMLipsiDReadFailed	I his monitoring checks if the Linear position sensor related NVM item can be read, or the item	OR	= True	Ignition state ON	= True	Immediately	Once	Type A, 1 Trip
		L		is valid.	LiPS-related NvM item is invalid	= True					_
		All	PbcShadowMemError	of the EEPROM write procedure.	Invalid cell result received during read back after writing to the EEPROM	= True	Ignition state ON	= True	0.02 [s]	Continuous	Type A, 1 Trip
		All	PSCGearRatioReadFailed	This monitoring checks if the gear ratio information	Gear ratio information can be read out from the NVM	= False	Ignition state ON	= True	Immediately	Once	Type A, 1 Trip
				can be read our non menon-volatile menory.	_ Gear ratio information is correct	= False					
		All	PSCMotorSizeReadFailed	This monitoring checks if the motor size	Motor Size information can be read out from the NVM	= False	Ignition state ON	= True	Immediately	Once	Type A, 1 Trip
				memory.	Motor Size information is correct	= False					
Internal Control Medula	BORO1	A11	PREpablication -	This manitoring about a proper functionality of	Uppermentable flexik ECC fault segurred	- Tous	Institute state ON	- True	0.08 (e)	Continuous	Turne A. 4 Trie
Memory Checksum Error	1 0001			Flash.	OR		Support and one	- 1100	0.00 [3]		1,000,000,000
					Multiple flash ECC faults occurred	= True					
					Number of flash ECC single bit faults is too high	= True					
					OR Flash checksum verification failed	= True					
								-			-
Internal Control Module Random Access Memory	P0604	All	RBHWBISTError	This monitoring checks if the LBIST and MBIST are working properly	Test result bits set do no match reference register value OR	= True	Ignition state ON	= True	Immediately	Once	Type A, 1 Trip
(RAM) Error					Signature register values do no match reference register value	= True					
		All	RBRAMFailure	This monitoring checks proper functionality of RAM.	Coupling fault occurred between neighboring RAM cells OR	= True	Ignition state ON AND	= True	Immediately	Continuous	Type A, 1 Trip
					RAM addressing fault occurred	= True	During initialization	= True			
					OR RAM ECC correctable bit transient fault occurred	= True					
					RAM ECC correctable bit permanent fault occurred	= True					
					OR .	T					
					Uncorrectable RAMECC fault occurred	= True			1	L	-
Key Table Not Provisioned	U1960	All	AuthoritativeCounterOverflow	This monitoring checks if the Authoritative Counte	Authoritative Counter value reached its maximum	= True	Ignition state ON	= True	0.02 [s]	Continuous	Type B, 2
		All	CSM_SECP_E_KEY_EMPTY	This monitoring checks if the key provisioning has	HSM (hardware security module) returns a fault code referring to a key	= True	Ignition state ON	= True	0.01 [s]	Continuous	Type B, 2
				been done at all.	empty error					1	Trips
							Communication related conditions fulfilled (No error passive. no	= True			
		I			J	l	undervoltace)		J	J	
		All	Key I ableNotProvisioned	This monitoring checks if the key provisioning has been done in OEM's plant.	Kev table provisioned NVM item value	= True	Ignition state UN AND	= Irue	0.02 [s]	Once	Trips
							ECU is in initialization state	= True	<u> </u>	L	1
Security Peripheral	U1961	All	CSM_SECP_E_GENERAL_FAILURE	This monitoring checks for general failure in	Internal failure in HSM is detected	= True	Ignition state ON	= True	0.01 [s]	Continuous	Type B, 2
Performance - Performance		1		security peripheral.	OR		-				Trips
or Incorrect Operation	1	1	1		HSM state is not correct	= Irue		1	1	1	1

	1		1								
System/ Component	Fault Code	Variant	Failure Word	Monitoring Strategy Description	Malfunction Criteria	Malfanction Criteria Threshold Value	Secondary Parameters	Enable Condition	Time Required	Frequency of Checks	MIL Illumination
		All	CSM_SECP_E_MEMORY_FAILURE	This monitoring checks the integrity of the security peripheral's ROM memory.	HSM returns a fault code referring to ROM memory error	= True	Ignition state ON	= True	0.01 [s]	Continuous	Type B, 2 Trips
		All	CSM_SECP_E_SEQUENCE_ERROR	This monitoring checks for sequence error in	HSM prerequisites are not met	= True	Ignition state ON	= True	0.01 [s]	Continuous	Type B, 2
		All	SecurityPerinheralIncorrectOneration	Security peripheral.	The security peripheral is not responding for time	> 0.005 (e)	Innition state ON	= True	0.02 [e]	Continuous	Trips
				able to generate/verify a Message Authentication	The second y perpiritual a new responding to rune	5 0.005 [5]		- 1100	0.02 [3]		Trips
System Voltage High	P0563	All	LIN Overwittene Renjacement	This monitoring charks if there is an existing	ECII Supply voltage	> 16 IVI	Cranking	- Foles	Immediately	Continuous	Tune B 2
Oystelli Voltage riigh			En_oreronage_replacement	overvoltage situation while other LIN failure is	AND			- 1 435			Trips
		Brembo	PhrEquitState 11	present. This monitoring checks if the supply voltage is too	Another LIN failure has been detected	= True	Actuation has been requested	= True	2[e]	Continuous	Tune B 2
			i bii uutotate_i i	high for the actuation.	AND	1		- 1100	2[0]		Trips
					Voltage above threshold for time AND	> 0.050 [s]					
					Actuation stopped twice due to recurring Mature conditions, leading to final	= True	Actuation has been requested	= True	-		
					actuation abort. De-Mature condition: - Supply voltage less than 16.1 [V] for 50 [ms]. The mature method described is applicable in case of: - Static apply, - Static release, - Hot brake re-clamp, - Open brake rear, - Close						
		TRW	PbcFaultState_11	I This monitoring checks if the supply voltage is too	Power supply voltage	> 16.5 [V]	Actuation (apply or release) has been requested	= True	2[s]	Continuous	Type B, 2
		I		high for the actuation.						· · · · · · · · · · · · · · · · · · ·	Trips
		All	PSCOverVoltageLeveH	This monitoring checks if there is an overvoltage measured atUBB sucolvline.	Measured UBB voltage	>16[V]	Ignition state UN	= True	0.2 [s]	Continuous	Type B, 2 Trips
		All	PSCOverVoltageLevel2	This monitoring checks if there is an overvoltage	Measured UBB voltage	>20[V]	Ignition state ON	= True	0.2 [s]	Continuous	Type B, 2
		All	PSCOverVoltageShutDownLevel	measured atUBB sucolvline. This monitoring checks if there is an overvoltage	Measured UBB voltage	>2711	Ignition state ON	= True	0.2 [s]	Continuous	Trips Type B. 2
		L		measured atUBB sucolvline.	J						Trips
		All	RBNET_Overvoltage_Replacement	This monitoring checks if there is an existing overvoltage situation and this is only a	AND	>16[VI	Ignition state ON	= True	Immediately	Continuous	Type B, 2 Trips
				reolacement failure instead of other NET failures.	Another NETfailure has been detected	= True					
		All	RBOvervoltage	valve path is too high.	UB_VR	> 16.5 [V]	Ignition state ON	= True	1.02 [s]	Continuous	Trips
	1		·			1 -					
Calibration Detected	P064F	All	SSC_ISPRSP_NotPresent	peripheral key storage is present or not.	IVMAS is activated in SUM-SSC	= I rue	Ignition state UN	= True	Immediately	Continuous	Type A, 1 Trip
					AND	- Thus					
		All	SSC_KeySlotConfiguration_Invalid	This monitoring checks if the key slot configuration	Key slot configuration is not as per the MACT	= True	Ignition state ON	= True	Immediately	Continuous	Type A, 1 Trip
				is Invalid.	OR Invalid keyslot configuration in SUM-SSC	- True					
		All	SSC_MoreThanOneTxEcuEnabledAuthentication_ID	This monitoring checks if more than one Tx ECU	More than one Tx ECU is enabled for the same message authentication ID	= True	Ignition state ON	= True	Immediately	Continuous	Type A, 1 Trip
				is enabled for the same authentication ID.					4		
Wheel Speed Sensor	C10EE	All	RBWssMuxDmaBu(Noise	This monitoring checks if there is an overflow in	(DMA buffer state	= Overflow	Ignition state ON	= True	0.03 [s]	Continuous	Type A, 1 Trip
Frequency				the Direct Memory Access Transfer Unit.	OR Buffer transfer error occurred (DMA TU is receiving time stamps too	= True	AND Front Left WSS Test is finished as sensor undervoltage fault is not logged	= True			
					freouently) 1		(SAE code: C0501)				
					AND DMA buffer failure for specific wheel speed signal is not set (the signal	= True	AND Front Right WSS Test is finished as sensor undervoltage fault is not logged	= True			
					which is on the output of the multiplexer channel)		(SAE code: C0507) AND				
							Rear Left WSS Test is finished as sensor undervoltage fault is not logged ((SAE code: C050D)	= True			
							Rear Right WSS Test is finished as sensor undervoltage fault is not logged	= True			
Hudroulie Values							(SAE code: C0513)	r			
Brake Booster Performance	C0021	AII	Ppc_PressureTooLow	This monitoring checks if the pressure in plunger circuit is too low	Target pressure AND	> 60 [barl	Ignition state ON AND	= True	0.3 [s]	Continuous	Type A, 1 Trip
					Pressure sensor 2 value	< 30 Fbarl	Braking is recuested (either by driver or by external)	= True			
							AND BBE System state	= Full			
		All	Ppc_PressureTooLow_GC	This monitoring checks with goodcheck if the	Target pressure	> 60 [barl	Ignition state ON	= True	0.3 [s]	Continuous	Type A, 1 Trip
				pressure in plunger circuit is too low.	AND Pressure sensor 2 value	< 30 [barl	AND Braking is requested (either by driver or by external)	= True			
Broke Eluid		A.	DBBroko EluidEmotu	This manitoring shocks if the brake fluid reconvoir	Proke fluid level eccess value is set to legisst value "4"	- Taua	Institute state ON	- True	40.51	Continuous	Turne A. 4 Trie
Brake Fluid	C0049		RBBrakeFluidempty	is emoty.	Brake huid level sensor value is set to logical value 1	= True	Ignition state ON	= True	10 [8]	Continuous	Type A, 1 Thp
Brake Hydraulic Circuit "C"	C0580	All	AIM RADAirPlungerGircuit	This monitoring checks if there is air in the	RAD - Calculated volume deviation (based on Pressure sensor 2 value and	> 2 [cm ^A 3]	BBF System state	= Circuit separation OR One	0.02[8]	RAD: At each slow	Type A 1 Trip
Leak	1	1		plunger. It checks the system during three	plunger position)			circuit		replenishment in	
				situation: - during replenishment (Replenishment air	AND For time	>1 [8]	AND Replenishment is active	= True		degraded state. TAD: At each	
				detection, RAD)			AND			pressure based	
				 during TAD (Transition to idle air Detection, TAD) active test after power on (Fluid level indicator) 			Pressure sensor 1 value AND	> 10 [barl		TTI in degraded state	
				Plausibility aur detection, FAD).			Ignition state ON	= True	_	FAD: At least once	
					I AD - Calculated volume deviation (based on Pressure sensor 2 value and plunger position)	> 1.6 [cm^3]	BBF System state	= Full system OR Degraded pedal feel OR Circuit separation OR One circuit		per power cycle.	
		1			AND		AND				
		1			For time	>5 Fsl	TTI (Transition to Idle) is active for the plunger AND	= True			
	1	1					Pressure sensor 1 value	> 10 [barl			
		1					AND Ignition state ON	= True			
		1			FAD - Calculated volume deviation (based on Pressure sensor 2 value and	> 1.5 [cm ^A 3]	BBF System state	= Full system OR Degraded	1		
		1			plunger position)			pedal feel OR Hydraulic backup with actuators			
		1			AND	101-1	AND	False			
1	1	1	1	1	For time	1>10[8]	praking is reguested (either by driver or by external)	= raise	1	1	1 1

System/	Fault	Variant	Failure Word	Monitoring Strategy Description	Malfunction Criteria	Mallunction Criteria Threshold	Secondary Parameters	Enable Condition	Time Required	Frequency of	MIL
Component	Code	1				Value	1			Checks	Illumination
							AND			-	
							Vehicle speed	= 9.3243.5 [moh]			
							AND				
							Pressure sensor 1 value AND	> 10 (barl			
							Ignition state ON	= True			
Excessive Compliance -	COSSD	All	STF_SoftCircuit1	This monitoring checks if there is a leakage in [Circuit 1	Calculated leakage based on pressure sensor 2 value and plunger position	> 500 [mm 3/s]	BBF System state	= Circuit separation	0.100 0.500	Continuous	Type A, 1 Trip
Level 2							AND		[0]		
		L					Braking is reguested (either by driver or by external)	= True	_		
		All	STF_SoftCircuit1_GC	This monitoring checks if there is a leakage in	Calculated leakage based on pressure sensor 2 value and plunger position	> 500 [mm ⁿ 3/s]	BBF System state	= Circuit separation	0.100 0.500	Continuous	Type A, 1 Trip
				Cilcuit I:			AND		[5]		
							Braking is reguested (either by driver or by external)	= True			
	C055E	All	STF_SoftCircuit2	This monitoring checks if there is a leakage in	Calculated leakage based on pressure sensor 2 value and plunger position	> 500 [mm [*] 3/s]	BBF System state	= Circuit separation	0.100 0.500	Continuous	Type A, 1 Trip
				Circuit 2.			AND		[5]		
							Braking is reguested (either by driver or by external)	= True			
		All	STF_SoftCircuit2_GC	This monitoring checks if there is a leakage in	Calculated leakage based on pressure sensor 2 value and plunger position	> 500 [mm ^A 3/s]	BBF System state	= Circuit separation	0.100 0.500	Continuous	Type A, 1 Trip
				Circuit 2.			AND		[s]		
							Braking is reguested (either by driver or by external)	= True			
	C2A20	All	STF_SoftSingleCircuit	This monitoring checks if there is a leak in the	Calculated leakage based on pressure sensor 2 value and plunger position	> 500 [mm ^A 3/s]	BBF System state	= One circuit	0.100 0.500	Continuous	Type A, 1 Trip
				remaining single circuit.			AND		[S]		
							Braking is requested (either by driver or by external)	= True			
		All	STF_SoftSystem	This monitoring checks if there is a leak in the	Calculated leakage based on pressure sensor 2 value and plunger position	> 2000 [mm ^A 3/s]	BBF System state	= Full	0.100 0.500	Continuous	Type A, 1 Trip
				plunger circuit.					[S]		1
							AND Braking is requested (either by driver or by external)	= True			
	_										
Brake Master Cylinder Cut	C05D5	All	RBVLV_MV5B_GeneralValveDriverFailure	This monitoring checks continuously if the valve	Current through valve coil (Over Current feedback bit is set)	>4-6.5 [A]	Ignition state ON	= True	0.03 [s]	Continuous	Type A, 1 Trip
Off Valve				Coll has Over Current, Over Temperature, Power	UK Temperature in &SIC output stage (Over Temperature feedback hit is set)	> 195-220 PC1	AND Any value test is activated	- Falee			
					·····	1					
					OR						
					Voltage drop between PGND at low-side driver and ECU-GND (PGND-Lost feedback bit is east)	> 0.4-0.9 [V]					
					OR						
					Voltage at Qx (Free Wheeling Lost feedback bit is set)	> 32.8-39.4 fVI					
		All	RBVLV_MV5B_SVDTFailure	This monitoring checks cyclically if there is	Voltage at low-side in off-state (Open Load feedback bit is set)	< 2-2.5 rvi	SVDT is running	= True	20 [s]	Cyclically every 20	Type A, 1 Trip
				Shortcut between valves during Silent Valve Drive	f UK Current through value coil (Under Current feedback bit is set)	<0.075-0.125 FA1	AND Ignition state ON	- True		[S]	
				paths.	OR	1	AND	- 1100			
					Current through valve coil (Over Current feedback bit is set)	>4-6.5 FA1	Valve relav sucolv voltage	> 6.9 M			
					OR	405 000 (00)	AND Outside during a second	T			
					remperature in ASIC output stage (Over Temperature feedback bit is set)	> 190-220[.0]	Outside of valve control	= True			
					OR		AND				
					Voltage drop between PGND at low-side driver and ECU-GND (PGND-Lost	> 0.4 - 0.9 [V]	Hydraulic request is set	= False			
					OP						
					Voltage at Qx (Freewheeling Lost feedback bit is set)	> Clamping voltage 32.839.	4				
					1	м					
					OR Deviation of measured surrents right hefers and right ofter suitables point.	- 20 19/1					
					(Hs-Ls Comcare feedback bit is set)	20[70]					
		All	RBVLV_MV5B_ValveActuationFailure	This monitoring checks continuously if there is	PWM failure feedback bit is set	= True	Ignition state ON	= True	0.03 [s]	Continuous	Type A, 1 Trip
				PWM failure or HsLs-Compare failure or wrong	OR	0.0.1911	AND	0.000			
				GateGX(ON/OFF) failure.	(Hs-Ls Compare feedback bit is set)	> 20 [76]	valve relay supply voltage	>0.9[4]			
					OR		AND				
					Wrong GateQx ON feedback bit is set	= True	Any valve test is activated	= False			
					UR Wrong CateOx OFF leadback bit is set	- True					
		All	RBVLV_MV5B_ValveCoilPathinterruptionFailure	This monitoring checks continuously if the valve-	Voltage at low-side in off-state (Open Load feedback bit is set)	< 2-2.5 rvi	Ignition state ON	= True	0.03 [s]	Continuous	Type A, 1 Trip
	1			coil path has interruption.	OR		AND	1		1	1
				This was blacked as the star With and is desired.	Current through valve coil (Under Current feedback bit is set)	<0.075 -0.125 [AI	Any valve test is activated	= False	20 (e)	0	T
			KBVEV_WV3B_valvecolikesistanceOutorkangeralure	between the measured valve resistance and the	OR	13.7 [01111	AND	= Hue	20 [0]	[s]	Type X, T Thp
				defined valve resistance in the software.	Measured valve resistance	<4.8 [Ohrnl	Outside of valve control	= True			
							AND	False			
		All	RBVLV MV5B ValveDriverLBISTFailure	This monitoring checks if there is failure inside	Failure in actuation logic and actuation compare logic	= True	Ignition state ON	= True	20 [s]	Cyclically every 20	Type A. 1 Trip
		1		valve driver actuation logic and actuation	OR		AND			[s]	1
	1	1		monitoring unit as well as inside valve driver ADC	Failure in low-side ADC measurement	= True	Outside of valve control	= True		1	
	1			unit.	UK Failure in high-side ADC measurement	= True	AND Hydraulic request is set	= False			
	1	1			OR					1	
	1	L	1		Failure in PWM compare unit	= True				1	1
	1	All	RBVLV_MV5B_VARTFailure	This monitoring checks cyclically the ASIC-Valve-	ASIC valve driver failure crosstalk	= True	Ignition state ON	= True	20 [s]	Cyclically every 20	Type A, 1 Trip
	1	1		priver internal output-driver actuation register.	Bit failure in ASIC valve driver actuation registers (stuck at 0 or 1)	= True	Valve relav supply voltage	> 6.9 M		[5]	
	1				OR		AND				
	1	1			Unexpected ASIC valve driver feedback (considered ASIC bits: OpenLoad,	= True	Outside of valve control	= True		1	
	1				Undercurrent GateQx (UN/UFF))		AND				
							Hvdraulic reguest is set	= False			
									_		
Brake Pedal Feedback	C0024	Alí	RBVLV_MV9_GeneralValveDriverFailure	This monitoring checks continuously if the valve	Current through valve coil (Over Current feedback bit is set)	> 5 - 8 [Al	Ignition state UN	= Irue	0.03 [s]	Continuous	Type A, 1 Trip
r ressure Sciencia Cifcuit	1	1		IGround Lost, Free Wheeling Lost failure	Temperature in ASIC output stage (Over Temperature feedback hit is set)	> 195-220 [°C]	Any valve test is activated	= False		1	
	1	1		g						1	
1	1	1	1		OR	1		1		1	

Svetem/	Fault	Variant	Esilure Word	Monitoring Strategy Description	Malfunction Criteria	Mallunction Criteria Threshold	Secondary Parametere	Enable Condition	Time Required	Frequency of	MI
Component	Code	Vanan	Pailule Wold	Monitoring Strategy Description	Manufaction Cintena	Value	I	I Condition	I IIIIe Kequireu	Checks	Illumination
									(1	
					Voltage drop between PGND at low-side driver and ECU-GND (PGND-Lost	> 0.4-0.9 [V]			1		
					feedback bit is set)				1		
					OR	00.0.00.4.00			1		
		AII	PRVLV MV9 SVDTEsilure	This monitoring chacks cyclically if there is	Voltage at Low-side in off-state (Open Load feedback bit is set)	> 32.8-39.4 (VI	SVDT is running	- True	20 [e]	Cuclically every 20	Tune & 1 Trin
				shortcut between valves during Silent Valve Driver	OR		AND	- 1100	20[3]	fel	i iype x, i inp
				Test due to defective coil low side and high side	Current through valve coil (Under Current feedback bit is set)	< 0.075 - 0.125 [A]	Ignition state ON	= True	1	[3]	
				paths.	OR		AND		1		
					Current through valve coil (Over Current feedback bit is set)	> 5 - 8 [AI	Valve relav supply voltage	> 6.9 [VI	1		
					OR		AND	1 - '	1		
					Temperature in ASIC output stage (Over Temperature feedback bit is set)	> 195-220 [°C]	Outside of valve control	= Irue	1		
					OP		AND		1		
					Voltage drop between PGND at low-side driver and ECU-GND (PGND-Lost	> 0.4 - 0.9 [V]	Hydraulic request is set	= False	1		
					feedback bit is set)				1		
					OR				1		
					Voltage at Qx (Freewheeling Lost feedback bit is set)	> Clamping voltage 32.839.4			1		
						[VI			1		
					OR	0.01711			1		
					Deviation of measured currents right before and right after switching point (Heal & Compare feedback bit is set)	> 20 [%]			1		
		All	RBVLV MV9 ValveActuationFailure	This monitoring checks continuously if there is	PWMfailure feedback bit is set	= True	Ignition state ON	= True	0.03[s]	Continuous	Type A 1 Trip
		1		PWM failure or HsLs-Compare failure or wrong	OR		AND			1	.,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,
				GateQx(ON/OFF) failure.	Deviation of measured currents right before and right after switching point	> 20 [%]	Valve relay supply voltage	> 6.9 [V]	1		
					(Hs-Ls Compare feedback bit is set)		I	1 '	1		
					OR	_	AND	1	1		
					Wrong GateQx ON feedback bit is set	= True	Any valve test is activated	= False	1		
					Wrong GateOx OFE feedback hit is set	- True			1		
		All	RBVLV MV9 ValveCoilPathInterruptionFailure	This monitoring checks continuously if the valve-	Voltage at low-side in off-state (Open Load feedback bit is set)	< 2-2.5 IVI	Ignition state ON	= True	0.03 [s]	Continuous	Type A. 1 Trip
		1		coil path has interruption.	OR		AND	1 ····	1 1 1 1 10		1
		I		J	Current through valve coil (Under Current feedback bit is set)	<0.075 -0.125 [AI	Anv valve test is activated	= False	i]	1
		All	RBVLV_MV9_ValveCoilResistanceOutOfRangeFailure	This monitoring checks if there is deviation	Measured valve resistance	> 6.9 [Ohm]	Ignition state ON	= True	20 [s]	Cyclically every 20	Type A, 1 Trip
				between the measured valve resistance and the	OR	0.0101-1	AND .		1	[S]	
				defined valve resistance in the software.	Measured valve resistance	<2.2 [Onm]	Outside of valve control	= Irue	1		
							Hudraulic raquest is sat	- Falsa	1		
		All	RBVLV MV9 ValveDriverLBISTFailure	This monitoring checks if there is failure inside	Failure in actuation logic and actuation compare logic	= True	Ignition state ON	= True	20 [s]	Cyclically every 20	Type A. 1 Trip
		1		valve driver actuation logic and actuation	OR		AND		1	[5]	1
				monitoring unit as well as inside valve driver ADC	Failure in low-side ADC measurement	= True	Outside of valve control	= True	1		
				unit.	OR		AND	1 /	1		
					Failure in high-side ADC measurement	= True	Hydraulic reouest is set	= False	1		
					UR Esilves in BWM compose unit	Teve			1		
		All	RBVLV MV9 VARTEailure	This monitoring checks cyclically the ASIC-Valve-	ASIC valve driver failure crosstalk	= True	Ignition state ON	= True	20.[8]	Cyclically every 20	Type A 1 Trip
		1		Driver internal output-driver actuation register.	OR		AND		(-)	[5]	1
					Bit failure in ASIC valve driver actuation registers (stuck at 0 or 1)	= True	Valve relav supply voltage	> 6.9 [VI	1	(-)	
					OR		AND	1 '	1		
					Unexpected ASIC valve driver feedback (considered ASIC bits: OpenLoad,	= True	Outside of valve control	= True	1		
					Undercurrent GateQx (ON/OFF))		AND		1		
							Hudraulic request is set	- Falsa	1		
				•							
BSCM/EBBC Hydraulic Unit	C055F	All	Bsm_LeakageMC	This monitoring checks if there is a leakage in the	Calculated leakage	> 200 fmm ^A 3/sl	BBF System state	= Full	Immediately	Continuous	Type A, 1 Trip
Performance				Master Cylinder.			AND	ļ ,	1		1
							Brake Pedal	= applied	1		
							AND	0.000	1		
		AII	PRSte MechanicalBlockedHwdraulicValue	This monitoring checks for signs of an inonerable	Active System Test (component STS) detects an unexpected pressure build	- True	Svetam State	= Poetrun	1918	Once in Postrun	Tune & 1 Trip
			noors_meenameableekeen yoraanevarre	or blocked Test Separation. Circuit Separation or	III	- 1100		- i danan	1		iype A, T inp
				Plunger Separation valve.	1		AND		1		
							BBF System state	= Full OR Degraded pedal feel	1		
								1 /	1		
							AND	1	1		
			PRCisiDRHud Diverger estPressurePoost	This monitoring shocks if broke boost's a section ""	Colordated air valuma (based on pressure concer & C value and a line of	9 fom ^A 21	BRE Sustem stote	= Faise	4[e]	Onen immediateli	Time A 1 T
			Rootsie priyu_PlungerLostPressureboost	is lost	calculated an volume (based on pressure sensor AC value and plunger position)	s=o [cm 3]	DDF System state	= run UK Degraded pedal feel	-101 	after start of a new	Type A, 1 (fip
					AND		AND	1	1	Power Cycle	
				1	Calculated leakage	> 800 [mm ^A 3/sl	Braking is reguested (either by driver or by external)	= False	1	1	
							AND	1 /	1		
		L					Vehicle speed	< 156.6 [mph]			
		All	RBStsIPBHyd_PlungerRedPressureBuildUp	This monitoring checks if the pressure build	Calculated air in plunger	> 5 [cm^3]	BBF System state	= Full OR Degraded pedal feel	4[s]	Once immediately	Type A, 1 Trip
				capaointy is reduced.			AND	1	1	Power Cucle	1
				1			Braking is requested (either by driver or by external)	= False	1	oyuu	
							AND		1		
		L					Vehicle speed	< 156.6 [mphl			
		All	RPL_PressureBuildupNotPossible	This monitoring checks if the pressure build up	Pressure sensor 2 value gradient	< 300 [barl	Ignition state ON	= True	0.2 [s]	Continuous	Type A, 1 Trip
				during replenishment is possible.	AND		AND	1	1	1	
				1	Plunger volume	> plunger volume at start of	Replenishment is active	= Irue	1	1	
		1	l	1	I	1.0providence + 1 cm 3	1	<u> </u>			1
Driver Applied Pressure	C05D3	All	Bsm HardPedalChar	This monitoring checks if the current pressure	Pressure sensor value*	> too high	Ignition state ON	= True	0.2 [s]	Continuous	Type A. 1 Trip
Higher Than Expected	1	1		sensor value is too high for the current Pedal	OR	Ĭ	AND	1	1		1
1		L		Travel Sensor value.	Pedal Travel Sensor value	< too low	ESP or ABS intervention	= No intervention			1
		All	Bsm_HardPedalChar_GC	This monitoring checks if the current pressure	Pressure sensor value*	> too high	Ignition state ON	= True	0.2 [s]	Continuous	Type A, 1 Trip
				sensor value is too high for the current Pedal	OR .		AND) Na latana di s	1	1	
			I	I ravei Sensor value.	Pedal travel sensor value	< too low	JESP of ABS Intervention	j = No intervention			1
Left Front Inlet Control	C0010	All	RBVI V MV2A GeneralValveDriverFailure	This monitoring checks continuously if the value	Current through valve coil (Over Current feedback bit is sel)	>4-6 5 [A]	Ignition state ON	= True	0.03[s]	Continuous	Type A 1 Trip
con a font milet control	50010		Novey_myzh_General valveon verrailure	coil has Over Current, Over Temperature. Power	OR	24-0-0 [M	AND	- 1100	0.03 [5]	Continuous	type A, 1 mp
	1	1	1	Ground Lost, Free Wheeling Lost failure.	Temperature in ASIC output stage (Over Temperature feedback bit is set)	> 195-220 [°C]	Any valve test is activated	= False	1	1	
	1	1	1	1	I	1		1	1	1	
1	1	1	1	1	OR	1	1	1 /	1	1	1

System/	Fault	Variant	Failure Word	Monitoring Strategy Description	Malfunction Criteria	Mallunction Criteria Threshold	Secondary Parameters	Enable Condition	Time Required	Frequency of	MIL
Component	Code					Value	1	1	1	Checks	Illumination
					Voltage drop between PGND at low-side driver and ECIL-GND (PGND-Lost	> 0.4-0.9 [V]					
					feedback bit is set)	5 0.4 0.5 [1]					
					OR						
		AU	PRVI V MV2A SVDTEnilura	This monitoring shocks surlicely if there is	Voltage at Qx (Free Wheelino Lost feedback bit is set)	> 32.8-39.4 FV1	SVDT is suspise	- True	20 (e)	Cuelicelly even 20	Tune A 1 Trie
			RBVEV_WV2A_SVD1Fallule	shortcut between valves during Silent Valve Driver	OR	< 2-2.0 IVI	AND	- 1100	20[5]	[s]	Type A, T Thp
				Test due to defective coil low side and high side	Current through valve coil (Under Current feedback bit is set)	<0.075-0.125 [AI	Ignition state ON	= True			
				paths.	OR	4.0.510	AND	0.0.0.0			
					OR	>4-0.5 [AI	AND	> 0.9[vi			
					Temperature in ASIC output stage (Over Temperature feedback bit is set)	> 195-220 [°C]	Outside of valve control	= True			
					I,		1				
					OR Voltage drap between BCND at law side driver and ECU CND (BCND Less	- 0.4 .0.0.0/2	AND budgeville request is not	- Folgo			
					feedback bit is set)	5 0.4 - 0.8 [V]	riyulaulic request is set	= raise			
					OR						
					Voltage at Qx (Freewheeling Lost feedback bit is set)	> Clamping voltage 32.839.4					
					OR	[VI					
					Deviation of measured currents right before and right after switching point	> 20 [%]					
					(Hs-Ls Compare feedback bit is set)						
		All	RBVLV_MV2A_ValveActuationFailure	This monitoring checks continuously if there is BWM follows of Hole Compare follows of urgans	PWM failure feedback bit is set	= True	Ignition state ON	= True	0.03 [s]	Continuous	Type A, 1 Trip
				GateQx(ON/OFF) failure.	Deviation of measured currents right before and right after switching point	> 20 [%]	Valve relay supply voltage	> 6.9 [V]			
					(Hs-Ls Compare feedback bit is set)		l l				
					OR		AND	1			
					Wrong GateQx ON feedback bit is set	= True	Any valve test is activated	= False			
					Wrong GateQx OFF feedback bit is set	= True					
		All	RBVLV_MV2A_ValveCoilPathInterruptionFailure	This monitoring checks continuously if the valve-	Voltage at low-side in off-state (Open Load feedback bit is set)	< 2-2.5 [VI	Ignition state ON	= True	0.03 [s]	Continuous	Type A, 1 Trip
				coil path has interruption.	OR	0.075 0.405	AND	Falsa			1
		All	RRVLV_MV2A_ValveCoilResistanceOutO/RangeFailure	This monitoring checks if there is deviation	Current through valve coil (Under Current feedback bit is set)	<0.075-0.125[AI	Any valve test is activated	= False	20.[8]	Cyclically every 20	Type A. 1 Trin
	1			between the measured valve resistance and the	OR		AND			[s]	
				defined valve resistance in the software.	Measured valve resistance	<4.8 [Ohml	Outside of valve control	= True		[
							AND	False			
		All	RBVLV MV2A ValveDrivert BISTFailure	This monitoring checks if there is failure inside	Failure in actuation logic and actuation compare logic	= True	Invition state ON	= Faise	20 [8]	Cyclically every 20	Type A 1 Trip
			novev_mvex_varebinerebiorrandie	valve driver actuation logic and actuation	OR	- 1100	AND	- 1100	20 [3]	[s]	i i jpe A, i i inp
				monitoring unit as well as inside valve driver ADC	Failure in low-side ADC measurement	= True	Outside of valve control	= True		í í	
				unit.	OR		AND	Falsa			
					OR	= True	Hydraulic recuest is set	= Faise			
					Failure in PWM comoare unit	= True]			
		All	RBVLV_MV2A_VARTFailure	This monitoring checks cyclically the ASIC-Valve-	ASIC valve driver failure crosstalk	= True	Ignition state ON	= True	20 [s]	Cyclically every 20	Type A, 1 Trip
				Driver internal output-driver actuation register.	UR Bit failure in ASIC value driver actuation renisters (stuck at 0 or 1)	- True	Value relay supply witting	>69IVI		[s]	
					OR	- 1100	AND	0.0[1]			
					Unexpected ASIC valve driver feedback (considered ASIC bits: OpenLoad,	= True	Outside of valve control	= True			
					Undercurrent GateQx (ON/OFF))		AND				
							Hydraulic recuest is set	= False			
Left Front Outlet Control	C0011	All	RBVLV_MV2B_GeneralValveDriverFailure	This monitoring checks continuously if the valve	Current through valve coil (Over Current feedback bit is set)	>4-6.5 [AI	Ignition state ON	= True	0.03 [s]	Continuous	Type A, 1 Trip
				Ground Lost Free Wheeling Lost failure	Temperature in ASIC output stage (Over Temperature feedback bit is set)	> 195-220 [°C]	And Any valve test is activated	= False			
				Ground Lost, Free Writeling Lost lande.		5 100 LL0[0]		- 1 4130			
					OR						
					Voltage drop between PGND at low-side driver and ECU-GND (PGND-Lost feedback bit is not)	> 0.4-0.9 [V]					
					OR						
]	Voltage at Qx (Free Wheelino Lost feedback bit is set)	> 32.8-39.4 [VI]		l .	1.
		All	RBVLV_MV2B_SVDTFailure	This monitoring checks cyclically if there is	Voltage at low-side in off-state (Open Load feedback bit is set)	< 2-2.5 [VI	SVDT is running	= True	20 [s]	Cyclically every 20	Type A, 1 Trip
				Test due to defective coil low side and hinh side	Current through valve coil (Under Current feedback bit is set)	< 0.075 - 0.125 [A]	Ignition state ON	= True	1	[5]	
				paths.	OR		AND	1			
					Current through valve coil (Over Current feedback bit is set)	>4-6.5 [AI	Valve relav supply voltage	> 6.9 [VI	1		
					UK Temperature in &SIC output stage (Over Temperature feedback bit is oot)	> 195-220 (*C)	AND Outside of value control	= True	1		
					I menperature in Aero output stage (over reinperature recubiles on is set)	2 100 220 [0]		- 1100			
					OR		AND	ļ			
					Voltage drop between PGND at low-side driver and ECU-GND (PGND-Lost	> 0.4 - 0.9 [V]	Hydraulic request is set	= False			
					OR						
					Voltage at Qx (Freewheeling Lost feedback bit is set)	> Clamping voltage 32.839.4					
					I TOTAL TO	[VI					
					OR Deviation of measured surrents right before and right after and the surrents of the	- 20 (9/1			1		
					(Hs-Ls Compare feedback bit is set)	20[20]					
		All	RBVLV_MV2B_ValveActuationFailure	This monitoring checks continuously if there is	PWM failure feedback bit is set	= True	Ignition state ON	= True	0.03 [s]	Continuous	Type A, 1 Trip
				PWM failure or HsLs-Compare failure or wrong	OR		AND	1			
				GateQx(ON/OFF) failure.	Deviation of measured currents right before and right after switching point (Hs-I s Compare feedback bit is set)	> 20 [%]	valve relay supply voltage	> 6.9 [V]			
					OR		AND]			
					Wrong GateQx ON feedback bit is set	= True	Any valve test is activated	= False	1		
					OR	T			1		
		All	RBVLV MV2B ValveCoilPathInterruptionFailure	This monitoring checks continuously if the valve-	Voltace at low-side in off-state (Open Load feedback bit is set)	< 2-2.5 FVI	Ignition state ON	= True	0.03 [s]	Continuous	Type A. 1 Trip
				coil path has interruption.	OR		AND				,
					Current through valve coil (Under Current feedback bit is set)	<0.075 -0.125 [AI	Any valve test is activated	= False		0	
		All	KBVLV_MV2B_ValveCollResistanceOutOfRangeFailure	I his monitoring checks if there is deviation	Measured valve resistance OR	> 13.7 [Unm]	AND	= true	∠u[8]	cyclically every 20	iype A, 1 frip
				defined valve resistance in the software.	Measured valve resistance	<4.8 [Ohml	Outside of valve control	= True		[0]	
							AND)			
1	1			1			Hvdraulic reguest is set	= False	1		1

System/	Fault	Variant	Failure Word	Monitoring Strategy Description	Malfunction Criteria	Malftinction Criteria Threshold	Secondary Parameters	Enable Condition	Time Require	d Frequency of	MIL
Component	Code					Value				Checks	Illumination
		All	RBVLV_MV2B_ValveDriverLBISTFailure	This monitoring checks if there is failure inside valve driver actuation lonic and actuation	Failure in actuation logic and actuation compare logic OR	= True	Ignition state ON AND	= True	20 [s]	Cyclically every 20	Type A, 1 Trip
				monitoring unit as well as inside valve driver ADC	Failure in low-side ADC measurement	= True	Outside of valve control	= True		[3]	
				unit.	Failure in high-side ADC measurement	= True	AND Hydraulic reguest is set	= False			
					OR Follows in DIMM compare unit	- True					
		All	RBVLV_MV2B_VARTFailure	This monitoring checks cyclically the ASIC-Valve-	ASIC valve driver failure crosstalk	= True	Ignition state ON	= True	20 [s]	Cyclically every 20	Type A, 1 Trip
				Driver internal output-driver actuation register.	OR Bit failure in ASIC valve driver actuation registers (stuck at 0 or 1)	= True	AND Valve relav supply voltage	> 6.9 M		[s]	
					OR	- True	AND Outside of white constrail	- True			
					Undercurrent GateQx (ON/OFF))	= nue		= 1100			
							AND Hydraulic request is set	= False			
Left Rear Inlet Centrel	00018	A11	BB/// // MI//A ConsersB/alusDriverFeiture	This manifesing sharks continuously if the union	Current through while call (Quer Current feedback bit is call)	- 4 8 5 (4)		- True	0.02 (a)	Continuous	Tuno A. A. Trio
Cent recar milet Opinion	00010			coil has Over Current, Over Temperature, Power	OR	1 0.0 [70	AND		0.00 [3]		Type A, T The
				Ground Lost, Free Wheeling Lost failure.	Temperature in ASIC output stage (Over Temperature feedback bit is set)	> 195-220 [*C]	Any valve test is activated	= halse			
					OR Voltage drop between PGND at low-eide driver and ECLLGND (PGND-Lost	> 0.4-0.9 [V]					
					feedback bit is set)						
					_ Voltage at Qx (Free Wheeling Lost feedback bit is set)	> 32.8-39.4 FV1					
		All	RBVLV_MV4A_SVDTFailure	This monitoring checks cyclically if there is shortcut between valves during Silent Valve Driver	Voltace at low-side in off-state (Open Load feedback bit is set) OR	< 2-2.5 FV1	SVDT is running AND	= True	20 [s]	Cyclically every 20	Type A, 1 Trip
				Test due to defective coil low side and high side	Current through valve coil (Under Current feedback bit is set)	<0.075 -0.125 [AI	Ignition state ON	= True			
				practice.	Current through valve coil (Over Current feedback bit is set)	>4-6.5 [AI	Valve relav supply voltage	> 6.9 M			
					UK Temperature in ASIC output stage (Over Temperature feedback bit is set)	> 195-220 [°C]	AND Outside of valve control	= True			
					l OP		AND	1			
					Voltage drop between PGND at low-side driver and ECU-GND (PGND-Lost	> 0.4 - 0.9 [V]	Hydraulic request is set	= False			
					feedback bit is set) OR						
					Voltage at Qx (Freewheeling Lost feedback bit is set)	> Clamping voltage 32.839.4	1				
					OR						
						> 20 [%]					
		All	RBVLV_MV4A_ValveActuationFailure	This monitoring checks continuously if there is PWM failure or HsI s-Compare failure or wrong	PWM failure feedback bit is set OR	= True	Ignition state ON AND	= True	0.03 [s]	Continuous	Type A, 1 Trip
				GateQx(ON/OFF) failure.	Deviation of measured currents right before and right after switching point	> 20 [%]	Valve relay supply voltage	> 6.9 [V]			
					OR		AND				
					Wrong GateQx ON feedback bit is set OR	= True	An v valve test is activated	= False			
		AII	PBVLV MV44 ValueCollPathinterruntionEsiture	This monitoring charks continuously if the value.	Wrong GateQx OFF feedback bit is set	= True	Institute state ON	- True	0.03 [e]	Continuous	Tune A. 1 Trin
				coil path has interruption.	OR	1	AND	1	0.00 [0]		1996 7, 1 119
		All	RBVLV_MV4A_ValveCoilResistanceOutOfRangeFailure	This monitoring checks if there is deviation	Current through valve coil (Under Current feedback bit is set) Measured valve resistance	<0.075 -0.125 [AI > 13.7 [Ohrnl	Any valve test is activated	= False = True	20 [s]	Cyclically every 20	Type A, 1 Trip
				between the measured valve resistance and the	OR Measured value resistance	<4.8 (Obrol	AND Outside of value control	- True		[S]	
				defined vare resistance in the solution.		(4.0 [Onni	AND				
		All	RBVLV_MV4A_ValveDriverLBISTFailure	This monitoring checks if there is failure inside	Failure in actuation logic and actuation compare logic	= True	Ignition state ON	= False	20 [s]	Cyclically every 20	Type A, 1 Trip
				valve driver actuation logic and actuation Imonitoring unit as well as inside valve driver ADC	OR Failure in low-side ADC measurement	= True	AND Outside of valve control	= True		[S]	
				unit.	OR	T	AND	- Talaa			
					OR	= Hue	muraunc reguest is set	= raise			
		All	RBVLV_MV4A_VARTFailure	This monitoring checks cyclically the ASIC-Valve-	Failure in PWM compare unitASIC valve driver failure crosstalk	= True = True	Ignition state ON	= True	20 [s]	Cyclically every 20	Type A, 1 Trip
				Driver internal output-driver actuation register.	OR Bit failure in ASIC value driver actuation registers (stuck at 0 or 1)	= True	AND Valve relay supply voltage	>6.9 M		[8]	
					OR	_	AND	1			
					[Unexpected ASIC valve driver teedback (considered ASIC bits: OpenLoad, Undercurrent GateQx (ON/OFF))	= true	Uutside of Valve Control	= irue			
							AND Hvdraulic reguest is set	= False			
Left Beer Outlet Certini		A11	BB/// V_NV/4B_ConnerolNetreDriverSoftwa	This monitoring shocks continuously "the units	Current through uptic cell (Quer Current feedback bit is c	- 4 6 5 141	Incident and ON	- True	0.02.[0]	Continuous	Time 6.4 T
Len Rear Outlet Control	C0019	0	NDVLV_mV40_GeneralValVeDriverraliure	coil has Over Current, Over Temperature, Power	OR	24-0.0 [AI	AND	- 1100	0.03 [5]	Continuous	туре А, т т пр
				Ground Lost, Free Wheeling Lost failure.	Temperature in ASIC output stage (Over Temperature feedback bit is set)	> 195-220 [°C]	Any valve test is activated	= False			
					OR Voltage drop between PGND at low-eide driver and ECU-GND (BCND Loost	> 0.4-0.9 IV1					
					feedback bit is set)						
					Voltage at Qx (Free Wheeling Lost feedback bit is set)	> 32.8-39.4 [VI]			
		All	RBVLV_MV4B_SVDTFailure	This monitoring checks cyclically if there is shortcut between valves during Silent Valve Driver	Voltage at low-side in off-state (Open Load feedback bit is set) OR	< 2-2.5 [VI	SVDT is running AND	= True	20 [s]	Cyclically every 20 [s]	Type A, 1 Trip
				Test due to defective coil low side and high side	Current through valve coil (Under Current feedback bit is set)	<0.075 -0.125 [AI	Ignition state ON	= True			
				paus.	Current through valve coil (Over Current feedback bit is set)	>4-6.5 [AI	Valve relav sucolv voltage	> 6.9 M			
					OR Temperature in ASIC output stage (Over Temperature feedback bit is set)	> 195-220 [°C]	AND Outside of valve control	= True			
					l OP		AND	1			
					Voltage drop between PGND at low-side driver and ECU-GND (PGND-Lost	> 0.4 - 0.9 [V]	Hydraulic request is set	= False			
			l		OR			1			

System/	Fault	Variant	Failure Word	Monitoring Strategy Description	Malfunction Criteria	Mallunction Criteria Threshold	Secondary Parameters	Enable Condition	Time Required	Frequency of	MI
Component	Code	Vanan		Internet of a cost of the cost		Value			I	Checks	Illumination
											4
					Voltage at QX (Freewheeling Lost leedback bit is set)	 Clamping voltage 32.839.4 					
					OR	i vi					
					Deviation of measured currents right before and right after switching point	> 20 [%]					
					(Hs-Ls Compare feedback bit is set)			l			
		All	RBVLV_MV4B_ValveActuationFailure	This monitoring checks continuously if there is PWM failure or Hells-Compare failure or wrong	P W M failure feedback bit is set	= True	AND	= True	0.03 [s]	Continuous	Type A, 1 Trip
				GateQx(ON/OFF) failure.	Deviation of measured currents right before and right after switching point	> 20 [%]	Valve relay supply voltage	> 6.9 [V]			
					(Hs-Ls Compare feedback bit is set)		1				
					OR	T	AND	E-las			
					OP	= True	Any valve test is activated	= raise			
					Wrong GateQx OFF feedback bit is set	= True					
		All	RBVLV_MV4B_ValveCoilPathinterruptionFailure	This monitoring checks continuously if the valve-	Voltaae at low-side in off-state (Open Load feedback bit is set)	< 2-2.5 rvi	lanition state ON	= True	0.03 [s]	Continuous	Type A, 1 Trip
				coil path has interruption.	OR		AND	1			
		A11	PBVLV_MV4B_ValveCoilResistanceOutOIRanceEailure	This monitoring checks if there is deviation	Current through valve coil (Under Current feedback bit is set)	< 0.075-0.125 FA1	Any valve test is activated	= False	20 [e]	Cuclically every 20	Tune & 1 Trin
			norer_mrep_rareconneastanceonontanger andre	between the measured valve resistance and the	OR	2 10.7 [01111	AND	- 1100	20(3)	[s]	type A, T tup
				defined valve resistance in the software.	Measured valve resistance	<4.8 [Ohm]	Outside of valve control	= True		í l	
							AND	E-las			
		AU	PB//// MI/AP VolueDrived BISTEeilure	This monitoring shocks if there is follows inside	Epilure in petuation logic and estuation compare logic	- Teue	Hydraulic reauest is set	= False	20.61	Cuelicelly even 20	Turne A. 1 Trie
		0.1	KBVEV_MV4B_ValveDilverEbi31Pallure	valve driver actuation logic and actuation	OR	= lide	AND	= fide	20 [5]	[s]	Type A, T Thp
				monitoring unit as well as inside valve driver ADC	Failure in low-side ADC measurement	= True	Outside of valve control	= True			
				unit.	OR		AND	1			
					Failure in hiah-side ADC measurement	= True	Hvdraulic reauest is set	= False			
				1	Failure in PWM compare unit	= True				1	
		All	RBVLV_MV4B_VARTFailure	This monitoring checks cyclically the ASIC-Valve-	ASIC valve driver failure crosstalk	= True	Ianition state ON	= True	20 [s]	Cyclically every 20	Type A, 1 Trip
				Driver internal output-driver actuation register.	OR		AND	1	1	[S]	1 1
					Bit failure in ASIC valve driver actuation registers (stuck at 0 or 1)	= True	Valve relay supply voltage	> 6.9 [VI		1	
					OR	T	AND Outside during sector	T			
					Undercurrent GateOx (ON/OFF))	= True	Outside of valve control	= True			
							AND				
							Hvdraulic reauest is set	= False			
	1										1
Low Brake Fluid Indicated -	C0676	All	RBBrakeFluidLevelOutOfRangeHigh	This monitoring checks if the fluid level sensor is	UADC/UZP voltage ratio	> 86 [%]	Ignition state ON	= True	1 [s]	Continuous	Type A, 1 Trip
l l l l l l l l l l l l l l l l l l l									-		-
Low Brake Fluid Indicated -	C0677	All	RBBrakeFluidLevelOutOfRangeLow	This monitoring checks if the fluid level sensor is	UADC/UZP voltage ratio	< 16 [%]	Ignition state ON	= True	1 [s]	Continuous	Type A, 1 Trip
Short to around	L			shorted to around.				1			
Right Front Jolet Control	00014	AU	PB/// V/ MI/14 Concernit/olueDriverEeiture	This monitoring shocks continuously if the value	Current through uption call (Quer Current feedback bit is set)	- 4 6 5 141	Instition state ON	- True	0.03 (a)	Continuous	Tuno A. 1 Trio
Kight From Inter Control	00014	0.1	KBVEV_WVIA_GeneralValveDriverFailure	coil has Over Current. Over Temperature. Power	OR	24-0.5 [AI	AND	= fide	0.03 [5]		Type X, T Thp
				Ground Lost, Free Wheeling Lost failure.	Temperature in ASIC output stage (Over Temperature feedback bit is set)	> 195-220 [°C]	Any valve test is activated	= False			
					I			1			
					OR						
					Voltage drop between PGND at low-side driver and ECU-GND (PGND-Lost feedback bit is set)	> 0.4-0.9 [V]					
					OR						
					Voltaae at Qx (Freewheelina Lost feedback bit is set)	> 32.8-39.4 [VI]] '	J J
		All	RBVLV_MV1A_SVDTFailure	This monitoring checks cyclically if there is	Voltage at low-side in off-state (Open Load feedback bit is set)	< 2-2.5 [V]	SVDT is running	= True	20 [s]	Cyclically every 20	Type A, 1 Trip
				shortcut between valves during Silent Valve Driver	OR	0.075 0.405 (4)	AND	T		[s]	
				rest due to delective coll low side and high side	OR	<0.075-0.125 [AI	AND	= Irue			
				patits.	Current through valve coil (Over Current feedback bit is set)	> 4-6.5 [A]	Valve relay supply voltage	> 6.9 [V]			
					OR		AND	1			
					Temperature in ASIC output stage (Over Temperature feedback bit is set)	> 195-220 [°C]	Outside of valve control	= True			
					OP		AND				
					Voltage drop between PGND at low-side driver and ECIL-GND (PGND-Lost	> 0.4 - 0.9 IVI	Hydraulic request is set	- Falea			
					feedback bit is set)	20.4 0.0[1]	ingendente regional la ser	- Tulse			
					OR						
				1	Voltage at Qx (Freewheeling Lost feedback bit is set)	> Clamping voltage 32.839.4				1	
	1			1	OP	LA.		1	1	1	1 1
	1			1	Deviation of measured currents right before and right after switching point	> 20 [%]		1	1	1	1
					(Hs-Ls Compare feedback bit is set)			L		'	
		All	RBVLV_MV1A_ValveActuationFailure	This monitoring checks continuously if there is	PWM failure feedback bit is set	= True	Ignition state ON	= True	0.03 [s]	Continuous	Type A, 1 Trip
				PWM failure or HsLs-Compare failure or wrong	UK Deviation of measured surrents right before and right effer-	- 20 (91)	AND Value relay supply yelfage	- 6 0 0 0		1	
	1			and at (Orworr) railord.	(Hs-Ls Compare feedback bit is set)	~ ~ U [70]	vario rowy supply vollage	- 0.0 [V]	1	1	1
				1	OR		AND	1		1	
					Wrong GateQx ON feedback bit is set	= True	Any valve test is activated	= False			
	1			1	OR	T		1	1	1	1 1
		A11	PBVLV_MV1A_ValveCoilPathinterruntionEsilure	This monitoring checks continuously if the value-	Voltage at low-side in off-state (Open Load feedback bit is set)	= True	Ignition state ON	- True	0.03 [e]	Continuous	Type & 1 Trip
				coil path has interruption.	OR	1	AND	- ····]		.,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,
	1			· · · · · · · · · · · · · · · · · · ·	Current through valve coil (Under Current feedback bit is set)	<0.075 -0.125 [AI	Anv valve test is activated	= False		J'	1
		All	RBVLV_MV1A_ValveCoilResistanceOutOfRangeFailure	This monitoring checks if there is deviation	Measured valve resistance	> 13.7 [Ohml	lanition state ON	= True	20 [s]	Cyclically every 20	Type A, 1 Trip
				between the measured valve resistance and the	UK Measured value resistance	<4.8 (Ohm)	AND Outside of value control	= True		[S]	
				denned være resistance in trie sottwafe.	measures verve resistance	<4.0 [Onim	AND		1	1	1
				<u> </u>			Hvdraulic reauest is set	= False		'	
		All	RBVLV_MV1A_ValveDriverLBISTFailure	This monitoring checks if there is failure inside	Failure in actuation loaic and actuation compare loaic	= True	lanition state ON	= True	20 [s]	Cyclically every 20	Type A, 1 Trip
				valve driver actuation logic and actuation	OR	T	AND Output design of the second	T	1	[5]	1
				monitoring unit as well as inside valve driver ADC unit	Pallure In low-side ADC measurement	= true	AND	= true		1	
					Failure in hiah-side ADC measurement	= True	Hydraulic reauest is set	= False		1	
				1	OR				1	1	1
				1	Failure in PWM compare unit	= True		J		J '	1 1
		All	RBVLV_MV1A_VARTFailure	This monitoring checks cyclically the ASIC-Valve-	ASIC valve driver failure crosstalk	= True	Ignition state ON	= True	20 [s]	Cyclically every 20	Type A, 1 Trip
				Driver internal output-oriver actuation register.	Bit failure in ASIC valve driver actuation registers (stuck at 0 or 1)	= True	Valve relay supply voltage	> 6 9 IVI	1	[5]	1
1				•		· · · · ·		4. 1. 1. 4. 1		· · · · · · · · · · · · · · · · · · ·	•

System/	Fault	Variant	Failure Word	Monitoring Strategy Description	Malfunction Criteria	Mallunction Criteria Threshold	Secondary Parameters	Enable Condition	Time Required	Frequency of	MI
Component	Code	1				Value			1	Checks	Illumination
	-				OR		AND		_		
					Unexpected ASIC valve driver feedback (considered ASIC bits: OpenLoad,	= True	Outside of valve control	= True			
					Undercurrent GateQx (ON/OFF))			1			
							AND Hudraulic request is set	- Falea			
								- 1 4130	-	-	-
Right Front Outlet Control	C0015	All	RBVLV_MV1B_GeneralValveDriverFailure	This monitoring checks continuously if the valve	Current through valve coil (Over Current feedback bit is set)	>4-6.5 [AI	Ignition state ON	= True	0.03 [s]	Continuous	Type A, 1 Trip
				coil has Over Current, Over Temperature, Power	OR Temperature in ASIC output stone (Over Temperature feedback hit is set)	> 195-220 [201	AND Any value test is activated	- Falea			
				cround cost, rice tricening cost landre.	Competitive in Acto output stage (over Tempetitive recoulds of its set)	100 220 [0]		- 1 4130			
					OR						
					Voltage drop between PGND at low-side driver and ECU-GND (PGND-Lost feedback bit is set)	> 0.4-0.9 [V]					
					OR						
					Voltage at Qx (Free Wheeling Lost feedback bit is set)	> 32.8-39.4 FV1			_		
		All	RBVLV_MV1B_SVDTFailure	This monitoring checks cyclically if there is	Voltage at low-side in off-state (Ocen Load feedback bit is set)	< 2-2.5 FV1	SVDT is running	= True	20 [s]	Cyclically every 20	Type A, 1 Trip
				Test due to defective coil low side and high side	Current through valve coil (Under Current feedback bit is set)	< 0.075 - 0.125 [A]	Ignition state ON	= True		[5]	
				paths.	OR		AND				
					Current through valve coil (Over Current feedback bit is set)	>4-6.5 [AI	Valve relav supply voltage	> 6.9 M			
					Temperature in ASIC output stage (Over Temperature feedback bit is set)	> 195-220 [°C]	Outside of valve control	= True			
					1		1				
					OR		AND	False			
					feedback hit is set)	> 0.4 - 0.9 [V]	hydraulic request is set	= Faise			
					OR						
					Voltage at Qx (Freewheeling Lost feedback bit is set)	> Clamping voltage 32.839.4					
					OR	[VI					
					Deviation of measured currents right before and right after switching point	> 20 [%]					
		l			(Hs-Ls Compare feedback bit is set)						
		All	RBVLV_MV1B_ValveActuationFailure	This monitoring checks continuously if there is PWM failure or HeLs-Compare failure or wrong	PWM failure feedback bit is set	= True	Ignition state ON	= True	0.03 [s]	Continuous	Type A, 1 Trip
				GateQx(ON/OFF) failure.	Deviation of measured currents right before and right after switching point	> 20 [%]	Valve relay supply voltage	> 6.9 [V]			
					(Hs-Ls Comcare feedback bit is set)		1				
					OR Wrong GateOv ON teerback hit is set	- True	AND Any value test is activated	- Falea			
					OR	- 1100		- 1 4.50			
				J	Wrong GateQx OFF feedback bit is set	= True					
		AII	RBVLV_MV1B_ValveCollPathInterruptionFailure	I his monitoring checks continuously if the valve-	Voltage at low-side in off-state (Open Load feedback bit is set)	< 2-2.5 [V]	Ignition state ON	= True	0.03 [s]	Continuous	Type A, 1 Trip
				con paur nas interruption.	Current through valve coil (Under Current feedback bit is set)	<0.075 -0.125 [AI	Any valve test is activated	= False			
		All	RBVLV_MV1B_ValveCoilResistanceOutOfRangeFailure	This monitoring checks if there is deviation	Measured valve resistance	> 13.7 [Ohrnl	Ignition state ON	= True	20 [s]	Cyclically every 20	Type A, 1 Trip
				between the measured valve resistance and the	OR Managurad united projectores	-4.8 (Ohm)	AND Outside of webre sentrel	- Teue		[s]	
				denned valve resistance in the software.	Weasured valve resistance	<4.8 IOIIIII	AND	= 1100			
		I					Hvdraulic reouest is set	= False			
		All	RBVLV_MV1B_ValveDriverLBISTFailure	This monitoring checks if there is failure inside	Failure in actuation logic and actuation compare logic	= True	Ignition state ON	= True	20 [s]	Cyclically every 20	Type A, 1 Trip
				Imonitoring unit as well as inside valve driver ADC	Failure in low-side ADC measurement	= True	Outside of valve control	= True		[S]	
				unit.	OR		AND				
					Failure in high-side ADC measurement	= True	Hvdraulic reguest is set	= False			
					Failure in PWM compare unit	= True					
		All	RBVLV_MV1B_VARTFailure	This monitoring checks cyclically the ASIC-Valve-	ASIC valve driver failure crosstalk	= True	Ignition state ON	= True	20 [s]	Cyclically every 20	J Type A, 1 Trip
				Driver internal output-driver actuation register.	OR		AND			[s]	1
					OR	= True	AND	> 0.9 M			
					Unexpected ASIC valve driver feedback (considered ASIC bits: OpenLoad,	= True	Outside of valve control	= True			
					Undercurrent GateQx (ON/OFF))		4115				
							Hydraulic request is set	= False			
	-		•	-							_
Right Rear Inlet Control	C001C	All	RBVLV_MV3A_GeneralValveDriverFailure	This monitoring checks continuously if the valve	Current through valve coil (Over Current feedback bit is set)	>4-6.5 [AI	Ignition state ON	= True	0.03 [s]	Continuous	Type A, 1 Trip
				IGround Lost, Free Wheeling Lost failure.	Temperature in ASIC output stage (Over Temperature feedback bit is set)	> 195-220 [°C]	Any valve test is activated	= False			
					1						
					OR	040000					
					feedback bit is set)	> 0.4-0.9 [V]					
					OR						
				This section is a straight with the sector	Voltage at Qx (Free Wheeling Lost feedback bit is set)	> 32.8-39.4 [VI	0VDT :=		00/-1	0	Track & Trip
		All	RBVLV_MV3A_SVD1Failure	I his monitoring checks cyclically in there is I shortcut between valves during Silent Valve Drive	r OR	< 2-2.5 FV1	AND	= True	20 [8]	Cyclically every 20 [s]	Type A, 1 Trip
				Test due to defective coil low side and high side	Current through valve coil (Under Current feedback bit is set)	<0.075-0.125 [AI	Ignition state ON	= True		1	
				paths.	OR		AND				
					OR	>4-0.0 [AI	AND	> 0.9 M			
					Temperature in ASIC output stage (Over Temperature feedback bit is set)	> 195-220 [°C]	Outside of valve control	= True			
					1		1	1			
					OR Voltage drop between PGND at low-side driver and ECU-GND (PGND-Lost	> 0.4 - 0.9 IV1	AND Hydraulic request is set	= False			
					feedback bit is set)	0.4 0.5[1]		- 1 4130			
	1	1		1	OR						
	1	1		1	Voltage at Qx (Freewheeling Lost feedback bit is set)	> Clamping voltage 32.839.4		1			
	1	1		1	OR	ľ.		1			
	1	1		1	Deviation of measured currents right before and right after switching point	> 20 [%]					
	1	All	RBVLV_MV3A_ValveActuationFailure	This monitoring checks continuously if there is	(Hs-Ls Compare feedback bit is set	= True	Ignition state ON	= True	0.03 [s]	Continuous	Type A 1 Trip
	1			PWM failure or HsLs-Compare failure or wrong	OR		AND	1			.,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,
	1	1		GateQx(ON/OFF) failure.	Deviation of measured currents right before and right after switching point	> 20 [%]	Valve relay supply voltage	> 6.9 [V]			
	1	1		1	(Hs-Ls Compare feedback bit is set)		AND	1			
1	1	1	1	1	5N	1	1000	1	1	1	

Svetem/	Fault	Variant	Esilure Word	Monitoring Strategy Description	Malfunction Criteria	Mallunction Criteria Threshold	Sacondary Paramatere	Enable Condition	Time Require	d Frequency of	MI
Component	Code	Vanan	Palitie Word	womoning sualegy bescription	mandiction cinena	Value	Secondary Parameters	Enable Condition		Checks	Illumination
-	1								4	4	4
					Wrong GateQx ON feedback bit is set	= True	Any valve test is activated	= False			
					Wrong GateQx OFF feedback bit is set	= True					
		All	RBVLV_MV3A_ValveCoilPathInterruptionFailure	This monitoring checks continuously if the valve-	Voltage at low-side in off-state (Ooen Load feedback bit is set)	< 2-2.5 rvi	Ignition state ON	= True	0.03 [s]	Continuous	Type A, 1 Trip
				coil path has interruption.	OR	0.075.0.105.511	AND	Falsa			
		All	RBVLV MV3A ValveCoilResistanceOutOfRangeFailure	This monitoring checks if there is deviation	_Current through valve coll (Under Current leedback bit is set)	> 13.7 [Ohm]	Ignition state ON	= True	_1	Cyclically every 20	J Type A. 1 Trip
		1		between the measured valve resistance and the	OR		AND	1		[s]	
				defined valve resistance in the software.	Measured valve resistance	<4.8 [Ohml	Outside of valve control	= True		1	
							AND	- Folge			
		All	RBVLV MV3A ValveDriverLBISTFailure	This monitoring checks if there is failure inside	Failure in actuation logic and actuation compare logic	= True	Ignition state ON	= True	20 [s]	Cyclically every 20	J Type A. 1 Trip
		1		valve driver actuation logic and actuation	OR		AND			[8]	
				monitoring unit as well as inside valve driver ADC	Failure in low-side ADC measurement	= True	Outside of valve control	= True		1	
				unit.	UR Esilure in high-side ADC measurement	- True	AND Hydraulic request is set	- Falee			
					OR	- 1100		- 1 0.50			
		I			Failure in PWM compare unit	= True					
		All	RBVLV_MV3A_VARTFailure	This monitoring checks cyclically the ASIC-Valve-	ASIC valve driver failure crosstalk	= True	Ignition state ON	= True	20 [s]	Cyclically every 20	Type A, 1 Trip
				Driver internal output-driver actuation register.	Bit failure in ASIC valve driver actuation registers (stuck at 0 or 1)	= True	Valve relav supply voltage	> 6.9 IVI		[5]	
					OR		AND				
					Unexpected ASIC valve driver feedback (considered ASIC bits: OpenLoad,	= True	Outside of valve control	= True			
					Undercurrent GateQx (ON/OFF))		AND				
							Hydraulic request is set	= False			
			· · · · · · · · · · · · · · · · · · ·								
Right Rear Outlet Control	C001D	All	RBVLV_MV3B_GeneralValveDriverFailure	This monitoring checks continuously if the valve	Current through valve coil (Over Current feedback bit is set)	>4-6.5 [AI	Ignition state ON	= True	0.03 [s]	Continuous	Type A, 1 Trip
				Ground Lost Free Wheeling Lost failure	UR Temperature in &SIC output stage (Over Temperature feetback bit is set)	> 195-220 PC1	AND Any value test is activated	- False			
				Ground Lost, Free Wreeling Lost landle.	lenperature in ASIC bulput stage (Over Temperature reedback bit is set)	3 180-220 [C]	Any valve test is activated	= Faise			
					OR						
					Voltage drop between PGND at low-side driver and ECU-GND (PGND-Lost	> 0.4-0.9 [V]					
					OR						
					Voltage at Qx (Free Wheelino Lost feedback bit is set)	> 32.8-39.4 FV1					
		All	RBVLV_MV3B_SVDTFailure	This monitoring checks cyclically if there is	Voltage at low-side in off-state (Open Load feedback bit is set)	< 2-2.5 [V]	SVDT is running	= True	20 [s]	Cyclically every 20	J Type A, 1 Trip
				shortcut between valves during Silent Valve Driver	OR Current through uptur call (Linder Current feedback bit is cat)	-0.075 0.125 (A)	AND Institute ON	- True		[S]	
				naths	OR	<0.075-0.125 [AI	AND	= True			
				plants.	Current through valve coil (Over Current feedback bit is set)	>4-6.5 [AI	Valve relay supply voltage	> 6.9 [VI			
					OR		AND	1			
					Temperature in ASIC output stage (Over Temperature feedback bit is set)	> 195-220 [°C]	Outside of valve control	= True			
					OR		AND				
					Voltage drop between PGND at low-side driver and ECU-GND (PGND-Lost	> 0.4 - 0.9 [V]	Hydraulic request is set	= False			
					feedback bit is set)						
					OR Voltage at Ox (Freewheeling Lost feerback hit is set)	Clamping voltage 32.8 39.4					
					Voltage at GX (Freewiteeling Lost reedback bit is set)	IVI					
					OR	,					
					Deviation of measured currents right before and right after switching point	> 20 [%]					
		AU	PRVI V MV3B Valve&ctuationEailure	This monitoring chacks continuously if there is		- True	Ignition state ON	= True	0.03 [e]	Continuous	Tune & 1 Trin
				PWM failure or HsLs-Compare failure or wrong	OR	- 1100	AND	- 1100	0.00 [0]		iypera, i inp
				GateQx(ON/OFF) failure.	Deviation of measured currents right before and right after switching point	> 20 [%]	Valve relay supply voltage	> 6.9 [V]			
					(Hs-Ls Compare feedback bit is set)						
					Wrong GateOx ON feedback bit is set	= True	AND Any valve test is activated	= False			
					OR						
					Wrong GateQx OFF feedback bit is set	= True					
		All	RBVLV_MV3B_ValveCoilPathInterruptionFailure	This monitoring checks continuously if the valve-	Voltage at low-side in off-state (Open Load feedback bit is set)	< 2-2.5 [VI	Ignition state ON	= True	0.03 [s]	Continuous	Type A, 1 Trip
				coil path has interruption.	Current through valve coil (Under Current feedback bit is set)	<0.075-0.125 [A]	Any valve test is activated	= False			
		All	RBVLV_MV3B_ValveCoilResistanceOutOfRangeFailure	This monitoring checks if there is deviation	Measured valve resistance	> 13.7 [Ohml	Ignition state ON	= True	20 [s]	Cyclically every 20	J Type A, 1 Trip
				between the measured valve resistance and the	OR		AND	1	1	[S]	1
				defined valve resistance in the software.	Measured valve resistance	<4.8 [Ohm]	Outside of valve control	= True			
							Hvdraulic reguest is set	= False			
		All	RBVLV_MV3B_ValveDriverLBISTFailure	This monitoring checks if there is failure inside	Failure in actuation logic and actuation compare logic	= True	Ignition state ON	= True	20 [s]	Cyclically every 20	J Type A, 1 Trip
				valve driver actuation logic and actuation	OR	-	AND	-	1	[S]	
				unit	OR	= True	AND	= irue			
					Failure in high-side ADC measurement	= True	Hvdraulic reouest is set	= False			
					OR	1					
		AU	PRVI V MV2R VARTEallura	This monitoring shocks surficely the ASIC Value	_ Failure in PWM compare unit	= True	Instition state ON	- True		Custically avenu 20	
			KBVEV_WV3B_VARTFailure	Driver internal output-driver actuation register.	OR	= fide	AND	= noe	20[5]	[s]	Type A, T Thp
	1				Bit failure in ASIC valve driver actuation registers (stuck at 0 or 1)	= True	Valve relay supply voltage	> 6.9 [VI		1 C	
					OR	T	AND	Tour			
	1				Undercurrent GateQx (ON/OFF))			100			
							AND				
	-	L					Hvdraulic reouest is set	= False			
700.0	00004				0	4.0.574	1		0.00./-1		Track & Track
Valve 1	00001		NDVLV_WV0_GeneralValveDriverFailure	coil has Over Current, Over Temperature Power	OR	24-0.0 [AI	AND	- 1108	0.03 [8]	Continuous	type A, T Trip
	1			Ground Lost, Free Wheeling Lost failure.	Temperature in ASIC output stage (Over Temperature feedback bit is set)	> 195-220 [°C]	Any valve test is activated	= False			
	1				1	1					
	1				UK Voltage drop between PGND at low-side driver and ECU-GND /PGND-Low	> 0.4-0.9 [V]					
	1				feedback bit is set)						
	1				OR	1					
	1	I			Voltage at Qx (Free Wheelino Lost feedback bit is set)	> 32.8-39.4 [VI		I	1		1
1	1	All	KBVLV_MV5_SVDTFailure	I his monitoring checks cyclically if there is	Voltage at low-side in off-state (Open Load feedback bit is set)	< 2-2.5 [VI	SVD1 is running	= Irue	20 [8]	Cyclically every 20	J Type A, 1 Trip

System/	Fault	Variant	Failure Word	Monitoring Strategy Description	Malfunction Criteria	Mallunction Criteria Threshold	Secondary Parameters	Enable Condition	Time Required	Frequency of	MIL
Component	Code			1		Value			1	Checks	Illumination
									<u> </u>	L	
				shortcut between valves during Silent Valve Driver	OR Surrent through upby call (Leder Current feedback bit is cat)	-0.075 0.125141	AND Institute of the ON	- True	1	[s]	
				paths.	OR	K0.075-0.125 [AI	AND	= Hde	1		
					Current through valve coil (Over Current feedback bit is set)	>4-6.5 FAI	Valve relav supply voltage	> 6.9 M	1		
					OR		AND		1		
					Temperature in ASIC output stage (Over Temperature feedback bit is set)	> 195-220 [°C]	Outside of valve control	= True	1		
					OR		AND		1		
					Voltage drop between PGND at low-side driver and ECU-GND (PGND-Lost	> 0.4 - 0.9 [V]	Hydraulic request is set	= False	1		
					feedback bit is set)				1		
					UR Voltage at Ox (Freewheeling Lost feerback hit is set)	Clamping voltage 32.8 39.4			1		
					tonage at ex (reconnecting cost reconder or is set)	M			1		
					OR				1		
					Deviation of measured currents right before and right after switching point	> 20 [%]			1		
		A11	PBVI V MV5 ValueActuationEailure	This monitoring checks continuously if there is	(Hs-Ls Comcare leedback bit is set)	- True	Institute etate ON	- True	0.03 [e]	Continuous	Tune & 1 Trin
				PWM failure or HsLs-Compare failure or wrong	OR	- 1100	AND	- 1100	0.00 [0]		iype A, i inp
				GateQx(ON/OFF) failure.	Deviation of measured currents right before and right after switching point	> 20 [%]	Valve relay supply voltage	> 6.9 [V]	1		
					(Hs-Ls Compare feedback bit is set)		1		1		
					UR Wrang CateOx ON feedback bit is set	- 7810	AND Any work is patiented	- Folgo	1		
					OR	= Tide	Any valve test is activated	= raise	1		
					Wrono GateQx OFF feedback bit is set	= True					
		All	RBVLV_MV5_ValveCoilPath1nterruptionFailure	This monitoring checks continuously if the valve-	Voltage at low-side in off-state (Open Load feedback bit is set)	< 2-2.5 (VI	Ignition state ON	= True	0.03 [s]	Continuous	Type A, 1 Trip
				coil path has interruption.	OR	0.075 0.405 (4)	AND	Falsa	1		
		All	RBVLV_MV5_ValveCoiResistanceOutO/RangeFaiture	This monitoring checks if there is deviation	Measured valve resistance	> 13 7 [Ohro]	Innition state ON	= True	20 [8]	Cyclically every 20	Type A 1 Trip
				between the measured valve resistance and the	OR		AND		(-)	[s]	.,,,
				defined valve resistance in the software.	Measured valve resistance	<4.8 [Ohrnl	Outside of valve control	= True	1	1	
				1			AND	1	1		
		AU	PRVLV MVE Volum Drived PISTEnilure	This monitoring shocks if there is follows inside	Eniture in perturbing logic and estuation compare logic	- True	Hvdraulic request is set	= False	20.61	Cuelicelly even 20	Turne A. 1 Trie
		00	KBVEV_WV5_ValveblivelEBI31Palidie	valve driver actuation logic and actuation	OR	= Tide	AND	= Hde	20[5]	Cyclically every 20	туре А, т тпр
				monitoring unit as well as inside valve driver ADC	Failure in low-side ADC measurement	= True	Outside of valve control	= True	1	[9]	
				unit.	OR		AND		1		
					Failure in high-side ADC measurement	= True	Hvdraulic reguest is set	= False	1		
					OR Follows in DIMM compare unit	True			1		
		All	RBVLV MV5 VARTEailure	This monitoring checks cyclically the ASIC-Valve-	ASIC valve driver failure crosstalk	= True	Ignition state ON	= True	20 [s]	Cyclically every 20	Type A 1 Trip
				Driver internal output-driver actuation register.	OR		AND	_ ···==	1	[s]	.,,,
					Bit failure in ASIC valve driver actuation registers (stuck at 0 or 1)	= True	Valve relav supply voltage	> 6.9 M	1	1	
					OR	T	AND .	Tour	1		
					Undercurrent GateOx (ON/OFF))	= True	Outside of valve control	= True	1		
							AND		1		
							Hvdraulic reguest is set	= False	L		
T00 0			DEVENUE AND ADDRESS STORES			5.0741	lectro and On	T	0.00.1-1	0	T
Valve 2	00002	00	KBVLV_WV0_GeneralvalveDriverParticle	coil has Over Current Over Temperature Power	OR	20-0[AI	AND	= Hde	0.03 [5]	Continuous	туре А, т тпр
				Ground Lost, Free Wheeling Lost failure.	Temperature in ASIC output stage (Over Temperature feedback bit is set)	> 195-220 [°C]	Any valve test is activated	= False	1		
									1		
					OR Voltage drep between BCND at low side drives and ECU CND (BCND Legs)	- 04 00 00			1		
					feedback bit is set)	\$ 0.4-0.8 [V]			1		
					OR				1		
					Voltage at Qx (Free Wheeling Lost feedback bit is set)	> 32.8-39.4 [VI			L		
		All	RBVLV_MV6_SVDTFailure	This monitoring checks cyclically if there is	Voltage at low-side in off-state (Open Load feedback bit is set)	< 2-2.5 FV1	SVDT is running	= True	20 [s]	Cyclically every 20	Type A, 1 Trip
				Test due to defective coil low side and high side	Current through value coil (I Inder Current feedback hit is set)	<0.075-0.125 (AL	AND Institute ON	- True	1	[5]	
				paths.	OR	K0.075-0.125 [AI	AND	= Hde	1		
					Current through valve coil (Over Current feedback bit is set)	> 5 - 8 [AI	Valve relav supply voltage	> 6.9 M	1		
					OR		AND		1		
					Temperature in ASIC output stage (Over Temperature feedback bit is set)	> 195-220 [*C]	Outside of valve control	= True	1		
					OR		AND		1		
					Voltage drop between PGND at low-side driver and ECU-GND (PGND-Lost	> 0.4 - 0.9 [V]	Hydraulic request is set	= False	1		
					feedback bit is set)				1		
					OR	01			1		
					voltage at GX (Freewheeling Lost reeuback bit is set)	IVI			1		
					OR	ľ.			1		
					Deviation of measured currents right before and right after switching point	> 20 [%]			1		
		AU	PB1/1 // M1/R VehichdruptionEpillure	This monitoring shocks continuously if there is	(Hs-Ls Compare feedback bit is set)	- True	Instition state ON	- True	0.02.[e]	Continuous	Tuno A. 1 Trio
		00	KBVEV_WV0_ValveActuationFailute	PWM failure or HsI s-Compare failure or wrong	OR	= Tide	AND	= Hde	0.03 [5]	Continuous	туре А, т тпр
				GateQx(ON/OFF) failure.	Deviation of measured currents right before and right after switching point	> 20 [%]	Valve relay supply voltage	> 6.9 [V]	1		
					(Hs-Ls Compare feedback bit is set)		I		1		
				1	UK CHARTER AND	Tour	AND	Falsa	1		
				1	OR	= true	Any valve test is activated	= raise	1		
				J	Wrong GateQx OFF feedback bit is set	= True			J	J	
	1	All	RBVLV_MV6_ValveCoiPath1nterruptionFailure	This monitoring checks continuously if the valve-	Voltage at low-side in off-state (Open Load feedback bit is set)	< 2-2.5 [VI	Ignition state ON	= True	0.03 [s]	Continuous	Type A, 1 Trip
				coil oath bas interruption	OR	0.075 0.405441	AND	Falsa			
				con patri nas interruption.	Constant de la constant de la constant de la de la constant de la constant de la constant de la constant de la	· · · · · · · · · · · · · · · · · · ·	Any valve test is activated	= raise		1	
		A11	PRVLV MV8 ValueCniPacietanenOutOrDenenEniture	This monitoring charks if there is deviation	Current through valve coil (Under Current feedback bit is set)	> 6 9 (Ohm)	Ignition state ON	- True	20 [8]	Cyclically avenuas	Tune & 4 Tri- 4
		All	RBVLV_MV6_ValveCoiResistanceOutOIRangeFailure	This monitoring checks if there is deviation between the measured valve resistance and the	Current through valve coil (Under Current feedback bit is set) Measured valve resistance OR	> 6.9 [Qhm]	Ignition state ON AND	= True	20 [s]	Cyclically every 20 [s]	Type A, 1 Trip
		All	RBVLV_MV6_ValveColResistanceOutOIRangeFailure	This monitoring checks if there is deviation between the measured valve resistance and the defined valve resistance in the software.	_Current through valve coil (Under Current feedback bit is set) Measured valve resistance OR Measured valve resistance	< 2.2 [Qhm]	Ignition state ON AND Outside of valve control	= True = True	20 [5]	Cyclically every 20 [8]	Type A, 1 Trip
		All	RBVLV_MV6_ValveCoiResistanceOutOIRangeFaiture	This monitoring checks if there is deviation between the measured valve resistance and the defined valve resistance in the software.	Current through vahe coil (Under Current feedback bit is set) Measured valve resistance Measured valve resistance	<0.073 00.128 [Al	Ignition state ON AND Outside of valve control AND	= True = True	20 [s]	Cyclically every 20 [8]	Type A, 1 Trip
		All	RBVLV_MV6_ValveColResistanceOutOlRangeFailure	This monitoring checks if there is deviation between the measured valve resistance and the defined valve resistance in the software.	Current through valve coil (Under Current feedback bit is set) Measured valve resistance OR Measured valve resistance Extension londe and actuation compare toole	< 2.2 [Qhm]	Ignition state ON AND Outside of valve control AND Indrautic request is set	= True = False	20 [s]	Cyclically every 20 [5]	Type A, 1 Trip
		AII AII	RBVLV_MV6_ValveCoiResistanceOutOlRangeFaiture RBVLV_MV6_ValveDriverLBISTFaiture	This monitoring checks if there is deviation between the measured valve resistance and the defined valve resistance in the software. This monitoring checks if there is failure inside valve driver actuation looic and actuation	Current through valve coil (Under Current feedback bit is set) Measured valve resistance OR Measured valve resistance Failure in actuation logic and actuation compare logic OR	<0.075 0.125 [Ali > 6.9 [Qhml <2.2 [Qhml = True	Ignition state ON AND Outside of valve control AND Hydraulic recuest is set Ignition state ON AND	= True = True = False = True	20 [8]	Cyclically every 20 [S] Cyclically every 20 [s]	Type A, 1 Trip Type A, 1 Trip
		All	RBVLV_MV6_ValveCoiResistanceOutOIRangeFaiture RBVLV_MV6_ValveDriverLBISTFaiture	This monitoring checks if there is deviation between the masured valve resistance and the defined valve resistance in the software. This monitoring checks if there is failure inside valve driver actuation logic and actuation fmonitoring unit as well as inside valve driver ADC	Current hrough valve cell (Under Current feedback bit is set) OR Measured valve resistance Failure in actuation logic and actuation compare logic OR Failure in low-side ADC measurement	<0.073 0.123 [Al	Ignition state ON AND Outside of valve control AND hdraulic resuest is set goition state ON AND Outside of valve control	= True = True = False = True = True	20 [8]	Cyclically every 20 [s] Cyclically every 20 [s]	Type A, 1 Trip Type A, 1 Trip
		All	RBVLV_MV6_ValveCoiResistanceOutOlRangeFailure RBVLV_MV6_ValveDrivert.BISTFailure	Les per la material regional. This monitoring thecks if there is deviation lebreen the measured valve resistance and the defined valve resistance in the software. This monitoring checks if there is failure inside wave driver actuation logic and actuation monitoring unit as well as inside valve driver ADC unit.	Current hrough valve coil (Under Current feedback bit is set) Measured valve resistance OR Failure in actuation logic and actuation compare logic OR Failure in low-side ADC measurement OR	<	Ignition state ON AND Outside di valve control AND Involution testes ON AND Outside di valve control AND	= True = True = False = True = True	20 [s]	Cyclically every 20 [8] Cyclically every 20 [8] [9]	Type A, 1 Trip Type A, 1 Trip

ADDE ADDE <th< th=""><th>System/</th><th>Fault</th><th>Variant</th><th>Failure Word</th><th>Monitoring Strategy Description</th><th>Malfunction Criteria</th><th>Mallunction Criteria Threshold</th><th>Secondary Parameters</th><th>Enable Condition</th><th>Time Requirer</th><th>d Frequency of</th><th>MIL</th></th<>	System/	Fault	Variant	Failure Word	Monitoring Strategy Description	Malfunction Criteria	Mallunction Criteria Threshold	Secondary Parameters	Enable Condition	Time Requirer	d Frequency of	MIL
No. No. <td>Component</td> <td>Code</td> <td></td> <td></td> <td></td> <td></td> <td>Value</td> <td></td> <td>1</td> <td></td> <td>Checks</td> <td>Illumination</td>	Component	Code					Value		1		Checks	Illumination
Normal problem Normal		-				OB					+	-
No. No. Status (Status (Statu						Failure in PWM comoare unit	= True			I		J
Normal Processes Normal Processes<			All	RBVLV_MV6_VARTFailure	This monitoring checks cyclically the ASIC-Valve-	ASIC valve driver failure crosstalk	= True	Ignition state ON	= True	20 [s]	Cyclically every 20	Type A, 1 Trip
Image: second					Driver internal output-driver actuation register.	OR Bit failure in ASIC valve driver actuation registers (stuck at 0 or 1)	= True	AND Valve relay supply voltage	>69IVI	1	[5]	1 1
Image: sec: sec: sec: sec: sec: sec: sec: se						OR		AND	1	1		1 1
Image: state in the s						Unexpected ASIC valve driver feedback (considered ASIC bits: OpenLoad,	= True	Outside of valve control	= True	1		1 1
Image: sec: sec: sec: sec: sec: sec: sec: se						Undercurrent GateGX (UN/OFF))		AND		1		1 1
Opposite Data P Opposite DataP Opposite Data P Opposite Da								Hvdraulic reouest is set	= False	L		
Name Name <th< td=""><td>TCR Control Channel 'P'</td><td>C0002</td><td>AU</td><td>PRV/11/ M/Z ConcernB/oburDriverEeiburg</td><td>This monitoring shocks continuously if the upby</td><td>Current through uptus poil (Quer Current feedback bit is pol)</td><td>- 4 8 E [A]</td><td>Institute state ON</td><td>- True</td><td>0.02.[e]</td><td>Continuous</td><td>Tuno A. 1 Trip</td></th<>	TCR Control Channel 'P'	C0002	AU	PRV/11/ M/Z ConcernB/oburDriverEeiburg	This monitoring shocks continuously if the upby	Current through uptus poil (Quer Current feedback bit is pol)	- 4 8 E [A]	Institute state ON	- True	0.02.[e]	Continuous	Tuno A. 1 Trip
No. No. <td>Valve 1</td> <td>00003</td> <td>0</td> <td>KBVEV_WV7_GeneralvalveDriverranure</td> <td>coil has Over Current, Over Temperature, Power</td> <td>OR</td> <td>24-0.0 [Ai</td> <td>AND</td> <td>= 1100</td> <td>0.03 [5]</td> <td>Continuous</td> <td>туре А, т тпр</td>	Valve 1	00003	0	KBVEV_WV7_GeneralvalveDriverranure	coil has Over Current, Over Temperature, Power	OR	24-0.0 [Ai	AND	= 1100	0.03 [5]	Continuous	туре А, т тпр
Normal Process of the second					Ground Lost, Free Wheeling Lost failure.	Temperature in ASIC output stage (Over Temperature feedback bit is set)	> 195-220 [°C]	Any valve test is activated	= False	1		1 1
Normal Process of State S						OR				1		1 1
Normal Participant Normal						Voltage drop between PGND at low-side driver and ECU-GND (PGND-Lost	> 0.4-0.9 [V]			1		1 1
No. 1 No. 2 No. 2 Another set						feedback bit is set)				1		1 1
No. No. No. 000000000000000000000000000000000000						Voltage at Qx (Free Wheeling Lost feedback bit is set)	> 32 8-39 4 EVI			1		1 1
Normal set is a set in the set in th			All	RBVLV_MV7_SVDTFailure	This monitoring checks cyclically if there is	Voltage at low-side in off-state (Open Load feedback bit is set)	< 2-2.5 fVI	SVDT is running	= True	20 [s]	Cyclically every 20	Type A, 1 Trip
No. 1 No. 2 No. 2 <th< td=""><td></td><td></td><td></td><td></td><td>shortcut between valves during Silent Valve Driver</td><td>OR Current through upbe cell (Under Current feedback bit is cet)</td><td>-0.075 0.125 [4]</td><td>AND Institute ON</td><td>- True</td><td>1</td><td>[5]</td><td>1 1</td></th<>					shortcut between valves during Silent Valve Driver	OR Current through upbe cell (Under Current feedback bit is cet)	-0.075 0.125 [4]	AND Institute ON	- True	1	[5]	1 1
Normal state					paths.	OR	C0.070-0.120[A]	AND	= 1100	1		1 1
No. 1000 Image: Section of the sectin of the sectin of the section of the section of the section of t						Current through valve coil (Over Current feedback bit is set)	>4-6.5 [A]	Valve relay supply voltage	> 6.9 [VI			1 1
Image: section of the secti						OR Temperature in ASIC output stans (Over Temperature feedback hit is set)	> 195-220 [20]	AND Outside of value control	- True	1		1 1
Normalize <						Construction of the stage (over reinpendiate recables on a set)	100 220 [0]		- 1100			1 1
Image: section of the sectio						OR		AND				1 1
Normalized in the second method is a second method method method method method is a second method meth						Voltage drop between PGND at low-side driver and ECU-GND (PGND-Lost feedback bit is set)	> 0.4 - 0.9 [V]	Hydraulic request is set	= False	1		1 1
Normal problem Image of problem </td <td></td> <td></td> <td></td> <td></td> <td></td> <td>OR</td> <td></td> <td></td> <td></td> <td>1</td> <td></td> <td>1 1</td>						OR				1		1 1
No. No. <td></td> <td></td> <td></td> <td></td> <td></td> <td>Voltage at Qx (Freewheeling Lost feedback bit is set)</td> <td>> Clamping voltage 32.839.4</td> <td></td> <td></td> <td>1</td> <td></td> <td>1 1</td>						Voltage at Qx (Freewheeling Lost feedback bit is set)	> Clamping voltage 32.839.4			1		1 1
Normal problem Normal						OR	TVI					1 1
No. No. Object						Deviation of measured currents right before and right after switching point	> 20 [%]			1		1 1
No. No. <td></td> <td></td> <td>AII</td> <td>PBVIV MVZ ValveActuationEsilure</td> <td>This monitoring checks continuously if there is</td> <td>(Hs-Ls Compare feedback bit is set)</td> <td>= True</td> <td>Instition state ON</td> <td>= True</td> <td>0.03 [e]</td> <td>Continuous</td> <td>Tune & 1 Trip</td>			AII	PBVIV MVZ ValveActuationEsilure	This monitoring checks continuously if there is	(Hs-Ls Compare feedback bit is set)	= True	Instition state ON	= True	0.03 [e]	Continuous	Tune & 1 Trip
Normal Algo <					PWM failure or HsLs-Compare failure or wrong	OR	- 1100	AND	- 1100	0.00[0]		1, pe 7, 1 mp
Nome Nome <th< td=""><td></td><td></td><td></td><td></td><td>GateQx(ON/OFF) failure.</td><td>Deviation of measured currents right before and right after switching point</td><td>> 20 [%]</td><td>Valve relay supply voltage</td><td>> 6.9 [V]</td><td>1</td><td></td><td>1 1</td></th<>					GateQx(ON/OFF) failure.	Deviation of measured currents right before and right after switching point	> 20 [%]	Valve relay supply voltage	> 6.9 [V]	1		1 1
No. No. <td></td> <td></td> <td></td> <td></td> <td></td> <td>(Hs-Ls Compare feedback bit is set)</td> <td></td> <td>AND</td> <td></td> <td>1</td> <td></td> <td>1 1</td>						(Hs-Ls Compare feedback bit is set)		AND		1		1 1
Image: state						Wrong GateQx ON feedback bit is set	= True	Any valve test is activated	= False			1 1
Nit BDX // VD7 / VMod/Web/Betterrug/out/Au/ The second pack accessory of the supervise of the VDF // VD7 // VMod/Web/Betterrug/out/Au/ The second pack accessory of the supervise of the VDF // VD7 // VMod/Web/Betterrug/Out/Au/ The second pack accessory of the supervise of the VDF // VD7 // VMod/Web/Betterrug/Out/Au/ The second pack accessory of the supervise of the VDF // VD7 // VMod/Web/Betterrug/Out/Au/ The second pack accessory of the supervise of the VDF // VD7 // VMod/Web/Betterrug/Out/Au/ The second pack accessory of the VDF // VD7 // VMod/Web/Betterrug/Out/Au/ The second pack accessory of the VDF // VD7 // VMod/Web/Betterrug/Out/Au/ The second pack accessory of the VDF // VD7 // VMod/Web/Betterrug/Out/Au/ The second pack accessory of the VDF // VD7 // VMod/Web/Betterrug/Out/Au/ The second pack accessory of the VDF // VD7 // VMod/Web/Betterrug/Out/Au/ The second pack accessory of the VDF // VD7 // VMod/Web/Betterrug/Out/Au/// VD7 // VMod/Web/Betterrug/Dur/// VD7 // VMod/Web/Betterrug/Out/Au/// VD7 // VMod/W						OR	T					1 1
No. No. <td></td> <td></td> <td>All</td> <td>RBVLV_MV7_ValveCoilPathInterruptionFailure</td> <td>This monitoring checks continuously if the valve-</td> <td>Voltage at low-side in off-state (Open Load feedback bit is set)</td> <td>< 2-2.5 EVI</td> <td>Ignition state ON</td> <td>= True</td> <td>0.03[8]</td> <td>Continuous</td> <td>Type A 1 Trip</td>			All	RBVLV_MV7_ValveCoilPathInterruptionFailure	This monitoring checks continuously if the valve-	Voltage at low-side in off-state (Open Load feedback bit is set)	< 2-2.5 EVI	Ignition state ON	= True	0.03[8]	Continuous	Type A 1 Trip
Image: space of the s					coil path has interruption.	OR	1	AND	1			.,,,
No. 1/2 - Joint of the state is the state of the state is the state of th			AU	PRV/11/_MV7_VolumColiRegisterserOutO(RepresEpilure	This monitoring shocks if there is deviation	Current through valve coil (Under Current feedback bit is set)	< 0.075 - 0.125 FAI	Any valve test is activated	= False	20.61	Cueliaethu eueeu 20	Turne A. 1 Trie
No. No. <td></td> <td></td> <td>0</td> <td>KBVEV_MV7_valvecolikesistanceoutorkangeralidre</td> <td>between the measured valve resistance and the</td> <td>OR</td> <td>Jana Polini</td> <td>AND</td> <td>= 1100</td> <td>20[5]</td> <td>[s]</td> <td>туре А, т тпр</td>			0	KBVEV_MV7_valvecolikesistanceoutorkangeralidre	between the measured valve resistance and the	OR	Jana Polini	AND	= 1100	20[5]	[s]	туре А, т тпр
No. 1 No. V. Mr. S. Mol. Mol. S. Mol. Mol. S. Mol. S. Mol. Mol. Mol. Mol. Mol. Mol. Mol. Mol					defined valve resistance in the software.	Measured valve resistance	<4.8 FOhm]	Outside of valve control	= True	1		1 1
All BRXLV_M7_ValueDired.BIT7aluer This monitoring desks split and size shall may be all datasets lead and be get and attained concare togic of the same shall be get attained on get and attained concare togic of the same shall be get attained on get attained on get attained concare togic of the same shall be get attained on								AND buttoulie request is not	- Folgo	1		1 1
Note Note <th< td=""><td></td><td></td><td>All</td><td>RBVLV_MV7_ValveDriverLBISTFailure</td><td>This monitoring checks if there is failure inside</td><td>Failure in actuation logic and actuation comoare logic</td><td>= True</td><td>Ignition state ON</td><td>= True</td><td>20 [s]</td><td>Cyclically every 20</td><td>Type A, 1 Trip</td></th<>			All	RBVLV_MV7_ValveDriverLBISTFailure	This monitoring checks if there is failure inside	Failure in actuation logic and actuation comoare logic	= True	Ignition state ON	= True	20 [s]	Cyclically every 20	Type A, 1 Trip
Image: bit is a bit is a bit is a bit is whice which ADD is a bit is a bit is whice which ADD is a bit is a bit is whice which ADD is a bit is a bit is which ADD is a bit is a bit is a bit is which ADD is a bit is					valve driver actuation logic and actuation	OR		AND	1	1	[5]	1 1
Image: Normal state Prime Prim Prime Prime <td></td> <td></td> <td></td> <td></td> <td>monitoring unit as well as inside valve driver ADC</td> <td>Failure in low-side ADC measurement</td> <td>= True</td> <td>Outside of valve control AND</td> <td>= True</td> <td>1</td> <td></td> <td>1 1</td>					monitoring unit as well as inside valve driver ADC	Failure in low-side ADC measurement	= True	Outside of valve control AND	= True	1		1 1
Name Name <th< td=""><td></td><td></td><td></td><td></td><td>MITTE.</td><td>Failure in high-side ADC measurement</td><td>= True</td><td>Hvdraulic reouest is set</td><td>= False</td><td></td><td></td><td>1 1</td></th<>					MITTE.	Failure in high-side ADC measurement	= True	Hvdraulic reouest is set	= False			1 1
All REVLY_MY_VARTTakue This monotoning datas a quotably the AUC Ware File point intervalue point inter						OR	_					1 1
Image: Problem in the state of the state			All	RBVLV MV7 VARTFailure	This monitoring checks cyclically the ASIC-Valve-	ASIC valve driver failure crosstalk	= True	Ignition state ON	= True	20 [s]	 Cyclically every 20	Type A. 1 Trip
Image: Application of the second of the s					Driver internal output-driver actuation register.	OR		AND)	1	[5]	1
Image:						Bit failure in ASIC valve driver actuation registers (stuck at 0 or 1)	= True	Valve relav supply voltage	> 6.9 [VI	1		1 1
Image:						Unexpected ASIC valve driver feedback (considered ASIC bits: OpenLoad,	= True	Outside of valve control	= True	1		1 1
NB NB<		1				Undercurrent GateQx (ON/OFF))		1	1	1		
Control Channel 'B' Collina da event fue c								AND Hydraulic request is set	- False	1		1 1
CTCS Council Channel TD* COULD All REVLV_MV8_General/VakeDrive/Failure Chine monitoring/packs continuously if the value of council Load. Free Wheeing Load tailure. Council through value coil (Der Current feedback bit is set) Repeature in ASIC output stage (Over Temperature feedback bit is set) Repeature in ASIC output stage (Over Temperature feedback bit is set) Repeature in ASIC output stage (Over Temperature feedback bit is set) Repeature in ASIC output stage (Over Temperature feedback bit is set) Repeature in ASIC output stage (Over Temperature feedback bit is set) Repeature in ASIC output stage (Over Temperature feedback bit is set) Repeature in ASIC output stage (Over Temperature feedback bit is set) Repeature in ASIC output stage (Over Temperature feedback bit is set) Repeature in ASIC output stage (Over Temperature feedback bit is set) Repeature in ASIC output stage (Over Temperature feedback bit is set) Repeature in ASIC output stage (Over Temperature feedback bit is set) Repeature in ASIC output stage (Over Temperature feedback bit is set) Repeature in ASIC output stage (Over Temperature feedback bit is set) Repeature in ASIC output stage (Over Temperature feedback bit is set) Repeature in ASIC output stage (Over Temperature feedback bit is set) Repeature in ASIC output stage (Over Temperature feedback bit is set) Repeature in ASIC output stage (Over Temperature feedback bit is set) Repeature in ASIC output stage (Over Temperature feedback bit is set) Repeature in ASIC output stage (Over Temperature feedback bit is set) Repeature in ASIC output stage (Over Temperature feedback bit is set) Repeature in ASIC output stage (Over Temperature feedback bit is set) Repeature in ASIC output stage (Over Temperature feedback bit is set) Repeature in ASIC output stage (Over Temperature feedback bit is set) Repeature in ASIC output stage (Over Temperature feedback bit is set) Repeature in ASIC output stage (Over Temperature feedback b		_										
Value 2 All RBVLV_MV8_SVDTFalue Impact and information of the integration in ASIC output stage (Over Temperature teedback bit is set) > 196-220 [C] Any value test is activated = False Impact and information of the integration of the integrate integrate integration of the integration of the inte	TCS Control Channel "B"	C0004	All	RBVLV_MV8_GeneralValveDriverFailure	This monitoring checks continuously if the valve	Current through valve coil (Over Current feedback bit is set)	> 5 - 8 FAI	Ionition state ON	= True	0.03 [s]	Continuous	Type A, 1 Trip
All RSVLV_MV8_SVDTFalure This monthoring checks cyclically (there is set) OR 22.8.79 F.0 SVD1s mining True OR OR All RSVLV_MV8_SVDTFalure This monthoring checks cyclically (there is set) OR 22.5.79 L SVD1s mining True Op Op Op Op Op All SVD1s mining True Op Op Op Op SVD1s mining True Op	valve 2				Ground Lost Free Wheeling Lost failure	Temperature in ASIC output stage (Over Temperature feedback bit is set)	> 195-220 [°C]	And Any valve test is activated	= False	1		1 1
All RBVLV_MV8_SVDTFalure This monitoring checks cyclically if there is voltage drop between PGND at low-side driver and ECU-GND (PGND-tost Note > 0.4-0.9 [V] > 0.4-0.9 [V] + Tue 20 [s] Cyclically every 20 PG Type A. 1 Trip information control between velow driver and ECU-GND (PGND-tost in grant welch is set) > 22-39.4 FW + Tue 20 [s] Cyclically every 20 PG Type A. 1 Trip information control between velow driver and ECU-GND (PGND-tost in grant welch is set) > 22-39.4 FW + Tue 20 [s] Cyclically every 20 PG Type A. 1 Trip information control between velow driver and grant value object to control between velow driver and ecol (Under Current feedback bit is set) > 22-39.4 FW + Tue 20 [s] Cyclically every 20 PG Type A. 1 Trip information control between velow driver and ecol (Under Current feedback bit is set) > 22-39.4 FW + Tue > 0.4-0.9 [V] + Tue						1				1		1 1
All RBVLV_MV8_SVDTFailure This monitoring decks optically if there is subject of the data built is subject of the data						OR Voltage drag between BCND at law side driver and ECU CND /BCND Lag	- 040000			1		1 1
NI RBVLV_MV8_SVDTFalure OR OR S28-39.4 FV Product of the back bit is set)<						feedback bit is set)	× 0.4-0.8 [V]			1		1 1
AI RBVLV_MV8_SVDTFalure This monitoring checks optically if there is ishortcut between values during Silent Value Diver Voltage all ov during checks optically is set) < 2.2.5 PV						OR				1		1 1
Note that the second of the		1	AII	PBVLV MV8 SVDTealure	This monitoring checks cyclically if there is	Voltage at Qx (Free Wheelino Lost feedback bit is set)	> 32.8-39.4 FVI	SVDT is running	- True	20.[e]	Cuclically even: 20	Tune & 1 Trin
Test due to defective collow side and high side Current through value coll (Under Current feedback bit is set) < 0.75 - 0.125 FAI			0	KBVEV_MV8_3VD1Pallule	shortcut between valves during Silent Valve Drive	r OR	< 2-2.5 F VI	AND	= 1100	20[5]	[s]	туре А, т тпр
paths. DR OR > 5 · 8 [AI Valvetaly supply voltage > 6 · 8 [V] Comment through valve coil (Over Current feedback bit is set) > 5 · 8 [AI Valvetaly supply voltage > 6 · 8 [V] Temperature in ASIC output stage (Over Temperature feedback bit is set) > 195-220 [°C] Outside of valve control = True I OR I I I I OR Voltage drop between PGND at low-side driver and ECU-GND (PGND-Loss) > 6 · 0 [V] I I OR I I I OR I I I I					Test due to defective coil low side and high side	Current through valve coil (Under Current feedback bit is set)	< 0.075 - 0.125 FAI	Ignition state ON	= True		(-)	1 1
OR OR AND AND AND AND AND OR AND OR AND AND AND AND OR Voltage drop between PGND at low-side driver and ECU-GND (PGND-Last) Outside or values and sight drage states and point AND Frage OR Voltage drop between PGND at low-side driver and ECU-GND (PGND-Last) Outside or values and sight drage states and point Frage Frage OR Voltage drop between PGND at low-side driver and ECU-GND (PGND-Last) Outside or values and point Frage Frage OR Voltage drop between registration of maximum contrast grint before and right drage statisting point >Clemping voltage 32.8					paths.	OR Current through value coil (Over Current feedback bit is set)	- 5 - 8 FA I	AND Value relay supply voltage	> 6 9 1 / 1	1		1 1
Temperature in ASIC output stage (Over Temperature feedback bit is set) > 195-220 [°C] Outuide of value control = True OR AND Voltage arrow between PGND at low-side driver and ECU-GND (PGND-Loss > 64.0.9 [V] Hydraulic request is set = False OR Voltage arrow between PGND at loss > 64.0.9 [V] Hydraulic request is set = False OR Voltage arrow feedback bit is set) > Climping voltage 32.8		1				OR		AND	1	1		
OR Voltage drop between PGND at low-side driver and ECU-GND (PGND-Lost) > 0.4 - 0.9 [V] hydraulic request is set > False OR Voltage drop between PGND at low-side driver and ECU-GND (PGND-Lost) > 0.4 - 0.9 [V] hydraulic request is set > False OR Voltage drop between PGND at 0x freedback bit is set) > 0.4 - 0.9 [V] hydraulic request is set > False OR Voltage drop between PGND at 0x freedback bit is set) > 0.4 - 0.9 [V] [V] Hydraulic request is set > False OR OP voltage drop between PGND at 0x freedback bit is set) > 0.4 - 0.9 [V] [V] Hydraulic request is set > 0.4 - 0.9 [V]		1				Temperature in ASIC output stage (Over Temperature feedback bit is set)	> 195-220 [°C]	Outside of valve control	= True	1		
Voltage drop between PGND at low-side driver and ECU-GND (PGND-Lost) > 0.4 - 0.9 [V] hydraufic request is set = False Voltage drop between PGND at low-side driver and ECU-GND (PGND-Lost) > 0.4 - 0.9 [V] hydraufic request is set = False PG PG Voltage drop between PGND at lost feedback bit is set) > Clamping voltage 32.839.4 Voltage drop between PGND at low-side driver and right after switching point >20 [%]						OR		AND		1		
Image: Constraint of the set of the se					1	Voltage drop between PGND at low-side driver and ECU-GND (PGND-Lost	> 0.4 - 0.9 [V]	Hydraulic request is set	= False	1		
OR > Clamping voltage 32.839.4 Voltage at 0x (Freewheeling Loss feedback bit is set) > Clamping voltage 32.839.4 IV IVI OR IVI Deviation of measured currents right before and right after switching point (Hs-Ls Compare feedback bit is set) > 20 [%]		1				feedback bit is set)				1		
OR [V ¹ Devision of measured currents right before and right after switching point (H1+Li Compare feedback bit is set) > 20 [%]		1				UK Voltage at Qx (Freewheeling Lost feedback bit is set)	> Clamping voltage 32.8 39.4			1		
OR Deviation of measured currents right before and right after switching point (Hs-Ls Compare feetback bit is set)		1					[VI			1		
Deviation of measured currents right before and right after switching point >20(%) (Hist-Lis Compare feedback bits is et)		1				OR	0.0 (91)			1		
						Deviation or measured currents right before and right after switching point (Hs-Ls Compare feedback bit is set)	> 20 [%]			1		

System/	Fault	Variant	Failure Word	Monitoring Strategy Description	Malfunction Criteria	Malftmction Criteria Threshold	Secondary Parameters	Enable Condition	Time Required	Frequency of	MIL
Component	Code	1				Value			1	Checks	Illumination
		All	RBVLV_MV8_ValveActuationFailure	This monitoring checks continuously if there is	PWM failure feedback bit is set	= True	Ignition state ON	= True	0.03 [s]	Continuous	Type A, 1 Trip
				PWM failure or HsLs-Compare failure or wrong	OR Deviation of measured currents right before and right ofter switching point	- 20 (9/1	AND Value relevicements weltere	- 6 0 0/1			1
				GateQX(OreOFF) failure.	(Hs-Ls Comcare feedback bit is set)	20[/0]	Valve relay supply voltage	2 0.9 [V]			
					OR Wrone CateOv ON feetback bit is set	- True	AND Any under text is patiented	- Folco			
					OR	l		- 1 0.00			
		All	BBVLV_MV8_ValveColPathInterruntionFailure	This monitoring checks continuously if the valve-	Wrono GateQx OFF feedback bit is set	= True	Ignition state ON	= True	0.03[s]	Continuous	Type A 1 Trip
		ĺ.		coil path has interruption.	OR	1	AND			1	.,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,
		All	RBVLV_MV8_ValveColResistanceOutOfRangeFailure	This monitoring checks if there is deviation	Current through valve coil (Under Current feedback bit is set)	<0.075 -0.125 [AI	Any valve test is activated	= False	20.[8]	Cyclically every 20	Type A 1 Trip
		ĺ.		between the measured valve resistance and the	OR		AND	1		[s]	.,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,
				defined valve resistance in the software.	Measured valve resistance	<2.2 [Qhml	AND	= True			
		I		J			Hvdraulic reouest is set	= False	l]	1
			RBVLV_MV8_ValveDriverLBIS1Failure	I his monitoring checks if there is failure inside valve driver actuation logic and actuation	Pailure in actuation logic and actuation compare logic OR	= True	AND	= True	20[8]	Cyclically every 20 [s]	Type A, 1 Trip
				monitoring unit as well as inside valve driver ADC	Failure in low-side ADC measurement	= True	Outside of valve control	= True			
				unit.	Failure in high-side ADC measurement	= True	Hydraulic reguest is set	= False			
					OR Failure in RWM compare unit	- True					
		All	RBVLV_MV8_VARTFailure	This monitoring checks cyclically the ASIC-Valve-	ASIC valve driver failure crosstalk	= True	Ignition state ON	= True	20 [s]	Cyclically every 20	Type A, 1 Trip
				Driver internal output-driver actuation register.	OR Bit failure in ASIC value driver actuation registers (stuck at 0 or 1)	- True	AND Value relay supply unitage	> 6 9 M		[5]	1
					OR	l	AND	0.0 m			
					Unexpected ASIC valve driver feedback (considered ASIC bits: OpenLoad, Undercurrent GateOx (ON/OFF))	= True	Outside of valve control	= True			
							AND				
Ilgnition Switch Run Crank							Hvdraulic reguest is set	= False			
ILine											
Ignition On/Start Switch	P2535	All	IgnSwitchCircuitHigh	This monitoring checks if the Ignition Switch	Hardwired ignition switch circuit	>4.5 [VI	None	= None	2.5 [s]	Continuous	Type B, 2
Circuit High Voltage				Circuit is short to Battery.	AND Engine controller run crank terminal status from CAN	- Low					Trips
								·			
Ignition On/Start Switch Circuit Low Voltage	P2534	All	IgnSwitchCircuitLow	This monitoring checks if the Ignition Switch Circuit is interrupted or short to GND	Hardwired ignition switch circuit AND	<2 [VI	None	= None	2.5 [s]	Continuous	Type B, 2 Trips
					Engine controller run crank terminal status from CAN	= High					
Twheel Soeed Sensors											
Left Front Wheel Speed Sensor Circuit High	C0503	All	RBWssFLLineHigh	This monitoring checks if there is a short circuit of the WSS Front Left signal line to the battery	Sensor current at the signal line	> 0.05 fAI	Ignition state ON	= True	0.120 [s]	Continuous	Type A, 1 Trip
Consor Oncon ringh				line woor roll cell signal line to the ballery.			Front Left WSS Test is finished as sensor undervoltage fault is not logged	= True			
							(SAE code: C0501) AND				
							Front Right WSS Test is finished as sensor undervoltage fault is not logged	= True			
							(SAE code: C0507) AND				
							Rear Left WSS Test is finished as sensor undervoltage fault is not logged	= True			
							(SAE code: C050D) AND				
							Rear Right WSS Test is finished as sensor undervoltage fault is not logged	= True			
							(SAE code: C0513)		-		
Left Front Wheel Speed Sensor Circuit Low	C0502	All	RBWssFLLineUndef	This monitoring checks for implausible error	Current value monitoring does not detect failure	= True	Ignition state ON	= True	0.120 [s]	Continuous	Type A, 1 Trip
				either as an electrical fault (such as supply to	Supply line monitoring does not detect failure	= True	Front Left WSS Test is finished as sensor undervoltage fault is not logged	= True			
				ground which are covered by other monitorings) o valid signal	AND		(SAE code: C0501) AND				
				1	Voltage value monitoring does not detect failure	= True	Front Right WSS Test is finished as sensor undervoltage fault is not logged	= True			
					AND		(SAE code: C0507) AND				
					Signal is not valid	= False	Rear Left WSS Test is finished as sensor undervoltage fault is not logged	= True			
							(SAE code: C050D) AND				
							Rear Right WSS Test is finished as sensor undervoltage fault is not logged	= True			
		All	RBWssFLSupplyGnd	This monitoring checks if there is supply line shore	Current at sensor supply line	> 0.055 [AI	Ignition state ON	= True	0.120 [s]	Continuous	Type A, 1 Trip
				to ground failure in case of front left WSS.	AND Current at sensor supply line	<0.16[4]	AND Front Left WSS Test is finished as sensor undervoltage fault is not logged	- True			1
							(SAE code: C0501)	- 1100			
							AND Front Right WSS Test is finished as sensor undervoltage fault is not logged	= True			
							(SAE code: C0507)				
							AND Rear Left WSS Test is finished as sensor undervoltage fault is not logged	= True			
							(SAE code: C050D)				
							AND Rear Right WSS Test is finished as sensor undervoltage fault is not logged	= True			
	-	L		I		L	(SAE code: C0513)	1	L	L	
Left Front Wheel Speed	C0500	All	RBWssFLLineGnd	This monitoring checks if there is a short to	Sensor current at the signal line	< 0.0038 [AI	Ignition state ON	= True	0.120 [s]	Continuous	Type A, 1 Trip
Sensor Circuit/Open				ground or interruption based on current			AND	- True			1
				Inclusion and the case of WSS From Left line.			(SAE code: C0501)				1
							AND	- True			1
							(SAE code: C0507)				
							AND Rear Left WSS Test is finished as sensor undervoltage fault is not looped	= True			1
							(SAE code: C050D)				
1	1	1	I	1	1	1	AND	1	1	1	1

System/	Fault	Variant	Failure Word	Monitoring Strategy Description	Malfunction Criteria	Malfunction Criteria Threshold	Secondary Parameters	Enable Condition	Time Required	Frequency of	MIL
Component	Code	1				Value			1	Checks	Illumination
							Rear Right WSS Test is finished as sensor undervoltage fault is not logged (SAE code: C0513)	= True			
		<u> </u>									
Left Front Wheel Speed Sensor Direction (Incorrect	C0056	All	Wss_MonWheelDir_FL	This monitoring checks if the measured rotation direction of FL wheel is correct	Rotation direction of monitored wheel differs from at least two other wheels rotation direction	= True	Ignition state ON	= True	20 [s]	Continuous	Type B, 2 Trips
Mounting)							AND				
							Vehicle speed AND	>3.13 fmphl			
							At least two WSS direction information is available	= True			
Left Front Wheel Sneed	C0555	Bosch\/DA	RRWeeEI WrongSane	This monitoring chacks if a wrong wheel speed	VDA protocol hits received	0	Ignition state ON	- True	3[0]	Continuous	Type A 1 Trip
Sensor Incorrect Component	1	ContiVdaR	normal Enrolgonia	sensor type is mounted.	1 bit plotest bits received			- 1100	0[0]		1,1,000,000,000
Installed	1						AND Senser supply yelfage	- R M			
							AND	1 NO M			
							Front Left WSS Test is finished as sensor undervoltage fault is not logged	= True			
							AND				
							Front Right WSS Test is finished as sensor undervoltage fault is not logged	= True			
							AND				
							Rear Left WSS Test is finished as sensor undervoltage fault is not logged	= True			
							AND				
							Rear Right WSS Test is finished as sensor undervoltage fault is not logged	= True			
		DF11i	RBWssFLWrongSens	This monitoring checks if a wrong wheel speed	Stop pulse accordina to WSS protocol is detected	= False	lanition state ON	= True	3[s]	Continuous	Type A, 1 Trip
				sensor type is mounted.			AND Sesser supply yelloss	- 614			
							AND	20m			
							Front Left WSS Test is finished as sensor undervoltage fault is not logged	= True			
							AND				
							Front Right WSS Test is finished as sensor undervoltage fault is not logged	= True			
							AND				
							Rear Left WSS Test is finished as sensor undervoltage fault is not logged	= True			
							AND				
							Rear Right WSS Test is finished as sensor undervoltage fault is not logged	= True			
		DF11s	RBWssFLWrongSens	This monitoring checks if a wrong wheel speed	Stop pulse accordina to WSS protocol is detected	= True	lanition state ON	= True	3[s]	Continuous	Type A, 1 Trip
		1		sensor type is mounted.			AND			1	
							AND	>6 M			
							Front Left WSS Test is finished as sensor undervoltage fault is not logged	= True			
							(SAE code: C0501) AND				
							Front Right WSS Test is finished as sensor undervoltage fault is not logged	= True			
							(SAE code: C0507) AND				
							Rear Left WSS Test is finished as sensor undervoltage fault is not logged	= True			
							AND				
							Rear Right WSS Test is finished as sensor undervoltage fault is not logged	= True			
		1				1	(SAE code: C0513)		-	1	-
Left Front Wheel Speed	C0504	All	RBWssFLDmaBufNoise	This monitoring checks if there is an overflow in the Direct Moment Access Transfer Linit	DMA buffer state	= Overflow	lanition state ON	= True	0.03 [s]	Continuous	Type A, 1 Trip
Sensor intermittent/Enauc				Life Direct Menory Access Transler Onit.	Buffer transfer error occurred (DMA TU is receiving time stamps too	= True	Front Left WSS Test is finished as sensor undervoltage fault is not logged	= True			
					frequently)		(SAE code: C0501)				
							Front Right WSS Test is finished as sensor undervoltage fault is not logged	= True			
							(SAE code: C0507)				
							Rear Left WSS Test is finished as sensor undervoltage fault is not logged	= True			
							(SAE code: C050D)				
							Rear Right WSS Test is finished as sensor undervoltage fault is not logged	= True			
		BoshVDA	RBWssEl VdaParityBitEail	This monitoring checks if a wrong parity bit is	Parity information in ASIC differs from Parity information from WSS	= True	(SAE code: C0513)	= True	1 [5]	Continuous	Type A 1 Trip
		ContiVdaR		received from WSS Front Left					. (4)	1	.,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,
							AND Front Laft WSS Test is finished as sensor undervoltage fault is not logged	- True			
							(SAE code: C0501)				
							AND Front Right WSS Test is finished as sensor undervoltage fault is not logged	- True			
							(SAE code: C0507)	- 1100			
							AND Rear Left WSS Test is finished as sensor undervoltage fault is not logged	- True			
							(SAE code: C050D)	- 1100			
							AND Rear Right WSS Test is finished as sensor undervoltage fault is not logged	= True			
	<u> </u>			l			(SAE code: C0513)	1 ····			
Left Front Wheel Speed	C0501	DF11i	RBWssFLAirGap	This monitoring checks if there is an incorrect air	Magnetic flux density	< 0.0022 [T]	Ignition state ON	= True	8 [s] if Veh	Continuous	Type B. 2
Sensor Range/Performance		BoschVDA		gap between the impulse wheel and the front left					Speed is 3.1		Trips
	1	ContiVdaR		sensor.	AND		AND		[mph] 22 [s] if Veh.		
	1	1		1	For a number of wheel rotations	>= 5	Front Left WSS Test is finished as sensor undervoltage fault is not logged	= True	Speed is 1.24		
	1	1					(SAE code: Cubu1) AND		[mph]		
	1	1		1			Front Right WSS Test is finished as sensor undervoltage fault is not logged	= True			
	1	1		1			AND				

OP End of the set of the s	Type B, 2 Trips
No. No. <td>Type B, 2 Trips Type B, 2 Trips</td>	Type B, 2 Trips Type B, 2 Trips
Description Binstruct Nucleage Intercontrants protocy in the points an entity The	Type B, 2 Trips
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Pri Nu Revery Value Revery Value Pri nu control registration Pri nu contregistration Pri nu control registration	Type B, 2 Trips
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Part I Rescription Rescripion Rescription <th< td=""><td>Type B, 2 Trips</td></th<>	Type B, 2 Trips
P111 R8WsFLMeEdge The monitoring checks if step pulses are not received from for the YSS. Prove	Type B, 2 Trips
Note Note - Tue	Trips
Normal Sector	
Res Let NSS Test in finited as sensor undervoltage fault in or logged Res FigUN SS Test in finited as sensor undervoltage fault in or logged Res FigUN SS Test in finited as sensor undervoltage fault in or logged Res FigUN SS Test in finited as sensor undervoltage fault in or logged Res FigUN SS Test in finited as sensor undervoltage fault in or logged Res FigUN SS Test in finited as sensor undervoltage fault in or logged Res FigUN SS Test in finited as sensor undervoltage fault in or logged Res FigUN SS Test in finited as sensor undervoltage fault in or logged Res FigUN SS Test in finited as sensor undervoltage fault in or logged (SAE code: COSS) AND Res FigUN SS Test in finited as sensor undervoltage fault in or logged (SAE code: COSS) AND Res FigUN SS Test in finited as sensor undervoltage fault in or logged (SAE code: COSS) Res FigUN SS Test in finited as sensor undervoltage fault in or logged (SAE code: COSS) Res FigUN SS Test in finited as sensor undervoltage fault in or logged (SAE code: COSS) Res FigUN SS Test in finited as sensor undervoltage fault in or logged (SAE code: COSS) Res FigUN SS Test in finited as sensor undervoltage fault in or logged (SAE code: COSS) Res FigUN SS Test in finited as sensor undervoltage fault in or logged (SAE code: COSS) Res FigUN SS Test in finited as sensor undervoltage fault in or logged (SAE code: COSS) Res FigUN SS Test in finited as sensor undervoltage fault in or logged (SAE code: COSS) Res FigUN SS Test in finited as sensor undervoltage fault in or logged (Res FigUN SS Test in finited as sensor undervoltage fault in or logged (Res FigUN SS Test in finited as sensor undervoltage fault in or logged (Res FigUN SS Test in finited as sensor undervoltage fault in or logged (Res FigUN SS Test in finited as sensor undervoltage fault in or logged (Res FigUN SS Test in finited as sensor undervoltage fault in or logged (Res FigUN SS Test in finited as sensor undervoltage fault in or logged (Res FigUN SS Test in finited as sensor undervoltage fault in or logged	
Rest Right WS FLUnderVoltage This monitoring checks if there is an undervoltage ECU supply line <td></td>	
BoschVDA RBWssFLUnderVoltage This monitoring checks # there is an undervoltage on the WSS Front Left Supply Line. ECU supply line c.9M Inguite state 0.00 During initiatization This provide across the WSS Continue ContIVulaR RBWssFLUnderVoltage This monitoring checks # there is an undervoltage (SAE code: COSPD) This monitoring checks # there is an undervoltage (SAE code: COSPD) This monitoring checks # there is an undervoltage (SAE code: COSPD) This monitoring checks # there is an undervoltage (SAE code: COSPD) This monitoring checks # there is an undervoltage (SAE code: COSPD) This monitoring checks # there is an undervoltage (SAE code: COSPD) This monitoring checks # there is an undervoltage (SAE code: COSPD) This monitoring checks # there is an undervoltage (SAE code: COSPD) This monitoring checks # there is an undervoltage (SAE code: COSPD) This monitoring checks # there is an undervoltage (SAE code: COSPD) This monitoring checks # there is an undervoltage (SAE code: COSPD) This monitoring checks # there is an undervoltage (SAE code: COSPD) This monitoring checks # there is an undervoltage (SAE code: COSPD) This monitoring checks # there is an undervoltage (SAE code: COSPD) This monitoring checks # there is an undervoltage (SAE code: COSPD) This monitoring checks # there is an undervoltage (SAE code: COSPD) This monitoring checks # there is an undervoltage (SAE code: COSPD) This monitoring checks # there is an undervoltage (SAE code: COSPD) This monitoring checks # there is an undervoltage (SAE code: COSPD) This monitoring checks # there is an undervoltage (SAE code: COSPD) This monitoring chec	
No AND The The O.06 [s] Supply voltace across the WS Supply voltace across the WS Since in the sensor undervoltage fault is not logged The O.06 [s] RewseFLunder/voltage This monitoring checks if there is an undervoltage ECU supply line Since in the sensor undervoltage fault is not logged The Initial and NH NHD NHD NHD Since in the sensor undervoltage fault is not logged The Initial and NH NHD NHD NHD Since in the sensor undervoltage fault is not logged The Initial and NH NHD NHD NHD Since in the sensor undervoltage fault is not logged The Initial and NH NHD NHD NHD NHD NHD The Initial and NH NHD NHD NHD NHD NHD The Initial and NH NHD NHD NHD NHD NHD The Initial and NH NHD NHD NHD NHD NHD The Initial and NH NHD NHD NHD NHD NHD NHD The Initial and NH NHD NHD NHD NHD NHD NHD The Initial and NHD NHD NH	Type B, 2
ContiVdaR RBWs#LUnderVoltage This monitoring checks if there is an undervoltage ECU supply Inte <td>Trips</td>	Trips
Note	
Image: Second	
Res Res <td></td>	
Contrivide RBWsFLUnderVoltage This monitoring checks if there is an undervoltage ECU supply Line. Contrivide Sector (SS) Initial and SS InitiAND Initial and SS	
Contrivideal RBWssFLUnderVoltage This monitoring checks if there is an undervoltage ECU supply line Ignation state ON AND = True 12 (b) Initial and Control No No During initialization = True 0 Control No During initialization = True 0 Control ND Front Left WSS Test is finished as sensor undervoltage fault is not logged (SAE code: CoGOT) = True 0.6 (s)	
Supplv voltace across the WSS < 5.65 IV1	Type B, 2 Trips
AND Front Left WSS Test is finished as sensor undervoltage fault is not logged (SAE dode: C0501) AND Front Right WSS Test is finished as sensor undervoltage fault is not logged True (SAE dode: C0507) True	
Front Right WSS Test is finished as sensor undervoltage fault is not logged = True (SAE code: C0507)	
AND	
Rear Left WSS Test is finished as sensor undervoltage fault is not logged (SAE code: CoSoD) AND = True	
rear wrght twiss i est is timstened as sensor undervoltage fault is not logged = True (SAE code: COST3)	
DF11s RBWssFLUnderVoltage This monitoring checks/ If there is an undervoltage ECU supply line cr.2[V] Ignition state ON cr	Type B, 2 Trips
Sunnh-whites arms the WSS <5.15.1VL	
AND Front Left WSS Tests in the WSS Control of the WSS Tests in the base of the the WSS Tests in the base of the the WSS Tests in the base of the the WSS Tests in the WSS Test	
AND AND Front Right WSS Test is finished as sensor undervoltage fault is not logged = True (SAE code: COSO7)	
AND Rear Left WSS Test is finished as sensor undervoltage fault is not logged (SAE code: C050D)	
AND Rear Right WSS Test is finished as sensor undervoltage fault is not logged (SAE code: CO5(3)	
All RBWsSTeatFLFallure This monitoring clocks of the system can Hardware check failed according to the ASIC internal register data renomicing a WS FL line failure	Type B, 2 Trice
All Wss_MonMssingTeeth_FL This monitoring checks the manual of the far and the far and the manual of the far and the far a	Type B, 2 Trips
Vehicle speed = 6.21.37.28 (mphi the 10th gap	

Singer State Singer State<	Svetem/	Fault	Variant	Esilure Word	Monitoring Strategy Description	Mallunction Criteria	Malflinction Criteria Threehold	Secondary Parametere	Enable Condition	Time Required	Frequency of	MI
$ \begin below between the large state of the larg$	Component	Code			Internet of the second se		Value			I	Checks	Illumination
Normal Processing Pro							1				1	
No. Resident, T. Propriet (Section 2) (Section 2) Operating (Section 2) (Section 2) Propriet (Section 2) (Section 2) Proprint (Section 2) (Section 2) Proprint (Section 2)								AND Reveals read in detected	- Folge			
Image: state			All	Wss MonNoise FL	This monitoring checks for a discontinuous WSS	(Wheel acceleration	> 981 [m/s ^A 2]	Ignition state ON	= True	20 [s]	Continuous	Type B. 2
Image: state in the s			1		Signal.	AND				1	1	Trips
Normal Normal<						For a calibrated number of counts	= 2					
Image: state						AND For time)	<1.2 [ei					
Normality Normality <t< td=""><td></td><td></td><td></td><td></td><td></td><td>OR</td><td>s 1.2 (b)</td><td></td><td></td><td></td><td></td><td></td></t<>						OR	s 1.2 (b)					
Normalization Normalinstation Normalization Normal						(Wheel acceleration	> 500 [m/s ^A 21					
Image: state in the						AND						
Image: state						Accumulation of the weighted noise amplitude in current driving cycle)	>4					
Image: Problem in the standard of the results of the resul						(Number of detected increasing edges AND	>= 3					
No. No. <td></td> <td></td> <td></td> <td></td> <td></td> <td>_ Within time)</td> <td>= 0.005 [si</td> <td></td> <td></td> <td>51-1</td> <td></td> <td></td>						_ Within time)	= 0.005 [si			51-1		
No. 2017			All	Wss_MonRange_FL	This monitoring checks WSS for implausibly high wheel energy value	Measured wheel speed	> 183.95 [mph]	Ignition state ON	= True	5[5]	Continuous	Type B, 2 Trine
Image: state			All	Wss_MonVDiff_FL	This monitoring checks if the difference between	Difference between maximum and minimum wheel soeed	>3.73 [mph]	Ignition state ON	= True	9 - 18 [s]	Continuous	Type B, 2
Image: second			1		the wheel speed sensor signals and WSS FL is			AND	1	1		Trips
Image: state in the state is a state in the state in the state is a state in the state in the state is a state state in the state in the state is a state in the state is a st					within a valid range.			Vehicle speed	< 12.43 [moh]			
Image: Section of the sectio								Curve driving	< 20 Ideo/sl			
Image: Section of the sectio						Difference between maximum and minimum wheel speed	> 6 [%1 of the vehicle speed	Ignition state ON	= True	9 - 18 [s]		
Normality Normality <t< td=""><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td>AND</td><td>1</td><td>1</td><td></td><td></td></t<>								AND	1	1		
Image: section of section and section andiference and section and section and section and s								Vehicle speed	> 12.43 [mph]			
Image: Proper intermediation of the second control of table intermediation of table intermediatintermediation of table intermediation of table intermed								Curve driving	< 20 [dea/s]			
Image: second						IDifference between maximum and minimum wheel soeedl	>3.73 [mohl	Ignition state ON	= True	9 - 18 [s]	1	
Intervention Intervention<								AND	1	1		
Index Index <th< td=""><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td>Vehicle speed</td><td><62.13 [moh]</td><td></td><td></td><td></td></th<>								Vehicle speed	<62.13 [moh]			
Image: series of the								Curve driving	> 20 fdeo/sl			
Image: series in the series in the series is a series in the series is a series is series is a series is a series is a series is a series						Difference between maximum and minimum wheel speed	> 6 [%1 of the vehicle speed	Ignition state ON	= True	9 - 18 [s]		
Image: Process of the second								AND				
Image: Proper interview Proper int						Difference between maximum and minimum wheel accord	- 2 72 (mob)	Vehicle speed	>= 62.13 [mph]	72 [e]	-	
Image: second						Difference between maximum and minimum wheel speed	33.73 (mom	OR	= ride	12 [3]		
Image: series of the								Number of defective WSS	>2			
Image: series of the								OR	ļ			
In Proceedings Normal Normal Signal Signal <td< td=""><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td>ABS is not available</td><td>= True</td><td></td><td></td><td></td></td<>								ABS is not available	= True			
Image: state in the								Number of wheel velocities below 3.1 moh)	>3			
All Mathematical Market All Market Al								AND)			
All Pitt Depict 2.0 r / 10 pm Pitt Depict 2.0 r / 10 p			I				ł	Ignition state ON	= True		l	
Left Normalization Participation Par			All	Wss_SignalLost_FL	This monitoring checks if there is a lost wheel	(Speed of one wheel AND	= 0 [mph]	Ignition state ON	= True	0.500 [s]	Continuous	Type B, 2
Image: Proper section Proper seccin Proper section P					speed sensor signal.	Vehicle speed increase)	>7.38 [mph]	ABS TCS EBD control	= False			inps
Left Rew Week Speek And No						OR		AND)			
Last Last Rest Multicle Speed Control Contro Contro						(Speed of two wheels	= 0 [mphi	Drive off from standstill	= True			
Image: bit is a						AND Vehicle sneed increases)	> 12 97 (all wheel drive) or					
Left Rear Wheek Speed Control Contro Contro Control <td></td> <td></td> <td></td> <td></td> <td></td> <td>venue spece norease y</td> <td>7.38 (two wheel drive) [moh]</td> <td></td> <td></td> <td></td> <td></td> <td></td>						venue spece norease y	7.38 (two wheel drive) [moh]					
All All <td></td> <td></td> <td></td> <td></td> <td></td> <td>Speed of one wheel</td> <td>= 0 [mphi</td> <td>Ignition state ON</td> <td>= True</td> <td>Immediately</td> <td></td> <td></td>						Speed of one wheel	= 0 [mphi	Ignition state ON	= True	Immediately		
Left Rev All ReviseLLevelup The mentange level (ALR code Code) (ALR						AND	44.405	AND	False			
Line with a grade All means						Wheel acceleration	>11.18 [mpn] < 300 [m/e ^A 21]	ABS ICS EBD control	= Faise	0.08 [e]	-	
Image: Constraints April 2000 April 2000 <th< td=""><td></td><td></td><td></td><td></td><td></td><td></td><td>1 000 (100 21</td><td>AND</td><td>- 1100</td><td>0.00 [3]</td><td></td><td></td></th<>							1 000 (100 21	AND	- 1100	0.00 [3]		
Image:								Vehicle speed	> 34.67 [moh]			
Line Rear Wheel Speed Color All RBWsaRLLineshigh The monitoring decks if there is a stort correct at the signal line Sensor Carrent at the signal line Source Carrent at the signal line The monitoring docks at flow carrent at the signal line of bigged The monitoring docks at flow carrent at the signal line of bigged The monitoring docks at flow carrent at the signal line of bigged The monitoring docks at flow carrent at the signal line of bigged The monitoring docks at flow carrent at the signal line of bigged The monitoring docks at flow carrent at the signal line of bigged The monitoring docks at dock at source carrent at the signal line of bigged The monitoring docks at dock at source carrent at the signal line of bigged The monitoring								AND	l			
Left Rear Wheel Speed Sensor Clicuit High Al A BaywsRLLineHigh Al BaywsRLIneHigh Al BaywsRLIneH							1	_ Aouaplanina	= False			-
Sensor Circuit High Li All All All Rescarce Circuit High The monolong descarce field is a sensor undervoltage fault is not logged in true Thus a sensor undervol	Left Rear Wheel Speed	C050F	All	RBWssRLLineHigh	This monitoring checks if there is a short circuit of	Sensor current at the signal line	> 0.05 [AI	Ignition state ON	= True	0.120 [s]	Continuous	Type A, 1 Trip
Left Image: Second Se	Sensor Circuit High	1	1	-	the WSS Rear Left signal line to the battery.			AND)	1	1	1
Left Rest Ward Spred Sensor Circuit Low Construction Page Ward Spred In a construction of the sensor undervoltage fault is not logged in the sensor undervoltage fault is								Front Left WSS Test is finished as sensor undervoltage fault is not logged	= True			
Image:								AND				
Image: Series Circuit Low Image: Series Circuit Low Image: Series Circuit Low AND AND True Image: Series Circuit Low Image: Series Circuit Low </td <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td>Front Right WSS Test is finished as sensor undervoltage fault is not logged (SAE code: C0507)</td> <td>= True</td> <td></td> <td></td> <td></td>								Front Right WSS Test is finished as sensor undervoltage fault is not logged (SAE code: C0507)	= True			
Image: sensor under-voltage fault is not logged Image: sensor under-voltage fault is not logged The member is for in regular built is not logge								AND	ļ	1		
Image: series of the series								Rear Left WSS Test is finished as sensor undervoltage fault is not logged	= True			
Image: Control in the control in t								AND				
Indication Indiduation Indiduation Indication<								Rear Right WSS Test is finished as sensor undervoltage fault is not logged	= True			
Left Rear Wheel Speed Sensor Clicuit Low Left Rear Wheel Speed Sensor Clicuit Low All RBWssRLLineUndef This monitoring checks for implausible error pattern of height which acrono the classifier and which are covered by other monitoring does not detect failure = True Ignition state ON AD = True = True Ignition state ON AD = True = True = True Ignition state ON AD = True = True = True = True = True Ignition state ON AD = True = True = True Ignition state ON AD = True = True = True Ignition state ON AD = True = True Ignition state ON AD = True Ignitston state ON								(SAE code: C0513)	I			
All REWERESupplyGnd The monitoring decks if there is supply line Current at sensor supply line Current at sens	Left Rear Wheel Sneed	C050E	All	PBWeePI Line Indef	This monitoring chacks for implausible error	Current value monitoring does not detect failure	- True	Insition state ON	= True	0.120 [e]	Continuous	Tune & 1 Trin
All RBWsRLSupp\Gnd This monitoring does in there is supply line Current at sensor supply line Current at sensor supply line >0.055 [All Image: All is a sensor undervoltage fault is not logged in a rule -Tue -Tue <td>Sensor Circuit Low</td> <td>3030E</td> <td></td> <td></td> <td>patterns of the signal which cannot be classified</td> <td>AND</td> <td></td> <td>AND</td> <td></td> <td></td> <td></td> <td>17955 A, 1 110</td>	Sensor Circuit Low	3030E			patterns of the signal which cannot be classified	AND		AND				17955 A, 1 110
All RSWssRLSupplyGnd This monitoring directs if there is supply line Current at sensor supply line > 0.055 (All NO Formula (All		1			either as an electrical fault (such as supply to	Supply line monitoring does not detect failure	= True	Front Left WSS Test is finished as sensor undervoltage fault is not logged	= True	1	1	
AII RBWsRLSupplyGnd This monitoring flocks if there is supply line Current at sensor supply line Current at sensor supply line >0.055 [AI Ignitional on the control on		1			ground which are covered by other monitorings) of	e		(SAE code: C0501)		1	1	1
All RBWssRLSupplyGnd The monitoring decks if there is supply line Current at sensor supply line - 0.055 [All Ignalis not logged - True					valid signal.	AND Voltage value monitoring does not detect failure	= True	AND Front Right WSS Test is finished as sensor undervoltage fault is not longed	= True			
AND								(SAE code: C0507)		1		
All RBWssRL5upp\/Gnd This monitoring dhecks if there is supply line Current at sensor supply line Current at sensor supply line > 0.055 [All [GNL code: CSD01) AND = Tue = Tue <td></td> <td></td> <td></td> <td></td> <td></td> <td>AND</td> <td></td> <td>AND</td> <td>ļ</td> <td></td> <td></td> <td></td>						AND		AND	ļ			
AII RBWssRLSupplyGnd This monitoring check if there is supply line short to ground failure in case of front right WSS. AND Current at sensor supply line > 0.055 [AI [Ighthere is sinkhed as sensor undervoltage fault is not logged AND (SAE code Codo)] = Tue 0.120 [s] Continuous Type A, 1 Trip AND Vision AND Current at sensor supply line AND Current at sensor supply line < 0.055 [AI						Signal is not valid	= False	Rear Left WSS Test is finished as sensor undervoltage fault is not logged	= True			
All RBWssRLSupplyGnd This monitoring decks if there is supply line thor to ground failure in case of front right WSS. Current at sensor supply line AND Current at sensor supply line > 0.055 [All Information of the context of the c		1						AND		1	1	1
All RBWssRLsupplyGnd This monitoring dhecks if there is supply line thore (supply line) Current at sensor supply line > 0.055 [All [Gan code: CO5(3) Part Part 0.120 [s] Continuous Type A, 1 Trip All RBWssRLsupplyGnd This monitoring dhecks if there is supply line thore (supply line) > 0.055 [All [Gan code: CO5(3) Part Part 0.120 [s] Continuous Type A, 1 Trip Current at sensor supply line < 0.055 [All			1					Rear Right WSS Test is finished as sensor undervoltage fault is not loaded	= True	1		
All RBWssRLSupplyGnd This monitoring dhecks if there is supply line short Current at sensor supply lin			I				l	_(SAE code: C0513))	1	J	1
AND			All	RBWssRLSupplyGnd	This monitoring checks if there is supply line shor	t Current at sensor supply line	> 0.055 [AI	Ignition state ON	= True	0.120 [s]	Continuous	Type A, 1 Trip
(SAE adde COSO) A COSO (SAE ADDE COSO (SAE ADDE COSO (SAE ADDE COSO) A COSO (SAE ADDE COSO (SAE ADDE COSO (SAE ADDE COSO) A COSO (SAE ADDE COSO) A COSO (SAE ADDE COSO) A COSO (SAE ADDE COSO					to ground failure in case of front right WSS.	Current at sensor supply line	<0.16 [A]	Front Left WSS Test is finished as sensor undervoltage fault is not logged	= True			
AND Front Right WSS Test is finished as sensor undervoltage fault is not logged True CALE and a CRECT						and a supply me	[44]	(SAE code: C0501)	1	1		
From WSS Test is find as sensor undervoltage fault is not logged = True (SA E Funder WSS Test is find as consort undervoltage fault is not logged = True		1						AND	1	1	1	1
IN REPORT LINU								Front Right WSS Test is finished as sensor undervoltage fault is not logged (SAE code: C0507)	= True			

System/	Fault	Variant	Failure Word	Monitoring Strategy Description	Malfunction Criteria	Malftinction Criteria Threshold	Secondary Parameters	Enable Condition	Time Required	Frequency of	MIL
Component	Code	1		1		Value	1		1 1	Checks	Illumination
							AND		4		
							Rear Left WSS Test is finished as sensor undervoltage fault is not logged	= True			
							(SAE code: C050D)				
							AND	Terre			
							(SAE code: C0513)	= Irue			
				1			(6/12 6662. 00515)		<u></u>		
Left Rear Wheel Speed	C050C	All	RBWssRLLineGnd	This monitoring checks if there is a short to	Sensor current at the sional line	< 0.0038 [AI	lanition state ON	= True	0.120 [s]	Continuous	Type A, 1 Trip
Sensor Circuit/Open				ground or interruption based on current			AND Erect Left WSS Text is finished as senser undervoltage foult is not logged	- True			
				measurement in case of WSS Real Lett line.			(SAE code: C0501)	= nue			
							AND	1			
							Front Right WSS Test is finished as sensor undervoltage fault is not logged	= True			
							AND				
							Rear Left WSS Test is finished as sensor undervoltage fault is not logged	= True			
							(SAE code: C050D)	1			
							AND Rear Right WSS Test is finished as sensor undervoltage fault is not logged	- True			
							(SAE code: C0513)	- 1100			
Left Rear Wheel Speed	C0058	All	Wss_MonWheelDir_RL	This monitoring checks if the measured rotation	Rotation direction of monitored wheel differs from at least two other wheels	= True	Ignition state ON	= True	20 [s]	Continuous	Type B, 2
Mounting)				direction of RL wheel is correct.	rotation direction		AND				Thps
							Vehicle speed	>3.13 fmphl			
							AND	1_			
		1		1			At least two WSS direction information is available	= True			
Left Rear Wheel Speed	C0557	BoschVDA	RBWssRLWrongSens	This monitoring checks if a wrong wheel speed	VDA protocol bits received	<> 9	Ignition state ON	= True	3[s]	Continuous	Type A, 1 Trip
Sensor Incorrect Component	t	ContiVdaR	-	sensor type is mounted.			1	1	1		
Installed							AND	-			
							(Front Left WSS Test is finished as sensor undervoltage fault is not logged (SAE code: C0501)	= Irue			
							AND	1			
							Front Right WSS Test is finished as sensor undervoltage fault is not logged	= True			
							(SAE code: C0507) AND				
							Rear Left WSS Test is finished as sensor undervoltage fault is not logged	= True			
							(SAE code: C050D)				
							AND	Terre			
							(SAE code: C0513)	= Irue			
		DF11i	RBWssRLWrongSens	This monitoring checks if a wrong wheel speed	Stop pulse is not detected	= True	Ignition state ON	= True	3[s]	Continuous	Type A, 1 Trip
		1		sensor type is mounted.			AND	1	1		1 1
							(Pront Left WSS Test is finished as sensor undervoltage fault is not logged (SAE endo: C0E01)	= Irue			
							AND				
							Front Right WSS Test is finished as sensor undervoltage fault is not logged	= True			
							(SAE code: C0507)				
							AND Rear Left WSS Test is finished as sensor undervoltage fault is not logged	= True			
							(SAE code: C050D)	1			
							AND	-			
							(SAE code: C0513)	= Irue			
							(
Left Rear Wheel Speed	C0510	All	RBWssRLDmaBufNoise	This monitoring checks if there is an overflow in	DMA buffer state	= Overflow	Ignition state ON	= True	0.03 [s]	Continuous	Type A, 1 Trip
Sensor Intermittent/Erratic				the Direct Memory Access Transfer Unit.	OR Buffer transfer error occurred (DMA TILlis receiving time stamps too	- True	AND Front Left WSS Test is finished as sensor undervoltage fault is not logged	- True			
					frequently)	- 1100	(SAE code: C0501)	- 1100			
							AND	_			
							Front Right WSS Test is finished as sensor undervoltage fault is not logged (SAE code: C0E07)	= True			
							AND				
							Rear Left WSS Test is finished as sensor undervoltage fault is not logged	= True			
							(SAE code: C050D)				
							Rear Right WSS Test is finished as sensor undervoltage fault is not longed	= True			
]			(SAE code: C0513)				
		BoshVDA	RBWssRLVdaParityBitFail	This monitoring checks if a wrong parity bit is	Parity information in ASIC differs from Parity information from WSS	= True	Ignition state ON	= True	1 [s]	Continuous	Type A, 1 Trip
		ContivdaR		received irom WSS Rear Lett.			AND		1		
							Front Left WSS Test is finished as sensor undervoltage fault is not logged	= True			
							(SAE code: C0501)				
							AND	-			
							(Front Right WSS Test is finished as sensor undervoltage fault is not logged (SAE code: C0507)	= Irue			
							AND				
							Rear Left WSS Test is finished as sensor undervoltage fault is not logged	= True			
		1		1			(SAE code: CUSUD) AND		1		
							Rear Right WSS Test is finished as sensor undervoltage fault is not logged	= True			
	I						(SAE code: C0513)	1			
Loft Boor Wheel Sec. 7	COEOD	DE11	PPIMooPI AirCon	This monitoring shacks if there is an /	Monnetic flux dessity	- 0.0022 [T]	Instition state ON	- True	R fol if Mok	Continuous	Tuno P. 2
Sensor Range/Performance	00000	BoschVDA	iterroriteri edp	gap between the impulse wheel and the rear left	magnetic max density	- 0.0022 [1]	Sumon and Co.		Speed is 3 1		Trips
		ContiVdaR		sensor.			1		[mph]		1 1
		1		1	AND	-	AND	True	22 [s] if Veh.		1 1
		1		1	For a number or wheel rotations	>= 0	(SAE code: C0501)	= me	opeed is 1.24		
1	1			1			AND	1	Featbard .		
1	1			1			Front Right WSS Test is finished as sensor undervoltage fault is not logged	= True			
		1		1			(SAE code: CU5U7) AND		1		
1	1	1	1	1		1	7000		1	1	1 I

/stem/	Fault	Variant	Failure Word	Monitoring Strategy Description	Malfunction Criteria	Malfrinction Criteria Threshold	Secondary Parameters	Enable Condition	Time Required	Frequency of	MI
mponent	Code		Palue Wold	wonitoring strategy bescription		Value	Secondary Parameters	Enable Condition	I line Kequireu	Checks	Illumination
							Rear Left WSS Test is finished as sensor undervoltage fault is not logged (SAE code: C050D) AND	= True			
							Rear Right WSS Test is finished as sensor undervoltage fault is not logged (SAE code: C0513) AND	= True			
		BoschVDA	RBWssRLNoEdge	This monitoring checks if stop pulses are not	Speed pulses are not received (standstill condition)	= True	Vehicle speed	>1.24 fmphl = True	3.6 [s]	Continuous	Type B, 2
		ContiVdaR		received from rear left WSS.	AND		AND				Trips
					VDA standstill protocol is not received	= True	Front Left WSS Test is finished as sensor undervoltage fault is not logged (SAE code: C0501) AND	= True			
							Front Right WSS Test is finished as sensor undervoltage fault is not logged (SAE code: C0507) AND	= True			
							Rear Left WSS Test is finished as sensor undervoltage fault is not logged ((SAE code: C050D) AND	= True			
							Rear Right WSS Test is finished as sensor undervoltage fault is not logged (SAE code: C0513) AND	= True			
		DE11i	PRWeePI NoEdge	This monitoring chacks if stop pulses are not	Sansor is not carding speed/stop Dulses	- True	Sensor supply voltage	>6 [VI	3.6.[0]	Continuous	Tune B 2
			REWSSREWEEUge	received from rear left WSS.		= nue	AND	- 1100	3.0 [5]	Continuous	Trips
							(Front Left WSS Test is tinished as sensor undervoltage fault is not logged (SAE code: C0501) AND	= True			
							Front Right WSS Test is finished as sensor undervoltage fault is not logged (SAE code: C0507) AND	= True			
							Rear Left WSS Test is finished as sensor undervoltage fault is not logged (SAE code: C050D) AND	= True			
							Rear Right WSS Test is finished as sensor undervoltage fault is not logged (SAE code: C0513) AND	= True			
							Sensor supply voltage	>6 M			
		BOSCHVDA	RBWSSRLUndervoltage	on the WSS Rear Left Supply Line.	ECU supply line	<9M	AND	= True	1.2 [S]	Continuous	Trips
					Supply voltace across the WSS	<5.15 IV1	Ionition state ON	= True	0.06 [s]		
							AND Front Left WSS Test is finished as sensor undervoltage fault is not logged (SAE code: C0501)	= True			
							AND Front Right WSS Test is finished as sensor undervoltage fault is not logged (SAE code: C0507)	= True			
							AND Rear Left WSS Test is finished as sensor undervoltage fault is not logged (SAE code: C050D) AND	= True			
							Rear Right WSS Test is finished as sensor undervoltage fault is not logged (SAE code: C0513)	= True			
		ContiVdaR	RBWssRLUnderVoltage	This monitoring checks if there is an undervoltage	ECU supply line	< 9.3 rvi	Ignition state ON	= True	1.2 [s]	Initial and	Type B, 2 Trips
					0	.5.05.04	During initialization	= True	0.00 (-)		i iipu
					Supply voltable across the wSS	< 5.05 IV I	AND Front Left WSS Test is finished as sensor undervoltage fault is not logged	= True	0.06 [5]		
							AND Front Right WSS Test is finished as sensor undervoltage fault is not logged	= True			
							(SAE code: CUSV7) AND Rear Left WSS Test is finished as sensor undervoltage fault is not logged	= True			
							I(SAE code: C050D) AND Rear Right WSS Test is finished as sensor undervoltage fault is not logged	= True			
		DF11i	RBWssRLUnderVoltage	This monitoring checks if there is an undervoltage	ECU supplv line	< 7.2 IV1	_ (SAE code: CUb13) Ignition state ON	= True	1.2 [8]	Continuous	Type B, 2
				on the was Kear Left Supply Line.			During initialization	= True		4	nps
					Supply voltage across the WSS	<5.15 IV1	Ignition state ON AND	= True	0.06 [s]		
							Front Left WSS Test is finished as sensor undervoltage fault is not logged (SAE code: C0501) AND	= True			
							IF ront Kignt WSS Test is finished as sensor undervoltage fault is not logged (SAE code: C0507) AND	= Irue			
							Rear Left WSS Test is finished as sensor undervoltage fault is not logged (SAE code: C050D) AND	= True			
							Rear Right WSS Test is finished as sensor undervoltage fault is not logged (SAE code: C0513)	= True]] _
		All	RBWssTestRLFailure	This monitoring checks if the system can recoonize a WSS RL line failure.	Hardware check failed according to the ASIC internal register data	= True	Ignition state ON	= True	0.05 [s]	Once	Type B, 2 Trios
		All	Wss_MonMissingTeeth_RL	This monitoring checks the amount of the magnetic poles of the WSS RL tone wheel for one	A gap in the raw WSS signal is consequently detected for a defined number of times	>= 10	Ignition state ON	= True	Immediately after	Continuous	Type B, 2 Trips
				rotation.			AND Vehicle speed	= 6 21 37 28 fmph	recognizing		
							AND ESP or ARS intervention	= False			
							AND	- raisd			

Svetem/	Fault	Variant	Esilure Word	Monitoring Strategy Description	Malfunction Criteria	Mallunction Criteria Threehold	Secondary Parametere	Enable Condition	Time Requirer	Erequency of	MI
Component	Code	Vanant	Palute Wold	Monitoring Strategy Description		Value		Enable Condition	I mie Kequireu	Checks	Illumination
							Rough road is detected	= False			
		All	Wss_MonNoise_RL	This monitoring checks for a discontinuous WSS	(Wheel acceleration	> 981 [m/s ^A 21	Ignition state ON	= True	20 [s]	Continuous	Type B, 2
				Signal.	For a calibrated number of counts	= 2					inps
					AND For time \	- 1 2 fel					
					OR						
					(Wheel acceleration AND	> 500 [m/s*21					
					Accumulation of the weiahted noise amplitude in current drivina cvcle)	> 4					
					OR (Number of detected increasina edaes	>= 3					
					AND						
		All	Wss_MonRange_RL	This monitoring checks WSS for implausibly high	Within time) Measured wheel speed	> 183.95 [mph]	Ignition state ON	= True	5[s]	Continuous	Type B, 2
		I)	wheel soeed value.	J	· · · · · · · · · · · · · · · · · · ·	· · · · · · · · · · · · · · · · · · ·	·		J	Trios
		All	Wss_monvDiff_RL	the wheel speed sensor signals and WSS RL is	Difference between maximum and minimum wheel speedi	>3.73 impni	AND	= True	9 - 10 [5]	Continuous	Trips
				within a valid range.			Vehicle speed	< 12.43 [mph]			
							Curve driving	< 20 [deg/sl			
					IDifference between maximum and minimum wheel speed	> 6 [%1 of the vehicle speed	Ignition state ON AND	= True	9 - 18 [s]		
							Vehicle soeed	< 12.43 [mph]			
							AND Curve driving	< 20 Ideo/el			
					IDifference between maximum and minimum wheel speed	>3.73 [mphi	Ignition state ON	= True	9 - 18 [s]		
							AND Vehicle speed	<62.13 [mph]			
							AND				
					Difference between maximum and minimum wheel speed	> 6 1%1 of the vehicle speed	Ignition state ON	> 20 [deg/sl = True	9 - 18 [s]	-	
							AND		1		
					Difference between maximum and minimum wheel speed	>3.73 [mph]	Spinning wheel is detected	>= 62.13 [mph] = True	72 [8]	-	
							OR	1	1		
							OR	>2			
							ABS is not available	= True			
							Number of wheel velocities below 3.1 mph)	>3			
							AND	- True			
		All	Wss_SignafLost_RL	This monitoring checks if there is a lost wheel	(Speed of one wheel	= 0 [mph]	Ignition state ON	= True	0.500 [s]	Continuous	Type B, 2
				speed sensor signal.	AND Vehicle speed increase)	>7.38[mob]	AND ABS TCS EBD control	- Falea			Trips
					OR	1	AND				
					(Soeed of two wheels AND	= 0 [mph]	Drive off from standstill	= True			
					Vehicle speed increase)	> 12.97 (all wheel drive) or					
					Soeed of one wheel	7.38 (two wheel drive) [mph] = 0 [mph]	Ignition state ON	= True	Immediately	-	
					AND		AND		1		
					Wheel acceleration	< -300 [m/s ^A 21	Ignition state ON	= False = True	0.08 [s]	-	
							AND	04.07/	1		
							AND	> 34.67 [mph]			
							Aguaplaning	= False			
Right Front Wheel Speed	C0509	All	RBWssFRLineHigh	This monitoring checks if there is a short circuit of	Sensor current at the sianal line	> 0.05 [AI	Ignition state ON	= True	0.120 [s]	Continuous	Type A, 1 Trip
Sensor Circuit High				the WSS Front Right signal line to the battery.			AND	- True			1 1
							(SAE code: C0501)	- 1100			
							AND Eront Right WSS Test is finished as sensor undervoltage fault is not logged	- True			
							(SAE code: C0507)	- 1100			
							AND Rear Left WSS Test is finished as sensor undervoltage fault is not logged	= True			
							(SAE code: C050D)				
							AND Rear Right WSS Test is finished as sensor undervoltage fault is not logged	= True			
							(SAE code: C0513)				
Right Front Wheel Speed	C0508	All	RBWssFRLineUndef	This monitoring checks for implausible error	Current value monitoring does not detect failure	= True	Ignition state ON	= True	0.120 [s]	Continuous	Type A, 1 Trip
Sensor Circuit Low				patterns of the signal which cannot be classified	AND	T	AND	T		1	1
				ground which are covered by other monitorings) or	supply line monitoring does not detect failure	= True	(SAE code: C0501)	= True			
				valid signal.	AND	T	AND	T			
					vorage value monitoring does not detect failure	- 1100	(SAE code: C0507)	- 1100			
					AND Signal is not used	- Felee	AND	- True			
						= Faise	(SAE code: C050D)	= 1108			
							AND Rear Pinht WSS Test is finished as sensor under ultage fault is not longed	- True			
		L			<u> </u>		(SAE code: C0513)		<u> </u>	<u> </u>	
		All	RBWssFRSupplyGnd	This monitoring checks if there is supply line short I to ground failure in case of rear left WSS	Current at sensor succellent AND	> 0.055 [AI	Ignition state ON AND	= True	0.120 [s]	Continuous	Type A, 1 Trip
					Current at sensor supply line	<0.16 [A]	Front Left WSS Test is finished as sensor undervoltage fault is not logged	= True			
							(SAE code: Cubu1) AND				
							Front Right WSS Test is finished as sensor undervoltage fault is not logged	= True			
							(SAE code: Cubu/) AND				

System/	Fault	Variant	Failure Word	Monitoring Strategy Description	Malfunction Criteria	Malfrinction Criteria Threshold	Secondary Parameters	Enable Condition	Time Required	Frequency of	MIL
Component	Code					Value				Checks	Illumination
							Rear Left WSS Test is finished as sensor undervoltage fault is not logged	= True			
							(SAE code: C050D) AND				
							Rear Right WSS Test is finished as sensor undervoltage fault is not logged (SAE code: C0513)	= True			
Right Front Wheel Speed	C0506	All	RBWssFRLineGnd	This monitoring checks if there is a short to	Sensor current at the sianal line	< 0.0038 [AI	Ignition state ON	= True	0.120 [s]	Continuous	Type A, 1 Trip
Sensor Circuit/Open				ground or interruption based on current			AND Front Left WSS Test is finished as sensor undervoltage fault is not logged	- True			
				inclusion in cluse of the of their regit line.			(SAE code: C0501)				
							AND Front Right WSS Test is finished as sensor undervoltage fault is not logged	- True			
							(SAE code: C0507)	= Hue			
							AND Rear Left WSS Test is finished as sensor undervoltage fault is not logged	- True			
							(SAE code: C050D)				
							AND Rear Right WSS Test is finished as sensor undervoltage fault is not logged	= True			
							(SAE code: C0513)				
Right Front Wheel Speed	C0057	All	Wss_MonWheelDir_FR	This monitoring checks if the measured rotation	Rotation direction of monitored wheel differs from at least two other wheels	= True	Ignition state ON	= True	20 [s]	Continuous	Type B, 2
Sensor Direction (Incorrect	1			direction of FR wheel is correct.	rotation direction		-				Trips
Mounting)							Vehicle soeed	>3.13 tmohl			
							AND	1_			
							At least two WSS direction information is available	= me			
Right Front Wheel Speed Sensor Incorrect Component	C0556	BoschVDA Contil/daR	RBWssFRWrongSens	This monitoring checks if a wrong wheel speed	VDA protocol bits received	<>9	Ignition state ON	= True	3[s]	Continuous	Type A, 1 Trip
Installed		Controdak		sensor type is mounted.			AND	ļ			
							Sensor supply voltage	>6 [VI			
							Front Left WSS Test is finished as sensor undervoltage fault is not logged	= True			
							(SAE code: C0501) AND				
							Front Right WSS Test is finished as sensor undervoltage fault is not logged	= True			
							(SAE code: C0507) AND				
							Rear Left WSS Test is finished as sensor undervoltage fault is not logged	= True			
							(SAE code: C050D) AND				
							Rear Right WSS Test is finished as sensor undervoltage fault is not logged	= True			
		DF11i	RBWssFRWrongSens	This monitoring checks if a wrong wheel speed	Stoo oulse accordino to WSS orotocol is detected	= False	[gnition state ON	= True	3[s]	Continuous	Type A, 1 Trip
				sensor type is mounted.			AND				1 1
							AND	> 6 M			
							Front Left WSS Test is finished as sensor undervoltage fault is not logged (SAE corte: C0501)	= True			
							AND				
							Front Right WSS Test is finished as sensor undervoltage fault is not logged (SAE code: C0507)	= True			
							AND	_			
							(SAE code: C050D)	= Irue			
							AND	-			
							Rear Right WSS Test is finished as sensor undervoltage fault is not logged (SAE code: C0513)	= True			
		DF11s	RBWssFRWrongSens	This monitoring checks if a wrong wheel speed	Stop pulse according to WSS protocol is detected	= True	Ignition state ON	= True	3[s]	Continuous	Type A, 1 Trip
				sensor type is mounted.			Sensor supply voltage	>6 [VI			
							AND	- True			
							(SAE code: C0501)	= Hue			
							AND Front Right WSS Test is finished as sensor undervoltage fault is not logged	- True			
							(SAE code: C0507)				
	1						AND Rear Left WSS Test is finished as sensor undervoltage fault is not looged	= True			
							(SAE code: C050D)				
							Rear Right WSS Test is finished as sensor undervoltage fault is not logged	= True			
							(SAE code: C0513)	1			
Right Front Wheel Speed	C050A	All	RBWssFRDmaBufNoise	This monitoring checks if there is an overflow in	DMA buffer state	= Overflow	Ignition state ON	= True	0.03 [s]	Continuous	Type A, 1 Trip
Sensor Intermittent/Erratic				the Direct Memory Access Transfer Unit.	OR Buffer transfer error occurred (DMA TLL is receiving time stamps too	= True	AND Front Left WSS Test is finished as sensor undervoltage fault is not logged	= True			
					freouently)		(SAE code: C0501)				
							Front Right WSS Test is finished as sensor undervoltage fault is not logged	= True			
							(SAE code: C0507)				
							Rear Left WSS Test is finished as sensor undervoltage fault is not logged	= True			
							(SAE code: C050D)				
				1			Rear Right WSS Test is finished as sensor undervoltage fault is not logged	= True			
	1	BoshVDA	RBWssFRVdaParityBitFail	This monitoring checks if a wrong parity bit is	Parity information in ASIC differs from Parity information from WSS	= True	(SAE code: C0513)	= True	1 [6]	Continuous	Type A 1 Trip
		ContiVdaR		received from WSS Front Right.					. 64		. yes of a tub
	1			1			AND Front Left WSS Test is finished as sensor undervoltage fault is not logged	= True			
	1			1			(SAE code: C0501)				
	1			1			Front Right WSS Test is finished as sensor undervoltage fault is not looged	= True			
	1		1	1			(SAE code: C0507)	1			

						,					1
Component 0	Fault Code	Variant	Failure Word	Monitoring Strategy Description	Malfunction Criteria	Malfrinction Criteria Threshold Value	Secondary Parameters	Enable Condition	Time Required	Frequency of Checks	MIL
							AND Rear Left WSS Test is finished as sensor undervoltage fault is not logged (SAE code: C050D) AND	= True			
							Rear Right WSS Test is finished as sensor undervoltage fault is not logged (SAE code: C0513)	= True			
Right Front Wheel Speed	C0507	DF11i	RBWssFRAirGap	This monitoring checks if there is an incorrect air	Magnetic flux density	< 0.0022 [T]	Ignition state ON	= True	8 [s] if Veh.	Continuous	Type B, 2
Sensor Range/Performance		BoschVDA ContiVdaR		gap between the impulse wheel and the front right sensor.					Speed is 3.1 [mph]		Trips
					For a number of wheel rotations	>= 5	AND Front Left WSS Test is finished as sensor undervoltage fault is not logged (SAE code: C0501)	= True	22 [s] if Ven. Speed is 1.24 [mph]		
							Front Right WSS Test is finished as sensor undervoltage fault is not logged (SAE code: C0507) AND	= True			
							Rear Left WSS Test is finished as sensor undervoltage fault is not logged (SAE code: C050D) AND	= True			
							Rear Right WSS Test is finished as sensor undervoltage fault is not logged (SAE code: C0513) AND	= True			
	L	BoschVDA	RBWssFRNoEdge	This monitoring checks if stop pulses are not	Speed pulses are not received (standstill condition)	= True	Vehicle soeed	>1.24 Fmohl	3.6 [s]	Continuous	Type B, 2
	Í	ContiVdaR		received from front right WSS.	AND		AND	_			Trips
					VDA standstill protocol is not received	= True	Front Left WSS Test is finished as sensor undervoltage fault is not logged (SAE code: C0501) AND	= True			
							Front Right WSS Test is finished as sensor undervoltage fault is not logged (SAE code: C0507) AND	= True			
							Rear Left WSS Test is finished as sensor undervoltage fault is not logged (SAE code: C050D) AND	= True			
							Rear Right WSS Test is finished as sensor undervoltage fault is not logged (SAE code: C0513) AND	= True			
		DF11i	RBWssFRNoEdge	This monitoring checks if stop pulses are not	Sensor is not sending speed/stop pulses	= True	_Sensor sucolv voltaae Ignition state ON	>6 M	3.6 [s]	Continuous	Type B, 2
				received from front right WSS.			AND Front Left WSS Test is finished as sensor undervoltage fault is not logged (SAE code: C0501)	= True			Trips
							AND Front Right WSS Test is finished as sensor undervoltage fault is not logged (SAE code: C0507)	= True			
							AND Rear Left WSS Test is finished as sensor undervoltage fault is not logged (SAE code: C050D)	= True			
							Rear Right WSS Test is finished as sensor undervoltage fault is not logged (SAE code: C0513)	= True			
	l						Sensor sucoly voltage	>6 [VI			
	ĺ	BoschVDA	RBWssFRUnderVoltage	This monitoring checks if there is an undervoltage on the WSS Front Right Supply Line.	ECU suoolv line	<9M	Ignition state ON AND	= True	1.2 [s]	Continuous	Type B, 2 Trips
					Supply voltage across the WSS	<5.15 [VI	During initialization Ignition state ON	= True = True	0.06 [s]	-	
							AND Front Left WSS Test is finished as sensor undervoltage fault is not logged (SAE code: C0501)	= True			
							Front Right WSS Test is finished as sensor undervoltage fault is not logged (SAE code: C0507)	= True			
							Rear Left WSS Test is finished as sensor undervoltage fault is not logged (SAE code: C050D)	= True			
							Rear Right WSS Test is finished as sensor undervoltage fault is not logged (SAE code: C0513)	= True			
	L	ContiVdaR	RBWssFRUnderVoltage	This monitoring checks if there is an undervoltage	ECU sucolv line	< 9.3 [VI	Ignition state ON	= True	1.2 [s]	Initial and	Type B, 2
				on the WSS Front Right Supply Line.			During initialization	= True	0.00 (-1	Continuous	Trips
					Subbit Vollage across the WSS	< 3.65 [VI	AND	- 110e	0.00 [5]		
							(Front Left WSS 1est is tinished as sensor undervoltage fault is not logged (SAE code: C0501) AND	= True			
							[Front Right WSS Test is finished as sensor undervoltage fault is not logged (SAE code: C0507) AND	= True			
							Intern Len WSS 1451 Is finished as sensor undervoitage fault is not logged (SAE code: C050D) AND Desc Dicks WCC Test in ficial data	True			
							Rear Right WSS Test is tinished as sensor undervoltage fault is not logged (SAE code: C0513)	= true			
		DF11s DF11i	RBWss⊢RUnderVoltage	I his monitoring checks if there is an undervoltage on the WSS Front Right Supply Line.	ECU supply line	< 1.2 [V]	AND	= Irue	1.2 [8]	Initial and Continuous	Trips
					Suoolv voltage across the WSS	<5.15 IV1	During initialization	= True	0.06 [s]	1	
							AND Front Left WSS Test is finished as sensor undervoltage fault is not logged (SAE code: C0501)	= True			

System/	Fault	Variant	Failure Word	Monitoring Strategy Description	Malfunction Criteria	Mallunction Criteria Threshold	Secondary Parameters	Enable Condition	Time Requirer	Frequency of	MIL
Component	Code	1				Value				Checks	Illumination
							AND				
							Front Right WSS Test is finished as sensor undervoltage fault is not logged	= True			
							(SAE code: C0507)	1			
							AND Rear Left WSS Test is finished as sensor undervoltage fault is not logged	= True			
							(SAE code: C050D)				
							AND	1			
							Rear Right WSS Test is finished as sensor undervoltage fault is not logged (SAE code: C0513)	= True			
		All	RBWssTestFRFailure	This monitoring checks if the system can	Hardware check failed according to the ASIC internal register data	= True	Ignition state ON	= True	0.05 [s]	Once	Type B. 2
		L		recognize a WSS FR line failure.							Trips
		All	Wss_MonMissingTeeth_FR	This monitoring checks the amount of the	A gap in the raw WSS signal is consequently detected for a defined number	>= 10	Ignition state ON	= True	Immediately	Continuous	Type B, 2
				rotation	orumes		AND		recognizing		inps
							Vehicle speed	= 6.2137.28 [mph]	the 10th gap		
							AND	1	1		
							AND	= False			
							Rough road is detected	= False			
		All	Wss_MonNoise_FR	This monitoring checks for a discontinuous WSS	(Wheel acceleration	> 981 [m/s ^A 21	Ignition state ON	= True	20 [s]	Continuous	Type B, 2
				Signal.	AND				1		Trips
					For a calibrated number of counts AND	= 2		1			
					For time 1	< 1.2 fol		1			
					OR			1			
					(Wheel acceleration	> 500 tm/s ² 1					
					Accumulation of the weighted noise amplitude in current driving cycle)	>4		1			
					OR						
					(Number of detected increasing edges	>= 3					
					AND Within time 1	- 0.005 roi					
		All	Wss MonRange FR	This monitoring checks WSS for implausibly high	Measured wheel speed	> 183.95 [mph]	Ignition state ON	= True	5[s]	Continuous	Type B. 2
		I		wheel soeed value.				J			Trips
		All	Wss_MonVDiff_FR	This monitoring checks if the difference between	Difference between maximum and minimum wheel speed!	>3.73 [mphi	Ignition state ON	= True	9 - 18 [s]	Continuous	Type B, 2
				the wheel speed sensor signals and WSS FR is within a valid range			Vehicle eneed	< 12.43 [mob]			Trips
				line a valid range.			AND	< 12.40 [inpin			
							Curve driving	< 20 [deg/sl		_	
					Difference between maximum and minimum wheel speed	> 6 [%1 of the vehicle speed	Ignition state ON	= True	9 - 18 [s]		
							Vehicle speed	> 12 43 [mph]			
							AND	1			
							Curve driving	< 20 fdeo/sl		_	
					Difference between maximum and minimum wheel speed	>3.73 [mphi	Ignition state ON	= True	9 - 18 [s]		
							Vehicle speed	<62.13 [mph]			
							AND				
							Curve driving	> 20 [deg/sl	0. 40 (-1	-	
					Difference between maximum and minimum wheel speed	> 6 [%1 of the vehicle speed	Ignition state ON AND	= True	a - 19 [s]		
							Vehicle soeed	>= 62.13 [mph]			
					IDifference between maximum and minimum wheel speedl	>3.73 tmphi	(Spinning wheel is detected	= True	72 [s]		
							OR Number of defeative WES	- 2			
							OR	<u>í</u>			
							ABS is not available	= True			
							OR	1			
							Number of wheel velocities below 3.1 mph)	>3			
							Ignition state ON	= True			
		All	Wss_SignalLost_FR	This monitoring checks if there is a lost wheel	(Speed of one wheel	= 0 [mphl	Ignition state ON	= True	0.500 [s]	Continuous	Type B, 2
				speed sensor signal.	AND Vehicle second instructs 1	- 7. 29 mobil	AND ARS TOS ERD equation	- Foloo	1		Trips
					OR	27.38 mom	AND	= Faise			
					(Soeed of two wheels	= 0 [mph]	Drive off from standstill	= True			
					AND						
					Vehicle speed increase)	> 12.97 (all wheel drive) or 7 38 (two wheel drive) [mob]					
					Soeed of one wheel	= 0 [mph]	Ignition state ON	= True	Immediately	-	
					AND		AND	1	1		
					Vehicle soeed increase	>11.18 [mph]	_ABS TCS EBD control	= False	0.08.(e)	-	
					Wheel acceleration	< -300 (III/S 21	AND	_ ride	0.08 [5]		
							Vehicle speed	> 34.67 [mph]			
							AND	1			
	-			ļ			Aguaplaning	,= False			-
Right Rear Wheel Speed	C0515	All	RBWssRRLineHigh	This monitoring checks if there is a short circuit of	Sensor current at the signal line	> 0.05 [AI	Ignition state ON	= True	0.120 [s]	Continuous	Type A, 1 Trip
Sensor Circuit High				the WSS Rear Right signal line to the battery.			AND	1	1		1 1
							Front Left WSS Test is finished as sensor undervoltage fault is not logged	= True			
							AND				
		1					Front Right WSS Test is finished as sensor undervoltage fault is not logged	= True		1	
		1					(SAE code: C0507)			1	
							AND Page 1 at WSS Tast is finished as sensor undervaliges fould is a strength	- True			
							(SAE code: C050D)	= nue			
							AND	1			
		1					Rear Right WSS Test is finished as sensor undervoltage fault is not logged	= True		1	
		1	1	1	1	1	(SAE 6008, C0513)	<u> </u>	<u> </u>	1	-
Right Rear Wheel Speed	C0514	All	RBWssRRLineUndef	This monitoring checks for implausible error	Current value monitoring does not detect failure	= True	Ignition state ON	= True	0.120 [s]	Continuous	Type A, 1 Trip
Sensor Circuit Low		1	1	patterns of the signal which cannot be classified	AND	I	AND	1	1		1 1
System/	Fault	Variant	Failure Word	Monitoring Strategy Description	Malfunction Criteria	Malfrinction Criteria Threshold	Secondary Parameters	Enable Condition	Time Required	Frequency of	MIL
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Component	Code					Value			1	Checks	Illumination
				either as an electrical fault (such as supply to	Supply line monitoring does not detect failure	= True	Front Left WSS Test is finished as sensor undervoltage fault is not logged	= True			
				ground which are covered by other monitorings) or valid signal	AND		FSAE code: C0501) AND				
				1	Voltage value monitoring does not detect failure	= True	Front Right WSS Test is finished as sensor undervoltage fault is not logged	= True			
					AND		(SAE code: C0507) AND				
					Signal is not valid	= False	Rear Left WSS Test is finished as sensor undervoltage fault is not logged	= True			
							AND				
							Rear Right WSS Test is finished as sensor undervoltage fault is not logged (SAE code: COE12)	= True			
		All	RBWssRRSupplyGnd	This monitoring checks if there is supply line short	Current at sensor sucolv line	> 0.055 FAI	Ianition state ON	= True	0.120 [s]	Continuous	Type A, 1 Trip
				to ground failure in case of rear right WSS.	AND Current at sensor supply line	<0.16 [A]	AND Front Left WSS Test is finished as sensor undervoltage fault is not logged	- True			1
							(SAE code: C0501)				
							AND Front Right WSS Test is finished as sensor undervoltage fault is not logged	= True			
							FSAE code: C0507)				
							Rear Left WSS Test is finished as sensor undervoltage fault is not logged	= True			
							(SAE code: C050D)				
							Rear Right WSS Test is finished as sensor undervoltage fault is not logged	= True			
							FSAE code: C0513)		L		
Right Rear Wheel Speed	C0512	All	RBWssRRLineGnd	This monitoring checks if there is a short to	Sensor current at the sional line	< 0.0038 FAI	lanition state ON	= True	0.120 [s]	Continuous	Type A, 1 Trip
Sensor Circuit/Open				ground or interruption based on current measurement in case of WSS Rear Right line.			Front Left WSS Test is finished as sensor undervoltage fault is not logged	= True			
							(SAE code: C0501)				
							AND Front Right WSS Test is finished as sensor undervoltage fault is not logged	= True			
							FSAE code: C0507)				
							Rear Left WSS Test is finished as sensor undervoltage fault is not logged	= True			
							(SAE code: C050D)				
							Rear Right WSS Test is finished as sensor undervoltage fault is not logged	= True			
							_FSAE code: C0513)		L		
Right Rear Wheel Speed	C0059	All	Wss_MonWheelDir_RR	This monitoring checks if the measured rotation	Rotation direction of monitored wheel differs from at least two other wheels	= True	Ignition state ON	= True	20 [s]	Continuous	Type B, 2
Sensor Direction (Incorrect Mounting)				direction of RR wheel is correct.	rotation direction		AND				Inps
57							Vehicle speed	>3.13 [mph]			
							At least two WSS direction information is available	= True			
Right Rear Wheel Speed	C0558	Bosch\/DA	RBWeeRRWrongSane	This monitoring checks if a wrong wheel speed	VDA protocol bite received		Institute CN	- True	3[0]	Continuous	Type A 1 Trip
Sensor Incorrect Component	00000	ContiVdaR	Rowsski Wolgoens	sensor type is mounted.	VDA protocorbits received	0.0	Ignition state ON	= ride	5[6]	Continuous	Type A, T Thp
Installed							AND Front Left WSS Test is finished as sensor undervoltage fault is not logged	- True			
							(SAE code: C0501)	= ride			
							AND Front Right WSS Test is finished as sensor undervoltage fault is not logged	= True			
							FSAE code: C0507)				
							Rear Left WSS Test is finished as sensor undervoltage fault is not logged	= True			
							(SAE code: C050D)				
							Rear Right WSS Test is finished as sensor undervoltage fault is not logged	= True			
		DE11i	RBWssRRWrongSens	This monitoring checks if a wrong wheel speed	Stop pulse is not detected	= True	_FSAE code: C0513)	= True	3[8]	Continuous	Type A 1 Trip
		[sensor type is mounted.			AND	1			.,,,,
							Front Left WSS Test is finished as sensor undervoltage fault is not logged FSAE code: C0501)	= True			
							AND	-			
							(SAE code: C0507)	= True			
							AND Rear Left WSS Test is finished as sensor undervoltage fault is not logged	- True			
							FSAE code: C050D)	- 1100			
							AND Rear Right WSS Test is finished as sensor undervoltage fault is not logged	= True			
							(SAE code: C0513)		<u> </u>		
Right Rear Wheel Speed	C0516	All	RBWssRRDmaBufNoise	This monitoring checks if there is an overflow in	DMA buffer state	= Overflow	Ignition state ON	= True	0.03 [s]	Continuous	Type A, 1 Trip
Sensor Intermittent/Erratic				the Direct Memory Access Transfer Unit.	OR Buffer transfer error occurred (DMA TIL is receiving time closers too	- True	AND	- True			
					freouently)	- 1100	FSAE code: C0501)	- 1100			
							AND Front Right WSS Test is finished as sensor undervoltage fault is not logged	= True			
							(SAE code: C0507)				
							Rear Left WSS Test is finished as sensor undervoltage fault is not logged	= True			
				1			FSAE code: C050D) AND				
				1			Rear Right WSS Test is finished as sensor undervoltage fault is not logged	= True			
		BoshVDA	RBWssRRVdaParityBitFail	This monitoring checks if a wrong parity hit is	Parity information in ASIC differs from Parity information from WSS	= True	(SAE code: C0513)	= True	1 [s]	Continuous	Type A. 1 Trip
		ContiVdaR		received from WSS Rear Right.							Second Comp.
				1			Front Left WSS Test is finished as sensor undervoltage fault is not logged	= True			
				1			FSAE code: C0501) AND	1			
							Front Right WSS Test is finished as sensor undervoltage fault is not logged (SAE code: C0507)	= True			

System/ Component	Fault Code	Variant	Fallure Word	Monitoring Strategy Description	Malfunction Criteria	Malfrinction Criteria Threshold Value	Secondary Parameters	Enable Condition	Time Required	Frequency of Checks	MIL Illumination
							AND Rear Left WSS Test is finished as sensor undervoltage fault is not logged (SAE code: C050D)	= True			
							AND Rear Right WSS Test is finished as sensor undervoltage fault is not logged (SAE code: C0513)	= True			
Right Rear Wheel Speed Sensor Range/Performance	C0513	DF11i BoschVDA	RBWssRRAirGap	This monitoring checks if there is an incorrect air gap between the impulse wheel and the rear right	Magnetic flux density	< 0.0022 [T]	Ignition state ON	= True	8 [s] if Veh. Speed is 3.1	Continuous	Type B, 2 Trips
		Controdare		sensor.	AND For a number of wheel rotations	>= 5	AND Front Left WSS Test is finished as sensor undervoltage fault is not logged (SAE code: C0501)	= True	[mpn] 22 [s] if Veh. Speed is 1.24 [mph]		
							AND Front Right WSS Test is finished as sensor undervoltage fault is not logged (SAE code: C0507) AND	= True			
							Rear Left WSS Test is finished as sensor undervoltage fault is not logged ((SAE code: C050D) AND	= True			
							Rear Right WSS Test is finished as sensor undervoltage fault is not logged (SAE code: C0513) AND	= True			
		BoschVDA	RBWssRRNoEdge	This monitoring checks if stop pulses are not	Speed pulses are not received (standstill condition)	= True	Ignition state ON	= True	3.6 [s]	Continuous	Type B, 2
		ContiVdaR		received from rear right WSS.	AND		AND				Trips
					VDA standstill protocol is not received	= True	Front Left WSS Test is finished as sensor undervoltage fault is not logged (SAE code: C0501) AND	= True			
							Front Right WSS Test is finished as sensor undervoltage fault is not logged (SAE code: C0507) AND	= True			
							(SAE code: C050D) AND Page Picht WSS Test is finished as sensor undervoltage fault is not logged	- True			
							(SAE code: C0513) AND				
		DF11i	RBWssRRNoEdge	This monitoring checks if stop pulses are not	Sensor is not sending speed/stop pulses	= True	Ignition state ON	= True	3.6 [s]	Continuous	Type B, 2
				received from rear right WSS.			AND Front Left WSS Test is finished as sensor undervoltage fault is not logged (SAE code: C0501) AND	= True			Trips
							Front Right WSS Test is finished as sensor undervoltage fault is not logged (SAE code: C0507) AND	= True			
							Rear Left WSS Test is finished as sensor undervoltage fault is not logged (SAE code: C050D) AND	= True			
							Rear Right WSS Test is finished as sensor undervoltage fault is not logged (SAE code: C0513) AND	= True			
		BoschVDA	RBWssRRUnderVoltage	This monitoring checks if there is an undervoltage	ECU suoolv line	<9M	gnition state ON	>6 [VI	1.2 [s]	Continuous	Type B, 2
				on the WSS Rear Right Supply Line.			AND During initialization	- True			Trips
					Supply voltage across the WSS	<5.15 [VI	Ignition state ON AND Front Left WSS Test is finished as sensor undervoltage fault is not logged	= True	0.06 [s]		
							(SAE code: C0501) AND Front Right WSS Test is finished as sensor undervoltage fault is not logged	= True			
							(SAE code: C0507) AND Rear Left WSS Test is finished as sensor undervoltage fault is not logged	= True			
							(SAE code: C050D) AND Rear Right WSS Test is finished as sensor undervoltage fault is not logged	= True			
		ContiVdaR	RBWssRRUnderVoltage	This monitoring checks if there is an undervoltage	ECU suoolv line	< 9.3 IV1	Ignition state ON	= True	1.2 [s]	Initial and	Type B, 2
				on the WSS Rear Right Supply Line.			AND During initialization	= True		Continuous	Trips
					Suoolv voltage across the WSS	< 5.65 [VI	Ignition state ON	= True	0.06 [s]		
							Front Left WSS Test is finished as sensor undervoltage fault is not logged (SAE code: C0501) AND	= True			
							Front Right WSS Test is finished as sensor undervoltage fault is not logged (SAE code: C0507) AND	= True			
							Rear Left WSS Test is finished as sensor undervoltage fault is not logged (SAE code: C050D) AND	= True			
							Rear Right WSS Test is finished as sensor undervoltage fault is not logged (SAE code: C0513)	= True			
		DF11i	RBWssRRUnderVoltage	This monitoring checks if there is an undervoltage on the WSS Rear Right Supply Line.	ECU sucolv line	< 7.2 IV1	Ignition state ON AND	= True	1.2 [s]	Continuous	Type B, 2 Trips
					Sucolv voltage across the WSS	<5.15 [VI	During initialization Ignition state ON	= True	0.06 [s]	1	
							AND Front Left WSS Test is finished as sensor undervoltage fault is not logged (SAE code: C0501) AND	= True			

Svetem/	Fault	Variant	Esilure Word	Monitoring Strategy Description	Mallunction Criteria	Mallunction Criteria Threshold	Secondary Parametere	Enable Condition	Time Required	Frequency of	MI
Component	Code			line intering of allogy beachprish		Value				Checks	Illumination
							Front Diabit W/S.C. Test is finished as sensor undervalues fault is not lossed	- Teue	4	<u>+</u>	1
							(SAE code: C0507)	= True			
							AND				
							Rear Left WSS Test is finished as sensor undervoltage fault is not logged	= True			
							AND				
							Rear Right WSS Test is finished as sensor undervoltage fault is not logged	= True			
		I					(SAE code: C0513)	┦		J	
		All	RBWssTestRRFailure	This monitoring checks if the system can	Hardware check failed according to the ASIC internal register data	= True	Ignition state ON	= True	0.05 [s]	Once	Type B, 2
		All	Wss_MonMissingTeeth_RR	This monitoring checks the amount of the	A gap in the raw WSS signal is consequently detected for a defined number	>= 10	Ignition state ON	= True	Immediately	Continuous	Type B, 2
		1		magnetic poles of the WSS RR tone wheel for one	of times	1	- 	1	after	1	Trips
				rotation.			AND Vokiele second	- 6 21 27 28 Emobil	recognizing		1
							AND	= 0.2137.28 Philon	l l		
							ESP or ABS intervention	= False			
							AND	1			
		AII	Wee MonNoise PR	This monitoring checks for a discontinuous WSS	(Wheel acceleration	> 981 Em/r ^A 21	Kough road is detected	= False	20.[e]	Continuous	Tune B 2
		1		Signal.	AND	500111113 21		- 1100	20[3]		Trips
					For a calibrated number of counts	= 2					1
					AND	-1.2.00					
					OR OR	1.2 [5]					
					(Wheel acceleration	> 500 [m/s ^A 21					
					AND	1.					
					Accumulation of the weighted noise amplitude in current driving cvcle)	>4					
					(Number of detected increasing edges	>= 3					
					AND						
					Within time)	= 0.005 [si		l		<u> </u>	
		All	Wss_MonKange_RK	I his monitoring checks WSS for implausibly high wheel speed value	Measured wheel speed	> 183.95 [mpn]	Ignition state ON	= Irue	5[5]	Continuous	Trips
		All	Wss_MonVDiff_RR	This monitoring checks if the difference between	Difference between maximum and minimum wheel soeedl	>3.73 Fmohl	Ignition state ON	= True	9 - 18 [s]	Continuous	Type B, 2
			1	the wheel speed sensor signals and WSS RR is			AND	1	1	1	Trips
				within a valid range.			Vehicle speed	< 12.43 Fmohl			
							Curve driving	< 20 Fdeo/sl			
					IDifference between maximum and minimum wheel speedl	> 6 [%1 of the vehicle speed	Ignition state ON	= True	9 - 18 [s]	1	
							AND	1	1		
							AND	< 12.43 Emphi			
							Curve driving	< 20 Fdeg/sl			
					IDifference between maximum and minimum wheel soeedl	>3.73 Fmohl	Ignition state ON	= True	9 - 18 [s]	1	
							AND		1		
							AND	<62.13 Fmoni			
							Curve driving	> 20 Fdeo/sl			
					IDifference between maximum and minimum wheel speedl	> 6 [%1 of the vehicle speed	Ignition state ON	= True	9 - 18 [s]	1	
							AND	00.40 5	1		
					Difference between maximum and minimum wheel speed	>3 73 [mpb]	/ Spinning wheel is detected	= 52.13 Pmpni	72 fe1	-	
						1 (OR	1			
							Number of defective WSS	>2			
							OR	Tour			
							OR	= True			
							Number of wheel velocities below 3.1 moh)	>3			
							AND	1			
		All	Wss SignalLost RR	This monitoring checks if there is a lost wheel	(Speed of one wheel	= 0 [mph]	Ignition state ON	= True	0.500 [s]	Continuous	Type B 2
		1		speed sensor signal.	AND		AND		1	1	Trips
					Vehicle speed increase)	>7.38 [mphl	ABS TCS EBD control	= False			
					OR (Second of two wheels	- 0 (mobil	AND Brive off from standatill	- True			
1					AND	- o turbui			1	1	
1					Vehicle speed increase)	> 12.97 (all wheel drive) or			1	1	
1						7.38 (two wheel drive) [moh1		/ <u></u>	- I man a d'a ta '	-	
1					AND	= o (mpni	AND	= Hue	Immediately	1	
1					Vehicle speed increase	>11.18 [mphl	ABS TCS EBD control	= False			
					Wheel acceleration	< -300 Fm/s ^A 21	Ignition state ON	= True	0.08 [s]	1	
							AND Vehicle second	- 24 67 Emobil			
							AND	34.07 Phillin			
							Aouaolanino	= False			
						1					
Vehicle Speed - Wheel Speed Correlation	P215A	All	Wss_MonGenericTemphail	I his monitoring checks it sensor signals seem to be affected by temporary failure suspicion at the	Number of sensor signal monitoring fault suspicions detected	>2	Ignition state ON	= Irue	0.500 [s]	Continuous	Trips
				same time to ensure the proper working of ABS					1	1	
1		L		functionality.	J			ł			
1		All	Wss_MonVDiff_Gen	I his monitoring checks if the source of the invalid signal can be found	Difference between maximum and minimum wheel soeed	>52.12 [mph]	Ignition state ON AND	= Irue	9 - 72 [s]	Continuous	Trine
1				arginar call be louilo.			Vehicle speed	> 3.1 Fmohl	1	1	ips
1		All	Wss_MoreThanOneSuspected	This monitoring checks if sensor signals seem to	Number of sensor signal monitoring fault suspicions detected	> 1	Ignition state ON	= True	0-1 [s]	Continuous	Type B, 2
				be affected by temporary failure suspicion at the					1		Trips
				same time to ensure the proper working of Vehicle Dynamic Control functionality					1		
			· · · · · · · · · · · · · · · · · · ·		·	·	·	·	<u> </u>	<u> </u>	
Wheel Speed Sensor Signal	C2A23	All	Wss_SignFA	This monitoring checks if the wheel speed sensor	Integrated model vaw rate out of Front Axle Wheel Speed Sensors	< -90 Fdeol	Ignition state ON	= True	30 [s]	Continuous	Type A, 1 Trip
Cross Coupled				at the Front Axle are mounted incorrectly or if the	AND	- 00 Edual	AND Vakiele speed	- 4.47 Emobil			
1				swapped.	AND	CEOI	AND	2 4.47 Pmon	1	1	
1		I			Integrated model vaw rate out of Steering Angle Sensor	> 90 Fdeol	Curve driving	> 3 Fdeo/sl]	
1		All	Wss_SignRA	This monitoring checks if the wheel speed sensors	Integrated model yaw rate out of Rear Axle Wheel Speed Sensors	< -90 fdegl	Ignition state ON	= True	30 [s]	Continuous	Type A, 1 Trip

System/	Fault	Variant	Failure Word	Monitoring Strategy Description	Malfunction Criteria	Malfrmction Criteria Threshold	Secondary Parameters	Enable Condition	Time Required	Frequency of	MIL
Component	Code					Value				Checks	Illumination
				at the Rear Axle are mounted incorrectly or if the	AND		AND				
				wheel speed sensors at the Rear axle are	Intearated model vaw rate out of Steerina Anale Sensor	< -90 [deal	Vehicle speed	> 4.47 [mohl			
				swapped.	AND Integrated model your rate out of Stearing Apple Second	- 00 Maal	AND Currue driving	- 2 Educial			
		1			Intearated model vaw rate out of Steerina Anale Sensor]> 90 (deai		> 3 Pdea/si			1
Wheel Speed Sensors	C003F	All	Wss_MonWheelDirGen	This monitoring checks the rotation direction of	Rotation direction of monitored wheel differs from at least two other wheels	= True	Ignition state ON	= True	20 [s]	Continuous	Type B, 2
Direction Correlation				wheel speed sensors.	rotation direction				1	1	Trips
							AND	0.404			
							AND	>3.13 [mpn]			
							Number of WSS direction information is available	>= 3			
			1		1						
Control Module Input Power	U3006	All	PSC_Init_MT_Interrupt_Undervoltage	This monitoring checks if the motor supply voltage	UBMotor voltage	<5[V]	Ignition state ON	= True	Immediately	Once	Type B, 2
i Girdin				is suncient to full the initial words rest.	AND		AND				inps
					UB VR	< 6.2 rvi	Durina initialization	= True			
		All	RBChargePumpUndervoltage	This monitoring checks if charge pump tests could	Charge pump tests could not be executed due to undervoltage	= True	Ignition state ON	= True	57 [s]	Cyclically in every	Type B, 2
				not be executed because of undervoltage from	AND					19 [s]	Trips
				both OBB and OB_VR.	For number of times	>= 3					
		All	RBRSS_Redundant_UBVR	This monitoring checks if the supply voltage on the	UBB supply voltaae	< 6.2 IV]	lanition state ON	= True	0.05 [s]	Continuous	Type B, 2
				UBB line drops significantly and that UBVR can	AND				1		Trips
				be used as redundant powersupply.	UBVR supply voltaae	> 9 [0]					_
Control Module Input Power	103007	All	PSC MotorTestDisable LIBVR Undervolt	This monitoring checks if Power Supply via LIBVR	Measured LIBVR voltage	<8[V]	Ignition state ON	= True	Immediately	Continuous	Type B 2
2 Circuit		1		voltage is too low to perform robust motor test.	1		1		1	1	Trips
					OR		AND	1 -			1
					(Measured UBVR voltaae	< 6.2 IV1	Only UBVR is used as redundant supply	= True			
					UBB supply voltaae	<8 M	Normal initial motor test was successful	= False			
					AND						
					UBB sucolv voltaae)	> 6.2 IV1					- 1
		All	RBHydraulicHardUndervoltage	This monitoring checks if the power supply at	UB_VR	< 6.2 [V]	Ignition state ON	= True	0.2 [s]	Continuous	Type B, 2
				threshold.	AND						inps
					UBB	< 6.2 rvi					
		All	RBHydraulicUndervoltage	This monitoring checks if the power supply at	UB VR	< 9.6 [V]	Ignition state ON	= True	1 [s]	Continuous	Type B, 2
				valve path is below the undervoltage threshold.	UR VR	- 6 2 mi					Inps
					AND	0.2101					
					UBB	< 9.6 [V]					
					AND						
		AU	PPPCC HordHudroulial Indet/altageEastDatested	This monitoring shocks if there is a hard	UBB)	>6.2 [VI	Instition state ON	- True	0.02.[6]	Continuous	Turne R 2
			KBK35_hardhydraulicolidei voltager asibelecied	undervoltage during vehicle is driving in both	OR OR	<	AND	= 110e	0.02 [5]	Continuous	Trips
				power supply lines.	(UBB supply voltaae	< 6.2 IV1	(Vehicle speed	> 9.32 [moh]			
					AND		OR	1			
					UB_VR	<9[V]	Vehicle speed)	= between 1.86 and 9.32			
					AND		AND	Impin			
					UB VR)	>6.2 [VI	Cranking	= True			
		All	RBWssUnderVoltage	This monitoring checks if the power supply at	UB VR	< 9 M	Ionition state ON	= True	1.2 [s]	Once	Type B, 2
				WSS is below the undervoltage threshold.	OR UD VD	0.000					Trips
					AND	< 0.2 [V]					
					UBB	< 9.6 [VI	AND			1	1
					AND	1				1	1
			PPPCC Redundant LIPP	This monitoring shocks if the supply where a shock	UBB)	> 6.2 IV1	Durina initialization	= True	0.01.(e)	Continuous	Turne R. 2
		01	Kokaa_keuundant_UBB	This monitoring checks in the supply voltage on the	AND	< 0.2 [VI	Ignition state ON	- True	0.01 [8]	Continuous	Tripe
1	1			be used as redundant powersupply.	UBB supply voltase	>9 [VI					pu

Component / System	SAE J2012 Fault Code	Monitor Strategy Description	Primary Malfunction Signal and Criteria	Threshold Values	Secondary Parameters	Enable Values	Time Required	MIL Illum.
1. CATALYST DIAGNOSIS	P0420	Catalyst System Efficiency Below Threshold Bank 1	Ewma filtered normalized corrected Oxygen Storage Capacity (OSC) of catalyst, bank 1	<1	primary A/F commanded lambda	=1	Fast Init. Response / Response to Step Change modes: 3 samples over 2 trips Stabilized mode: 1 sample per trip	1Trip EWMA
					engine runs	=TRUE		
			Borderline OSC	=125 to 300(mg)	(Deceleration Fuel Cut-Off (DFCO)	=FALSE		
			(see Look-Op-Table #62) Corrected OSC: ((a) - (b)) * (c) / (d)		for time	≥10(sec)		
			(a) Measured OSC bank 1		Vehicle speed	≥9,32(mph)		
			(b) O2 mass for OSC correction using Sec. O2 performance diag. results		engine speed	≤4000(rpm)		
			(c) Correction map for transition and delayed response time		engine speed	≥1000(rpm)		
			(d) compensation time for OSC correction using Sec. O2 performance diag. results		engine load (see Look-Up-Table #20)	≥ 12 to 1536(%)		
					Integrated air mass flow	>0,06(kg)		
					measured ambient temperatuer	≥-48(°C)		
					measured ambient pressure	≥0(kPa)		
					measured engine coolant temperature	≥57,96(°C)		
					no transmission gear change	=TRUE		
					for time	≥2(sec)		
)			
					(

integrated exhaust gas mass flow after the following operation points are in the monitoring window bank 1	>0,06(kg)
(
Change of exhaust gas mass flow bank 1: (a) - (b)	≤32(kg/h)

 (a) - (b) Change of exhaust gas mass flow bank 1: (a) - (b) (a) exhaust gas mass flow bank 1 (b) filtered exhaust gas mass flow 	≥-32(kg/h)
bank 1 PT1 time constant Low window exhaust gas mass flow bank 1	=0,8(sec) ≤1,11(g/sec)
Low window exhaust gas mass flow bank 1	≥20(kg/h)
Low window exhaust gas mass flow bank 1	≥(a) - (b)
(a) minimum exhaust gas mass flow bank 1	<20(kg/h)
(b) offset exhaust gas mass flow	=5(g/sec)
for time	≥3(sec)
High window exhaust gas mass flow bank 1	≤0(g/sec)
High window exhaust gas mass flow bank 1)	≥6553,5(kg/h)
(
Modeled catalyst temperature gradient bank 1: (a) - (b)	≤40(°C)
Modeled catalyst temperature gradient bank 1:	≥-40(°C)
(a) Modeled catalyst temperature bank 1	
(b) filtered modeled catalyst	=5(sec)
temperature bank 1	0.0()
FIT ume constant	=υ,δ(Sec)
Low window Modeled estatest	≥1000(C) >/75(°C)
temperature bank 1	2475(0)
High window modeled catalyst	≤-273(°C)

tomporatura hank 1

High window Modeled catalyst	≥1263(°C)
Modeled catalyst temperature bank 1 after the first engine start and driving	>345(°C)
for time))	≥60(sec)
((Integrated purge mass flow after a	≥0(g)
longer purge stop HC concentration factor in chacoal	≤64
relative fuel portion of canister purge to injected fuel mass : (a) / (b)	≤4
(a) fuel mass supplied by canisterpurge control(b) fuel mass supplied by injection	
Or	
open loop canister purge control	=TRUE
canister purge control mass flow into the manifold	≤7,11(g/sec)
((integrated exhaust gas mass flow bank 1 since engine start (see Look-Up-Table #19)	>2250 to 10000(g)
integrated exhaust gas mass flow bank 1 after the following sensors's readiness	>0,1(kg)
Secondary O2 sensor readiness	=TRUE
Primary A/F sensor readiness bank 1	=TRUE
) exhaust gas temperature at oxygen sensor 2 bank 1	≥450(°C)
temperature deviation of Primary A/F sensor heater control bank 1: (a) - (b)	<50(°C)
 (a) primary A/F sensor temperature set point for heater control (b) measured primary A/F sensor temperature for heater control) 	<800(°C)

statemachine = sm statemachine (sm =0) : inactive a commanded lambda active primary A/F commanded lambda if the following conditions are met, sm moves to sm = 2	=1
Secondary O2 sensor voltage bank1	≥0(V)
if the following conditions are met, sm moves to sm = 1	
Secondary O2 sensor voltage bank1	<0(V)
Secondary O2 sensor voltage bank1	≥0,45(V)
statemachine (sm=1) - rich mixture	= TRUE
a commanded lambda active primary A/F commanded lambda bank1	=TRUE =0,87
for time	≥3(sec)
for time if the following conditions are met, sm moves to sm = 2	≥0,1(sec)
Secondary O2 sensor voltage	≥0,1(V/sec)
Secondary O2 sensor voltage bank1	≥0,68(V)
) Or Secondary O2 sensor voltage bank1	≥0(V)
) Integrated exhaust mass flow bank 1	≥0(g)
if the following conditions are met, sm moves to sm $= 3$	
(Secondary O2 sensor voltage bank 1	≥0,9(V)
Or	
ر Secondary O2 sensor voltage bank 1	≥0,8(V)
Secondary O2 sensor voltage	≤66,5(V/sec)
gradient over 0.05s Secondary O2 sensor voltage gradient over 0.05s	≥-66,5(V/sec)

Integrated Oxygen mass flow bank 1

>250(mg)

≤(a) + (b)

))	
Primary A/F sensor lambda bank 1 (a) Primary lambda control set point	≤(a) + (b)
(b) maximum lambda deviation of	≤0,05
Primary A/F sensor lambda bank 1 (a) Primary lambda control set point	≥(a) - (b)
(b) maximum lambda deviation of rich	≥0,05
for time Integrated rich exhaust gas mass flow bank 1	≥0,1(sec) ≥0,005(kg)
And	
(Secondary O2 sensor voltage bank 1	>(a) + (b)
 (a) minimum secondary O2 voltage (b) Offset voltage of Secondary O2 sensor 	=0,02(V)
statemachine (sm=2) - Lean mixture in catalyst a commanded lambda active primary A/F commanded lambda for time	=TRUE =1,07 ≥3(sec)
for time if the following conditions are met, sm moves to sm = 4	≥0,1(sec)
((Secondary O2 sensor voltage for time) Or	≤0,07(V) ≥0,1(sec)
Secondary O2 sensor voltage	≤0,2(V)
Secondary O2 sensor voltage	≤0,1(V/sec)
Secondary O2 sensor voltage	≥-0,1(V/sec)
Integrated Oxygen mass flow bank 1	>150(mg)
))	

Primary A/F sensor lambda

(a) Primary lambda	a control set point
--------------------	---------------------

(b) maximum lambda deviation of	≤0,05
Primary A/F sensor lambda (a) Primary lambda control set point	≥(a) - (b)
(b) maximum lambda deviation of rich	≤0,05
for time Integrated lean exhaust gas mass flow bank 1)	≥0,1(sec) ≥0,005(kg)
statemachine (sm=3) -	= TRUE
Lean mixture in catalyst a commanded lambda active bank 1	=TRUE
primary A/F commanded lambda	=1,07
for time	≥3(sec)
for time if the following conditions are met, sm moves to sm = 4	≥0,1(sec)
(Secondary O2 sensor voltage bank 1	≤0,07(V)
for time Or	≥0,1(sec)
(Secondary O2 sensor voltage bank 1	≤0,2(V)
Secondary O2 sensor voltage	≤0,1(V/sec)
Secondary O2 sensor voltage	≥-0,1(V/sec)
Integrated Oxygen mass flow bank 1	>150(mg)
))	
(Primary A/F sensor lambda bank 1 (a) Primary lambda control set point	≤(a) + (b)
(b) maximum lambda deviation of	=0,05
Primary A/F sensor lambda bank 1 (a) Primary lambda control set point	≥(a) - (b)
(b) maximum lambda deviation of rich	≥0,05
for time	≥0,1(sec)

Integrated lean exhaust gas mass flow bank 1	≥0,005(kg)
) Measurement Oxygen Storage Capacity bank 1 with Secondary O2	≤0,45(V)
sensor voltage bank 1 done statemachine (sm=4) - Rich mixture in catalyst	=TRUE
a commanded lambda active primary A/F commanded lambda for time	=TRUE =0,87 ≥3(sec)
for time if the following conditions are met, sm moves to sm = 3	≥0,1(sec)
Measurement Oxygen Storage Capacity bank 1 starts	
(Secondary O2 sensor voltage bank 1	≥0,9(V)
Or (
Secondary O2 sensor voltage bank 1	≥0,8(V)
Secondary O2 sensor voltage	≤66,5(V/sec)
Secondary O2 sensor voltage	≥-66,5(V/sec)
gradient over 0.05s Integrated Oxygen mass flow bank 1	>250(mg)
))	
(Primary A/F sensor lambda bank 1 (a) Primary lambda control set point	≤(a) + (b)
(b) maximum lambda deviation of	≤0,05
lean mixture Primary A/F sensor lambda bank 1 (a) Primary lambda control set point	≥(a) - (b)
(b) maximum lambda deviation of rich	≤0,05
for time Integrated rich exhaust gas mass flow bank 1)	≥0,1(sec) ≥0,005(kg)
EWMA filter strategy	
Fast initialization mode (FIR) EWMA filter initial value for FIR	=8
mode EWMA filter constant	=0,2
	-0,2

				Maximum number of samples per trip	=2(counts)		
				Total number of samples for FIR mode	=3(counts)		
				Response to Step Change mode (RSC) Response to Step Change mode			
				inactive absolute difference : ABS((a) - (b)) (a) measured Oxygen Storage Capacity	>(b) * (c)		
				(b) EWMA filtered normalized monitoring result (c) Step change detection factor	-0.3		
				EWMA filter constant Maximum number of samples per trip	=0,0 =0,2 =2(counts)		
				Total number of samples for RSC mode	=3(counts)		
				EWMA filter constant Total number of samples for stablilized mode	=0,2 =1(counts)		
				No pending or confirmed DTCs	=see sheet inhibit table		
				Basic enable conditions met	=see sheet enable tables		
P0430	Catalyst System Efficiency Below Threshold Bank 2	Ewma filtered normalized corrected Oxygen Storage Capacity (OSC) of catalyst, bank 2	<1	Basic enable conditions met	=see sheet enable tables =1	Fast Init. Response / Response to Step Change modes: 3 samples over 2 trips Stabilized mode: 1 sample per trip	1⊤rip EWMA
P0430	Catalyst System Efficiency Below Threshold Bank 2	Ewma filtered normalized corrected Oxygen Storage Capacity (OSC) of catalyst, bank 2	<1	Basic enable conditions met primary A/F commanded lambda engine runs	=see sheet enable tables =1	Fast Init. Response / Response to Step Change modes: 3 samples over 2 trips Stabilized mode: 1 sample per trip	1Trip EWMA
P0430	Catalyst System Efficiency Below Threshold Bank 2	Ewma filtered normalized corrected Oxygen Storage Capacity (OSC) of catalyst, bank 2	<1 =0,1(g)	Basic enable conditions met primary A/F commanded lambda engine runs (Deceleration Fuel Cut-Off (DFCO)	=see sheet enable tables =1 =TRUE =FALSE	Fast Init. Response / Response to Step Change modes: 3 samples over 2 trips Stabilized mode: 1 sample per trip	1Trip EWMA
P0430	Catalyst System Efficiency Below Threshold Bank 2	Ewma filtered normalized corrected Oxygen Storage Capacity (OSC) of catalyst, bank 2 Borderline OSC	<1 =0,1(g)	Basic enable conditions met primary A/F commanded lambda engine runs (Deceleration Fuel Cut-Off (DFCO) for time Vehicle speed	=see sheet enable tables =1 =TRUE =FRLSE ≥10(sec) ≥9,32(mph)	Fast Init. Response / Response to Step Change modes: 3 samples over 2 trips Stabilized mode: 1 sample per trip	1Trip EWMA

(b) O2 mass for OSC correction using Sec. O2 performance diag, results	engine speed	≥1000(rpm)
(c) Correction map for transition and delayed	engine load (see Look-Up-Table #20)	≥ 12 to 1536(%)
	Integrated air mass flow	>0,06(kg)
	measured ambient temperatuer measured ambient pressure measured engine coolant temperature	≥-48(°C) ≥0(kPa) ≥57,96(°C)
	for time	≥2(sec)
	(integrated exhaust gas mass flow after the following operation points are in the monitoring window bank 2	>0,06(kg)
	(
	Change of exhaust gas mass flow bank 2:	≤32(kg/h)
	 (a) - (b) Change of exhaust gas mass flow bank 2: (a) - (b) (a) exhaust gas mass flow bank 2 (b) filtered exhaust gas mass flow bank 2 	≥-32(kg/h)
	PT1 time constant Low window exhaust gas mass flow bank 2	=0,8(sec) ≤111,1(g/sec)
	Low window exhaust gas mass flow bank 2	≥20(kg/h)
	Low window exhaust gas mass flow bank 2	≥(a) - (b)
	(a) minimum exhaust gas mass flow bank 2	<20(kg/h)
	(b) offset exhaust gas mass flow bank 2 at tip-out	=5(g/sec)
	for time	≥3(sec)
	High window exhaust gas mass flow bank 2	≤0(g/sec)
	High window exhaust gas mass flow bank 2) (≥6553,5(kg/h)

Modeled catalyst temperature gradient bank 2:	≤40(°C)
Modeled catalyst temperature gradient bank 2:	≥-40(°C)
(a) - (b) (a) Modeled catalyst temperature	
(b) filtered modeled catalyst temperature bank 2	=5(sec)
Low window modeled catalyst	≤1000(°C)
Low window Modeled catalyst	≥475(°C)
High window modeled catalyst temperature bank 2	≤-273,15(°C)
High window Modeled catalyst	≥1262,83(°C)
Modeled catalyst temperature bank 2 after the first engine start and driving	>350(°C)
for time))	≥60(sec)
((Integrated purge mass flow after a longer purge stop	≥0(g)
HC concentration factor in chacoal canister	≤64
relative fuel portion of canister purge to injected fuel mass : (a) / (b)	≤4
(a) fuel mass supplied by canister purge control (b) fuel mass supplied by injection	
Or	
open loop canister purge control	=TRUE
canister purge control mass flow into the manifold	≤7,11(g/sec)
((integrated exhaust gas mass flow bank 2 since engine start (see Look-Up-Table #19)	>2250 to 10000(g)
integrated exhaust gas mass flow bank 2 after the following sensors's readiness (>0,1(kg)

Secondary O2 sensor readiness bank 2 Primary A/F sensor readiness bank 2

)	
exhaust gas temperature at oxygen sensor 2 bank 1	≥450(°C)
temperature deviation of Primary A/F sensor heater control bank 2: (a) - (b)	<50(°C)
 (a) primary A/F sensor temperature set point for heater control (b) measured primary A/F sensor temperature for heater control) 	<800(°C)
statemachine = sm statemachine (sm =0) : inactive a commanded lambda active primary A/F commanded lambda if the following conditions are met, sm moves to sm = 2	=FALSE
Secondary O2 sensor voltage bank 2	≥0(V)
if the following conditions are met, sm moves to sm = 1	
Secondary O2 sensor voltage bank 2	<0(V)
Secondary O2 sensor voltage bank 2	≥0,45(V)
statemachine (sm=1) - rich mixture in catalyst	
a commanded lambda active primary A/F commanded lambda	=0,87
for time	≥3(sec)
for time if the following conditions are met, sm moves to sm = 2	≥0,1(sec)
((Secondary O2 sensor voltage	≥0,1(V/sec)
gradient over 0.05s Secondary O2 sensor voltage bank 2	≥0,68(V)
) Or Secondary O2 sensor voltage bank 2	≥0(V)
) Integrated exhaust mass flow bank 2	≥0(g)

if the following conditions are met,			
sm moves to sm = 3			

(Secondary O2 sensor voltage bank 2	≥0,9(V)
Or	
(Secondary O2 sensor voltage bank 2	≥0,8(V)
Secondary O2 sensor voltage gradient over 0.05s	≤66,5(V/sec)
Secondary O2 sensor voltage	≥-66,5(V/sec)
Integrated Oxygen mass flow bank 2	>250(mg)
))	
Primary A/F sensor lambda bank 2 (a) Primary lambda control set point	≤(a) + (b)
(b) maximum lambda deviation of	≤0,05
Primary A/F sensor lambda bank 2 (a) Primary lambda control set point	≥(a) - (b)
(b) maximum lambda deviation of rich mixture	≤0,05
for time Integrated rich exhaust gas mass flow bank 2	≥0,1(sec) ≥0,005(kg)
) And	
(Secondary O2 sensor voltage bank 2	>(a) + (b)
 (a) minimum secondary O2 voltage (b) Offset voltage of Secondary O2 sensor 	=0,019531(V)
) statemachine (sm=2) - Lean mixture in catalyst a commanded lambda active	
primary A/F commanded lambda for time	=1,07 ≥3(sec)
for time if the following conditions are met, sm moves to sm = 4	≥0,1(sec)
((
Secondary OZ sensor voltage	≥0,07(V)

>N 1(epr)

) Or	
(Secondary O2 sensor voltage bank 2	≤0,200195(V)
Secondary O2 sensor voltage	≤0,1(V/sec)
Secondary O2 sensor voltage	≥-0,09944(V/sec)
Integrated Oxygen mass flow bank 2	>150(mg)
))	
Primary A/F sensor lambda (a) Primary lambda control set point	≤(a) + (b)
(b) maximum lambda deviation of	≤0,05
Primary A/F sensor lambda (a) Primary lambda control set point	≥(a) - (b)
(b) maximum lambda deviation of rich mixture	≤0,05
for time Integrated lean exhaust gas mass flow bank 2	≥0,1(sec) ≥0,005(kg)
, statemachine (sm=3) - Lean mixture in catalyst a commanded lambda active bank 2	
primary A/F commanded lambda	=1,07()
for time	≥3(sec)
for time if the following conditions are met, sm moves to sm = 4	≥0,1(sec)
(Secondary O2 sensor voltage bank 2	≤0,07(V)
for time Or	≥0,1(sec)
(Secondary O2 sensor voltage bank 2	≤0,200195(V)
Secondary O2 sensor voltage	≤0,1(V/sec)
Secondary O2 sensor voltage	≥-0,09944(V/sec)
Integrated Oxygen mass flow bank 2	>150(mg)

))

(Primary A/F sensor lambda bank 2 (a) Primary lambda control set point	≤(a) + (b)
(b) maximum lambda deviation of	≤0,05
Primary A/F sensor lambda bank 2 (a) Primary lambda control set point	≥(a) - (b)
(b) maximum lambda deviation of rich mixture	≤0,05
for time Integrated lean exhaust gas mass flow bank 2	≥0,1(sec) ≥0,005(kg)
Measurement Oxygen Storage Capacity bank 2 with Secondary O2	≤0,45(V)
sensor voltage bank 2 done statemachine (sm=4) -	=TRUE
a commanded lambda active primary A/F commanded lambda for time	=TRUE =0,87 ≥3(sec)
for time if the following conditions are met, sm moves to sm = 3	≥0,1(sec)
Measurement Oxygen Storage Capacity bank 2 starts	
(Secondary O2 sensor voltage bank 2	≥0,9(V)
Or (Secondary O2 sensor voltage bank 2	>0.8(\/)
	≥0,0(V)
gradient over 0.05s	≤66,5(V/SeC)
Secondary O2 sensor voltage gradient over 0.05s	≥-66,5(V/sec)
Integrated Oxygen mass flow bank 2	>250(mg)
))	
Primary A/F sensor lambda bank 2 (a) Primary lambda control set point	≤(a) + (b)
(b) maximum lambda deviation of	≤0,05
Primary A/F sensor lambda bank 2 (a) Primary lambda control set point	≥(a) - (b)

					 (b) maximum lambda deviation of rich mixture for time Integrated rich exhaust gas mass flow bank 2) EWMA filter strategy Fast initialization mode (FIR) EWMA filter initial value for FIR mode EWMA filter constant Maximum number of samples per trip Total number of samples for FIR mode Response to Step Change mode (RSC) Response to Step Change mode institute 	≤0,05 ≥0,1(sec) ≥0,005(kg) =8 =0,2 =2(counts) =3(counts)		
					 inactive absolute difference : ABS((a) - (b)) (a) measured Oxygen Storage Capacity (b) EWMA filtered normalized monitoring result 	>(b) * (c)		
					(c) Step change detection factor EWMA filter constant Maximum number of samples per trip	=0,3 =0,2 =2(counts)		
					Total number of samples for RSC mode	=3(counts)		
					EWMA filter constant Total number of samples for stablilized mode	=0,2 =1(counts)		
					No pending or confirmed DTCs	=see sheet inhibit table		
					Basic enable conditions met	=see sheet enable tables		
2. MONITORING OF MISFIRE DETECTION	P0300	Fault Path 1: Emission relevant misfire rate within first 1000 crankshaft revolutions after engine start	Total misfire counts across all cylinders within first test frame outside of catalyst heating	>120(counts)	Engine speed	≥600(rpm)	see Fault Paths 1-3 below	2 Trip
			or		Engine speed	≤8600(rpm)		

Total misfire counts across all cylinders within first test frame during catalyst heating and/or Total misfire counts for cylinder 1 within test frame	- >120(counts) >[A] x [B]	Engine coolant temperature at engine start or	>-12,04(°C)
where [A] Total misfire counts across all cylinders within test frame	=measured parameter	[Engine coolant temperature at engine start then monitoring enabled	<-12,04(°C)
[B] Minimum ratio of misfire sum for multiple cylinder fault code and/or Total misfire counts for cylinder 2 within test frame where	=10(%) >[A] x [B]	Engine coolant temperature] Zero torque detection is not active Overrun/fuel cut-off is not active (Combustion delay after engine start has completed	>-12,04(°C) =TRUE =TRUE =TRUE
 [A] Total misfire counts across all cylinders within test frame [B] Minimum ratio of misfire sum for multiple cylinder fault code 	=measured parameter =10(%)	means [Engine speed	>650(rpm)
and/or Total misfire counts for cylinder 3 within test frame	>[A] x [B]	tor Number of combustions]	≥8(counts)

where		Calculated EPM segment time is valid	=TRUE
[A] Total misfire counts across all cylinders within test frame	=measured parameter	No pending or confirmed DTCs	=see sheet inhibit tables
[B] Minimum ratio of misfire sum for multiple cylinder fault code	=10(%)	Basic enable conditions met	=see sheet enable tables
and/or Total misfire counts for cylinder 4 within test frame where	>[A] x [B]		
[A] Total misfire counts across all cylinders within test frame	=measured parameter		
[B] Minimum ratio of misfire sum for multiple cylinder fault code	=10(%)		
and/or Total misfire counts for cylinder 5 within test frame	>[A] x [B]		
where [A] Total misfire counts across all cylinders within test frame	=measured parameter		
[B] Minimum ratio of misfire sum for multiple cylinder fault code	=10(%)		
Total misfire counts for cylinder 6 within test frame	>[A] x [B]		
[A] Total misfire counts across all cylinders within test frame	=measured parameter		
[B] Minimum ratio of misfire sum for multiple cylinder fault code	=10(%)		
Total misfire counts for cylinder 7 within test frame where	>[A] x [B]		

[A] Total misfire counts across =measured parameter all cylinders within test frame

	[B] Minimum ratio of misfire sum for multiple cylinder fault code and/or	=10(%)
	Total misfire counts for cylinder 8 within test frame where	>[A] x [B]
	[A] Total misfire counts across all cylinders within test frame	=measured parameter
	[B] Minimum ratio of misfire sum for multiple cylinder fault code	=10(%)
	with [One test frame defined by: Total number of crankshaft revolutions in first test frame specific to emission relevant misfire rate at engine start or	=1000(counts)
Fault Path 2: Emission relevant misfire rate after the first 1000 crankshaft revolutions	Total misfire counts across all cylinders within test frame	>120(counts)
	and/or Total misfire counts for cylinder 1 within test frame where	>[A] x [B]
	[A] Total misfire counts across	=measured parameter

where
[A] Total misfire counts across =measured parameter all cylinders within test frame
[B] Minimum ratio of misfire =10(%)
sum for multiple cylinder fault code and/or
Total misfire counts for cylinder >[A] x [B]
2 within test frame where
[A] Total misfire counts across =measured parameter

all cylinders within test frame

[B] Minimum ratio of misfire sum for multiple cylinder fault code	=10(%)
and/or Total misfire counts for cylinder 3 within test frame where	>[A] x [B]
[A] Total misfire counts across all cylinders within test frame	=measured parameter
[B] Minimum ratio of misfire sum for multiple cylinder fault code	=10(%)
Total misfire counts for cylinder 4 within test frame where	>[A] x [B]
[A] Total misfire counts across all cylinders within test frame	=measured parameter
[B] Minimum ratio of misfire sum for multiple cylinder fault code	=10(%)
Total misfire counts for cylinder 5 within test frame where	>[A] x [B]
[A] Total misfire counts across all cylinders within test frame	=measured parameter
[B] Minimum ratio of misfire sum for multiple cylinder fault code and/or	=10(%)
Total misfire counts for cylinder 6 within test frame where	>[A] x [B]
[A] Total misfire counts across all cylinders within test frame	=measured parameter
[B] Minimum ratio of misfire sum for multiple cylinder fault code and/or	=10(%)
Total misfire counts for cylinder 7 within test frame where	>[A] x [B]
[A] Total misfire counts across all cylinders within test frame	=measured parameter
[B] Minimum ratio of misfire sum for multiple cylinder fault	=10(%)
and/or Er	M Section 10 of 772

	Total misfire counts for cylinder 8 within test frame	>[A] x [B]
	where [A] Total misfire counts across all cylinders within test frame	=measured parameter
	[B] Minimum ratio of misfire sum for multiple cylinder fault code	=10(%)
	with [One test frame defined by: Total number of crankshaft revolutions in test frame for emission relevant misfire rate and	=1000(counts)
	Misfire test frame counter]	=4(counts)
Fault Path 3: Catalyst damaging misfire rate	Weighted misfire counter for exhaust bank	>3000(counts)
	or Weighted misfire counter for exhaust bank during first interval after engine start	>3000(counts)
	Total weighted misfire counts for cylinder 1 within test frame	≥[A] x [B]
	where [A] Total weighted misfire counts per exhaust bank within test frame	=measured parameter
	[B] Minimum ratio of weighted misfire sum for multiple cylinder fault code	=10(%)
	and/or Total weighted misfire counts for cylinder 2 within test frame	≥[A] x [B]
	where [A] Total weighted misfire counts per exhaust bank within test frame	=measured parameter
	[B] Minimum ratio of weighted misfire sum for multiple cylinder fault code	=10(%)
	and/or Total weighted misfire counts for cylinder 3 within test frame	≥[A] x [B]
	where [A] Total weighted misfire counts per exhaust bank within test frame	=measured parameter
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[B] Minimum ratio of weighted misfire sum for multiple cylinder fault code and/or	=10(%)
Total weighted misfire counts for cylinder 4 within test frame	≥[A] x [B]
where [A] Total weighted misfire counts per exhaust bank within test frame	=measured parameter
[B] Minimum ratio of weighted misfire sum for multiple cylinder fault code and/or	=10(%)
Total weighted misfire counts for cylinder 5 within test frame	≥[A] x [B]
[A] Total weighted misfire counts per exhaust bank within test frame	=measured parameter
[B] Minimum ratio of weighted misfire sum for multiple cylinder fault code and/or	=10(%)
Total weighted misfire counts for cylinder 6 within test frame	≥[A] x [B]
where [A] Total weighted misfire counts per exhaust bank within test frame	=measured parameter
[B] Minimum ratio of weighted misfire sum for multiple cylinder fault code and/or	=10(%)
Total weighted misfire counts for cylinder 7 within test frame	≥[A] x [B]
where [A] Total weighted misfire counts per exhaust bank within	=measured parameter
[B] Minimum ratio of weighted misfire sum for multiple cylinder fault code and/or	=10(%)
Total weighted misfire counts for cylinder 8 within test frame	≥[A] x [B]

where

		[A] Total weighted misfire counts per exhaust bank within test frame	=measured parameter				
		[B] Minimum ratio of weighted misfire sum for multiple cylinder fault code with	=10(%)				
		Total number of crankshaft revolutions in test frame for catalyst damaging misfire or	=200(counts)				
		Total number of crankshaft revolutions in first test frame after engine start for catalyst damaging misfire [A] Total number of crankshaft revolutions in test frame for catalyst damaging misfire	=[A] x [B](revolutions)				
		[B] Test frame extension factor for first interval after engine start]	=1				
P0301	Fault Path 1: Emission relevant misfire rate within first 1000 crankshaft revolutions after engine start	Total misfire counts across all cylinders within first test frame outside of catalyst heating	>120(counts)	Engine speed	≥600(rpm)	see Fault Paths 1-3 below	2 Trip
		or Total misfire counts across all	>120(counts)	Engine speed	≤8600(rpm)		
		cylinders within first test frame during catalyst heating	>120(counts)				
		cylinders within first test frame during catalyst heating and/or	>120(000113)	Engine coolant temperature at engine start	>-12,04(°C)		
		cylinders within first test frame during catalyst heating and/or Total misfire counts for cylinder 1 within test frame	>[A] x [B]	Engine coolant temperature at engine start or	>-12,04(°C)		
		cylinders within first test frame during catalyst heating and/or Total misfire counts for cylinder 1 within test frame	>[A] x [B]	Engine coolant temperature at engine start or	>-12,04(°C)		
		cylinders within first test frame during catalyst heating and/or Total misfire counts for cylinder 1 within test frame	>[A] x [B]	Engine coolant temperature at engine start or [Engine coolant temperature at	>-12,04(°C)		

[A] Total misfire counts across =measured parameter then monitoring enabled all cylinders within test frame

[B] Minimum ratio of misfire sum for cylinder-individual fault	=10(%)	Engine coolant temperature]	>-12,04(°C)
with		Zero torque detection is not active	-TRUE
One test frame defined by:		Overrun/fuel cut-off is not active	=TRUE
Total number of crankshaft revolutions in first test frame specific to emission relevant misfire rate at engine start	=1000(counts)	(Combustion delay after engine start has completed	=TRUE

Fault Path 2: Emission relevant misfire rate after the first 1000 crankshaft revolutions	or Total misfire counts across all cylinders within test frame	>120(counts)	means [Engine speed	>650(rpm)
	and/or		for	
	Total misfire counts for cylinder 1 within test frame	>[A] x [B]	Number of combustions]	≥8(counts)
	where		Calculated EPM segment time is valid	=TRUE

[A] Total misfire counts across =measured parameter No pending or confirmed DTCs =see sheet inhibit tables

[B] Minimum ratio of misfire	=10(%)	Basic enable conditions met	=see sheet enable
sum for cylinder-individual fault			tables
code			

[One test frame defined by:	
Total number of crankshaft	=1000(counts)
revolutions in test frame for	
emission relevant misfire rate	
and	
Misfire test frame counter]	=4(counts)

Fault Path 3: Catalyst damaging misfire rate

or Weighted misfire counter for exhaust bank

>3000(counts)

or

Weighted misfire counter for >3000(counts) exhaust bank during first interval after engine start and/or Total weighted misfire counts ≥[A] x [B] for cylinder 1 within test frame

where

[A] Total weighted misfire
counts per exhaust bank within
test frame
[B] Minimum ratio of weighted
misfire sum for cylinderindividual fault code
with
[One test frame defined by:
Total number of crankshaft
revolutions in test frame for
catalyst damaging misfire
=measured parameter
=20(%)
=20(%)
=20(%)

or

Total number of crankshaft =[A] x [B](revolutions) revolutions in first test frame after engine start for catalyst damaging misfire

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			[A] Total number of crankshaft revolutions in test frame for catalyst damaging misfire	=200(revolutions)				
L			[B] Test frame extension factor for first interval after engine start]	=1				
Γ	P0302	Fault Path 1: Emission relevant misfire rate within first 1000 crankshaft revolutions after engine start	Total misfire counts across all cylinders within first test frame outside of catalyst heating	>120(counts)	Engine speed	≥600(rpm)	see Fault Paths 1-3 below	2 Trip
		5	or Total misfire counts across all cylinders within first test frame during catalyst heating	>120(counts)	Engine speed	≤8600(rpm)		
			and/or		Engine coolant temperature at engine start	>-12,04(°C)		
			Total misfire counts for cylinder 2 within test frame	>[A] x [B]	or			
			where		[Engine coolant temperature at engine start	<-12,04(°C)		
			[A] Total misfire counts across all cylinders within test frame	=measured parameter	then monitoring enabled			
			[B] Minimum ratio of misfire sum for cylinder-individual fault code	=10(%)	Engine coolant temperature]	>-12,04(°C)		
		with [One test frame defined by: Total number of crankshaft revolutions in first test frame specific to emission relevant misfire rate at engine start	=1000(counts)	Zero torque detection is not active Overrun/fuel cut-off is not active (Combustion delay after engine start has completed	=TRUE =TRUE =TRUE			

Fault Path 2: Emission relevant misfire rate after the first 1000 crankshaft revolutions	or Total misfire counts across all cylinders within test frame	>120(counts)	means [Engine speed	>650(rpm)
164010113	and/or Total misfire counts for cylinder	>[A] x [B]	for Number of combustions]	≥8(counts)
	2 within test frame where		Calculated EPM segment time is valid	=TRUE
	[A] Total misfire counts across all cylinders within test frame	=measured parameter	No pending or confirmed DTCs	=see sheet inhibit tables
	[B] Minimum ratio of misfire sum for cylinder-individual fault code	=10(%)	Basic enable conditions met	=see sheet enable tables
	with [One test frame defined by: Total number of crankshaft revolutions in test frame for emission relevant misfire rate and	=1000(counts)		
	Misfire test frame counter]	=4(counts)		
Fault Path 3: Catalyst damaging misfire rate	Weighted misfire counter for exhaust bank	>3000(counts)		
	or Weighted misfire counter for exhaust bank during first interval after engine start	>3000(counts)		
	and/or Total weighted misfire counts for cylinder 2 within test frame	≥[A] x [B]		
	where			

		[A] Total weighted misfire counts per exhaust bank within test frame[B] Minimum ratio of weighted misfire sum for cylinder- individual fault code	=measured parameter =20(%)				
		with [One test frame defined by: Total number of crankshaft revolutions in test frame for catalyst damaging misfire or Total number of crankshaft	=200(revolutions) =[A] x [B](revolutions)				
		revolutions in first test frame after engine start for catalyst damaging misfire					
		[A] Total number of crankshaft revolutions in test frame for catalyst damaging misfire	=200(revolutions)				
		[B] Test frame extension factor for first interval after engine start]	=1				
P0303	Fault Path 1: Emission relevant misfire rate within first 1000 crankshaft revolutions after engine start	Total misfire counts across all cylinders within first test frame outside of catalyst heating	>120(counts)	Engine speed	≥600(rpm)	see Fault Paths 1-3 below	2 Trip
		or Total misfire counts across all cylinders within first test frame during catalyst beating	>120(counts)	Engine speed	≤8600(rpm)		
		and/or		Engine coolant temperature at engine start	>-12,04(°C)		
		Total misfire counts for cylinder 3 within test frame	>[A] x [B]	or			

[A] Total misfire counts across =measured parameter then monitoring enabled all cylinders within test frame

[B] Minimum ratio of misfire sum for cylinder-individual fault	=10(%)	Engine coolant temperature]	>-12,04(°C)
with [One test frame defined by: Total number of crankshaft revolutions in first test frame specific to emission relevant misfire rate at engine start	=1000(counts)	Zero torque detection is not active Overrun/fuel cut-off is not active (Combustion delay after engine start has completed	=TRUE =TRUE =TRUE
A 7			

Fault Path 2: Emission relevant misfire rate after the first 1000 crankshaft	Total misfire counts across all cylinders within test frame	>120(counts)	[Engine speed	>650(rpm)
Tevolutions	and/or Total misfire counts for cylinder	>[A] x [B]	for Number of combustions]	≥8(counts)
	3 within test frame where		Calculated EPM segment time is valid	=TRUE

[A] Total misfire counts across =measured parameter No pending or confirmed DTCs =see sheet inhibit tables

	[B] Minimum ratio of misfire sum for cylinder-individual fault code	=10(%)	Basic enable conditions met	=see sheet enable tables	
	with [One test frame defined by: Total number of crankshaft revolutions in test frame for emission relevant misfire rate	=1000(counts)			
	Misfire test frame counter]	=4(counts)			
Fault Path 3: Catalyst damaging misfire rate	or Weighted misfire counter for exhaust bank	>3000(counts)			
	or Weighted misfire counter for exhaust bank during first interval after engine start	>3000(counts)			
	and/or Total weighted misfire counts for cylinder 3 within test frame	≥[A] x [B]			
	where [A] Total weighted misfire counts per exhaust bank within	=measured parameter			
	[B] Minimum ratio of weighted misfire sum for cylinder- individual fault code	=20(%)			
	with				
	IOne test frame defined by: Total number of crankshaft revolutions in test frame for catalyst damaging misfire	=200(revolutions)			
	or Total number of crankshaft revolutions in first test frame after engine start for catalyst damaging misfire	=[A] x [B](revolutions)			
	[A] Total number of crankshaft revolutions in test frame for catalyst damaging misfire	=200(revolutions)			
	[B] Test frame extension factor for first interval after engine start]	=1			

P0304	Fault Path 1 : Emission relevant misfire rate within first 1000 crankshaft revolutions	Total misfire counts across all cylinders within first test frame outside of catalyst heating	>120(counts)	Engine speed	≥600(rpm)	see Fault Paths 1-3 below	2 Trip
	after engine start	or Total misfire counts across all cylinders within first test frame	>120(counts)	Engine speed	≤8600(rpm)		
		during catalyst heating and/or		Engine coolant temperature at engine start	>-12,04(°C)		
		Total misfire counts for cylinder 4 within test frame	>[A] x [B]	or			
		where [A] Total misfire counts across all cylinders within test frame	=measured parameter	[Engine coolant temperature at engine start then monitoring enabled	<-12,04(°C)		
		[B] Minimum ratio of misfire sum for cylinder-individual fault code	=10(%)	Engine coolant temperature]	>-12,04(°C)		
		with		Zero torque detection is not active	=TRUE		
		Total number of crankshaft revolutions in first test frame specific to emission relevant misfire rate at engine start	=1000(counts)	(Combustion delay after engine start has completed	=TRUE =TRUE		
	Fault Path 2: Emission relevant misfire rate after the first 1000 crankshaft	or Total misfire counts across all cylinders within test frame	>120(counts)	means [Engine speed	>650(rpm)		
		and/or		for			

	Total misfire counts for cylinder 4 within test frame	>[A] x [B]	Number of combustions]	≥8(counts)
	where		Calculated EPM segment time is valid	=TRUE
	[A] Total misfire counts across all cylinders within test frame	=measured parameter	No pending or confirmed DTCs	=see sheet inhibit tables
	[B] Minimum ratio of misfire sum for cylinder-individual fault code	=10(%)	Basic enable conditions met	=see sheet enable tables
	with [One test frame defined by: Total number of crankshaft revolutions in test frame for emission relevant misfire rate and	=1000(counts)		
	Misfire test frame counter]	=4(counts)		
Fault Path 3: Catalyst damaging misfire rate	Weighted misfire counter for exhaust bank	>3000(counts)		
	Weighted misfire counter for exhaust bank during first interval after engine start	>3000(counts)		
	and/or Total weighted misfire counts for cylinder 4 within test frame	≥[A] x [B]		
	where [A] Total weighted misfire counts per exhaust bank within test frame	=measured parameter		

		[B] Minimum ratio of weighted misfire sum for cylinder- individual fault code	=20(%)				
		with [One test frame defined by: Total number of crankshaft revolutions in test frame for catalyst damaging misfire	=200(revolutions)				
		Total number of crankshaft revolutions in first test frame after engine start for catalyst damaging misfire	=[A] x [B](revolutions)				
		[A] Total number of crankshaft revolutions in test frame for catalyst damaging misfire	=200(revolutions)				
		[B] Test frame extension factor for first interval after engine start]	=1				
P0305	Fault Path 1: Emission relevant misfire rate within first 1000 crankshaft revolutions	Total misfire counts across all cylinders within first test frame outside of catalyst heating	>120(counts)	Engine speed	≥600(rpm)	see Fault Paths 1-3 below	2 Trip
		or Total misfire counts across all cylinders within first test frame during catalyst beating	>120(counts)	Engine speed	≤8600(rpm)		
		and/or		Engine coolant temperature at engine start	>-12,04(°C)		
		Total misfire counts for cylinder 5 within test frame	>[A] x [B]	or			
[A] Total misfire counts across =measured parameter then monitoring enabled all cylinders within test frame

[B] Minimum ratio of misfire sum for cylinder-individual fault	=10(%)	Engine coolant temperature]	>-12,04(°C)
code			
with		Zero torque detection is not active	=TRUE
[One test frame defined by:		Overrun/fuel cut-off is not active	=TRUE
Total number of crankshaft revolutions in first test frame	=1000(counts)	(Combustion delay after engine start has completed	=TRUE
specific to emission relevant misfire rate at engine start			

	or		means	
Fault Path 2: Emission relevant misfire rate after the first 1000 crankshaft revolutions	Total misfire counts across all cylinders within test frame	>120(counts)	[Engine speed	>650(rpm)
	and/or		for	
	Total misfire counts for cylinder 5 within test frame	>[A] x [B]	Number of combustions]	≥8(counts)
	where		Calculated EPM segment time is valid	=TRUE

[A] Total misfire counts across =measured parameter No pending or confirmed DTCs =see sheet inhibit tables

	[B] Minimum ratio of misfire sum for cylinder-individual fault code	=10(%)	Basic enable conditions met	=see sheet enable tables
	with [One test frame defined by: Total number of crankshaft revolutions in test frame for emission relevant misfire rate	=1000(counts)		
	and Misfire test frame counter]	=4(counts)		
Fault Path 3: Catalyst damaging misfire rate	or Weighted misfire counter for exhaust bank	>3000(counts)		
	or Weighted misfire counter for exhaust bank during first interval after engine start	>3000(counts)		
	and/or			
	Total weighted misfire counts for cylinder 5 within test frame	≥[A] x [B]		
	where [A] Total weighted misfire counts per exhaust bank within	=measured parameter		
	[B] Minimum ratio of weighted misfire sum for cylinder- individual fault code	=20(%)		
	with			
	[One test frame defined by: Total number of crankshaft revolutions in test frame for catalyst damaging misfire	=200(revolutions)		
	or Total number of crankshaft revolutions in first test frame after engine start for catalyst damaging misfire	=[A] x [B](revolutions)		
	[A] Total number of crankshaft revolutions in test frame for catalyst damaging misfire	=200(revolutions)		
	[B] Test frame extension factor for first interval after engine start]	=1		

P0306	Fault Path 1: Emission relevant misfire rate within first 1000 crankshaft revolutions	Total misfire counts across all cylinders within first test frame outside of catalyst heating	>120(counts)	Engine speed	≥600(rpm)	see Fault Paths 1-3 below	2 Trip
	alter engine start	or Total misfire counts across all cylinders within first test frame	>120(counts)	Engine speed	≤8600(rpm)		
		and/or Total misfire counts for cylinder	>[A] x [B]	Engine coolant temperature at engine start or	>-12,04(°C)		
		6 within test frame where [A] Total misfire counts across all cylinders within test frame	=measured parameter	[Engine coolant temperature at engine start then monitoring enabled	<-12,04(°C)		
		[B] Minimum ratio of misfire sum for cylinder-individual fault code	=10(%)	Engine coolant temperature]	>-12,04(°C)		
		with [One test frame defined by: Total number of crankshaft revolutions in first test frame specific to emission relevant misfire rate at engine start	=1000(counts)	Zero torque detection is not active Overrun/fuel cut-off is not active (Combustion delay after engine start has completed	=TRUE =TRUE =TRUE		
	Fault Path 2: Emission relevant misfire rate after the first 1000 crankshaft	or Total misfire counts across all cylinders within test frame	>120(counts)	means [Engine speed	>650(rpm)		
	12VUIUIUIIS	and/or		for			

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	250BDG07A Part 2 ECM Summary Tables					
	Total misfire counts for cylinder 6 within test frame	>[A] x [B]	Number of combustions]	≥8(counts)		
	where		Calculated EPM segment time is valid	=TRUE		
	[A] Total misfire counts across all cylinders within test frame	=measured parameter	No pending or confirmed DTCs	=see sheet inhibit tables		
	[B] Minimum ratio of misfire sum for cylinder-individual fault	=10(%)	Basic enable conditions met	=see sheet enable tables		
	code with [One test frame defined by: Total number of crankshaft revolutions in test frame for emission relevant misfire rate and	=1000(counts)				
Fault Path 3: Catalyst	Misfire test frame counter] or Weighted misfire counter for	=4(counts) >3000(counts)				
uamaying misine fale	or Weighted misfire counter for exhaust bank during first interval after engine start	>3000(counts)				

		and/or Total weighted misfire counts for cylinder 6 within test frame	≥[A] x [B]				
		where [A] Total weighted misfire counts per exhaust bank within test frame	=measured parameter				
		[B] Minimum ratio of weighted misfire sum for cylinder- individual fault code	=20(%)				
		with [One test frame defined by: Total number of crankshaft revolutions in test frame for catalyst damaging misfire	=200(revolutions)				
		or Total number of crankshaft revolutions in first test frame after engine start for catalyst damaging misfire	=[A] x [B](revolutions)				
		[A] Total number of crankshaft revolutions in test frame for catalyst damaging misfire	=200(revolutions)				
		[B] Test frame extension factor for first interval after engine start]	=1				
P0307	Fault Path 1: Emission relevant misfire rate within first 1000 crankshaft revolutions	Total misfire counts across all cylinders within first test frame outside of catalyst heating	>120(counts)	Engine speed	≥600(rpm)	see Fault Paths 1-3 below	2 Trip
		or Total misfire counts across all cylinders within first test frame during catalyst beating	>120(counts)	Engine speed	≤8600(rpm)		
		and/or		Engine coolant temperature at engine start	>-12,04(°C)		
		Total misfire counts for cylinder 7 within test frame	>[A] x [B]	or			

where		[Engine coolant temperature at	<-12,04(°C)
		engine start	
[A] Total misfire counts across all cylinders within test frame	=measured parameter	then monitoring enabled	

[B] Minimum ratio of misfire sum for cylinder-individual fault	=10(%)	Engine coolant temperature]	>-12,04(°C)
with [One test frame defined by: Total number of crankshaft revolutions in first test frame specific to emission relevant misfire rate at engine start	=1000(counts)	Zero torque detection is not active Overrun/fuel cut-off is not active (Combustion delay after engine start has completed	=TRUE =TRUE =TRUE

	or		means	
Fault Path 2: Emission relevant misfire rate after the first 1000 crankshaft revolutions	Total misfire counts across all cylinders within test frame	>120(counts)	[Engine speed	>650(rpm)
	and/or		for	
	Total misfire counts for cylinder 7 within test frame	>[A] x [B]	Number of combustions]	≥8(counts)
	where		Calculated EPM segment time is valid	=TRUE

[A] Total misfire counts across =measured parameter No pending or confirmed DTCs =see sheet inhibit tables

	[B] Minimum ratio of misfire sum for cylinder-individual fault code	=10(%)	Basic enable conditions met	=see sheet enable tables	
	with [One test frame defined by: Total number of crankshaft revolutions in test frame for emission relevant misfire rate	=1000(counts)			
	Misfire test frame counter]	=4(counts)			
Fault Path 3: Catalyst damaging misfire rate	Weighted misfire counter for exhaust bank	>3000(counts)			
	or Weighted misfire counter for exhaust bank during first interval after engine start	>3000(counts)			
	and/or Total weighted misfire counts for cylinder 7 within test frame	≥[A] x [B]			
	where [A] Total weighted misfire counts per exhaust bank within	=measured parameter			
	test frame [B] Minimum ratio of weighted misfire sum for cylinder- individual fault code	=20(%)			
	with				
	[One test frame defined by: Total number of crankshaft revolutions in test frame for catalyst damaging misfire or	=200(revolutions)			
	Total number of crankshaft revolutions in first test frame after engine start for catalyst damaging misfire	=[A] x [B](revolutions)			
	[A] Total number of crankshaft revolutions in test frame for catalyst damaging misfire	=200(revolutions)			
	[B] Test frame extension factor for first interval after engine start]	=1			

			,					
P0308	Fault Path 1: Emission relevant misfire rate within first 1000 crankshaft revolutions after engine start	Total misfire counts across all cylinders within first test frame outside of catalyst heating	>120(counts)	Engine speed	≥600(rpm)	see Fault Paths 1-3 below	2 Trip	
		or Total misfire counts across all cylinders within first test frame during catalyst heating	>120(counts)	Engine speed	≤8600(rpm)			
		and/or		Engine coolant temperature at engine start	>-12,04(°C)			
		Total misfire counts for cylinder 8 within test frame	>[A] x [B]	or				
		where		[Engine coolant temperature at engine start	<-12,04(°C)			
		[A] Total misfire counts across all cylinders within test frame	=measured parameter	then monitoring enabled				
		[B] Minimum ratio of misfire sum for cylinder-individual fault code	=10(%)	Engine coolant temperature]	>-12,04(°C)			
		with [One test frame defined by: Total number of crankshaft revolutions in first test frame specific to emission relevant misfire rate at engine start	=1000(counts)	Zero torque detection is not active Overrun/fuel cut-off is not active (Combustion delay after engine start has completed	=TRUE =TRUE =TRUE			
		or		means				
	Fault Path 2: Emission relevant misfire rate after the first 1000 crankshaft revolutions	Total misfire counts across all cylinders within test frame	>120(counts)	[Engine speed	>650(rpm)			
		and/or		for	\mathbf{N}			
		I otal mistire counts for cylinder	>[A] x [B] M Section 40 of 772	inumber of compustions]	≥ơ(counts)		152 of 1	,098

	where		Calculated EPM segment time is valid	=TRUE
	[A] Total misfire counts across all cylinders within test frame	=measured parameter	No pending or confirmed DTCs	=see sheet inhibit tables
	[B] Minimum ratio of misfire sum for cylinder-individual fault code	=10(%)	Basic enable conditions met	=see sheet enable tables
	with [One test frame defined by: Total number of crankshaft revolutions in test frame for emission relevant misfire rate	=1000(counts)		
	and Misfire test frame counter]	=4(counts)		
Fault Path 3: Catalyst damaging misfire rate	or Weighted misfire counter for exhaust bank or	>3000(counts)		
	Weighted misfire counter for exhaust bank during first interval after engine start	>3000(counts)		
	and/or Total weighted misfire counts for cylinder 8 within test frame	≥[A] x [B]		
	where [A] Total weighted misfire counts per exhaust bank within test frame	=measured parameter		
	[B] Minimum ratio of weighted misfire sum for cylinder- individual fault code	=20(%)		

			[One test frame defined by: Total number of crankshaft revolutions in test frame for catalyst damaging misfire or Total number of crankshaft revolutions in first test frame after engine start for catalyst	=200(revolutions) =[A] x [B](revolutions)				
			damaging misfire [A] Total number of crankshaft revolutions in test frame for catalyst damaging misfire	=200(revolutions)				
			[B] Test frame extension factor for first interval after engine start]	=1				
3. EVAPORATIV E SYSTEM - PURGE	P0497	Monitoring of fuel tank pressure while CVV is closed and CPV open (CPV stuck closed)	Difference between low pass filtered tank and start pressure for Tank leakage diagnosis	≤-0,0744(hPa)	Basic Enable conditions are fulfilled as following conditions:	=TRUE	1(s)	2 Trip
FLOW			or Integrated CPV mass flow during vacuum build-up	>0,09(g)	Diagnosis of canister purge system is active means	=TRUE		
					(Battery Voltage Battery Voltage Fuel Tank Pressure Fuel Tank Pressure Pressure ratio of manifold pressure and ambient pressure	≥10,9(V) ≤25,6(V) ≥-35(hPa) ≤13(hPa) <0,8		
) Engine Coolant Temperature ambient air temperature vehicle speed engine speed engine speed at idle	>69,75(°C) >-7,5(°C) ≤0,126(mph) >0(rpm) =TRUE		
					(Purge mass flow Canister close valve check (≤0,03(kg/h) =TRUE		
					Lowpass filtered tank pressure OR Time for measurement (maximum)	≥-0,9(kPa) ≥5(sec)		
) Pressure Stabilization Check	=TRUE		
					Absolute reference value of differential tank pressure	≤0,4(hPa)		
					for time)	≥2(sec)		

				Compensation Gradient Determination (Time for gradient measurements))	=TRUE ≥3(sec)		
				Monitor has not completed this drive cycle (i.e. monitor runs once per trip)	=TRUE		
				Basic enable conditions met	=see sheet enable tables		
				No pending or confirmed DTCs	=see sheet inhibit tables		
P0496	Monitoring of fuel tank pressure while CPV and CVV	Difference between low pass filtered tank and start pressure	<-0,6(hPa)	Basic Enable conditions are fulfilled as following conditions:	=TRUE	1(s)	2 Trip
				Diagnosis of canister purge system is active means (=TRUE		
				Battery Voltage	≥10,9(V)		
				Battery Voltage	≤25,6(V)		
				Fuel Tank Pressure	≥-35(hPa) <12(bPa)		
				Pressure ratio of manifold pressure and ambient pressure	<0,8		
) Engine Coolent Temperature			
				ambient air temperature	>69,75(°C)		
				vehicle speed	≤0.126(mph)		
				engine speed	>0(rpm)		
				engine speed at idle	=TRUE		
				Purge mass flow	≤0,03(kg/h)		
				Canister close valve check (=TRUE		
				Lowpass filtered tank pressure OR	≥-0,9(kPa)		
				Time for measurement (maximum))	≥5(sec)		
				Pressure Stabilization Check	=TRUE		
				Absolute reference value of differential tank pressure	≤0,4(hPa)		
				for time)	≥2(sec)		
				Compensation Gradient Determination (=TRUE		
				Time for gradient measurements	≥3(sec)		

)			
				Monitor has not completed this drive cycle (i.e. monitor runs once per trip)	=TRUE		
				Basic enable conditions met	=see sheet enable		
				No pending or confirmed DTCs	tables =see sheet inhibit tables		
P04DF	Canister purge valve Bank1 is monitored for further pinpointing of a stuck open pruge valve. The diagnostic evaluates the impact on the MAP pressure bank 1 signal during an intrusively commanded purge valve opening	failing counter results during canister purge valve bank 1 diagnosis	≥3(counts)	integrated purge mass flow bank 2	≥0(g)	1(s)	2 Trip
		Counter is incremented if the following occurs (during intrusive purge valve command):	2	filtered difference of environmental pressure and intake manifold pressure	<300(hPa)		
		difference in intake manifold pressure bank1 (difference is between intake manifold pressure bank 1 at the beginning of intrusive caniste purge valve activation and th end)	<5(hPa) S er le	Canister purge valve release conditions met:	=TRUE		
				(
				engine coolant temperature ambient air pressure correction factor	>69,75(°C) >0,69		
				ambient air temperature	>-7,5(°C)		
) time in between diagnostic events has elapsed. Waiting time betwee events	=1(sec)		
				Difference in filtered mixture	>0,1		
				Difference in filtered mixture correction	<-0,1		
				Monitor has not completed this drive cycle (i.e. monitor runs once per trip)	=TRUE		
				Basic enable conditions met	=see sheet enable		
			ECM Section 44 of 772		INDIES		156 0

					No pending or confirmed DTCs	=see sheet inhibit tables		
	P04AE	Canister purge valve Bank2 is monitored for further pinpointing of a stuck open pruge valve. The diagnostic evaluates the impact on the MAP pressure bank 2 signal during an intrusively commanded purge valve opening	failing counter results during canister purge valve diagnosis	≥3(counts)	integrated purge mass flow bank 2	≥0(g)	1(s)	2 Trip
			Counter is incremented if the following occurs (during intrusive purge valve command):		filtered difference of environmental pressure and intake manifold pressure	<300(hPa)		
			difference in intake manifold pressure bank2 (difference is between intake manifold pressure bank 2 at the beginning of intrusive canister purge valve activation and the end)	<5(hPa)	Canister purge valve release conditions met:	=TRUE		
					(engine coolant temperature ambient air pressure correction factor	>69,75(°C) >0,69		
					ambient air temperature	>-7,5(°C)		
					, time in between diagnostic events has elapsed. Waiting time betwee	=1(sec)		
					Difference in filtered mixture correction	>0,1		
					Difference in filtered mixture correction	<-0,1		
					Monitor has not completed this drive cycle (i.e. monitor runs once per trip)	=TRUE		
					Basic enable conditions met	=see sheet enable tables		
					No pending or confirmed DTCs	=see sheet inhibit tables		
4. EVAPORATIV E EMISSION SYSTEM DIAGNOSIS	P0446	Path 1 : Monitoring of Canister Ventilation Valve control - offset diagnosis	(Error message for internal cycle Canister close valve error	=TRUE	1(s)	2 Trip

			25OBDG0	7A Part 2 ECM Summary	/ Tables			
			Purge valve closed due to hig vacuum	h =TRUE	No pending or confirmed DTCs	=see sheet inhibit tables		
			Difference between tank pressure filtered for offset and ccv error threshold because cpv can not open because of vacuum	<0(kPa)	Basic enable conditions met	=see sheet enable tables		
) for time	≥5(sec)				
		Path 2 : Monitoring of Canister Ventilation Valve control - based on environmental	Tank pressure	≥-0,9(kPa)	Diagnosis of canister purge system is active	=TRUE		
		pressure			Mass flow through purge control valve for tank leakage diagnosis	≤0,03(kg/h)		
					time for miscellaneous measurements	≥5(sec)		
					No pending or confirmed DTCs	=see sheet inhibit tables		
					Basic enable conditions met	=see sheet enable tables		
5. DIAGNOSIS	P0442	Phase 1: Monitoring of vacuum decay	Engine Off Natural Vacuum Test:		Conditions specific to Phase 1(engine running):		1(s)	1Trip EWMA
OF LEAK IN EVAPORATIV E SYSTEM		gradient while CPV and CVV Phase 2: Monitoring of tank pressure while CPV and CVV are closed	EWMA filtered fault index	>0,5	Tank pressure vacuum decay gradient while CPV and CVV are closed	>0(kPa/sec)		
			based on:		Engine coolant temperature at start	≥-7,5(°C)		
			(Difference hetween mey terri		Engine coolant temperature at start	≤100,5(°C)		
			differential pressure & min. tank differential pressure (A-E (see Look-Up-Table #58)	3)	Ampient temperature	≤35,25(C)		
			Max. & min differential		Ambient temperature	≥-7,5(°C) >7(l)		
			Phase 1 (CPV and CVV are		Fuel tank level	<63(l)		
			(A (Maximum pressure) Stabilization phase (CPV	>0(kPa)	 Absolute change in barometric for time 	<16,01(hPa/sec) =600(sec)		
			Wait for pressure to reach	=300(sec)) Canister purge active	()		
			Phase 2 (CPV and CVV) are		Minimum purging time of the charcoal	>20(sec)		
						<00(000)		
			(Load factor of charcoal canister	<40		

B: Minimum pressure	
---------------------	--

))

6. FUEL SUPPLY SYSTEM

DIAGNOSIS

P0171

Monitoring of maximum lambda controller deviation

when the lambda controller

calibrated threshold

mean value is greater than the

=0(kPa)

)		Conditions specific to Phase 2			
)		Consister purge valve (CPV)			
		Canister vent valve (CVV)	=TRUE		
		P0446 P0496 diagnostics have	=TRUE		
		Ambient temperature	<-7.5(°C)		
		Ambient temperature	>35 25(°C)		
		Engine coolant temperature at start	<100.5(°C)		
		Engine coolant temperature at start	≤100,5(°C)		
		Engine bad been running for time	<u>−</u> 99,75(°C)		
		Driving distance covered in current	>8100(sec)		
		(20100(iii)		
		Load factor of charcoal canister	<64		
		for time	>30(sec)		
)			
		Barometric pressure	>700(hPa)		
		Engine coolant temperature at engine	>60(°C)		
		Battery voltage	>10,9(V)		
		Condition - refueling detected	=FALSE		
		Condition filler cap has been opened	=FALSE		
		Condition - Sloshing of fuel detected	=FALSE		
		EWMA Filter Normal Mode:			
		Filter coefficient for stabilized mode	=0,18		
		Number of measurements for	=6(counts)		
		EWMA Filter Fast Initial Response			
		Filter coefficient for Fast Initial	=0,2		
		EWMA Filter Rapid Response (RR)			
		Filter coefficient for Rapid Responde	=0,2		
		No pending or confirmed DTCs	=see sheet inhibit		
			tables		
		Basic enable conditions met	=see sheet enable tables		
Deviation of fast lambda controller mean value from 1.0	>0,23	(10(s)	2 Trip Sim Cond
		,			
		(
		l			

Unrestricted operation of Upstream closed loop lambda controller is active	=TRUE
(
Enleanment protection of lambda controller	=FALSE
(
Large deceleration enleanment protection of lambda controller)	=FALSE
UR (
(Large acceleration enrichment protection of lambda controller	=FALSE
)	
)´	
and	
Upstream Lambda closed loop control for bank 1	=TRUE
(
Lambda control after injection cut off or fuel cut off is disabled	=FALSE
and Lambda swtiched ON after fuel	=TRUE
cutoff	
(Fuel cut off is active	=FALSE
time counter for after fuel out off	> 2(coc)
for enabling lambda control	>2(Sec)
(
Absolute value of diffence in	≤0.2
lambda of bank 1 and	-,
Difference of counter time and	>0(sec)
plant time constant	
a-(b+c)	
where a is time counter for	
after fuel cut off for enabling lambda control	
b is plant time constant for	
continuous air/fuel control	
c is plant parameter for dead	
time for lambda control	
)	
)	
)	
and	
LOU Sensor upstream to catalyst	=IKUE
l	

3	
Level of lambda sensor 1 s	ignal ≤12
quality	
)	
and ODDU amon flag, lagshide, and	
OBDII error flag, lambda col	Itrol =FALSE
disabled	
(Injector power stage fault i	
	=FALSE
active	
Camebaft fault in critical	
	-I ALOL
main air charge senor	
) and	
(
lambda control is active sir	ce =TRUF
warmup is finished	
and	
Relative air charge	>0(%)
(
for time	>2(sec)
)	=2(000)
)	
and	
Lamda control active due to	GDI =TRUE
mode change	
(
GDI mode homogeneous	=TRUE
for time	≥0,8(sec)
)	
)	
and	
lambda value referred to sense	sor ≥0,65
fitting location	
and	
Minimum injection time limitat	ion for =FALSE
GDI mode is active	
and	
(
Canister purge valve is active	and =FALSE
open	
OR	
Integral of canister purge mas	ss flow $\geq O(g)$
after a longer purge stop	
UK Condition for limit control	
Condition for limit control	=IKUE
(
Canister pures rate reducti	on 50
because of fuel rate controller	un ∠0
deviations	
and	
and	

				5			
				Canister purge mass flow (see Look-Up-Table #61)	≤5(kg/h)		
) for time)	≥10(sec)		
				and Engine Coolant temperature	≥0(°C)		
				Number of injections for enabling fuel mixture adaptation diagnosis	≥2000(counts)		
				high amount fuel in the oil (=FALSE		
				Maximum proportion of evaporating fuel from the engine oil to the fuel demand where	<a-b< th=""><th></th><th></th></a-b<>		
				A is Threshold for significant evaporation of fuel from oil	=0,25		
				B is Delta hysteresis for significant evaporation from oil)	=0,1		
) for time)	≥100(sec)		
) No pending or confirmed DTCs	=see sheet inhibit tables		
				Basic enable conditions met	=see sheet enable tables		
P0172	Monitoring of minimum lambda controller deviation when the lambda controller mean value is lesser than the calibrated threshold	Deviation of fast lambda controller mean value from 1.0	<-0,23	(10(s)	2 Trip Sim Cond
				((Unrestricted operation of Upstream closed loop lambda controller is	=TRUE		
				(Enleanment protection of lambda	=FALSE		
				controller (
				Large deceleration enleanment protection of lambda controller)	=FALSE		
				UK (Large acceleration enrichment			
				protection of lambda controller	=FALOE		

)	
)	
and	
Upstream Lambda closed loop	=TRUE
control for bank 1	
(
Lambda control after injection cut	=FALSE
off or fuel cut off is disabled	
and	
Lambda swtiched ON after fuel	=IRUE
cutoff	
(
Fuel cut off is active	=FALSE
and	
(- / 、
time counter for after fuel cut off	>2(sec)
for enabling lambda control	
OR	
(
Absolute value of diffence in	≤0,2
lambda of bank 1	
and	
Difference of counter time and	>0(sec)
plant time constant	
a-(b+c)	
where a is time counter for	
after fuel cut off for enabling lambda	
control	
b is plant time constant for	
continuous air/fuel control	
c is plant parameter for dead	
time for lambda control	
)	
)	
)	
and	
LSU sensor upstream to catalyst	=TRUE
ready for operation	
(
Level of lambda sensor 1 signal	≤12
quality	
)	
and	
OBDII error flag, lambda control	=FALSE
disabled	
(
Injector power stage fault is	=FALSE
active	
and	
Camshaft fault in critical	=FALSE
operating range present and MAF is	
main air charge senor	
)	
and	

=TRUE
>0(%)
≥2(sec)
Υ γ
=TRUE
=IRUE
≥0,8(sec)
≥0.65
_0,00
=FALSE
=FALSE
≥0(g)
-INOL
≥0
-
≤5(kg/h)
(10)
≥10(sec)
>0(°C)
=0(0)
≥2000(counts)
· · · · · · · · · · · · · · · · · · ·
=FALSE

				Maximum proportion of evaporating fuel from the engine oil to the fuel demand where	<a-b< th=""><th></th><th></th></a-b<>		
				A is Threshold for significant evaporation of fuel from oil B is Delta hysteresis for significant evaporation from oil	=0,25 =0,1		
)) for time)	≥100(sec)		
				No pending or confirmed DTCs	=see sheet inhibit tables		
				Basic enable conditions met	=see sheet enable tables		
P0174	Monitoring of maximum lambda controller deviation when the lambda controller mean value is greater than the calibrated threshold	Deviation of fast lambda controller mean value from 7 of bank 2	>0,23 1.0	(10(s)	2 Trip Sim Cond
				(
				(Unrestricted operation of Upstream closed loop lambda controller of bank 2 is active	=TRUE		
				(Enleanment protection of lambda controller of bank 2	=FALSE		
				(Large deceleration enleanment protection of lambda controller	=FALSE		
) OR (Large acceleration enrichment protection of lambda controller)	=FALSE		
				and Upstream Lambda closed loop control for bank 2	=TRUE		
				(Lambda control after injection cut off or fuel cut off of bank 2 is disabled	=FALSE		
				and Lambda swtiched ON after fuel cutoff of bank 2	=TRUE		
			ECM Section 53 of 772	(Fuel cut off is active	=FALSE		165 o

and	
(
time counter for after fuel cut off	>2(sec)
Absolute value of diffence in	<0.2
lambda of bank 2	<u> </u>
and	
Difference of counter time and	>0(sec)
plant time constant	
a-(b+c)	
where a is time counter for	
after fuel cut off for enabling lambda	
control	
b is plant time constant for	
continuous air/fuel control	
c is plant parameter for dead	
time for lambda control	
)	
)	
)	
and	
LSU sensor upstream to catalyst	=IRUE
ready for operation in bank 2	
1	
(<12
quality of bank 2	312
and	
OBDII error flag, lambda control of	=FALSE
bank 2 disabled	
(
Injector power stage fault is	=FALSE
active	
and	
Camshaft fault in critical	=FALSE
operating range present and MAF is	
main air charge senor	
)	
and	
(
lambda control is active since	=IRUE
warmup is finished	
ano Bolotivo oir chorgo	$\sim 0(0/)$
Relative all charge	>0(%)
for time	>2/200)
	≤∠(580)
)	
, and	
Lende control active due to CDI	

(GDI mode homogeneous for time	=TRUE ≥0,8(sec)
)	
and	
lambda value referred to sensor	≥0,65
fitting location of bank 2	
and Minimum injection time limitation for	
GDI mode of bank 2 is active	=FALSE
and	
(
Canister purge valve is active and	=FALSE
open	
UR	$\geq 0(a)$
after a longer purge stop	≥0(9)
OR	
Condition for limit control	=TRUE
(
(_
Canister purge rate reduction	≥0
deviations	
and	
Canister purge mass flow	≤5(kg/h)
(see Look-Up-Table #61)	
`	
) for time	>10(sec)
)	=10(000)
and	
Engine Coolant temperature	≥0(°C)
and	
Number of injections for enabling	≥2000(counts)
and	
high amount fuel in the oil	=FALSE
(
Maximum proportion of	<a-b< td=""></a-b<>
evaporating fuel from the engine oil	
to the fuel demand	
Where A is Threshold for significant	-0.25
evaporation of fuel from oil	-0,25
B is Delta hysteresis for significant	=0,1
evaporation from oil	
)	
) fan fin a	N400 (100)
ior time	≥100(sec)
1	

				No pending or confirmed DTCs	=see sheet inhibit tables		
				Basic enable conditions met	=see sheet enable tables		
P01	75 Monitoring of fast lambda controller mean value against Minimum rationality threshold	Deviation of fast lambda controller mean value from 1.0 corrected with P-part controller, bank 2	<-0,23	(10(s)	2 Trip Sim Cond
				((Unrestricted operation of Upstream closed loop lambda controller of bank	=TRUE		
				2 is active (Enleanment protection of lambda controller of bank 2	=FALSE		
				(Large deceleration enleanment protection of lambda controller)	=FALSE		
				OR (Large acceleration enrichment protection of lambda controller)	=FALSE		
) and Upstream Lambda closed loop control for bank 2	=TRUE		
				Lambda control after injection cut off or fuel cut off of bank 2 is disabled	=FALSE		
				and Lambda swtiched ON after fuel cutoff of bank 2	=TRUE		
				Fuel cut off is active and (=FALSE		
				time counter for after fuel cut off for enabling lambda control OR	>2(sec)		
				Absolute value of diffence in lambda of bank 2 and	≤0,2		
				Difference of counter time and plant time constant a-(b+c)	>0(sec)		

where a is time counter for	
control	
b is plant time constant for	
continuous air/fuel control	
c is plant parameter for dead	
time for lambda control	
)	
)	
and	
LSU sensor upstream to catalyst	=TRUE
ready for operation in bank 2	
	<10
cuality of bank 2	512
and	
OBDII error flag, lambda control of	=FALSE
bank 2 disabled	
(
Injector power stage fault is	=FALSE
active	
Camshaft fault in critical	=FALSE
operating range present and MAF is	
main air charge senor	
)	
and	
(
warmun is finished	TRUE
and	
Relative air charge	>0(%)
for time	≥2(sec)
)	
) and	
Lamda control active due to GDI	=TRUE
mode change	into 2
(
GDI mode homogeneous	=TRUE
for time	≥0,8(sec)
)	
) and	
lambda value referred to sensor	≥0,65
fitting location of bank 2	
and	
Minimum injection time limitation for	=FALSE
GDI mode of bank 2 is active	

			(Canister purge valve is active and open OR Integral of canister purge mass flow after a longer purge stop OR Condition for limit control ((Canister purge rate reduction because of fuel rate controllor	=FALSE ≥0(g) =TRUE ≥0		
			deviations and Canister purge mass flow (see Look-Up-Table #61)	≤5(kg/h)		
) for time) and	≥10(sec)		
			Engine Coolant temperature and Number of injections for enabling fuel mixture adaptation diagnosis and	≥0(°C) ≥2000(counts)		
			high amount fuel in the oil (Maximum proportion of	=FALSE <a-b< th=""><th></th><th></th></a-b<>		
			evaporating fuel from the engine oil to the fuel demand where A is Threshold for significant	=0,25		
			evaporation of fuel from oil B is Delta hysteresis for significant evaporation from oil	=0,1		
) for time)	≥100(sec)		
			No pending or confirmed DTCs	=see sheet inhibit tables		
			Basic enable conditions met	=see sheet enable tables		
7. FUEL SYSTEM ADAPTATION RATIONALITY	P2177 Multiplicative part of the Long Multiplicative part of LTFT, Term Fuel Trim for Bank 1 in Bank 1 gasoline mode is greater than a calibrated threshold	>1,27	LTFT Multiplicative mixture adaptation bank 1 is active	=TRUE	0,2(s)	2 Trip Sim Cond
CHECK			(

LTFT multiplicative part Bank 1 Integrator is stable which is of the following conditions	=TRUE
(Condition diagnostic thresholds of multiplicative correction currently exceeded of bank 1 is stable	=TRUE
(Multiplicative part of LTFT for bank 1	>1,27
OR Multiplicative part of LTFT for bank 1	<0,73
) OR Similar conditions for multiplicative fuel adaptation fulfilled	=TRUE
(Difference between Measured and reference Engine speed	≤375(rpm)
and Difference between reference and measured Engine speed	≤375(rpm)
and Difference between measured load value to reference load	≤20
and Difference between reference load value to measured load))	≤20
, and LTFT multiplicative part Bank 1 is stable, which is the following conditions for time (≥6(sec)
Condition diagnostic thresholds of multiplicative correction currently exceeded of bank 1 is stable	=TRUE
(Absolute change of LTFT multiplicative part, Bank 1)	≤0,06
, OR Absolute change of LTFT multiplicative part, Bank 1) and	≤0,04
(Condition diagnostic thresholds of multiplicative correction currently	=TRUE

OR	
Change in short term fuel trim, Bank 1 \	≤0,04
) and Absolute difference between LTFT additive part, Bank 1 and its fixed value at beginning of multiplicative steady state phase	≤1,5(%)
and Multiplicative mixture adaptation is active (=TRUE
(Multiplicative mixture adaptation is active, which is the following conditions:	=TRUE
(Fra operational readiness independent of the operating mode is active, which is the following conditions for time	≥0(sec)
(Fundamental operating mode independent operation readiness of mixture adaption (=TRUE
Condition error suspicion in mixture adaptation	=TRUE
(Coolant Engine Temperature where C - cut-in temperature adaptive precontrol for lambda	≥Min(C, D)(°C) =70,5(°C)
where D - cut-in temperature fuel mixture adaptation in case of error suspicion	=57,8(°C)
) OR Coolant Engine Temperature) and	≥70,5(°C)
and Basic willingness of fuel mixture adaptation, except engine temperature	=TRUE
(Intake air temperature	<90(°C)
and Conditiion of Wide Open Throttle (=FALSE

Propulsion torque after driving	<900 to 1300(Nm)
assistance coordination	
(see Look-Up-Table #5)	

١

)	
and Increased tolerances of air charge	-FALSE
determination expected	
and Maximum proportion of evaporating	≤1.99
fuel from the engine oil to the fuel	_1,00
demand (model based)	
)	
and (
Number of injections for enabling fuel mixture adaptation	≥2000(counts)
)	
) and	
FRA adaption physically enabled	=TRUE
Torque commanded to charge control	≥13.00 to 99.998(%)
(see Look-Up-Table #60)	
and	
I orque commanded to charge	≤0 to 40(%)
(see Look-Up-Table #59)	
)	
) and	
Operating mode dependent	=TRUE
Keadiness LRA	
(
Lambda closed loop control	=TRUE
upstream catalyst, bank 1	
(Enleanment protection of lambda	=FALSE
controller	
(
Large deceleration enleanment	=FALSE
protection of lambda controller	-
(Relative fuel mass transient	> 1500 to 22 046(0/)
component threshold for deceleration	<-1000 to -23,010(%)
enleanment (see Look-Up-Table #67)	

Relative fuel mass transient component threshold for deceleration enleanment in bank 2 (see Look-Up- Table #68)	≥-1500 to -23,016(%)
) OR	
(Large acceleration enrichment protection of lambda controller (=FALSE
Relative fuel mass transient componet threshold for acceleration enrichment (Bank 1)	≤37,5 to 600(%)
(see Look-Up-Table #91)	
and	
Relative fuel mass transient componet threshold for acceleration enrichment (Bank 2)	≤37,5 to 600(%)
(see Look-Up-Table #92)	
)))	
and Upstream Lambda closed loop control for bank 1	=TRUE
(Lambda control disabled during after cylinder cut-off	=FALSE
Lambda swtiched ON after fuel cutoff	=TRUE
(Fuel cut off is active and	=FALSE
(Time running down after fuel cut−off for enabling lambda control OR	>2(sec)
(Absolute value of diffence in lambda of bank 1	≤0,2
and Difference of counter time and plant time constant a-(b+c)	>0(sec)
where a is Time running down after fuel cut-off for enabling lambda control	

b is plant time constant for continuous air/fuel control c is plant parameter for dead time for lambda control	
)	
)	
and	
LSU sensor upstream to catalyst	=TRUE
ready for operation	
(Lovel of lambda sensor 1 signal	<12
quality	=12
)	
and	
Lambda control disabled by a fault	=FALSE
(Catalyst damaging misfire rate	-FALSE
exceeded	
and	
Injector power stage fault is active	=FALSE
and	541.05
camshaft fault in critical operating	=FALSE
charge sensor	
)	
and	
lambda control is active since	=TRUE
and	
Relative air charge	>0(%)
C C	
for time	≥2(sec)
)	
and Lamda control active due to GDI	=TRUE
mode change	THOL
(
GDI mode homogeneous	=TRUE
for time	≥0,8(sec)
and	
Lambda set point	≥0,65
and	
Minimum injection time limitation for	=FALSE
and	
(
Width of dead zone for lambda	<0
control deviation	
Lambda control continuos error	>0

) OR	
(Unrestricted operation of Upstream closed loop lambda controller of bank 2 is active	=TRUE
(Enleanment protection of lambda controller	=FALSE
(Large deceleration enleanment protection of lambda controller	=FALSE
(Relative fuel mass transient component threshold for deceleration enleanment (see Look-Up-Table #67)	≥-1500 to -23,016(%)
and Relative fuel mass transient component threshold for deceleration enleanment in bank 2 (see Look-Up- Table #68)	≥-1500 to -23,016(%)
) OR (
protection of lambda controller	=FALSE
(Relative fuel mass transient componet threshold for acceleration enrichment (Bank 1)	≤37,5 to 600(%)
(see Look-Up-Table #91)	
and	
Relative fuel mass transient componet threshold for acceleration enrichment (Bank 2)	≤37,5 to 600(%)
(see Look-Up-Table #92)	
)))	
Upstream Lambda closed loop control for bank 2	=TRUE
(Lambda control disabled during after cylinder cut-off	=FALSE

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Lambda swtiched ON after fuel cutoff	=TRUE
(Fuel cut off is active and	=FALSE
(Time running down after fuel cut-off for enabling lambda control OR	>2(sec)
Absolute value of diffence in lambda of bank 2	≤0,2
Difference of counter time and plant time constant a-(b+c) where a is Time running down after fuel cut-off for enabling lambda control	>0(sec)
b is plant time constant of bank 2 for continuous air/fuel control c is plant parameter of bank 2 for dead time for lambda control)	
and LSU sensor upstream to catalyst ready for operation	=TRUE
(Level of lambda sensor 1, bank 2 signal quality	≤12
and Lambda control disabled by a fault	=FALSE
(Catalyst damaging misfire rate exceeded	=FALSE
Injector power stage fault is active	=FALSE
Camshaft fault in critical operating range present and MAF is main air charge sensor	=FALSE
, and lambda control is active since warmup is finished and	=TRUE
Relative air charge	>0(%)
for time	≥2(sec)

and Lamda control active due to GDI mode change	=TRUE
(GDI mode homogeneous for time	=TRUE ≥0,8(sec)
)	
and	>0.65
and	20,00
Minimum injection time limitation for GDI mode of bank 2 is active and	=FALSE
(Width of dead zone for lambda control deviation	=0
OR Lambda control continuos error	>0
) for time	≥2(sec)
) and	
(Difference between lambda value referenced to sensor fitting of bank 1	≥0
and bank 2 and	
Lambda set point and	<1,1
(Detection of fuel mixture adaption (=TRUE
Lambda set point of bank 2)	>0,87
OR Lambda set point of bank 2	>0,96
) for time where A - delay time for lambda fuel adaption (rich condition) (see Look-Up-Table #65)	≥Max(A,B)(sec) =3 to 5(sec)
where B - delay time for lambda fuel adaption (lean condition) (see Look-Up-Table #66)	=3 to 5(sec)
) and Limitation due to fuel in oil is deactivated and	=TRUE

					Limitation due to fuel in oil is deactivated for bank 2) and)	=TRUE		
					and Lambda closed loop control upstream catalyst, bank 1	=TRUE		
) Multiplicative adaptation correction factor))	>0		
) No pending or confirmed DTCs	=see sheet inhibit tables		
					Basic enable conditions met	=see sheet enable tables		
I	P2178	Multiplicative part of the Long Term Fuel Trim for Bank 1 in gasoline mode is less than a calibrated threshold.	Multiplicative part of LTFT for bank 1	r <0,73	LTFT Multiplicative mixture adaptation bank 1 is active	=TRUE	0,2(s)	2 Trip Sim Cond
					(LTFT multiplicative part Bank 1 Integrator is stable which is of the following conditions (=TRUE		
					(Condition diagnostic thresholds of multiplicative correction currently exceeded of bank 1 is stable (=TRUE		
					Multiplicative part of LTFT for bank 1	>1,27		
					OR Multiplicative part of LTFT for bank 1	<0,73		
) OR Similar conditions for multiplicative fuel adaptation fulfilled	=TRUE		
					V Difference between Measured and reference Engine speed	≤375(rpm)		
					and Difference between reference and measured Engine speed and	≤375(rpm)		
					Difference between measured load value to reference load	≤20		
				FCM Section 67 of 770	and			170 -

Difference between reference load value to measured load	≤20
)) and	
LTFT multiplicative part Bank 1 is stable, which is the following conditions for time	≥6(sec)
Condition diagnostic thresholds of multiplicative correction currently exceeded of bank 1 is stable	=TRUE
Absolute change of LTFT multiplicative part, Bank 1	≤0,06
) OR Absolute change of LTFT multiplicative part, Bank 1	≤0,04
) and	
(
condition diagnostic thresholds of multiplicative correction currently exceeded of bank 1 is stable	=IRUE
Change in short term fuel trim, Bank	≤0,04
and	
Absolute difference between LTFT additive part, Bank 1 and its fixed value at beginning of multiplicative steady state phase	≤1,5(%)
and	
active	=IRUE
(Multiplicative mixture adaptation is	=TRUF
active, which is the following conditions:	
Fra operational readiness independent of the operating mode is active, which is the following conditions for time	≥0(sec)
Fundamental operating mode independent operation readiness of mixture adaption	=TRUE
(Condition error suspicion in mixture	=TRUE
---	-----------------------------
adaptation	
Coolant Engine Temperature where C - cut-in temperature adaptive precontrol for lambda closed-loop control	≥Min(C, D)(°C) =70,5(°C)
where D - cut-in temperature fuel mixture adaptation in case of error suspicion)	=57,8(°C)
OR Coolant Engine Temperature)	≥70,5(°C)
Basic willingness of fuel mixture adaptation, except engine temperature	=TRUE
(Intake air temperature	<90(°C)
and Conditiion of Wide Open Throttle	=FALSE
(Propulsion torque after driving assistance coordination (see Look-Up-Table #5)	<900 to 1300(Nm)
)	
and Increased tolerances of air charge determination expected	=FALSE
Maximum proportion of evaporating fuel from the engine oil to the fuel demand (model based) and	≤1,99
(Number of injections for enabling fuel mixture adaptation))	≥2000(counts)
and FRA adaption physically enabled	=TRUE
(Torque commanded to charge control (see Look-Up-Table #60)	≥13.00 to 99.998(%)

and

Torque commanded to charge control	≤0 to 40(%)
(see Look-Up-Table #59)	
)	
) and	
Operating mode dependent Readiness LRA (=TRUE
(Lambda closed loop control upstream catalyst, bank 1 (=TRUE
Controller	=FALSE
(Large deceleration enleanment protection of lambda controller	=FALSE
(Relative fuel mass transient component threshold for deceleration enleanment (see Look-Up-Table #67)	≥-1500 to -23,016(%)
and Relative fuel mass transient component threshold for deceleration enleanment in bank 2 (see Look-Up- Table #68)	≥-1500 to -23,016(%)
, OR	
(Large acceleration enrichment protection of lambda controller	=FALSE
Relative fuel mass transient componet threshold for acceleration enrichment (Bank 1)	≤37,5 to 600(%)
(see Look-Up-Table #91)	
and	
Relative fuel mass transient componet threshold for acceleration enrichment (Bank 2)	≤37,5 to 600(%)
(see Look-Up-Table #92)	
)	

)	
and Upstream Lambda closed loop control for bank 1	=TRUE
(
Lambda control disabled during after cylinder cut-off	=FALSE
and	
Lambda swtiched ON after fuel cutoff	=TRUE
(
Fuel cut off is active	=FALSE
and	
(
Time running down after fuel cut-off	>2(sec)
for enabling lambda control	
OR	
(
Absolute value of diffence in lambda	≤0,2
of bank 1	
and	
Difference of counter time and plant	>0(sec)
time constant	
a-(b+c)	
where a is Time running down after	
fuel cut-off for enabling lambda	
control	
b is plant time constant for	
continuous air/luei control	
c is plant parameter for dead time for	
)	
) and	
I SLI sensor upstream to catalyst	
ready for operation	THOL
(
Level of lambda sensor 1 signal	≤12
quality	
)	
and	
Lambda control disabled by a fault	=FALSE
(
Catalyst damaging misfire rate	=FALSE
exceeded	
and	
Injector power stage fault is active	=FALSE
and	
Camshaft fault in critical operating	=FALSE
range present and MAF is main air	
charge sensor	

lambda control is active since warmup is finished	=TRUE
Relative air charge	>0(%)
for time	≥2(sec)
and	
Lamda control active due to GDI mode change (=TRUE
GDI mode homogeneous	=TRUE
for time	≥0,8(sec)
)	
and Lombdo oct point	>0 6F
and	≥0,05
Minimum injection time limitation for GDI mode is active	=FALSE
(
Width of dead zone for lambda control deviation	<0
OR Lambda control continuos error	>0
)	
, OR	
(
closed loop lambda controller of bank 2 is active	TRUE
(Enleanment protection of lambda	-FALSE
controller	
(
(Large deceleration enleanment	=FALSE
protection of lambda controller	
(Relative fuel mass transient	>-1500 to -23 016(%)
component threshold for deceleration	= 1000 10 20,010(70)
enleanment (see Look-Up-Table #67)	
and	
Relative fuel mass transient	≥-1500 to -23,016(%)
component threshold for deceleration	
Table #68)	

)

(Large acceleration enrichment protection of lambda controller	=FALSE
, Relative fuel mass transient componet threshold for acceleration enrichment (Bank 1)	≤37,5 to 600(%)
(see Look-Up-Table #91)	
and	
Relative fuel mass transient componet threshold for acceleration enrichment (Bank 2)	≤37,5 to 600(%)
(see Look-Up-Table #92)	
)))	
Upstream Lambda closed loop control for bank 2	=TRUE
Lambda control disabled during after cylinder cut-off	=FALSE
Lambda swtiched ON after fuel cutoff	=TRUE
(Fuel cut off is active and	=FALSE
(Time running down after fuel cut-off for enabling lambda control OR	>2(sec)
(Absolute value of diffence in lambda of bank 2	≤0,2
Difference of counter time and plant time constant	>0(sec)
a-(b+c) where a is Time running down after fuel cut-off for enabling lambda	
b is plant time constant of bank 2 for continuous air/fuel control c is plant parameter of bank 2 for dead time for lambda control)	

)

)

and LSU sensor upstream to catalyst ready for operation	=TRUE
(Level of lambda sensor 1, bank 2 signal quality	≤12
)	
and Lambda control disabled by a fault	=FALSE
(
Catalyst damaging misfire rate exceeded and	=FALSE
Injector power stage fault is active	=FALSE
Camshaft fault in critical operating range present and MAF is main air charge sensor	=FALSE
) and	
lambda control is active since	=TRUE
warmup is finished	
and Relative air charge	>0(%)
for time	≥2(sec)
) and	
Lamda control active due to GDI mode change	=TRUE
(GDI mode homogeneous	=TRUE
for time	≥0,8(sec)
)	
) and	
Lambda set point	≥0,65
and	
Minimum injection time limitation for GDI mode of bank 2 is active and	=FALSE
(Width of dood zong for lombdo	0
control deviation	=0
OR	
Lambda control continuos error	>0
)	
, for time	≥2(sec)
)	
and (
l	

			Difference between lambda value referenced to sensor fitting of bank 1 and bank 2	≥0		
			and Lambda set point and (<1,1		
			Detection of fuel mixture adaption	=TRUE		
			Lambda set point of bank 2)	>0,87		
			OR Lambda set point of bank 2)	>0,96		
			, for time where A - delay time for lambda fuel adaption (rich condition) (see Look-Up-Table #65)	≥Max(A,B)(sec) =3 to 5(sec)		
			where B - delay time for lambda fuel adaption (lean condition) (see Look-Up-Table #66)	=3 to 5(sec)		
) and Limitation due to fuel in oil is deactivated	=TRUE		
			and Limitation due to fuel in oil is deactivated for bank 2))	=TRUE		
			and Lambda closed loop control upstream catalyst, bank 1	=TRUE		
) Multiplicative adaptation correction factor))	>0		
) No pending or confirmed DTCs	=see sheet inhibit tables		
			Basic enable conditions met	=see sheet enable tables		
P2179	Multiplicative part of the Long Multiplicative part of LTF Term Fuel Trim for Bank 2 in Bank 2 gasoline mode is greater than a calibrated threshold.	T, >1,27	LTFT Multiplicative mixture adaptation bank 2 is active	=TRUE	0,2(s)	2 Trip Sim Cond
			(

LTFT multiplicative part Bank 2 Integrator is stable which is of the following conditions (=TRUE
(Condition diagnostic thresholds of multiplicative correction currently exceeded of bank 2 is stable	=TRUE
(Multiplicative part of LTFT for bank 2	>1,27
OR Multiplicative part of LTFT for bank 2	<0,73
) OR Similar conditions for multiplicative fuel adaptation fulfilled for bank 2	=TRUE
(Difference between Measured and reference Engine speed, bank 2	≤375(rpm)
Difference between reference and measured Engine speed, bank 2	≤375(rpm)
Difference between measured load value to reference load, bank 2	≤20
Difference between reference load value to measured load, bank 2)	≤20
and LTFT multiplicative part Bank 2 is stable, which is the following conditions for time	≥6(sec)
Condition diagnostic thresholds of multiplicative correction currently exceeded of bank 2 is stable	=TRUE
(Absolute change of LTFT multiplicative part, Bank 2)	≤0,06
OR Absolute change of LTFT multiplicative part, Bank 2)	≤0,04
and (Condition diagnostic thresholds of multiplicative correction currently	=TRUE

OP	
Change in short term fuel trim, Bank 2	≤0,04
) and	
Absolute difference between LTFT additive part, Bank 1 and its fixed value at	≤1,5(%)
beginning of multiplicative steady state phase	
Multiplicative mixture adaptation is active, bank 2	=TRUE
(Multiplicative mixture adaptation is active, which is the following conditions:	=TRUE
(Fra operational readiness independent of the operating mode is active, which is the following conditions for time	≥0(sec)
(Fundamental operating mode independent operation readiness of mixture adaption (=TRUE
Condition error suspicion in mixture adaptation	=TRUE
Coolant Engine Temperature where C - cut-in temperature adaptive precontrol for lambda	≥Min(C, D)(°C) =70,5(°C)
where D - cut-in temperature fuel mixture adaptation in case of error suspicion)	=57,8(°C)
OR Coolant Engine Temperature)	≥70,5(°C)
and Basic willingness of fuel mixture adaptation, except engine temperature	=TRUE
ر Intake air temperature	<90(°C)
and Conditiion of Wide Open Throttle	=FAI SF
(

Propulsion torque after driving	<900 to 1300(Nm)
assistance coordination	
(see Look-Up-Table #5)	

`

)	
and	
Increased tolerances of air charge	=FALSE
determination expected	
and	
Maximum proportion of evaporating	≤1,99
fuel from the engine oil to the fuel	
demand (model based)	
)	
and	
(
Number of injections for enabling fuel	≥2000(counts)
mixture adaptation	
)	
)	
and	
FRA adaption physically enabled	-TRUE
(-INOL
Torque commanded to charge	>13 00 to 99 998(%)
control	=10.00 to 00.000(70)
(see Look-Up-Table #60)	
and	
Torque commanded to charge	<0 to 40(%)
control	
(see Look-Lin-Table #59)	
)	
)	
and	
Operating mode dependent	=TRUF
Readiness I RA	into 2
(
l ambda closed loop control	-TRUF
unstream catalyst bank 1	-INOL
Enloapment protection of lambda	
	=FALSE
(
Large deceleration enleanment	=FALSE
protection of lambda controller	
Relative fuel mass transient	≥-1500 to -23,016(%)
component threshold for deceleration	
enleanment (see Look-Up-Table #67)	

Relative fuel mass transient component threshold for deceleration enleanment in bank 2 (see Look-Up-	≥-1500 to -23,016(%)
Table #68)	
)	
) OP	
UR (
\ Large acceleration enrichment	-FALSE
protection of lambda controller	
(Relative fuel mass transient	<37.5 to 600(%)
componet threshold for acceleration	
enrichment (Bank 1)	
(see Look-Up-Table #91)	
and	
Relative fuel mass transient	≤37,5 to 600(%)
componet threshold for acceleration	
enrichment (Bank 2)	
(see Look-Up-Table #92)	
)	
)	
) and	
diiu Linstream Lambda closed loop	
control for bank 1	TROL
(
Lambda control disabled during after	=FALSE
cylinder cut-off	
and	
Lambda swtiched ON after fuel cutoff	=TRUE
(EN 05
Fuel cut off is active	=FALSE
ano (
<i>ر</i> Time running down after fuel cut–off	>2(sec)
for enabling lambda control	~2(000)
OR	
(
Absolute value of diffence in lambda	≤0,2
of bank 1	
and	
Difference of counter time and plant	>0(sec)
time constant	
a-(b+c)	
where a is Time running down after	
iuei cut-off for enabling lambda	
CONTION	

b is plant time constant for continuous air/fuel control c is plant parameter for dead time for lambda control)	
) and	
LSU sensor upstream to catalyst ready for operation	=TRUE
(Level of lambda sensor 1 signal quality	≤12
) and	
Lambda control disabled by a fault	=FALSE
Catalyst damaging misfire rate exceeded	=FALSE
Injector power stage fault is active	=FALSE
Camshaft fault in critical operating range present and MAF is main air charge sensor)	=FALSE
and lambda control is active since warmup is finished	=TRUE
and Relative air charge	>0(%)
for time	≥2(sec)
and Lamda control active due to GDI mode change	=TRUE
(GDI mode homogeneous for time)	=TRUE ≥0,8(sec)
)	
and Lambda set point and	≥0,65
Minimum injection time limitation for GDI mode is active and	=FALSE
(Width of dead zone for lambda control deviation OR	<0
Lambda control continuos error	>0

) OR	
(Unrestricted operation of Upstream closed loop lambda controller of bank 2 is active	=TRUE
(Enleanment protection of lambda controller (=FALSE
(Large deceleration enleanment protection of lambda controller	=FALSE
(Relative fuel mass transient component threshold for deceleration enleanment (see Look-Up-Table #67)	≥-1500 to -23,016(%)
and Relative fuel mass transient component threshold for deceleration enleanment in bank 2 (see Look-Up- Table #68))) OR	≥-1500 to -23,016(%)
(Large acceleration enrichment protection of lambda controller	=FALSE
(Relative fuel mass transient componet threshold for acceleration enrichment (Bank 1)	≤37,5 to 600(%)
(see Look-Up-Table #91)	
and	
Relative fuel mass transient componet threshold for acceleration enrichment (Bank 2)	≤37,5 to 600(%)
(see Look-Up-Table #92)	
)))	
and Upstream Lambda closed loop control for bank 2	=TRUE
(Lambda control disabled during after	=FALSE

Lambda swtiched ON after fuel cutoff	=TRUE
(Fuel cut off is active and	=FALSE
(Time running down after fuel cut-off for enabling lambda control OR	>2(sec)
Absolute value of diffence in lambda of bank 2	≤0,2
Difference of counter time and plant time constant a-(b+c) where a is Time running down after fuel cut-off for enabling lambda control	>0(sec)
b is plant time constant of bank 2 for continuous air/fuel control c is plant parameter of bank 2 for dead time for lambda control)	
and LSU sensor upstream to catalyst ready for operation	=TRUE
(Level of lambda sensor 1, bank 2 signal quality	≤12
and Lambda control disabled by a fault	=FALSE
Catalyst damaging misfire rate exceeded	=FALSE
and Injector power stage fault is active	=FALSE
Camshaft fault in critical operating range present and MAF is main air charge sensor	=FALSE
, and lambda control is active since warmup is finished and	=TRUE
Relative air charge	>0(%)
for time	≥2(sec)

and Lamda control active due to GDI mode change	=TRUE
(GDI mode homogeneous for time	=TRUE ≥0,8(sec)
)	
and Lambda set point	≥0,65
and Minimum injection time limitation for	
GDI mode of bank 2 is active and	=FALSE
(Width of dead zone for lambda control deviation	=0
Lambda control continuos error	>0
) for time	>2(sec)
)	22(360)
and (
Difference between lambda value referenced to sensor fitting of bank 1 and bank 2	≥0
and Lambda set point and	<1,1
(
Detection of fuel mixture adaption	=IRUE
Lambda set point of bank 2	>0,87
) OR	
Lambda set point of bank 2	>0,96
) for time	≥Max(A,B)(sec)
where A - delay time for lambda fuel adaption (rich condition) (see Look-Up-Table #65)	=3 to 5(sec)
where B - delay time for lambda fuel adaption (lean condition) (see Look-Up-Table #66)	=3 to 5(sec)
)	
and Limitation due to fuel in oil is deactivated	=TRUE
and Limitation due to fuel in oil is	=TRUE

) and Lambda closed loop control upstream catalyst, bank 2) Multiplicative adaptation correction factor of bank 2)) No pending or confirmed DTCs Basic enable conditions met	=TRUE >0 =see sheet inhibit tables =see sheet enable tables		
P2180	Multiplicative part of the Long Multiplicative part of LTFT Term Fuel Trim for Bank 2 in bank 2 gasoline mode is less than a calibrated threshold.	T for <0),73	LTFT Multiplicative mixture adaptation bank 2 is active	=TRUE	0,2(s)	2 Trip Sim Cond
				(LTFT multiplicative part Bank 2 Integrator is stable which is of the following conditions (=TRUE		
				Condition diagnostic thresholds of multiplicative correction currently exceeded of bank 2 is stable	=TRUE		
				(Multiplicative part of LTFT for bank 2	>1,27		
				OR Multiplicative part of LTFT for bank 2	<0,73		
) OR Similar conditions for multiplicative fuel adaptation fulfilled for bank 2	=TRUE		
				(Difference between Measured and reference Engine speed, bank 2	≤375(rpm)		
				and Difference between reference and measured Engine speed, bank 2	≤375(rpm)		
				and Difference between measured load value to reference load, bank 2	≤20		
				Difference between reference load value to measured load, bank 2	≤20		

) and LTFT multiplicative part Bank 2 is stable, which is the following conditions for time	≥6(sec)
((Condition diagnostic thresholds of multiplicative correction currently exceeded of bank 2 is stable	=TRUE
(Absolute change of LTFT multiplicative part, Bank 2)	≤0,06
OR Absolute change of LTFT multiplicative part, Bank 2	≤0,04
) and (Condition diagnostic thresholds of	=TRUE
multiplicative correction currently exceeded of bank 2 is stable OR	
Change in short term fuel trim, Bank 2)	≤0,04
and Absolute difference between LTFT additive part, Bank 1 and its fixed value at beginning of multiplicative steady	≤1,5(%)
state phase and Multiplicative mixture adaptation is	=TRUE
active, bank 2 ((
Multiplicative mixture adaptation is active, which is the following conditions:	=TRUE
Fra operational readiness independent of the operating mode is active, which is the following conditions for time	≥0(sec)
Fundamental operating mode independent operation readiness of mixture adaption (=TRUE
Condition error suspicion in mixture	=TRUE

,		
(Coolan where adaptiv closed-	t Engine Temperature C - cut-in temperature re precontrol for lambda loop control	≥Min(C, D)(°C) =70,5(°C)
where mixture suspici)	D - cut-in temperature fuel adaptation in case of error on	=57,8(°C)
OR Coolan)	t Engine Temperature	≥70,5(°C)
and Basic v adapta temper	villingness of fuel mixture tion, except engine ature	=TRUE
(Intake	air temperature	<90(°C)
and Conditi (ion of Wide Open Throttle	=FALSE
Prop assista (see L	ulsion torque after driving nce coordination ook-Up-Table #5)	<900 to 1300(Nm)
) and Increas determ and Maximi fuel fro	eed tolerances of air charge ination expected um proportion of evaporating m the engine oil to the fuel	=FALSE ≤1,99
deman) and (d (model based)	
Numbe mixture))	er of injections for enabling fuel adaptation	≥2000(counts)
FRA ac	aption physically enabled	=TRUE
(Torque control (see I	commanded to charge Look-Up-Table #60)	≥13.00 to 99.998(%)
and Torque control (see l	commanded to charge .ook-Up-Table #59)	≤0 to 40(%)

) and	
Operating mode dependent Readiness LRA	=TRUE
(
Lambda closed loop control upstream catalyst, bank 1	=TRUE
(Enleanment protection of lambda controller	=FALSE
Large deceleration enleanment protection of lambda controller	=FALSE
(Relative fuel mass transient component threshold for deceleration enleanment (see Look-Up-Table #67)	≥-1500 to -23,016(%)
and	
Relative fuel mass transient component threshold for deceleration enleanment in bank 2 (see Look-Up- Table #68)	≥-1500 to -23,016(%)
)	
) OR	
(
Large acceleration enrichment protection of lambda controller (=FALSE
Relative fuel mass transient componet threshold for acceleration enrichment (Bank 1)	≤37,5 to 600(%)
(see Look-Up-Table #91)	
and	
Relative fuel mass transient componet threshold for acceleration enrichment (Bank 2)	≤37,5 to 600(%)
(see Look-Up-Table #92)	
)	
))	
) and	
Upstream Lambda closed loop control for bank 1	=TRUE

í

Lambda control disabled during after cylinder cut-off and	=FALSE
Lambda swtiched ON after fuel cutoff	=TRUE
(Fuel cut off is active and (=FALSE
Time running down after fuel cut-off for enabling lambda control OR (>2(sec)
Absolute value of diffence in lambda of bank 1 and	≤0,2
Difference of counter time and plant time constant a-(b+c) where a is Time running down after fuel cut-off for enabling lambda	>0(sec)
control b is plant time constant for continuous air/fuel control c is plant parameter for dead time for lambda control))	
and LSU sensor upstream to catalyst ready for operation	=TRUE
(Level of lambda sensor 1 signal quality)	≤12
Lambda control disabled by a fault	=FALSE
Catalyst damaging misfire rate exceeded and	=FALSE
Injector power stage fault is active and	=FALSE
Camshaft fault in critical operating range present and MAF is main air charge sensor) and	=FALSE
lambda control is active since warmup is finished and	=TRUE

Relative air charge	>0(%)
(for time)	≥2(sec)
and Lamda control active due to GDI mode change	=TRUE
(GDI mode homogeneous for time)	=TRUE ≥0,8(sec)
) and	
Lambda set point	≥0,65
Minimum injection time limitation for GDI mode is active and	=FALSE
(
Width of dead zone for lambda control deviation	<0
Lambda control continuos error)	>0
) OR	
(Unrestricted operation of Upstream closed loop lambda controller of bank 2 is active	=TRUE
(Enleanment protection of lambda controller (=FALSE
(
Large deceleration enleanment protection of lambda controller	=FALSE
Relative fuel mass transient component threshold for deceleration enleanment (see Look-Up-Table #67)	≥-1500 to -23,016(%)
and Relative fuel mass transient component threshold for deceleration enleanment in bank 2 (see Look-Up- Table #68))	≥-1500 to -23,016(%)
, OR (

Large acceleration enrichment protection of lambda controller	=FALSE
Relative fuel mass transient componet threshold for acceleration enrichment (Bank 1)	≤37,5 to 600(%)
(see Look-Up-Table #91)	
and	
Relative fuel mass transient componet threshold for acceleration enrichment (Bank 2)	≤37,5 to 600(%)
(see Look-Up-Table #92)	
)) and Upstream Lambda closed loop	=TRUE
control for bank 2	-
Lambda control disabled during after cylinder cut-off	=FALSE
Lambda swtiched ON after fuel cutoff	=TRUE
(Fuel cut off is active and	=FALSE
Time running down after fuel cut-off for enabling lambda control OR	>2(sec)
(Absolute value of diffence in lambda of bank 2 and	≤0,2
Difference of counter time and plant time constant a-(b+c) where a is Time running down after fuel cut-off for enabling lambda	>0(sec)
control b is plant time constant of bank 2 for continuous air/fuel control c is plant parameter of bank 2 for dead time for lambda control))	
/	

LSU sensor upstream to catalyst ready for operation	=TRUE
(Level of lambda sensor 1, bank 2 signal quality	≤12
) and	
Lambda control disabled by a fault	=FALSE
Catalyst damaging misfire rate exceeded and	=FALSE
Injector power stage fault is active	=FALSE
Camshaft fault in critical operating range present and MAF is main air charge sensor	=FALSE
) and	
lambda control is active since warmup is finished	=TRUE
Relative air charge	>0(%)
(for time	≥2(sec)
and Lamda control active due to GDI mode change	=TRUE
(GDI mode homogeneous for time)	=TRUE ≥0,8(sec)
)	
and Lambda set point	≥0,65
Minimum injection time limitation for GDI mode of bank 2 is active and	=FALSE
(Width of dead zone for lambda control deviation	=0
UK Lambda control continuos error	>0
)	
for time	≥2(sec)
) and	
anu (
1	

P2BF2	Maximum fault of the multiplicative fuel mixture	Multiplicative correction of the mixture adaptation PFI path -	>1,27(-)	Condition FRAPFI-integrator (local) stable - bank 2	=TRUE	2 Trip
				Basic enable conditions met	=see sheet enable tables	
) No pending or confirmed DTCs	=see sheet inhibit tables	
				tactor of bank 2))		
) Multiplicative adaptation correction	>0	
				Lambda closed loop control upstream catalyst, bank 2	=TRUE	
) and		
				Limitation due to fuel in oil is deactivated for bank 2	=TRUE	
				Limitation due to fuel in oil is deactivated and	=IKUE	
) and		
				adaption (lean condition) (see Look-Up-Table #66)	_0 10 0(000)	
				(see Look-Up-Table #65) where B - delay time for lambda fuel	=3 to 5(sec)	
				where A - delay time for lambda fuel adaption (rich condition)	=3 to 5(sec)	
) for time	≥Max(A,B)(sec)	
				, OR Lambda set point of bank 2	>0.96	
				Lambda set point of bank 2	>0,87	
				 Detection of fuel mixture adaption 	=TRUE	
				and (<1,1	
				and bank 2 and Lambda set point	-1 1	

Multiplicative range of mixture adaptation is active on PFI path -	=TRUE
bank 2.	
That means:	
((
Operating mode independent	=TRUE
activation conditions:	
That means:	
(
Basic conditions:	=TRUE
Operation readiness of mixture	
adaption. That means:	
(
Engine coolant temperature	>=70,5(°C)
Injection counter	>=2000(-)
Condition for wide open throttle	=FALSE
Propulsion torque after driving	<(900 to 1300)(Nm)
assistance coordination (see Look-	
Up-Table #5)	
Condition desired lambda for catalyst	=FALSE
heating	
Increased tolerances of air charge	=FALSE
determination expected	
Max. proportion of evaporating fuel	<=1,99(-)
from the engine oil to the fuel	
demand	
Condition to indicate scavenging	=FALSE
Demand for HDEV purge because of	=FALSE
carbonisation	
Intake air temperature	<90(°C)
)	
Coordinated torque request for	<=(0 to 39)(%)
charge (see look-up table #)	
Coordinated torque request for	>=(10 to 99,99)(%)
charge (see look-up table #)	
Condition additive correction of the	=FALSE
mixture adaptation PFI switched off	
Condition multiplicative correction of	=FALSE
the mixture adaptation PFI switched	
off	
)	
Pure port fuel injection is active	=TRUE
For time	>2(sec)
)	
For time	>0(sec)
Operating mode dependent activation	=TRUE
conditions:	
Readiness for function LRA (Lambda	
closed loop control; Adaptive pilot	
control). That means:	
(
Fuel mixture adaptation requirement	=FALSE
detected (no error suspicion)	

Lambda setpoint at sensor mounting position - bank 2	>0,96(-)
Fuel mixture adaptation requirement detected (error suspicion)	=TRUE
Lambda setpoint at sensor mounting	>0,87(-)
Lambda setpoint at sensor mounting position - bank 2	<1,1(-)
, For time where A - delay time for lambda fuel adaption (rich condition)	≥Max(A,B)(sec) =(3 to 5)(sec)
(see Look-Up-Table #65) where B - delay time for lambda fuel adaption (lean condition) (see Look-Up-Table #66)	=(3 to 5)(sec)
Enabling condition for lambda closed loop control upstream catalyst - bank	=TRUE
For time	>=2(sec)
) Limitation of adaptation values because of fuel in oil is deactivated -	=TRUE
Limitation of adaptation values because of fuel in oil is deactivated -	=TRUE
Enabling condition for lambda closed loop control upstream catalyst - bank 2	=TRUE
) Integration speed integrator FRA_IK - bank 2	>0(1/sec)
) Time for stable check of FRAPFI -	>=6(sec)
Absolute value of delta Frai for PFI injection path - bank 2	<=0,06(-)
Condition diagnostic thresholds of multiplicative correction exceeded - bank 2	=TRUE
Condition diagnostic thresholds of multiplicative correction of PFI path exeeded - bank 2	=TRUE
filtered dfrm_w corrected with the P- part of the HK controller - bank 2	<=0,04(-)

				Condition diagnostic thresholds of multiplicative correction of PFI path currently exceeded - bank 2 OR Similar conditions for fra PFI fulfilled - bank 2)	=TRUE =TRUE	
				No pending or confirmed DTCs	=see sheet inhibit tables	
P2BF3	Minimum fault of the multiplicative fuel mixture adaptation value on PFI fuel path - bank 2	Multiplicative correction of the mixture adaptation PFI path - bank 2	<0,73(-)	Condition FRAPFI-integrator (local) stable - bank 2	=TRUE	2 Trip
				(Multiplicative range of mixture adaptation is active on PFI path - bank 2. That means: ((=TRUE	
				Operating mode independent activation conditions: That means:	=TRUE	
				Basic conditions: Operation readiness of mixture adaption. That means:	=TRUE	
				Constitution for which are an effective	>=70,5(°C) >=2000(-)	
				Propulsion for wide open throttle Propulsion torque after driving assistance coordination (see Look- Up-Table #5)	=FALSE <(900 to 1300)(Nm)	
				Condition desired lambda for catalyst heating	=FALSE	
				Increased tolerances of air charge determination expected	=FALSE	
				Max. proportion of evaporating fuel from the engine oil to the fuel demand	<=1,99(-)	
				Condition to indicate scavenging	=FALSE	
				carbonisation		
)	<90(-C)	
				Coordinated torque request for charge (see look-up table #)	<=(0 to 39)(%)	
				Coordinated torque request for charge (see look-up table #)	>=(10 to 99,99)(%)	
				Condition additive correction of the mixture adaptation PFI switched off	=FALSE	

the mixture adaptation PFI switched	=FALSE
) Pure port fuel injection is active For time	=TRUE >2(sec)
) For time Operating mode dependent activation conditions: Readiness for function LRA (Lambda	>0(sec) =TRUE
closed loop control; Adaptive pilot control). That means: (
Fuel mixture adaptation requirement detected (no error suspicion)	=FALSE
Lambda setpoint at sensor mounting position - bank 2	>0,96(-)
Fuel mixture adaptation requirement detected (error suspicion)	=TRUE
Lambda setpoint at sensor mounting	>0,87(-)
Lambda setpoint at sensor mounting	<1,1(-)
) For time where A - delay time for lambda fuel adaption (rich condition)	≥Max(A,B)(sec) =(3 to 5)(sec)
) For time where A - delay time for lambda fuel adaption (rich condition) (see Look-Up-Table #65) where B - delay time for lambda fuel adaption (lean condition) (see Look-Up-Table #66)	≥Max(A,B)(sec) =(3 to 5)(sec) =(3 to 5)(sec)
) For time where A - delay time for lambda fuel adaption (rich condition) (see Look-Up-Table #65) where B - delay time for lambda fuel adaption (lean condition) (see Look-Up-Table #66) (Enabling condition for lambda closed loop control upstream catalyst - bank	≥Max(A,B)(sec) =(3 to 5)(sec) =(3 to 5)(sec) =TRUE
) For time where A - delay time for lambda fuel adaption (rich condition) (see Look-Up-Table #65) where B - delay time for lambda fuel adaption (lean condition) (see Look-Up-Table #66) (Enabling condition for lambda closed loop control upstream catalyst - bank 2 For time	≥Max(A,B)(sec) =(3 to 5)(sec) =(3 to 5)(sec) =TRUE >=2(sec)
) For time where A - delay time for lambda fuel adaption (rich condition) (see Look-Up-Table #65) where B - delay time for lambda fuel adaption (lean condition) (see Look-Up-Table #66) (Enabling condition for lambda closed loop control upstream catalyst - bank 2 For time) Limitation of adaptation values because of fuel in oil is deactivated - bank 1	≥Max(A,B)(sec) =(3 to 5)(sec) =(3 to 5)(sec) =TRUE >=2(sec) =TRUE
) For time where A - delay time for lambda fuel adaption (rich condition) (see Look-Up-Table #65) where B - delay time for lambda fuel adaption (lean condition) (see Look-Up-Table #66) (Enabling condition for lambda closed loop control upstream catalyst - bank 2 For time) Limitation of adaptation values because of fuel in oil is deactivated - bank 1 Limitation of adaptation values because of fuel in oil is deactivated - bank 2	≥Max(A,B)(sec) =(3 to 5)(sec) =(3 to 5)(sec) =TRUE >=2(sec) =TRUE =TRUE
) For time where A - delay time for lambda fuel adaption (rich condition) (see Look-Up-Table #65) where B - delay time for lambda fuel adaption (lean condition) (see Look-Up-Table #66) (Enabling condition for lambda closed loop control upstream catalyst - bank 2 For time) Limitation of adaptation values because of fuel in oil is deactivated - bank 1 Limitation of adaptation values because of fuel in oil is deactivated - bank 2 Enabling condition for lambda closed loop control upstream catalyst - bank 2	≥Max(A,B)(sec) =(3 to 5)(sec) =(3 to 5)(sec) =TRUE >=2(sec) =TRUE =TRUE =TRUE

					Time for stable check of FRAPFI - bank 2 Absolute value of delta Frai for PFI injection path - bank 2 (>=6(sec) <=0,06(-)	
					Condition diagnostic thresholds of multiplicative correction exceeded - bank 2 OR	TRUE	
					Condition diagnostic thresholds of multiplicative correction of PFI path exeeded - bank 2 OR	=IRUE	
					filtered dfrm_w corrected with the P- part of the HK controller - bank 2) (<=0,04(-)	
					Condition diagnostic thresholds of multiplicative correction of PFI path currently exceeded - bank 2 OR	=TRUE	
					Similar conditions for fra PFI fulfilled - bank 2)	=TRUE	
l					No pending or confirmed DTCs	=see sheet inhibit tables	
	P2BF0	Maximum fault of the multiplicative fuel mixture adaptation value on PFI fuel path - bank 1	Multiplicative correction of the mixture adaptation PFI path - bank 1	>1,27(-)	Condition FRAPFI-integrator (local) stable - bank 1	=TRUE	2 Trip
	P2BF0	Maximum fault of the multiplicative fuel mixture adaptation value on PFI fuel path - bank 1	Multiplicative correction of the mixture adaptation PFI path - bank 1	>1,27(-)	Condition FRAPFI-integrator (local) stable - bank 1 (Multiplicative range of mixture adaptation is active on PFI path - bank 1. That means:	=TRUE =TRUE	2 Trip
	P2BF0	Maximum fault of the multiplicative fuel mixture adaptation value on PFI fuel path - bank 1	Multiplicative correction of the mixture adaptation PFI path - bank 1	>1,27(-)	Condition FRAPFI-integrator (local) stable - bank 1 (Multiplicative range of mixture adaptation is active on PFI path - bank 1. That means: ((Operating mode independent activation conditions: That means: (=TRUE =TRUE	2 Trip
	P2BF0	Maximum fault of the multiplicative fuel mixture adaptation value on PFI fuel path - bank 1	Multiplicative correction of the mixture adaptation PFI path - bank 1	>1,27(-)	Condition FRAPFI-integrator (local) stable - bank 1 (Multiplicative range of mixture adaptation is active on PFI path - bank 1. That means: ((Operating mode independent activation conditions: That means: (Basic conditions: Operation readiness of mixture adaption. That means: (=TRUE =TRUE =TRUE	2 Trip
	P2BF0	Maximum fault of the multiplicative fuel mixture adaptation value on PFI fuel path - bank 1	Multiplicative correction of the mixture adaptation PFI path - bank 1	>1,27(-)	Condition FRAPFI-integrator (local) stable - bank 1 (Multiplicative range of mixture adaptation is active on PFI path - bank 1. That means: ((Operating mode independent activation conditions: That means: (Basic conditions: Operation readiness of mixture adaption. That means: (Engine coolant temperature Injection counter	=TRUE =TRUE =TRUE >=70,5(°C) >=2000(-)	2 Trip
	P2BF0	Maximum fault of the multiplicative fuel mixture adaptation value on PFI fuel path - bank 1	Multiplicative correction of the mixture adaptation PFI path - bank 1	>1,27(-)	Condition FRAPFI-integrator (local) stable - bank 1 (Multiplicative range of mixture adaptation is active on PFI path - bank 1. That means: ((Operating mode independent activation conditions: That means: (Basic conditions: Operation readiness of mixture adaption. That means: (Engine coolant temperature Injection counter Condition for wide open throttle Propulsion tergue after driving	=TRUE =TRUE =TRUE =TRUE >=70,5(°C) >=2000(-) =FALSE <(000 to 1200)(Nm)	2 Trip
	P2BF0	Maximum fault of the multiplicative fuel mixture adaptation value on PFI fuel path - bank 1	Multiplicative correction of the mixture adaptation PFI path - bank 1	>1,27(-)	Condition FRAPFI-integrator (local) stable - bank 1 (Multiplicative range of mixture adaptation is active on PFI path - bank 1. That means: ((Operating mode independent activation conditions: That means: (Basic conditions: Operation readiness of mixture adaption. That means: (Engine coolant temperature Injection counter Condition for wide open throttle Propulsion torque after driving assistance coordination (see Look- Up-Table #5)	=TRUE =TRUE =TRUE =TRUE >=70,5(°C) >=2000(-) =FALSE <(900 to 1300)(Nm)	2 Trip

Increased tolerances of air charge	=FALSE
Max. proportion of evaporating fuel from the engine oil to the fuel	<=1,99(-)
demand Condition to indicate scavenging Demand for HDEV purge because of carbonisation	=FALSE =FALSE
Intake air temperature	<90(°C)
) Coordinated torque request for charge (see look-up table #)	<=(0 to 39)(%)
Coordinated torque request for charge (see look-up table #)	>=(10 to 99,99)(%)
Condition additive correction of the mixture adaptation PEI switched off	=FALSE
Condition multiplicative correction of the mixture adaptation PFI switched off	=FALSE
) Pure port fuel injection is active For time	=TRUE >2(sec)
) For time Operating mode dependent activation	>0(sec) =TRUE
Readiness for function LRA (Lambda closed loop control; Adaptive pilot control). That means:	
(Fuel mixture adaptation requirement detected (no error suspicion)	=FALSE
Lambda setpoint at sensor mounting position - bank 1	>0,96(-)
Fuel mixture adaptation requirement detected (error suspicion)	=TRUE
Lambda setpoint at sensor mounting	>0,87(-)
Lambda setpoint at sensor mounting position - bank 1	<1,1(-)
) For time	≥Max(A,B)(sec)
where A - delay time for lambda fuel adaption (rich condition)	=(3 to 5)(sec)
where B - delay time for lambda fuel adaption (lean condition) (see Look-Up-Table #66)	=(3 to 5)(sec)

(

				Enabling condition for lambda closed loop control upstream catalyst - bank 1	=TRUE	
				For time	>=2(sec)	
) Limitation of adaptation values because of fuel in oil is deactivated - bank 1	=TRUE	
				Limitation of adaptation values because of fuel in oil is deactivated - bank 2	=TRUE	
				Enabling condition for lambda closed loop control upstream catalyst - bank 1	=TRUE	
) Integration speed integrator FRA_IK - bank 1)	>0(1/sec)	
				/ Time for stable check of FRAPFI - bank 1	>=6(sec)	
				Absolute value of delta Frai for PFI injection path - bank 1	<=0,06(-)	
				Condition diagnostic thresholds of multiplicative correction exceeded - bank 1 OR	=TRUE	
				Condition diagnostic thresholds of multiplicative correction of PFI path exeeded - bank 1 OR	=TRUE	
				filtered dfrm_w corrected with the P- part of the HK controller - bank 1)	<=0,04(-)	
				Condition diagnostic thresholds of multiplicative correction of PFI path currently exceeded - bank 1	=TRUE	
				Similar conditions for fra PFI fulfilled - bank 1	=TRUE	
) No pending or confirmed DTCs	=see sheet inhibit tables	
P2BF1	Minimum fault of the multiplicative fuel mixture adaptation value on PFI fuel path - bank 1	Multiplicative correction of the mixture adaptation PFI path - bank 1	<0,73(-)	Condition FRAPFI-integrator (local) stable - bank 1	=TRUE	2 Trip
				(Multiplicative range of mixture adaptation is active on PFI path - bank 1.	=TRUE	
			ECM Section 99 of 772	That means:		211 o

11	
((Operating mode independent activation conditions: That means:	=TRUE
(Basic conditions: Operation readiness of mixture adaption. That means:	=TRUE
(Engine coolant temperature Injection counter Condition for wide open throttle Propulsion torque after driving assistance coordination (see Look-	>=70,5(°C) >=2000(-) =FALSE <(900 to 1300)(Nm)
Up-Table #5) Condition desired lambda for catalyst	=FALSE
Increased tolerances of air charge	=FALSE
determination expected Max. proportion of evaporating fuel from the engine oil to the fuel	<=1,99(-)
Condition to indicate scavenging Demand for HDEV purge because of	=FALSE =FALSE
carbonisation Intake air temperature	<90(°C)
) Coordinated torque request for charge (see look-up table #)	<=(0 to 39)(%)
Coordinated torque request for charge (see look-up table #)	>=(10 to 99,99)(%)
Condition additive correction of the	=FALSE
Condition multiplicative correction of the mixture adaptation PFI switched off	=FALSE
) Pure port fuel injection is active For time	=TRUE >2(sec)
For time Operating mode dependent activation conditions: Readiness for function LRA (Lambda	>0(sec) =TRUE
closed loop control; Adaptive pilot control). That means:	
v Fuel mixture adaptation requirement detected (no error suspicion)	=FALSE
Lambda setpoint at sensor mounting position - bank 1 OR	>0,96(-)

Fuel mixture adaptation requirement detected (error suspicion)	=TRUE
Lambda setpoint at sensor mounting	>0,87(-)
Lambda setpoint at sensor mounting position - bank 1	<1,1(-)
, For time where A - delay time for lambda fuel adaption (rich condition)	≥Max(A,B)(sec) =(3 to 5)(sec)
(see Look-Up-Table #65) where B - delay time for lambda fuel adaption (lean condition) (see Look-Up-Table #66)	=(3 to 5)(sec)
(Enabling condition for lambda closed loop control upstream catalyst - bank	=TRUE
For time	>=2(sec)
) Limitation of adaptation values because of fuel in oil is deactivated -	=TRUE
Limitation of adaptation values because of fuel in oil is deactivated -	=TRUE
Enabling condition for lambda closed loop control upstream catalyst - bank	=TRUE
) Integration speed integrator FRA_IK - bank 1	>0(1/sec)
) Time for stable check of FRAPFI -	>=6(sec)
Absolute value of delta Frai for PFI injection path - bank 1	<=0,06(-)
Condition diagnostic thresholds of multiplicative correction exceeded - bank 1	=TRUE
Condition diagnostic thresholds of multiplicative correction of PFI path exeeded - bank 1	=TRUE
filtered dfrm_w corrected with the P- part of the HK controller - bank 1)	<=0,04(-)
 Condition diagnostic thresholds of multiplicative correction of PFI path 	=TRUE

					OR Similar conditions for fra PFI fulfilled - bank 1) No pending or confirmed DTCs	=TRUE =see sheet inhibit tables	
ľ	P21FA	Maximum fault of the additive fuel mixture adaptation value on PFI fuel path - bank 2	Additive correction of the mixture adaptation PFI path - bank 2	>5,8125(-)	Condition ORAPFI-integrator stable was set after FRAPFI-integrator stable on PFI path - bank 2	=TRUE	2 Trip
					(Condition FRAPFI-integrator (local) stable - bank 2 (=TRUE	
					 Multiplicative range of mixture adaptation is active on PFI path - bank 2. That means: 	=TRUE	
					((Operating mode independent activation conditions: That means:	=TRUE	
					(Basic conditions: Operation readiness of mixture adaption. That means:	=TRUE	
					(Engine coolant temperature Injection counter Condition for wide open throttle Propulsion torque after driving assistance coordination (see Look-	>=70,5(°C) >=2000(-) =FALSE <(900 to 1300)(Nm)	
					Condition desired lambda for catalyst heating	=FALSE	
					Increased tolerances of air charge determination expected Max. proportion of evaporating fuel	=FALSE <=1,99(-)	
					demand Condition to indicate scavenging Demand for HDEV purge because of	=FALSE =FALSE	
					carbonisation Intake air temperature)	<90(°C)	
					Coordinated torque request for charge (see look-up table #)	<=(0 to 39)(%)	
					Coordinated torque request for charge (see look-up table #) Condition additive correction of the mixture adaptation PFI switched off	>=(10 to 99,99)(%) =FALSE	

Condition multiplicative correction of	=FALSE
off	
)	
Pure port fuel injection is active	=TRUE
For time	>2(sec)
)	
For time	>0(sec)
Operating mode dependent activation conditions:	=TRUE
Readiness for function LRA (Lambda	
closed loop control; Adaptive pilot	
control). That means:	
(
Fuel mixture adaptation requirement	=FALSE
detected (no error suspicion)	
Lambda astroint at concor mounting	> 0.06()
Lambua selpoint at sensor mounting	>0,90(-)
OR	
Fuel mixture adaptation requirement	=TRUE
detected (error suspicion)	
Lambda setpoint at sensor mounting	>0,87(-)
position - bank 2	
Lambda setpoint at sensor mounting	<1,1(-)
position - bank 2	
For time	≥Max(A,B)(sec)
For time where A - delay time for lambda fuel	≥Max(A,B)(sec) =(3 to 5)(sec)
For time where A - delay time for lambda fuel adaption (rich condition) (see Look-Up-Table #65)	≥Max(A,B)(sec) =(3 to 5)(sec)
For time where A - delay time for lambda fuel adaption (rich condition) (see Look-Up-Table #65) where B - delay time for lambda fuel	≥Max(A,B)(sec) =(3 to 5)(sec)
For time where A - delay time for lambda fuel adaption (rich condition) (see Look-Up-Table #65) where B - delay time for lambda fuel adaption (lean condition)	≥Max(A,B)(sec) =(3 to 5)(sec) =(3 to 5)(sec)
For time where A - delay time for lambda fuel adaption (rich condition) (see Look-Up-Table #65) where B - delay time for lambda fuel adaption (lean condition) (see Look-Up-Table #66)	≥Max(A,B)(sec) =(3 to 5)(sec) =(3 to 5)(sec)
For time where A - delay time for lambda fuel adaption (rich condition) (see Look-Up-Table #65) where B - delay time for lambda fuel adaption (lean condition) (see Look-Up-Table #66) (≥Max(A,B)(sec) =(3 to 5)(sec) =(3 to 5)(sec)
For time where A - delay time for lambda fuel adaption (rich condition) (see Look-Up-Table #65) where B - delay time for lambda fuel adaption (lean condition) (see Look-Up-Table #66) (Enabling condition for lambda closed	≥Max(A,B)(sec) =(3 to 5)(sec) =(3 to 5)(sec) =TRUE
For time where A - delay time for lambda fuel adaption (rich condition) (see Look-Up-Table #65) where B - delay time for lambda fuel adaption (lean condition) (see Look-Up-Table #66) (Enabling condition for lambda closed loop control upstream catalyst - bank	≥Max(A,B)(sec) =(3 to 5)(sec) =(3 to 5)(sec) =TRUE
For time where A - delay time for lambda fuel adaption (rich condition) (see Look-Up-Table #65) where B - delay time for lambda fuel adaption (lean condition) (see Look-Up-Table #66) (Enabling condition for lambda closed loop control upstream catalyst - bank 2	≥Max(A,B)(sec) =(3 to 5)(sec) =(3 to 5)(sec) =TRUE
For time where A - delay time for lambda fuel adaption (rich condition) (see Look-Up-Table #65) where B - delay time for lambda fuel adaption (lean condition) (see Look-Up-Table #66) (Enabling condition for lambda closed loop control upstream catalyst - bank 2 For time	≥Max(A,B)(sec) =(3 to 5)(sec) =(3 to 5)(sec) =TRUE >=2(sec)
For time where A - delay time for lambda fuel adaption (rich condition) (see Look-Up-Table #65) where B - delay time for lambda fuel adaption (lean condition) (see Look-Up-Table #66) (Enabling condition for lambda closed loop control upstream catalyst - bank 2 For time)	≥Max(A,B)(sec) =(3 to 5)(sec) =(3 to 5)(sec) =TRUE >=2(sec)
For time where A - delay time for lambda fuel adaption (rich condition) (see Look-Up-Table #65) where B - delay time for lambda fuel adaption (lean condition) (see Look-Up-Table #66) (Enabling condition for lambda closed loop control upstream catalyst - bank 2 For time) Limitation of adaptation values	≥Max(A,B)(sec) =(3 to 5)(sec) =(3 to 5)(sec) =TRUE >=2(sec) =TRUE
For time where A - delay time for lambda fuel adaption (rich condition) (see Look-Up-Table #65) where B - delay time for lambda fuel adaption (lean condition) (see Look-Up-Table #66) (Enabling condition for lambda closed loop control upstream catalyst - bank 2 For time) Limitation of adaptation values because of fuel in oil is deactivated - bank 1	≥Max(A,B)(sec) =(3 to 5)(sec) =(3 to 5)(sec) =TRUE >=2(sec) =TRUE
For time where A - delay time for lambda fuel adaption (rich condition) (see Look-Up-Table #65) where B - delay time for lambda fuel adaption (lean condition) (see Look-Up-Table #66) (Enabling condition for lambda closed loop control upstream catalyst - bank 2 For time) Limitation of adaptation values because of fuel in oil is deactivated - bank 1	≥Max(A,B)(sec) =(3 to 5)(sec) =(3 to 5)(sec) =TRUE >=2(sec) =TRUE _TRUE
For time where A - delay time for lambda fuel adaption (rich condition) (see Look-Up-Table #65) where B - delay time for lambda fuel adaption (lean condition) (see Look-Up-Table #66) (Enabling condition for lambda closed loop control upstream catalyst - bank 2 For time) Limitation of adaptation values because of fuel in oil is deactivated - bank 1 Limitation of adaptation values	≥Max(A,B)(sec) =(3 to 5)(sec) =(3 to 5)(sec) =TRUE >=2(sec) =TRUE =TRUE
For time where A - delay time for lambda fuel adaption (rich condition) (see Look-Up-Table #65) where B - delay time for lambda fuel adaption (lean condition) (see Look-Up-Table #66) (Enabling condition for lambda closed loop control upstream catalyst - bank 2 For time) Limitation of adaptation values because of fuel in oil is deactivated - bank 1 Limitation of adaptation values because of fuel in oil is deactivated - bank 2	≥Max(A,B)(sec) =(3 to 5)(sec) =(3 to 5)(sec) =TRUE >=2(sec) =TRUE =TRUE
For time where A - delay time for lambda fuel adaption (rich condition) (see Look-Up-Table #65) where B - delay time for lambda fuel adaption (lean condition) (see Look-Up-Table #66) (Enabling condition for lambda closed loop control upstream catalyst - bank 2 For time) Limitation of adaptation values because of fuel in oil is deactivated - bank 1 Limitation of adaptation values because of fuel in oil is deactivated - bank 2 Enabling condition for lambda closed	≥Max(A,B)(sec) =(3 to 5)(sec) =(3 to 5)(sec) =TRUE >=2(sec) =TRUE =TRUE =TRUE
For time where A - delay time for lambda fuel adaption (rich condition) (see Look-Up-Table #65) where B - delay time for lambda fuel adaption (lean condition) (see Look-Up-Table #66) (Enabling condition for lambda closed loop control upstream catalyst - bank 2 For time) Limitation of adaptation values because of fuel in oil is deactivated - bank 1 Limitation of adaptation values because of fuel in oil is deactivated - bank 2 Enabling condition for lambda closed loop control upstream catalyst - bank	≥Max(A,B)(sec) =(3 to 5)(sec) =(3 to 5)(sec) =TRUE >=2(sec) =TRUE =TRUE =TRUE
For time where A - delay time for lambda fuel adaption (rich condition) (see Look-Up-Table #65) where B - delay time for lambda fuel adaption (lean condition) (see Look-Up-Table #66) (Enabling condition for lambda closed loop control upstream catalyst - bank 2 For time) Limitation of adaptation values because of fuel in oil is deactivated - bank 1 Limitation of adaptation values because of fuel in oil is deactivated - bank 2 Enabling condition for lambda closed loop control upstream catalyst - bank 2	≥Max(A,B)(sec) =(3 to 5)(sec) =(3 to 5)(sec) =TRUE >=2(sec) =TRUE =TRUE =TRUE
For time where A - delay time for lambda fuel adaption (rich condition) (see Look-Up-Table #65) where B - delay time for lambda fuel adaption (lean condition) (see Look-Up-Table #66) (Enabling condition for lambda closed loop control upstream catalyst - bank 2 For time) Limitation of adaptation values because of fuel in oil is deactivated - bank 1 Limitation of adaptation values because of fuel in oil is deactivated - bank 2 Enabling condition for lambda closed loop control upstream catalyst - bank 2	≥Max(A,B)(sec) =(3 to 5)(sec) =(3 to 5)(sec) =TRUE >=2(sec) =TRUE =TRUE =TRUE
For time where A - delay time for lambda fuel adaption (rich condition) (see Look-Up-Table #65) where B - delay time for lambda fuel adaption (lean condition) (see Look-Up-Table #66) (Enabling condition for lambda closed loop control upstream catalyst - bank 2 For time) Limitation of adaptation values because of fuel in oil is deactivated - bank 1 Limitation of adaptation values because of fuel in oil is deactivated - bank 2 Enabling condition for lambda closed loop control upstream catalyst - bank 2 ioop control upstream catalyst - bank 2) Integration speed integrator FRA_IK -	<pre>≥Max(A,B)(sec) =(3 to 5)(sec) =(3 to 5)(sec) =TRUE >=2(sec) =TRUE =TRUE =TRUE >0(1/sec)</pre>

Ti	me for stable check of FRAPFI -	>=6(sec)
Al	psolute value of delta Frai for PFI jection path - bank 2	<=0,06(-)
(C m ba	ondition diagnostic thresholds of ultiplicative correction exceeded - ank 2	=TRUE
O C m e>	R ondition diagnostic thresholds of ultiplicative correction of PFI path eeded - bank 2	=TRUE
O fili pa)	R tered dfrm_w corrected with the P- art of the HK controller - bank 2	<=0,04(-)
(C m cu	ondition diagnostic thresholds of ultiplicative correction of PFI path urrently exceeded - bank 2	=TRUE
O Si ba)	R milar conditions for fra PFI fulfilled - ank 2	=TRUE
O C (F	R ondition FRA stable since last DCY PFI)	=TRUE
) C(st	ondition ORAPFI-integrator (local) able - bank 2	=TRUE
(Ad is Th	dditive range of mixture adaptation active on PFI path - bank 2. nat means:	=TRUE
((O ac Th	perating mode independent ctivation conditions: nat means:	=TRUE
(Ba O ac	asic conditions: peration readiness of mixture daption. That means:	=TRUE
(Er Di Ci Pr as	ngine coolant temperature jection counter ondition for wide open throttle ropulsion torque after driving ssistance coordination (see Look- o-Table #5)	>=70,5(°C) >=2000(-) =FALSE <900 to 1300(Nm)
C	ondition desired lambda for catalyst	=FALSE
In	creased tolerances of air charge	=FALSE
Max. proportion of evaporating fuel from the engine oil to the fuel	<=1,99(-)	
---	-------------------	
demand		
Condition to indicate scavenging	=FALSE	
Demand for HDEV purge because of	=FALSE	
carbonisation		
Intake air temperature	<90(°C)	
)		
Coordinated torgue request for	<=0 to 18(%)	
charge (see look-up table #81)		
Coordinated torque request for	>=2.5 to 99.99(%)	
charge (see look-up table #80)	,	
Condition additive correction of the	=FALSE	
mixture adaptation PEI switched off		
Condition multiplicative correction of	=FALSE	
the mixture adaptation PEI switched	171202	
off		
) Pure port fuel injection is active		
For time	=11(0L	
	>2(560)	
) For time	· (/222)	
Por unite	>U(Sec)	
Operating mode dependent activation	=IRUE	
conditions:		
Readiness for function LRA (Lambda		
closed loop control; Adaptive pilot		
control). That means:		
(
Fuel mixture adaptation requirement	=FALSE	
detected (no error suspicion)		
Lambda setpoint at sensor mounting	>0,96(-)	
position - bank 2		
OR		
Fuel mixture adaptation requirement	=TRUE	
detected (error suspicion)		
Lambda setpoint at sensor mounting	>0,87(-)	
position - bank 2		
Lambda setpoint at sensor mounting	<1,1(-)	
position - bank 2		
)		
For time	≥Max(A,B)(sec)	
where A - delay time for lambda fuel	=(3 to 5)(sec)	
adaption (rich condition)		
(see Look-Up-Table #65)		
where B - delay time for lambda fuel	=(3 to 5)(sec)	
adaption (lean condition)		
(see Look-Up-Table #66)		
(
Enabling condition for lambda closed	=TRUE	
loop control upstream catalyst - bank		
2		
For time	2-2/coc)	

) Limitation of adaptation values because of fuel in oil is deactivated -	=TRUE	
				bank 1 Limitation of adaptation values because of fuel in oil is deactivated - bank 2	=TRUE	
				Enabling condition for lambda closed loop control upstream catalyst - bank 2)	=TRUE	
				Integration speed integrator ORA_IK - bank 2	>0(1/sec)	
				, Time for stable check of ORAPFI - bank 2	>=10(sec)	
				Absolute value of delta Orai for PFI injection path - bank 2 (<=0,188(-)	
				Condition diagnostic thresholds of additive correction exceeded - bank 2	=TRUE	
				OR Condition diagnostic thresholds of additive correction of PFI path exeeded - bank 2 OR	=TRUE	
				filtered dfrm_w corrected with the P- part of the HK controller - bank 2) (<=0,04(-)	
				Condition diagnostic thresholds of additive correction of PFI path currently exceeded - bank 2 OR	=TRUE	
				Similar conditions for ORAPFI fulfilled - bank 2)	=TRUE	
				No pending or confirmed DTCs	=see sheet inhibit tables	
P21FB	Minimum fault of the additive fuel mixture adaptation value on PFI fuel path - bank 2	Additive correction of the mixture adaptation PFI path bank 2	5,484(-)	Condition ORAPFI-integrator stable was set after FRAPFI-integrator stable on PFI path - bank 2	=TRUE	2 Trip
				Condition FRAPFI-integrator (local) stable - bank 2 (=TRUE	
				Multiplicative range of mixture adaptation is active on PFI path - bank 2. That means:	=TRUE	
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Operating mode independent activation conditions:	=TRUE
That means:	
(
Basic conditions:	=TRUE
Operation readiness of mixture	
adaption. That means:	
(
Engine coolant temperature	>=70,5(°C)
Injection counter	>=2000(-)
Condition for wide open throttle	=FALSE
Propulsion torque after driving	<900 to 1300(Nm)
assistance coordination (see Look-	()
Up-Table #5)	
Condition desired lambda for catalyst	=FALSE
heating	
Increased tolerances of air charge	=FALSE
determination expected	
Max proportion of evaporating fuel	<=1.99(-)
from the engine oil to the fuel	(),00()
demand	
Condition to indicate scavenging	=FALSE
Demand for HDEV purge because of	=FALSE
carbonisation	
Intake air temperature	<90(°C)
Coordinated torque request for	$(0, t_{2}, 0, 0)(0/)$
	<=(0.10.39)(%)
charge (see look-up table #)	<=(0 to 39)(%)
charge (see look-up table #) Coordinated torque request for	<=(0 to 39)(%) >=(10 to 99 99)(%)
charge (see look-up table #) Coordinated torque request for charge (see look-up table #)	<=(0 to 39)(%)
charge (see look-up table #) Coordinated torque request for charge (see look-up table #) Condition additive correction of the	<=(0 to 39)(%) >=(10 to 99,99)(%) =FALSE
charge (see look-up table #) Coordinated torque request for charge (see look-up table #) Condition additive correction of the mixture adaptation PEI switched off	<=(0 to 39)(%) >=(10 to 99,99)(%) =FALSE
charge (see look-up table #) Coordinated torque request for charge (see look-up table #) Condition additive correction of the mixture adaptation PFI switched off Condition multiplicative correction of	<=(0 to 39)(%) >=(10 to 99,99)(%) =FALSE =FALSE
charge (see look-up table #) Coordinated torque request for charge (see look-up table #) Condition additive correction of the mixture adaptation PFI switched off Condition multiplicative correction of the mixture adaptation PFI switched	<=(0 to 39)(%) >=(10 to 99,99)(%) =FALSE =FALSE
charge (see look-up table #) Coordinated torque request for charge (see look-up table #) Condition additive correction of the mixture adaptation PFI switched off Condition multiplicative correction of the mixture adaptation PFI switched off	<=(0 to 39)(%) >=(10 to 99,99)(%) =FALSE =FALSE
charge (see look-up table #) Coordinated torque request for charge (see look-up table #) Condition additive correction of the mixture adaptation PFI switched off Condition multiplicative correction of the mixture adaptation PFI switched off	<=(0 to 39)(%) >=(10 to 99,99)(%) =FALSE =FALSE
charge (see look-up table #) Coordinated torque request for charge (see look-up table #) Condition additive correction of the mixture adaptation PFI switched off Condition multiplicative correction of the mixture adaptation PFI switched off) Pure port fuel injection is active	<=(0 to 39)(%) >=(10 to 99,99)(%) =FALSE =FALSE
charge (see look-up table #) Coordinated torque request for charge (see look-up table #) Condition additive correction of the mixture adaptation PFI switched off Condition multiplicative correction of the mixture adaptation PFI switched off) Pure port fuel injection is active For time	<=(0 to 39)(%) >=(10 to 99,99)(%) =FALSE =FALSE =TRUE >2(sec)
charge (see look-up table #) Coordinated torque request for charge (see look-up table #) Condition additive correction of the mixture adaptation PFI switched off Condition multiplicative correction of the mixture adaptation PFI switched off) Pure port fuel injection is active For time)	<=(0 to 39)(%) >=(10 to 99,99)(%) =FALSE =FALSE =TRUE >2(sec)
charge (see look-up table #) Coordinated torque request for charge (see look-up table #) Condition additive correction of the mixture adaptation PFI switched off Condition multiplicative correction of the mixture adaptation PFI switched off) Pure port fuel injection is active For time) For time	<=(0 to 39)(%) >=(10 to 99,99)(%) =FALSE =FALSE =TRUE >2(sec) >0(sec)
charge (see look-up table #) Coordinated torque request for charge (see look-up table #) Condition additive correction of the mixture adaptation PFI switched off Condition multiplicative correction of the mixture adaptation PFI switched off) Pure port fuel injection is active For time) For time Operating mode dependent activation	<=(0 to 39)(%) >=(10 to 99,99)(%) =FALSE =FALSE =TRUE >2(sec) >0(sec) =TRUE
charge (see look-up table #) Coordinated torque request for charge (see look-up table #) Condition additive correction of the mixture adaptation PFI switched off Condition multiplicative correction of the mixture adaptation PFI switched off) Pure port fuel injection is active For time) For time Operating mode dependent activation conditions:	<=(0 to 39)(%) >=(10 to 99,99)(%) =FALSE =FALSE =TRUE >2(sec) >0(sec) =TRUE
charge (see look-up table #) Coordinated torque request for charge (see look-up table #) Condition additive correction of the mixture adaptation PFI switched off Condition multiplicative correction of the mixture adaptation PFI switched off) Pure port fuel injection is active For time) For time Operating mode dependent activation conditions: Readiness for function LRA (Lambda	<=(0 to 39)(%) >=(10 to 99,99)(%) =FALSE =FALSE =TRUE >2(sec) >0(sec) =TRUE
charge (see look-up table #) Coordinated torque request for charge (see look-up table #) Condition additive correction of the mixture adaptation PFI switched off Condition multiplicative correction of the mixture adaptation PFI switched off) Pure port fuel injection is active For time) For time Operating mode dependent activation conditions: Readiness for function LRA (Lambda closed loop control: Adaptive pilot	<=(0 to 39)(%) >=(10 to 99,99)(%) =FALSE =FALSE =TRUE >2(sec) >0(sec) =TRUE
charge (see look-up table #) Coordinated torque request for charge (see look-up table #) Condition additive correction of the mixture adaptation PFI switched off Condition multiplicative correction of the mixture adaptation PFI switched off) Pure port fuel injection is active For time) For time Operating mode dependent activation conditions: Readiness for function LRA (Lambda closed loop control; Adaptive pilot control). That means:	<=(0 to 39)(%) >=(10 to 99,99)(%) =FALSE =FALSE =TRUE >2(sec) >0(sec) =TRUE
charge (see look-up table #) Coordinated torque request for charge (see look-up table #) Condition additive correction of the mixture adaptation PFI switched off Condition multiplicative correction of the mixture adaptation PFI switched off) Pure port fuel injection is active For time) For time Operating mode dependent activation conditions: Readiness for function LRA (Lambda closed loop control; Adaptive pilot control). That means: (<=(0 to 39)(%) >=(10 to 99,99)(%) =FALSE =FALSE =TRUE >2(sec) >0(sec) =TRUE
charge (see look-up table #) Coordinated torque request for charge (see look-up table #) Condition additive correction of the mixture adaptation PFI switched off Condition multiplicative correction of the mixture adaptation PFI switched off) Pure port fuel injection is active For time) For time Operating mode dependent activation conditions: Readiness for function LRA (Lambda closed loop control; Adaptive pilot control). That means: (Fuel mixture adaptation requirement	<=(0 to 39)(%) >=(10 to 99,99)(%) =FALSE =FALSE =TRUE >2(sec) >0(sec) =TRUE =FALSE
charge (see look-up table #) Coordinated torque request for charge (see look-up table #) Condition additive correction of the mixture adaptation PFI switched off Condition multiplicative correction of the mixture adaptation PFI switched off) Pure port fuel injection is active For time) For time Operating mode dependent activation conditions: Readiness for function LRA (Lambda closed loop control; Adaptive pilot control). That means: (Fuel mixture adaptation requirement detected (error suspicion)	<=(0 to 39)(%) >=(10 to 99,99)(%) =FALSE =FALSE =TRUE >2(sec) >0(sec) =TRUE =FALSE
charge (see look-up table #) Coordinated torque request for charge (see look-up table #) Condition additive correction of the mixture adaptation PFI switched off Condition multiplicative correction of the mixture adaptation PFI switched off) Pure port fuel injection is active For time) For time Operating mode dependent activation conditions: Readiness for function LRA (Lambda closed loop control; Adaptive pilot control). That means: (Fuel mixture adaptation requirement detected (error suspicion)	<=(0 to 39)(%) >=(10 to 99,99)(%) =FALSE =FALSE =TRUE >2(sec) >0(sec) =TRUE =FALSE
charge (see look-up table #) Coordinated torque request for charge (see look-up table #) Condition additive correction of the mixture adaptation PFI switched off Condition multiplicative correction of the mixture adaptation PFI switched off) Pure port fuel injection is active For time) For time Operating mode dependent activation conditions: Readiness for function LRA (Lambda closed loop control; Adaptive pilot control). That means: (Fuel mixture adaptation requirement detected (error suspicion) Lambda setpoint at sensor mounting	<=(0 to 39)(%) >=(10 to 99,99)(%) =FALSE =FALSE =TRUE >2(sec) >0(sec) =TRUE =FALSE >0,96(-)
charge (see look-up table #) Coordinated torque request for charge (see look-up table #) Condition additive correction of the mixture adaptation PFI switched off Condition multiplicative correction of the mixture adaptation PFI switched off) Pure port fuel injection is active For time) For time Operating mode dependent activation conditions: Readiness for function LRA (Lambda closed loop control; Adaptive pilot control). That means: (Fuel mixture adaptation requirement detected (error suspicion) Lambda setpoint at sensor mounting position - bank 2	<=(0 to 39)(%) >=(10 to 99,99)(%) =FALSE =FALSE =TRUE >2(sec) >0(sec) =TRUE =FALSE >0,96(-)

Fuel mixture adaptation requirement detected (error suspicion)	=TRUE
Lambda setpoint at sensor mounting	>0,87(-)
position - bank 2 Lambda setpoint at sensor mounting position - bank 2	<1,1(-)
, For time where A - delay time for lambda fuel adaption (rich condition)	≥Max(A,B)(sec) =(3 to 5)(sec)
(see Look-Up-Table #65) where B - delay time for lambda fuel adaption (lean condition) (see Look-Up-Table #66)	=(3 to 5)(sec)
(Enabling condition for lambda closed loop control upstream catalyst - bank 2	=TRUE
For time	>=2(sec)
) Limitation of adaptation values because of fuel in oil is deactivated -	=TRUE
Limitation of adaptation values because of fuel in oil is deactivated -	=TRUE
Enabling condition for lambda closed loop control upstream catalyst - bank 2	=TRUE
) Integration speed integrator FRA_IK - bank 2	>0(1/sec)
) Time for stable check of FRAPFI -	>=6(sec)
Absolute value of delta Frai for PFI injection path - bank 2	<=0,06(-)
Condition diagnostic thresholds of multiplicative correction exceeded - bank 2	=TRUE
Condition diagnostic thresholds of multiplicative correction of PFI path exeeded - bank 2	=TRUE
filtered dfrm_w corrected with the P- part of the HK controller - bank 2)	<=0,04(-)
Condition diagnostic thresholds of multiplicative correction of PFI path	=TRUE

OR Similar conditions for fra PFI fulfilled - bank 2	=TRUE
) OR Condition FRA stable since last DCY (PFI))	=TRUE
Condition ORAPFI-integrator (local) stable - bank 2	=TRUE
Additive range of mixture adaptation is active on PFI path - bank 2. That means:	=TRUE
((Operating mode independent activation conditions: That means:	=TRUE
(Basic conditions: Operation readiness of mixture adaption. That means: (=TRUE
Engine coolant temperature	>=70,5(°C)
Injection counter	>=2000(-)
Condition for wide open throttle Propulsion torque after driving assistance coordination (see Look-	=FALSE <900 to 1300(Nm)
Condition desired lambda for catalyst	=FALSE
heating Increased tolerances of air charge	=FALSE
determination expected Max. proportion of evaporating fuel from the engine oil to the fuel	<=1,99(-)
Condition to indicate scavenging	
Demand for HDEV purge because of	=FALSE
Intake air temperature	<90(°C)
) Coordinated torque request for	<=0 to 18(%)
Coordinated torque request for	>=2,5 to 99,99(%)
charge (see look-up table #80) Condition additive correction of the	=FALSE
Condition multiplicative correction of the mixture adaptation PFI switched off	=FALSE
)	
Pure port fuel injection is active	=TRUE

) For time Operating mode dependent activation	>0(sec) =TRUE
Readiness for function LRA (Lambda closed loop control; Adaptive pilot control). That means:	
Fuel mixture adaptation requirement detected (no error suspicion)	=FALSE
Lambda setpoint at sensor mounting position - bank 2	>0,96(-)
Fuel mixture adaptation requirement detected (error suspicion)	=TRUE
Lambda setpoint at sensor mounting position - bank 2	>0,87(-)
Lambda setpoint at sensor mounting position - bank 2	<1,1(-)
For time where A - delay time for lambda fuel adaption (rich condition)	≥Max(A,B)(sec) =(3 to 5)(sec)
(see Look-Up-Table #65) where B - delay time for lambda fuel adaption (lean condition) (see Look-Up-Table #66)	=(3 to 5)(sec)
(Enabling condition for lambda closed loop control upstream catalyst - bank	=TRUE
For time	>=2(sec)
) Limitation of adaptation values because of fuel in oil is deactivated -	=TRUE
Limitation of adaptation values because of fuel in oil is deactivated -	=TRUE
Enabling condition for lambda closed loop control upstream catalyst - bank 2	=TRUE
Integration speed integrator ORA_IK - bank 2	>0(1/sec)
/ Time for stable check of ORAPFI - bank 2	>=10(sec)
Absolute value of delta Orai for PFI injection path - bank 2	<=0,188(-)

				Condition diagnostic thresholds of additive correction exceeded - bank 2	=TRUE	
				OR Condition diagnostic thresholds of additive correction of PFI path exeeded - bank 2	=TRUE	
				OR filtered dfrm_w corrected with the P- part of the HK controller - bank 2) (<=0,04(-)	
				Condition diagnostic thresholds of additive correction of PFI path currently exceeded - bank 2	=TRUE	
				Similar conditions for ORAPFI fulfilled - bank 2	=TRUE	
) No pending or confirmed DTCs	=see sheet inhibit tables	
P21F8	Maximum fault of the additive fuel mixture adaptation value on PFI fuel path - bank 1	Additive correction of the mixture adaptation PFI path - bank 1	>5,8125(-)	Condition ORAPFI-integrator stable was set after FRAPFI-integrator stable on PFI path - bank 1	=TRUE	2 Trip
				(Condition FRAPFI-integrator (local) stable - bank 1 (=TRUE	
				Multiplicative range of mixture adaptation is active on PFI path - bank 1. That means:	=TRUE	
				((Operating mode independent activation conditions: That means:	=TRUE	
				(Basic conditions: Operation readiness of mixture adaption. That means: (=TRUE	
				Engine coolant temperature	>=70,5(°C)	
				Injection counter	>=2000(-)	
				Condition for wide open throttle	=FALSE	
				Propulsion torque after driving assistance coordination (see Look- Lip-Table #5)	<900 to 1300(Nm)	
				Condition desired lambda for catalyst heating	=FALSE	
				Increased tolerances of air charge determination expected	=FALSE	

Max. proportion of evaporating fuel from the engine oil to the fuel	<=1,99(-)
demand	
Condition to indicate scavenging	=FALSE
Demand for HDEV purge because of	=FALSE
carbonisation	
Intake air temperature	<90(°C)
)	
Coordinated torque request for	<=(0 to 39)(%)
charge (see look-up table #)	
Coordinated torgue request for	>=(10 to 99,99)(%)
charge (see look-up table #)	
Condition additive correction of the	=FALSE
mixture adaptation PEI switched off	
Condition multiplicative correction of	=FALSE
the mixture adaptation PEI switched	
off	
) Pure part fuel injection is active	
For time	
	>2(Sec)
	$\mathbf{O}(\mathbf{z},\mathbf{z},\mathbf{z})$
	>U(sec)
Operating mode dependent activation	=IRUE
conditions:	
Readiness for function LRA (Lambda	
closed loop control; Adaptive pilot	
control). That means:	
(
Fuel mixture adaptation requirement	=FALSE
detected (no error suspicion)	
Lambda setpoint at sensor mounting	>0,96(-)
position - bank 1	
OR	
Fuel mixture adaptation requirement	=TRUE
detected (error suspicion)	
Lambda setpoint at sensor mounting	>0.87(-)
position - bank 1	× 0,01 ()
Lambda setpoint at sensor mounting	<1 1(-)
nosition - bank 1	(1,1())
) For time	$Max(\Lambda P)(aaa)$
	$\geq V ax(A,D)(Sec)$
where A - delay time for lambda fuel	=(3 to 5)(sec)
adaption (rich condition)	
(see Look-Up-Table #65)	
where B - delay time for lambda fuel	=(3 to 5)(sec)
adaption (lean condition)	
(see Look-Up-Table #66)	
(
Enabling condition for lambda closed	=TRUE
loop control upstream catalyst - bank	
1	
For time	>-2(coc)

) Limitation of adaptation values because of fuel in oil is deactivated -	=TRUE
Limitation of adaptation values because of fuel in oil is deactivated -	=TRUE
bank 2 Enabling condition for lambda closed loop control upstream catalyst - bank 1	=TRUE
/ Integration speed integrator FRA_IK - bank 1	>0(1/sec)
) Time for stable check of FRAPFI -	>=6(sec)
Absolute value of delta Frai for PFI injection path - bank 1	<=0,06(-)
Condition diagnostic thresholds of multiplicative correction exceeded - bank 1	=TRUE
Condition diagnostic thresholds of multiplicative correction of PFI path exceeded - bank 1	=TRUE
filtered dfrm_w corrected with the P- part of the HK controller - bank 1)	<=0,04(-)
Condition diagnostic thresholds of multiplicative correction of PFI path currently exceeded - bank 1	=TRUE
Similar conditions for fra PFI fulfilled - bank 1)	=TRUE
OR Condition FRA stable since last DCY (PFI)	=TRUE
) Condition ORAPFI-integrator (local) stable - bank 1	=TRUE
Additive range of mixture adaptation is active on PFI path - bank 1. That means:	=TRUE
((Operating mode independent activation conditions: That means:	=TRUE

Basic conditions: Operation readiness of mixture adaption. That means:	=TRUE
(Engine coolant temperature Injection counter Condition for wide open throttle	>=70,5(°C) >=2000(-) =FALSE
Propulsion torque after driving assistance coordination (see Look- Up-Table #5)	<900 to 1300(Nm)
Condition desired lambda for catalyst heating	=FALSE
Increased tolerances of air charge determination expected	=FALSE
Max. proportion of evaporating fuel from the engine oil to the fuel demand	<=1,99(-)
Condition to indicate scavenging	=FALSE
Demand for HDEV purge because of carbonisation	=FALSE
Intake air temperature	<90(°C)
Coordinated torque request for charge (see look-up table #81)	<=0 to 18(%)
Coordinated torque request for charge (see look-up table #80)	>=2,5 to 99,99(%)
Condition additive correction of the mixture adaptation PFI switched off	=FALSE
Condition multiplicative correction of the mixture adaptation PFI switched off	=FALSE
Pure port fuel injection is active For time	=TRUE >2(sec)
) For time Operating mode dependent activation conditions:	>0(sec) =TRUE
Readiness for function LRA (Lambda closed loop control; Adaptive pilot control). That means:	
Fuel mixture adaptation requirement detected (no error suspicion)	=FALSE
Lambda setpoint at sensor mounting position - bank 1 OR	>0,96(-)
Fuel mixture adaptation requirement detected (error suspicion)	=TRUE
Lambda setpoint at sensor mounting position - bank 1	>0,87(-)

Lambda setpoint at sensor mounting position - bank 1	<1,1(-)
) For time where A - delay time for lambda fuel adaption (rich condition)	≥Max(A,B)(sec) =(3 to 5)(sec)
(see Look-Up-Table #65) where B - delay time for lambda fuel adaption (lean condition) (see Look-Up-Table #66)	=(3 to 5)(sec)
(Enabling condition for lambda closed loop control upstream catalyst - bank	=TRUE
For time	>=2(sec)
) Limitation of adaptation values because of fuel in oil is deactivated -	=TRUE
Limitation of adaptation values because of fuel in oil is deactivated -	=TRUE
Enabling condition for lambda closed loop control upstream catalyst - bank 1	=TRUE
) Integration speed integrator ORA_IK - bank 1	>0(1/sec)
) Time for stable check of ORAPFI -	>=10(sec)
bank 1 Absolute value of delta Orai for PFI injection path - bank 1	<=0,188(-)
(Condition diagnostic thresholds of additive correction exceeded - bank 1	=TRUE
OR Condition diagnostic thresholds of additive correction of PFI path exeeded - bank 1	=TRUE
filtered dfrm_w corrected with the P- part of the HK controller - bank 1)	<=0,04(-)
(Condition diagnostic thresholds of additive correction of PFI path currently exceeded - bank 1	=TRUE
Similar conditions for ORAPFI fulfilled - bank 1)	=TRUE

				No pending or confirmed DTCs	=see sheet inhibit tables	
P21F9	Minimum fault of the additive fuel mixture adaptation value on PFI fuel path - bank 1	Additive correction of the mixture adaptation PFI path - bank 1	<-5,484(-)	Condition ORAPFI-integrator stable was set after FRAPFI-integrator stable on PFI path - bank 1	=TRUE	2 Trip
				(Condition FRAPFI-integrator (local) stable - bank 1 (=TRUE	
				 Multiplicative range of mixture adaptation is active on PFI path - bank 1. That means: ((=TRUE	
				Öperating mode independent activation conditions: That means:	=TRUE	
				Conditions: Operation readiness of mixture adaption. That means:	=TRUE	
				Engine coolant temperature	>=70,5(°C)	
				Injection counter	>=2000(-)	
				Condition for wide open throttle	=FALSE	
				Propulsion torque after driving assistance coordination (see Look- Up-Table #5)	<900 to 1300(Nm)	
				Condition desired lambda for catalyst heating	=FALSE	
				Increased tolerances of air charge determination expected	=FALSE	
				Max. proportion of evaporating fuel from the engine oil to the fuel demand	<=1,99(-)	
				Condition to indicate scavenging	=FALSE	
				Demand for HDEV purge because of carbonisation	=FALSE	
				Intake air temperature)	<90(°C)	
				Coordinated torque request for charge (see look-up table #)	<=(0 to 39)(%)	
				Coordinated torque request for charge (see look-up table #)	>=(10 to 99,99)(%)	
				Condition additive correction of the mixture adaptation PFI switched off	=FALSE	
				Condition multiplicative correction of the mixture adaptation PFI switched off	=FALSE	
				Pure port fuel injection is active	=TRUE	
				For time	>2(sec)	
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) For time Operating mode dependent activation	>0(sec) =TRUE
Readiness for function LRA (Lambda closed loop control; Adaptive pilot control). That means:	
Fuel mixture adaptation requirement detected (no error suspicion)	=FALSE
Lambda setpoint at sensor mounting position - bank 1	>0,96(-)
OR Fuel mixture adaptation requirement detected (error suspicion)	=TRUE
Lambda setpoint at sensor mounting position - bank 1	>0,87(-)
Lambda setpoint at sensor mounting position - bank 1	<1,1(-)
For time where A - delay time for lambda fuel adaption (rich condition)	≥Max(A,B)(sec) =(3 to 5)(sec)
(see Look-Up-Table #65) where B - delay time for lambda fuel adaption (lean condition) (see Look-Up-Table #66)	=(3 to 5)(sec)
(Enabling condition for lambda closed loop control upstream catalyst - bank	=TRUE
For time	>=2(sec)
) Limitation of adaptation values because of fuel in oil is deactivated -	=TRUE
Limitation of adaptation values because of fuel in oil is deactivated -	=TRUE
Enabling condition for lambda closed loop control upstream catalyst - bank	=TRUE
) Integration speed integrator FRA_IK - bank 1	>0(1/sec)
) Time for stable check of FRAPFI -	>=6(sec)
Absolute value of delta Frai for PFI injection path - bank 1	<=0,06(-)

Condition diagnostic thresholds of multiplicative correction exceeded - bank 1	=TRUE
OR Condition diagnostic thresholds of multiplicative correction of PFI path exeeded - bank 1	=TRUE
filtered dfrm_w corrected with the P- part of the HK controller - bank 1	<=0,04(-)
(Condition diagnostic thresholds of multiplicative correction of PFI path currently exceeded - bank 1	=TRUE
OR Similar conditions for fra PFI fulfilled - bank 1)	=TRUE
OR Condition FRA stable since last DCY (PFI)	=TRUE
) Condition ORAPFI-integrator (local) stable - bank 1	=TRUE
 Additive range of mixture adaptation is active on PFI path - bank 1. That means: 	=TRUE
((Operating mode independent activation conditions: That means:	=TRUE
(Basic conditions: Operation readiness of mixture adaption. That means:	=TRUE
Engine coolant temperature Injection counter Condition for wide open throttle Propulsion torque after driving assistance coordination (see Look-	>=70,5(°C) >=2000(-) =FALSE <900 to 1300(Nm)
Condition desired lambda for catalyst	=FALSE
Increased tolerances of air charge determination expected	=FALSE
Max. proportion of evaporating fuel from the engine oil to the fuel demand	<=1,99(-)
Condition to indicate scavenging	=FALSE

Demand for HDEV purge because of	=FALSE
carbonisation Intake air temperature	<90(°C)
) Coordinated torque request for	<=0 to 18(%)
charge (see look-up table #81) Coordinated torque request for	>=2,5 to 99,99(%)
charge (see look-up table #80) Condition additive correction of the	=FALSE
mixture adaptation PFI switched off Condition multiplicative correction of the mixture adaptation PFI switched off	=FALSE
) Pure port fuel injection is active For time	=TRUE >2(sec)
, For time Operating mode dependent activation	>0(sec) =TRUE
Readiness for function LRA (Lambda closed loop control; Adaptive pilot control). That means:	
(Fuel mixture adaptation requirement detected (no error suspicion)	=FALSE
Lambda setpoint at sensor mounting position - bank 1	>0,96(-)
Fuel mixture adaptation requirement detected (error suspicion)	=TRUE
Lambda setpoint at sensor mounting	>0,87(-)
Lambda setpoint at sensor mounting position - bank 1	<1,1(-)
) For time where A - delay time for lambda fuel adaption (rich condition)	≥Max(A,B)(sec) =(3 to 5)(sec)
where B - delay time for lambda fuel adaption (lean condition) (see Look-Up-Table #66)	=(3 to 5)(sec)
(Enabling condition for lambda closed loop control upstream catalyst - bank 1	=TRUE
For time	>=2(sec)
, Limitation of adaptation values because of fuel in oil is deactivated -	=TRUE

				Limitation of adaptation values because of fuel in oil is deactivated - bank 2	=TRUE		
				Enabling condition for lambda closed loop control upstream catalyst - bank 1)	=TRUE		
				, Integration speed integrator ORA_IK - bank 1)	>0(1/sec)		
				Time for stable check of ORAPFI - bank 1	>=10(sec)		
				Absolute value of delta Orai for PFI injection path - bank 1 (<=0,188(-)		
				Condition diagnostic thresholds of additive correction exceeded - bank 1	=TRUE		
				OR Condition diagnostic thresholds of additive correction of PFI path exeeded - bank 1	=TRUE		
				filtered dfrm_w corrected with the P- part of the HK controller - bank 1) (<=0,04(-)		
				Condition diagnostic thresholds of additive correction of PFI path currently exceeded - bank 1 OR	=TRUE		
				Similar conditions for ORAPFI fulfilled - bank 1)	=TRUE		
				No pending or confirmed DTCs	=see sheet inhibit tables		
8. UPSTREAM OXYGEN SENSOR FUEL TRIM DIAGNOSIS	P2096 Fuel trim fault diagnosis of upstream exhaust gas sensor when the lambda offset is not within the calibrated threshold range - out of range low	(Debounce condition for fault confirmation by offset adaptation (sensor 1, bank 1)	=TRUE	0,1(s)	2 Trip Sim Cond
		Lambda offset of upstream exhaust gas sensor	<-0,03	(
		Lambda offset of upstream exhaust gas sensor	≥-0,07	Debouncing of offset fault by slow offset adaptation	=TRUE		
		Difference between lambda offset of the sensor and lambda offset at the beginning of the driving cycle	<0,003	(
		(Slow offset adaptation (=TRUE		

Maximum offset fault is healed in the current driving cycle	=TRUE	Bit p-part controlability primary control enable	=TRUE
Minimum offset fault is healed in the current driving cycle	=TRUE	(
) OR ((Lambda regulator setpoint active	=TRUE
Maximum offset fault is set in the previous driving cycle OR	=TRUE		
Minimum offset fault is set in the previous driving cycle	=TRUE	(
) OR		Lambda closed loop control (upstream catalyst), bank 1 OR	=TRUE
(Fuel trim maximum fault is set in the previous driving cycle	=TRUE	Lambda setpoint for sensor after addition of trim control action is not	=TRUE
OR		Difference between upper limit action value lambda control and temporary value before test for enleanment	≥0
Fuel trim minimum fault is set in the previous driving cycle	=TRUE	Difference between temporary value before test for enleanment protection and lower bound of dfr during	≥0
)		Lambda (measured and setpoint) is below minimal measurable lambda (bank 1)	=FALSE
)) OR		TEMIN-limitation active, bench 1))	=FALSE
() Current lowpass value of p-part control upstream primary control	>0(%)
Fuel trim maximum fault is set in the previous driving cycle	=TRUE	Lambda closed loop control (upstream catalyst), bank 1	=TRUE
OR Fuel trim minimum fault is set in the previous driving cycle	=TRUE	(Lambda control disabled during or after cylinder cut-off	=FALSE
)		Lambda swtiched ON after fuel cutoff	=TRUE
Lambda offset of upstream exhaust gas sensor	<0,07	(
)		Fuel cut off is active (=FALSE
		Time running down after fuel cut-off	>2(sec)

OR	
(Absolute value of control difference in lambda, bank 1	≤0,2
Difference of counter time and plant time constant	>0(sec)
a-(b+c) where a is Time running down after fuel cut-off for enabling lambda control	
b is plant time constant for continuous air/fuel control c is plant parameter for dead time for lambda control)	
) LSU sensor upstream to catalyst ready for operation	=TRUE
(lambda sensor 1 temperature, bank 1	≥655(°C)
) Lambda control disabled by a fault lambda control is active since warmup is finished	=FALSE =TRUE
Relative air charge for time	>0(%) ≥2(sec)
) HEM condition to block lambda closed loop control upstream catalyst	=FALSE
Lamda control active due to GDI mode change	=TRUE
GDI mode homogeneous for time	=TRUE ≥0,8(sec)
(Lambda control enabled for Cold operation sensor 2 bank 1	=TRUE
UR HEGO sensor 2 bank 1, signal valid	=TRUE
(Status of heating enable conditions for the sensor operating readiness	=TRUE
(Protective heating is finished for time	=TRUE ≥25(sec)

Internal resistance OK for operating readiness	=TRUE
(Unfiltered internal resistance of	≤2000(Ohm)
HEGO sensor Protective heating is finished Counter for valid internal resistance measurements)	=TRUE ≥3(counts)
) Status of sensor signal enable conditions for the sensor operating readiness	=TRUE
Internal resistance OK for operating readiness OR (=TRUE
(Output voltage of HEGO Sensor Output voltage of HEGO Sensor)	≥0,552(V) ≤1,201(V)
OR Output voltage of HEGO Sensor)	≤0,322(V)
OR Sensor voltage stuck in countervoltage band (=TRUE
(Output voltage of HEGO Sensor Output voltage of HEGO Sensor	<0,552(V) >0,322(V)
) (Sensor open circuit fault existed in previous trip OR	=TRUE
Sensor open circuit fault currently not detected	=TRUE
) Electrical diagnostics enabled	=TRUE
) for time	≥20(sec)
)) for time)	≥0,2(sec)

Bit p-part system balanced primary control enable	=TRUE
Lambda setpoint for sensor is set	=TRUE
Lambda setpoint for sensor is set	=FALSE
for time	≥10(sec)
, Rich catalyst purge Mass flow of exhaust gas, sensor 2	=FALSE >0(g)
) P-part active from temperature and dynamic diagnosis	=TRUE
Temperature of catalyst 1	≥250(°C)
Temperature of catalyst 1	<900(°C)
) Bit I-part global primary control enable (=TRUE
Current lowpass value of I-part load	>-1(%)
Current lowpass value of I-part load primary control enable	≤1(%)
Diagnosis of canister purge system is active	=FALSE
Width of dead zone for lambda control deviation	=0
Maximum value among the engine coolant temperature and model- based substitute value for engine temperature signal in case of error	>34,96(°C)
Bit I-part global load and engine speed control enable	=TRUE
Engine speed with low resolution Engine speed with low resolution (<5000(rpm) ≥1320(rpm)
Relative air mass	<99,8(%)
Relative air mass (see Look-Up-Table #95)	≥15.8 to 39.8(%)

))))	
(Bit i-part system primary control enable	=TRUE
(Current integrator value of P-part balanced primary control enable (see Look-Up-Table #96)	>200 to 300(g)
((Dew point end of sensor 2 Bank1 is reached End of start is reached	=TRUE =TRUE
Exhaust gas mass now sensor 2 Bank 1	>199,82(g)
) OR (
Dew point end of sensor 2 reached OR	=FALSE
End of start is reached	=FALSE
) Exhaust gas mass flow sensor 2 (see Look-Up-Table #97)	>219.73 to 320(g)
))	
) Bit i-part system temperature primary control enable	=TRUE
(Temperature of catalyst 1	>350(°C)
Temperature of catalyst 1))	<900(°C)
) Cumulated time in which slow offset adaptation was active	≥10(sec)
) Debounce condition for fault confirmation by fast offset adaptation (sensor 1, bank 1) General enabling condition of fast offset adaptation (=TRUE

Enabling condition of fast offset adaptation due to catalyst conditioning	=TRUE
(
(Bit signal valid, HEGO sensor 2 bank 1	=TRUE
Flag lambda setpoint for sensor	=TRUE
Rich catalyst purge Bank-independent disabling conditions of fast offset adaptation	=FALSE =FALSE
(Fuel cut-off Mass flow exhaust gas catalyst 1	=TRUE >50(g)
) OR	
(Fuel cut-off Mass flow exhaust gas catalyst 1)	=FALSE >50(g)
) ((Parallelization done at least once from LSU plausibility diagnosis point	=TRUE
((Target sensor voltage for rich during	=TRUF
active parallelisation reached once, sensor 1, bank 2	-1102
Oil gas mass flow by active lambda shifting minus the maximal possible influence of LSU offset part, segment 1, bank 1 for time	≥1800(mg)
) OR	
Lean target sensor voltage during active parallelisation reached once,	=TRUE
Oxygen mass flow in catalyst 1, deduct from maximum present LSU Offset in a fault free system for time	≥1600(mg)
)	
OR Dynamic diagnosis error of upstream exhaust gas sensor is not set	=TRUE

) OR (
(lambda control is set when lambda controller reaches lower limit FRMIN	=TRUE
Lambda actual value sensor 1 bank 1	<1
Output voltage of HEGO sensor 2 bank 1) OR (<0,4
lambda control is set when lambda controller reaches lower limit FRMAX	=TRUE
Lambda actual value sensor 1 bank 1	>1
Output voltage of HEGO sensor 2 bank 1)	>0,6(V)
for time Condition for Lambda closed loop control upstream catalyst; bank 1	≥2(sec) =TRUE
, for time) (≥2(sec)
Temperature of catalyst 1	>399,96(°C)
Temperature of catalyst 1	<799,96(°C)
) for time) (=0(sec)
Mass flow exhaust gas catalyst 1	>20(kg/h)
Mass flow exhaust gas catalyst 1	<120(kg/h)
) OR (
Mass flow exhaust gas catalyst 1	>20(kg/h)
Mass flow exhaust gas catalyst 1	≤20(kg/h)
) for time	≥0(sec)

		Lambda offset of upstream exhaust gas sensor	>0,0 ECM Section 12	03 28 of 772	(240 of 1.0
P2097	Fuel trim fault diagnosis of upstream exhaust gas sensor when the lambda offset is not within the calibrated threshold range-out of range high	(Debounce condition for fault confirmation by offset adaptation (sensor 1, bank 1)	=TRUE	0,1(s)	2 Trip Sim Cond
					Basic enable conditions met	=see sheet enable tables		
)))) No pending or confirmed DTCs	=see sheet inhibit table		
					(Counter for no step in offset or increasing offset in a row OR Counter for exhaust masses to debounce fault with fast offset adaptation	≥6(counts) ≥6(counts)		
					Difference betweeen Lambda offset (sensor 1, bank 1) and Lambda offset (delayed by one calculation raster)	≤0,003		
					(CAT damage during past interval) Mass flow of exhaust gas catalyst 1	=FALSE ≥100(g)		
) Hydrogen-correction-voltage, HEGO sensor 2 bank 1 with high resolution	≤80(V)		
)) Condition for upstream cat LSU ready for operation f(lamsons_w) (lambda sensor 1 temperature, bank 1	=TRUE ≥655(°C)		

Lambda offset of upstream exhaust gas sensor	≤0,07	Debouncing of offset fault by slow offset adaptation	=TRUE
Difference between lambda offset at the beginning of the	<0,003	(
driving cycle and lambda offset			
(Slow offset adaptation	=TRUF
((into 2
Maximum offset fault is healed in the current driving cycle	=TRUE	Bit p-part controlability primary control enable	=TRUE
Minimum offset fault is healed in the current driving cycle	=TRUE	(
)		(
OR		Lambda regulator setpoint active	=TRUE
(
the previous driving cycle	=IRUE		
Minimum offset fault is set in the previous driving cycle	=TRUE	(
)		Lambda closed loop control	=TRUE
OP		(upstream catalyst), bank 1	
((
Fuel trim maximum fault is set	=TRUE	Lambda setpoint for sensor after	=TRUE
in the previous driving cycle		addition of trim control action is not eqaul to 0	
OR		Difference between upper limit action	≥0
		value lambda control and temporary	
		protection	
Fuel trim minimum fault is set	=TRUE	Difference between temporary value	≥0
in the previous driving cycle		before test for enleanment protection	
		and lower bound of dfr during	
)		Lambda (measured and setpoint) is	=FALSE
,		below minimal measurable lambda	_
		(bank 1)	
)		IEMIN-limitation active, bench 1	=FALSE
) OR			
()	
(Current lowpass value of p-part	>0(%)
		control upstream primary control	
Fuel trim maximum fault is set	-TRUF	enable Lambda closed loop control	-TRUE
in the previous driving cycle	-11(0)	(upstream catalyst), bank 1	-mol
OR		(
Fuel trim minimum fault is set	=TRUE	Lambda control disabled during or	=FALSE
in the previous driving cycle		atter cylinder cut-off	

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)		Lambda swtiched ON after fuel cutoff	=TRUE
Lambda offset of upstream	>0,07	(
)		Fuel cut off is active (=FALSE
		Time running down after fuel cut-off for enabling lambda control OR	>2(sec)
		(Absolute value of control difference in lambda, bank 1	≤0,2
		Difference of counter time and plant time constant a-(b+c) where a is Time running down after fuel cut-off for enabling lambda control b is plant time constant for continuous air/fuel control c is plant parameter for dead time for lambda control)	>0(sec)
)) LSU sensor upstream to catalyst ready for operation	=TRUE
		(lambda sensor 1 temperature, bank 1	≥655(°C)
) Lambda control disabled by a fault lambda control is active since warmup is finished Relative air charge for time) HEM condition to block lambda	=FALSE =TRUE >0(%) ≥2(sec)
		closed loop control upstream catalyst	=FALSE
		Lamda control active due to GDI mode change	=TRUE
		GDI mode homogeneous for time))	=TRUE ≥0,8(sec)
		Lambda control enabled for Cold operation sensor 2 bank 1 OR	=TRUE
		HEGO sensor 2 bank 1, signal valid	=TRUE

(Status of heating enable conditions for the sensor operating readiness	=TRUE
(Protective heating is finished for time	=TRUE ≥25(sec)
OR Internal resistance OK for operating readiness	=TRUE
(Unfiltered internal resistance of	≤2000(Ohm)
HEGO sensor Protective heating is finished Counter for valid internal resistance measurements	=TRUE ≥3(counts)
)	
Status of sensor signal enable conditions for the sensor operating readiness	=TRUE
(Internal resistance OK for operating readiness OR	=TRUE
(
Output voltage of HEGO Sensor Output voltage of HEGO Sensor)	≥0,552(V) ≤1,201(V)
OR Output voltage of HEGO Sensor)	≤0,322(V)
OR Sensor voltage stuck in countervoltage band (=TRUE
(Output voltage of HEGO Sensor Output voltage of HEGO Sensor	<0,552(V) >0,322(V)
) (
Sensor open circuit fault existed in previous trip	=TRUE
Sensor open circuit fault currently not detected	=TRUE
) Electrical diagnostics enabled	=TRUE

) for time	≥20(sec)
)	
)	
	for time	≥0,2(sec)
)	
)	
	Bit p-part system balanced primary	=TRUE
	(
	(
	Lambda setpoint for sensor is set equal to 1	=IRUE
	OR	
	Lambda setpoint for sensor is set	=FALSE
	for time	≥10(sec)
)	
	Rich catalyst purge	=FALSE
	mass now of exhaust gas, senser 2	20(g)
) Disert estive from terroritori est	
	dvnamic diagnosis	=IRUE
	(
	Temperature of catalyst 1	≥250(°C)
	Temperature of catalyst 1	<900(°C)
)	
) Bit I-part global primary control	=TRUE
	enable	
	(
	Current lowpass value of I-part load	>-1(%)
	primary control enable	
	Current lowpass value of I-part load primary control enable	≤1(%)
)	
	Diagnosis of canister purge system is	=FALSE
	Width of dead zone for lambda	=0
	control deviation	
	Maximum value among the engine coolant temperature and model-	>34,96(°C)
	based substitute value for engine	
	temperature signal in case of error	
	ر Bit I-part global load and engine	=TRUE
	speed control enable	
770	(Engine speed with low resolution	<5000(rpm)

Engine speed with low resolution (≥1320(rpm)
(Relative air mass	<99,8(%)
Relative air mass (see Look-Up-Table #95)	≥15.8 to 39.8(%)
))))	
Bit i-part system primary control enable	=TRUE
Current integrator value of P-part balanced primary control enable (see Look-Up-Table #96)	>200 to 300(g)
(
Dew point end of sensor 2 Bank1 is reached	=TRUE
End of start is reached Exhaust gas mass flow sensor 2 Bank 1	>199,82 >199,82(g)
) OR (
(Dew point end of sensor 2 reached	-FALSE
OR End of stort is reached	
End of start is reactied) Exhaust gas mass flow sensor 2 (see Look-Up-Table #97)	=FALSE
)	
<i>)</i> Bit i-part system temperature primary control enable	=TRUE
(Temperature of catalyst 1	<900(°C)
Temperature of catalyst 1))	<900(°C)
, Cumulated time in which slow offset adaptation was active	≥10(sec)

) Debounce condition for fault confirmation by fast offset adaptation (sensor 1, bank 1) General enabling condition of fast offset adaptation	=TRUE
(Enabling condition of fast offset adaptation due to catalyst conditioning (=TRUE
Bit signal valid, HEGO sensor 2 bank	=TRUE
Flag lambda setpoint for sensor	=FALSE
equal to 1 Rich catalyst purge Bank-independent disabling conditions of fast offset adaptation	=FALSE
(Fuel cut-off Mass flow exhaust gas catalyst 1	=TRUE >50(g)
) OR (Fuel cut-off Mass flow exhaust gas catalyst 1)) (=FALSE >50(g)
(Parallelization done at least once from LSU plausibility diagnosis point of view (sensor 1, bank 1) (=TRUE
(Target sensor voltage for rich during active parallelisation reached once, sensor 1 bank 2	=TRUE
Oil gas mass flow by active lambda shifting minus the maximal possible influence of LSU offset part, segment	≥1800(mg)
1, bank 1 for time) OR	≥1(sec)
(Lean target sensor voltage during active parallelisation reached once, sensor 1, bank 2	=TRUE
Oxygen mass flow in catalyst 1, deduct from maximum present LSU	≥1(sec)

for time	≥1(sec)
)) OR Dynamic diagnosis error of upstream exhaust gas sensor is not set	=TRUE
) OR (
lambda control is set when lambda controller reaches lower limit FRMIN	=TRUE
Lambda actual value sensor 1 bank 1	<1
Output voltage of HEGO sensor 2 bank 1	<0,4
) OR	
(lambda control is set when lambda controller reaches lower limit FRMAX	=TRUE
Lambda actual value sensor 1 bank 1	>1
Output voltage of HEGO sensor 2 bank 1	>0,6(V)
) for time Condition for Lambda closed loop control upstream catalyst; bank 1	≥2(sec) =TRUE
) for time) (≥2(sec)
(Temperature of catalyst 1	>399,96(°C)
Temperature of catalyst 1	<799,96(°C)
) for time) (=0(sec)
(Mass flow exhaust gas catalyst 1	>20(kg/h)
Mass flow exhaust gas catalyst 1	<120(kg/h)
) OR	

Mass flow exhaust gas catalyst 1	>20(kg/h)		
Mass flow exhaust gas catalyst 1	≤20(kg/h)		
) for time	≥0(sec)		
)			
Condition for upstream cat LSU ready for operation f(lamsons_w)	=TRUE		
lambda sensor 1 temperature, bank 1	≥655(°C)		
) Hydrogen-correction-voltage, HEGO sensor 2 bank 1 with high resolution	≤80(V)		
(CAT damage during past interval	=FALSE		
) Mass flow of exhaust gas catalyst 1	≥100(g)		
Difference betweeen Lambda offset (sensor 1, bank 1) and Lambda offset (delayed by one calculation raster)	≤0,003		
(Counter for no step in offset or increasing offset in a row	≥6(counts)		
Counter for exhaust masses to debounce fault with fast offset adaptation))	≥6(counts)		
) No pending or confirmed DTCs	=see sheet inhibit table		
Basic enable conditions met	=see sheet enable tables		
Debounce condition for fault confirmation by offset adaptation (sensor 1, bank 2)	=TRUE	0,1(s)	2 Trip Sim Cond

Fuel trim fault diagnosis of	(
upstream exhaust gas sensor	
when the lambda offset is not	
within the calibrated threshold	
range - out of range low	
	Fuel trim fault diagnosis of upstream exhaust gas sensor when the lambda offset is not within the calibrated threshold range - out of range low

Lambda offset of upstream	<-0,03	(
Lambda offset of upstream	≥-0.07	Debouncing of offset fault by slow	=TRUE
exhaust gas sensor, bank 2		offset adaptation, bank 2	
Difference between lambda	<0,003	(
offset of the sensor, bank 2			
and lambda offset at the			
beginning of the driving cycle,			
Dank Z		Slow offset adaptation bank 2	
		(TROL
Maximum offset fault of the	=TRUE	Bit p-part controlability primary	=TRUE
bank 2 sensor is healed in the		control enable 2	
current driving cycle			
Minimum offset fault of the	=TRUE	(
bank 2 sensor is healed in the			
current driving cycle		1	
) OB		(Lambda regulator setpoint active	
on		bank 2	-1102
(
Maximum offset fault of the	=TRUE		
bank 2 sensor is set in the			
previous driving cycle			
UR Minimum offsot fault of the		1	
hank 2 sensor is set in the	TRUE	(
previous driving cycle			
)		Lambda closed loop control	=TRUE
		(upstream catalyst), bank 2	
OR		OR	
(Fuel trim movimum foult of the	триг	(трис
hank 2 sensor is set in the	TRUE	addition of trim control action, bank 2	TRUE
previous driving cycle		is not eqaul to 0	
OR		Difference between upper limit action	≥0
		value lambda control and temporary	
		value before test for enleanment	
First trian maining and first the		protection, bank 2	>0
Fuel trim minimum fault of the	=IRUE	Difference between temporary value	20
previous driving cycle		bank 2 and lower bound of dfr during	
previous anving cycle		enleanmant protection	
)		Lambda (measured and setpoint) is	=FALSE
		below minimal measurable lambda	
		(bank 2)	
)		TEMIN-limitation active, bench 2	=FALSE
) OR)	
()	
ì		, Current lowpass value of p-part	>0(%)
-		control upstream primary control	
		enable 2	

Fuel trim maximum fault of t bank 2 sensor is set in the previous driving cycle	the =TRUE	Lambda closed loop control (upstream catalyst), bank 2	=TRUE
OR Fuel trim minimum fault of the bank 2 sensor is set in the	he =TRUE	(Lambda control disabled during or after cylinder cut-off, bank 2	=FALSE
)		Lambda swtiched ON after fuel cutoff, bank 2	=TRUE
Lambda offset of upstream exhaust gas sensor, bank 2	>0,07	(
)		Fuel cut off is active, bank 2 (=FALSE
		Time running down after fuel cut-off for enabling lambda control OR	>2(sec)
		Absolute value of control difference in lambda, bank 2	≤0,2
		Difference of counter time and plant time constant a-(b+c) where a is Time running down after	>0(sec)
		fuel cut-off for enabling lambda control b is plant time constant for	
		continuous air/fuel control, bank 2 c is plant parameter for dead time for lambda control, bank 2)	
) LSU sensor upstream to catalyst ready for operation, bank 2	=TRUE
		lambda sensor 1 temperature, bank 2	≥655(°C)
) Lambda control disabled by a fault, bank 2	=FALSE
		lambda control is active since	=TRUE
		Relative air charge	>0(%)
		for time	≥2(sec)
		HEM condition to block lambda closed loop control upstream	=FALSE
		catalyst, bank 2 Lamda control active due to GDI mode change	=TRUE
	ECM Section 138 of 772	(GDI mode homogeneous for time	=TRUE

(Lambda control enabled for Cold operation sensor 2 bank 2 OR	=TRUE
HEGO sensor 2 bank 2, signal valid	=TRUE
(Status of heating enable conditions for the sensor operating readiness (=TRUE
Protective heating is finished, bank 2	=TRUE
for time	≥25(sec)
OR Internal resistance OK for operating readiness, bank 2	=TRUE
Unfiltered internal resistance of	≤2000(Ohm)
HEGO sensor, bank 2 Protective heating is finished, bank 2	=TRUE
Counter for valid internal resistance measurements, bank 2)	≥3(counts)
) Status of sensor signal enable conditions for the sensor operating readiness, bank 2	=TRUE
(Internal resistance OK for operating readiness OR	=TRUE
(
Output voltage of HEGO Sensor, bank 2	≥0,552(V)
Output voltae of HEGO Sensor, bank 2)	≤1,201(V)
OR Output voltae of HEGO Sensor, bank 2	≤0,322(V)
) OR Sensor voltage stuck in countervoltage band ((=TRUE
l	

Output voltage of HEGO Sensor,	<0,552(V)
bank 2 Output voltage of HEGO Sensor, bank 2	>0,322(V)
) (
Sensor open circuit fault existed in previous trip	=IRUE
OR Sensor open circuit fault currently not detected	=TRUE
) Electrical diagnostics enabled, bank 2	=TRUE
) for time	≥20(sec)
)) for time))	≥0.2(sec)
) Bit p-part system balanced primary control enable 2 (=TRUE
(Lambda setpoint for sensor is set equal to 1, bank 2	=TRUE
OR Lambda setpoint for sensor is set equal to 1, bank 2	=FALSE
for time	≥10(sec)
) Rich catalyst purge, bank 2 Mass flow of exhaust gas, sensor 1, bank 2	=FALSE >0(g)
) P-part active from temperature and dynamic diagnosis, bank 2	=TRUE
Temperature of catalyst 1 bank 2	≥250(°C)
Temperature of catalyst 1, bank 2	<900(°C)
) Bit I-part global primary control enable	=TRUE
(
--	--------------------------
Current lowpass value of I-part load	>-1(%)
Current lowpass value of I-part load primary control enable	≤1(%)
) Diagnosis of canister purge system is active	=FALSE
Width of dead zone for lambda	=0
Maximum value among the engine coolant temperature and model- based substitute value for engine temperature signal in case of error	>34,96(°C)
(Bit I-part global load and engine speed control enable	=TRUE
(Engine speed with low resolution Engine speed with low resolution (<5000(rpm) ≥1320(rpm)
(Relative air mass	<99,8(%)
Relative air mass (see Look-Up-Table #95)	≥15.8 to 39.8(%)
))))	
(Bit i-part system primary control enable, bank 2	=TRUE
Current integrator value of P-part balanced primary control enable (see Look-Up-Table #96)	>200 to 300(g)
(
Dew point end of sensor 1 Bank 2 is reached	=TRUE
End of start is reached Exhaust gas mass flow sensor 1 Bank 2	=TRUE >199,82(g)
) OR (
(Dew point end of sensor 2 reached, bank 2	=FALSE

OR End of start is reached	=FALSE
) Exhaust gas mass flow sensor 2 (see Look-Up-Table #97)	>219.73 to 320(g)
)) Dit i port system temperature primary	
control enable, bank 2	=IRUE
Temperature of catalyst 1 bank 2	>350(°C)
Temperature of catalyst 1, bank 2)))	<900(°C)
Cumulated time in which slow offset adaptation was active, bank 2	≥10(sec)
) Debounce condition for fault confirmation by fast offset adaptation (sensor 1, bank 2) General enabling condition of fast offset adaptation, bank 2	=TRUE
(Enabling condition of fast offset adaptation due to catalyst conditioning, bank 2 (=TRUE
, Bit signal valid, HEGO sensor 2 bank 2	=TRUE
Flag lambda setpoint for sensor equal to 1, bank 2 and	=TRUE
Rich catalyst purge, bank 2 Bank-independent disabling conditions of fast offset adaptation (=FALSE =FALSE
Fuel cut-off, bank Mass flow exhaust gas catalyst 1, bank 2) OR	=TRUE >50(g)
(Fuel cut-off Mass flow exhaust gas catalyst 1, bank 2))	=FALSE >50(g)

	(Parallelization done at least once from LSU plausibility diagnosis point of view (sensor 1, bank 2)	=TRUE
	Target sensor voltage for rich during active parallelisation reached once,	=TRUE
	Oil gas mass flow by active lambda shifting minus the maximal possible influence of LSU offset part, segment	≥1800
	1, bank 2 for time)	≥1(sec)
	OR (
	Lean target sensor voltage during active parallelisation reached once, sensor 1, bank 2	=TRUE
	Oxygen mass flow in catalyst 1, deduct from maximum present LSU Offset in a fault free system, bank 2	≥1600(mg)
	for time))	≥1(sec)
	OR Dynamic diagnosis error of upstream exhaust gas sensor is not set	=FALSE
) OR (
	(lambda control is set when lambda controller reaches lower limit FRMIN, bank 2	=TRUE
	Lambda actual value sensor 1 bank 2	<1
	Output voltage of HEGO sensor 2 bank 2	<0,4(V)
) OR (
	ambda control is set when lambda controller reaches lower limit	=TRUE
	Lambda actual value sensor 1 bank 2	>1
	Output voltage of HEGO sensor 2 bank 2	>0,6(V)
,) for time	>2(000)

Condition for Lambda closed loop control upstream catalyst; bank 2	=TRUE
) for time)	≥2(sec)
, ((
Temperature of catalyst 1, bank 2	>399,96(°C)
Temperature of catalyst 1, bank 2	<799,96(°C)
) for time) (=0(sec)
Mass flow exhaust gas catalyst 1,	>20(kg/h)
bank 2 Mass flow exhaust gas catalyst 1, bank 2	<120(kg/h)
) OR ((
Mass flow exhaust gas catalyst 1, bank 2	>20(kg/h)
Mass flow exhaust gas catalyst 1, bank 2	≤20(kg/h)
) for time	≥0(sec)
)) Condition for upstream cat LSU ready for operation f(lamsons_w), bank 2	=TRUE
(lambda sensor 1 temperature, bank 2	≥655(°C)
) Hydrogen-correction-voltage, HEGO sensor 2 bank 2 with high resolution	≤80(V)
(CAT damage during past interval	=FALSE
, Mass flow of exhaust gas catalyst 1 bank 2	≥100(g)
Difference betweeen Lambda offset (sensor 1, bank 2) and Lambda offset (delayed by one calculation raster)	≤0,003

			Counter for no step in offset or increasing offset in a row, bank 2 OR Counter for exhaust masses to debounce fault with fast offset adaptation, bank 2)))	≥6(counts) ≥6(counts)		
) No pending or confirmed DTCs	=see sheet inhibit table		
			Basic enable conditions met	=see sheet enable tables		
P2099 Fuel trim fault upstream exh when the laml within the cali range - out of	diagnosis of (aust gas sensor oda offset is not prated threshold range high		Debounce condition for fault confirmation by offset adaptation (sensor 1, bank 2)	=TRUE	0,1(s)	2 Trip Sim Cond
	Lambda offset of upstream	>0,03	(
	exhaust gas sensor, bank 2 Lambda offset of upstream exhaust gas sensor, bank 2	≤0,07	Debouncing of offset fault by slow offset adaptation, bank 2	=TRUE		
	Difference between lambda offset at the beginning of the driving cycle, bank 2 and lambda offset of the sensor, bank 2	<0,003	(
	(Slow offset adaptation, bank 2	=TRUE		
	Maximum offset fault of the bank 2 sensor is healed in th current driving cycle	=TRUE ne	Bit p-part controlability primary control enable 2	=TRUE		
	Minimum offset fault of the bank 2 sensor is healed in th current driving cycle	=TRUE le	(
) OR		(Lambda regulator setpoint active, bank 2	=TRUE		
	Maximum offset fault of the bank 2 sensor is set in the previous driving cycle OR	=TRUE	t			
	Minimum offset fault of the bank 2 sensor is set in the previous driving cycle	=TRUE	(
)		Lambda closed loop control	=TRUE		

OR (OR (
(Fuel trim maximum fault of the bank 2 sensor is set in the previous driving cycle	=TRUE	Lambda setpoint for sensor after addition of trim control action, bank 2 is not eqaul to 0	=TRUE
OR		Difference between upper limit action value lambda control and temporary value before test for enleanment protection, bank 2	≥0
Fuel trim minimum fault of the bank 2 sensor is set in the previous driving cycle	=TRUE	Difference between temporary value before test for enleanment protection, bank 2 and lower bound of dfr during enleanment protection	≥0
)		Lambda (measured and setpoint) is below minimal measurable lambda (bank 2)	=FALSE
)) OR ((TEMIN-limitation active, bench 2)))	=FALSE
Fuel trim maximum fault of the bank 2 sensor is set in the previous driving cycle OR	=TRUE	Current lowpass value of p-part control upstream primary control enable 2 Lambda closed loop control	=TRUF
Fuel trim minimum fault of the bank 2 sensor is set in the previous driving cycle	=TRUE	(upstream catalyst), bank 2 (
)		Lambda control disabled during or after cylinder cut-off, bank 2	=FALSE
Lambda offset of upstream exhaust gas sensor, bank 2)	>0,07	Lambda swtiched ON after fuel cutoff, bank 2 (=TRUE
,		Fuel cut off is active, bank 2	=FALSE
		Time running down after fuel cut-off for enabling lambda control OR (>2(sec)
		Absolute value of control difference	≤0,2
		Difference of counter time and plant time constant a-(b+c)	>0(sec)
		where a is Time running down after fuel cut-off for enabling lambda control	
		b is plant time constant for continuous air/fuel control, bank 2 c is plant parameter for dead time for lambda control, bank 2	

)	
LSU sensor upstream to catalyst ready for operation, bank 2	=TRUE
(lambda sensor 1 temperature, bank 1	≥655(°C)
) Lambda control disabled by a fault,	=FALSE
lambda control is active since	=TRUE
warmup is finished Relative air charge	>0(%)
for time	≥2(sec)
) HEM condition to block lambda closed loop control upstream	=FALSE
catalyst, bank 2 Lamda control active due to GDI mode change	=TRUE
(GDI mode homogeneous for time)	=TRUE ≥0,8(sec)
) (Lambda control enabled for Cold operation sensor 2 bank 2	=TRUE
OR HEGO sensor 2 bank 2, signal valid	=TRUE
(Status of heating enable conditions for the sensor operating readiness	=TRUE
(Protective heating is finished, bank 2	=TRUE
for time	≥25(sec)
OR Internal resistance OK for operating readiness, bank 2	=TRUE
(Unfiltered internal resistance of	≤2000(Ohm)
HEGO sensor, bank 2 Protective heating is finished, bank 2	=TRUE
Counter for valid internal resistance measurements, bank 2))	≥3(counts)

Status of sensor signal enable conditions for the sensor operating readiness, bank 2	=TRUE
(Internal resistance OK for operating readiness OR (=TRUE
(
Output voltage of HEGO Sensor,	≥0,552(V)
Output voltae of HEGO Sensor, bank 2	≤1,201(V)
, OR	
Output voltae of HEGO Sensor, bank 2)	≤0,322(V)
OR Sensor voltage stuck in countervoltage band	=TRUE
(
(0
bank 2	<0,552(V)
Output voltage of HEGO Sensor, bank 2	>0,322(V)
)	
(=TRUF
Sensor open circuit fault existed in previous trip	-mol
Sensor open circuit fault currently not detected	=TRUE
) Electrical diagnostics enabled, bank 2	=TRUE
) for time	≥20(sec)
)	
) for time	≥0.2(sec)
)	-, \()
)	
Bit p-part system balanced primary control enable 2	=TRUE

(
Lambda setpoint for sensor is set equal to 1, bank 2	=TRUE
OR Lambda setpoint for sensor is set equal to 1, bank 2	=FALSE
for time	≥10(sec)
Rich catalyst purge, bank 2 Mass flow of exhaust gas, sensor 1, bank 2	=FALSE >0(g)
) P-part active from temperature and dynamic diagnosis, bank 2	=TRUE
Temperature of catalyst 1 bank 2	≥250(°C)
Temperature of catalyst 1, bank 2	<900(°C)
) Bit I-part global primary control enable (=TRUE
Current lowpass value of I-part load	>-1(%)
Current lowpass value of I-part load primary control enable	≤1(%)
) Diagnosis of canister purge system is	=FALSE
Width of dead zone for lambda	=0
Maximum value among the engine coolant temperature and model- based substitute value for engine temperature signal in case of error	>34,96(°C)
(Bit I-part global load and engine speed control enable	=TRUE
Engine speed with low resolution Engine speed with low resolution (<5000(rpm) ≥1320(rpm)
Relative air mass	<99,8(%)
Relative air mass (see Look-Up-Table #95)	≥15.8 to 39.8(%)

)

)) (Pit i part quatam primany control	
enable, bank 2	=IRUE
Current integrator value of P-part balanced primary control enable (see Look-Up-Table #96)	>200 to 300(g)
((Dew point end of sensor 1 Bank 2 is reached End of start is reached	=TRUE =TRUE
Exhaust gas mass flow sensor 1 Bank 2	>199,82(g)
) OR (
Dew point end of sensor 2 reached, bank 2	=FALSE
End of start is reached	=FALSE
/ Exhaust gas mass flow sensor 2 (see Look-Up-Table #97)	>219.73 to 320(g)
)	
) Bit i-part system temperature primary control enable, bank 2	=TRUE
(Temperature of catalyst 1 bank 2	>350(°C)
Temperature of catalyst 1, bank 2))	<900(°C)
Cumulated time in which slow offset adaptation was active, bank 2	≥10(sec)
) Debounce condition for fault confirmation by fast offset adaptation (sensor 1, bank 2) General enabling condition of fast offset adaptation, bank 2 (=TRUE

Enabling condition of fast offset adaptation due to catalyst	=TRUE
Bit signal valid, HEGO sensor 2 bank	=TRUE
Flag lambda setpoint for sensor	=TRUE
Rich catalyst purge, bank 2 Bank-independent disabling conditions of fast offset adaptation	=FALSE =FALSE
Fuel cut-off, bank Mass flow exhaust gas catalyst 1, bank 2	=TRUE >50(g)
OR	
Fuel cut-off Mass flow exhaust gas catalyst 1, bank 2	=FALSE >50(g)
)) (
Parallelization done at least once from LSU plausibility diagnosis point of view (sensor 1, bank 2) (=TRUE
Target sensor voltage for rich during active parallelisation reached once,	=TRUE
Oil gas mass flow by active lambda shifting minus the maximal possible influence of LSU offset part, segment	≥1800(mg)
for time) OR	≥1(sec)
(Lean target sensor voltage during active parallelisation reached once, sensor 1, bank 2	=TRUE
Oxygen mass flow in catalyst 1, deduct from maximum present LSU Offset in a fault free system, bank 2	≥1600(mg)
for time)) OR	≥1(sec)

Dynamic diagnosis error of upstream exhaust gas sensor is not set	=FALSE
) OR ((lambda control is set when lambda controller reaches lower limit FRMIN, bank 2 Lambda actual value sensor 1 bank 2	=TRUE <1
Output voltage of HEGO sensor 2 bank 2) OR	<0,4
(lambda control is set when lambda controller reaches lower limit FRMAX_bank 2	=TRUE
Lambda actual value sensor 1 bank 2	>1
Output voltage of HEGO sensor 2 bank 2	>0,6(V)
for time Condition for Lambda closed loop control upstream catalyst; bank 2	≥2(sec) =TRUE
) for time) (≥2(sec)
(Temperature of catalyst 1, bank 2	>399,96(°C)
Temperature of catalyst 1, bank 2	<799,96(°C)
) for time) (=0(sec)
Mass flow exhaust gas catalyst 1,	>20(kg/h)
Mass flow exhaust gas catalyst 1, bank 2) OR (<120(kg/h)
Mass flow exhaust gas catalyst 1, bank 2	>20(kg/h)
Mass flow exhaust gas catalyst 1,	≤20(kg/h)

) for time	≥0(sec)		
)) Condition for upstream cat LSU ready for operation f(lamsons_w), bank 2 (lambda sensor 1 temperature, bank 2	=TRUE >655(°€)		
) Hydrogen-correction-voltage, HEGO sensor 2 bank 2 with high resolution	≤80(V)		
					(CAT damage during past interval) Mass flow of exhaust gas catalyst 1	=FALSE ≥100(g)		
					Difference betweeen Lambda offset (sensor 1, bank 2) and Lambda offset (delayed by one calculation raster)	≤0,003		
					(Counter for no step in offset or increasing offset in a row, bank 2 OR	≥6(counts)		
					Counter for exhaust masses to debounce fault with fast offset adaptation, bank 2)))	≥6(counts)		
) No pending or confirmed DTCs	=see sheet inhibit table		
					Basic enable conditions met	=see sheet enable tables		
9. FUEL SYSTEM MONITORING	P09E0	Cylinder Specific air-fuel imbalance detection too lean	Cylinder individual air-fuel ratio considering deviation from bank average air-fuel ratio	>2	Enable conditions for lambda imbalance diagnosis	=TRUE	0,1(s)	2 Trip
	P09E1				(2 Trip
	P09E2				(2 Trip

=TRUE

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~			ν

P09E4	(2 Trip
P09E5	Engine roughness signal is valid, which is the following conditions:	=TRUE	2 Trip
P09E6	(2 Trip
P09E7	Status of trigger wheel adaptation for segment time correction for cylinder individual lambda control function	=TRUE	2 Trip
	and Condition segment duration plausible	=TRUE	
	and Active rough road detection and	=FALSE	
	Clutch operator is active	=FALSE	
	Engine synchronisation is completed and engine is in normal operation mode) and	=TRUE	
	Engine operation point is within calibrated range (low or high operating range), as decribed below:	=TRUE	
	(Relative air charge (with AT) where	<a-b(%)< td=""><td></td></a-b(%)<>	
	A is Upper threshold for the relative air charge in order to determine the operating range LOW depending on the engine speed nmot for automatic transmission	=60(%)	
	(see Look-Up-Table #3)		

B is the upper thresholds of the relative air charge for determining the operating ranges LOW and HIGH for automatic transmission	=0,75(%)
and Relative air charge (with AT)	>22,5 to 26,3(%)
(see Look-Up-Table #4)	
and Engine speed (with AT) where	<a-b(rpm)< td=""></a-b(rpm)<>
A is Upper engine speed threshold for determining for operating range LOW, AT	=2320(rpm)
B is the hystersis for upper thresholds of the relative air charge for determining the operating ranges LOW and HIGH for automatic transmission	=40(rpm)
Engine speed (with AT))	>1560(rpm)
OR (High operation range is released and (=TRUE
Relative air charge (with AT)	<a-b(%)< td=""></a-b(%)<>
where A is Upper threshold for the relative air charge in order to determine the operating range LOW depending on the engine speed nmot for automatic transmission	=0(%)
B is the upper thresholds of the relative air charge for determining the operating ranges LOW and HIGH for automatic transmission	=0,75(%)
and Relative air charge (with AT)	>191,3(%)

Engine speed (with AT)	<a-b(rpm)< th=""></a-b(rpm)<>
where A is Upper engine speed threshold for determining for operating range	=0(rpm)
HIGH, AT B is the hysterisis for upper engine speed thresholds for determining the operating ranges LOW and HIGH for automatic transmission	=40(rpm)
Engine speed (with AT))	>10200(rpm)
) for time	≥0,5(sec)
and Environmental conditions are within calibrated range:	=TRUE
(Ambient pressure	>580(hPa)
and Environment temperature)	>-40,04(°C)
and Engine coolant temperature is within calibrated range:	=TRUE
(Engine coolant temperature and	>57,96(°C)
Engine coolant temperature	<143,26(°C)
and Catalyst temperature is within calibrated range, which is the following conditions:	=TRUE
(max(a,b) Where:	<950(°C)
a is Maximum catalyst 1 temperature at bank 1 b is Maximum catalyst 1 temperature at bank 2	
and max(a,b) Where: a is Minimum catalyst 1 temperature at bank 1	>400(°C)
b is Minimum catalyst 1 temperature at bank 2) and	
b is Maximum catalyst 1 temperature at bank 2 and max(a,b) Where: a is Minimum catalyst 1 temperature at bank 1 b is Minimum catalyst 1 temperature at bank 2) and	>400(°C)

Inlet/outlet camshaft adjustment is released as follows:	=TRUE
(Condition release of intake camshaft control is valid	=TRUE
and State of camshaftw control is not in ready state	=TRUE
and Condition release of outlet camshaft control is valid	=TRUE
and State of camshaftw control is not in ready state and	=TRUE
)	
and The following combustion conditions are fulfilled:	=TRUE
Closed loop lambda control is active for bank 1	=TRUE
and Flag lambda setpoint for sensor equal to 1	=TRUE
and Closed loop lambda control is active for bank 2	=TRUE
and Flag lambda setpoint for sensor equal to 1, bank 2	=TRUE
Catalyst heating is active and	=FALSE
Homogenous mode is activated and	=1
Air fuel ratio commanded rich for component protection is active)	=FALSE
and Current gear position	≥6
and Current gear position	≤8
and Waiting time after first end of start in a driving cycle	>0(sec)
) and	
Sum of high and low range adaptions in current driving cycle	≥1
and Deviation of the worst test cylinder	≤0,999969

)

				for time and (≥15(sec)		
				Switching state of intake camshaft position for the diagnosis for AFIM has been reached	=TRUE		
				Switching state of outlet camshaft position for the diagnosis for AFIM has been reached and	=TRUE		
				Actual rail pressure is adjusted to set point and	=TRUE		
				Actual value of fuel part purge control	<0,0078		
				and Engine roughness signal is released	=TRUE		
) for time)	≥0,1(sec)		
				Maximum number of cylinder enrichment is achieved	=FALSE		
				No pending or confirmed DTCs	=see sheet inhibit tables		
				Basic enable conditions met	=see sheet enable tables		
P09E8	Cylinder Specific air-fuel imbalance detection too rich	Cylinder individual air-fuel ratio considering deviation from bank average air-fuel ratio	<0	Enable conditions for lambda imbalance diagnosis	=TRUE	0,1(s)	2 Trip
P09E9				(2 Trip
P09EA				(2 Trip
P09EB				Basic enable conditions	=TRUE		2 Trip
P09EC				(2 Trip
P09ED				Engine roughness signal is valid, which is the following conditions:	=TRUE		2 Trip
P09EE				(2 Trip
P09EF				Status of trigger wheel adaptation for segment time correction for cylinder individual lambda control function	=TRUE		2 Trip

а

and Condition segment duration plausible	=TRUE
and Active rough road detection	=FALSE
Clutch operator is active	=FALSE
Engine synchronisation is completed and engine is in normal operation mode)	=TRUE
and Engine operation point is within calibrated range (low or high operating range), as decribed below:	=TRUE
(Relative air charge (with AT)	<a-b(%)< td=""></a-b(%)<>
where A is Upper threshold for the relative air charge in order to determine the operating range LOW depending on the engine speed nmot for automatic transmission	=60(%)
(see Look-Up-Table #3)	
B is the upper thresholds of the relative air charge for determining the operating ranges LOW and HIGH for automatic transmission	=0,75(%)
and Relative air charge (with AT)	>22,5 to 26,3(%)
(see Look-Up-Table #4)	
and Engine speed (with AT)	<a-b(rpm)< td=""></a-b(rpm)<>
A is Upper engine speed threshold for determining for operating range LOW, AT	=2320(rpm)
B is the hystersis for upper thresholds of the relative air charge for determining the operating ranges LOW and HIGH for automatic transmission	=40(rpm)
and Engine speed (with AT)	>1560(rpm)

OR	
(High operation range is released and (=TRUE
Relative air charge (with AT)	<a-b(%)< td=""></a-b(%)<>
A is Upper threshold for the relative air charge in order to determine the operating range LOW depending on the engine speed nmot for automatic transmission	=0(%)
B is the upper thresholds of the relative air charge for determining the operating ranges LOW and HIGH for automatic transmission	=0,75(%)
and Relative air charge (with AT)	>191,3(%)
and Engine speed (with AT)	<a-b(rpm)< td=""></a-b(rpm)<>
where A is Upper engine speed threshold for determining for operating range HIGH AT	=0(rpm)
B is the hysterisis for upper engine speed thresholds for determining the operating ranges LOW and HIGH for automatic transmission and	=40(rpm)
Engine speed (with AT)	>10200(rpm)
) for time	≥0,5(sec)
and Environmental conditions are within calibrated range:	=TRUE
(Ambient pressure	>580(hPa)
and Environment temperature)	>-40,04(°C)
and Engine coolant temperature is within calibrated range:	=TRUE
(Engine coolant temperature	>57,96(°C)
and Engine coolant temperature	<143,26(°C)

and Catalyst temperature is within calibrated range, which is the following conditions:	=TRUE
(max(a,b)	<950(°C)
Where: a is Maximum catalyst 1 temperature at bank 1 b is Maximum catalyst 1 temperature at bank 2 and max(a,b) Where: a is Minimum catalyst 1 temperature at bank 1 b is Minimum catalyst 1 temperature at bank 2	>400(°C)
and Inlet/outlet camshaft adjustment is released as follows:	=TRUE
(Condition release of intake camshaft control is valid	=TRUE
and State of camshaftw control is not in ready state	=TRUE
and Condition release of outlet camshaft control is valid	=TRUE
and State of camshaftw control is not in ready state and	=TRUE
) and The following combustion conditions are fulfilled:	=TRUE
(Closed loop lambda control is active for bank 1	=TRUE
and Flag lambda setpoint for sensor equal to 1	=TRUE
and Closed loop lambda control is active for bank 2	=TRUE
and Flag lambda setpoint for sensor equal to 1, bank 2	=TRUE
and Catalyst heating is active	=FALSE

Homogenous mode is activated	=1
Air fuel ratio commanded rich for component protection is active	=FALSE
and	
Current gear position and	≥6
Current gear position and	≥8
Waiting time after first end of start in a driving cycle)	>0(sec)
and Sum of high and low range adaptions in current driving cycle	s ≥1
and Deviation of the worst test cylinder	≤0,999969
) for time and	≥15(sec)
(Switching state of intake camshaft position for the diagnosis for AFIM has been reached	=TRUE
Switching state of outlet camshaft position for the diagnosis for AFIM has been reached and	=TRUE
Actual rail pressure is adjusted to set point	t =TRUE
and Actual value of fuel part purge contro	ol <0,0078
and Engine roughness signal is released	=TRUE
) for time	≥0,1(sec)
) Maximum number of cylinder	=FALSE
No pending or confirmed DTCs	=see sheet inhibit tables
Basic enable conditions met	=see sheet enable tables

10. FUEL INJECTOR OFFSET LEARNING	P10A4	Monitor 1: Rationality check of valve opening time delay (tantot) against default value	Difference between current opening time delay and default opening time delay	>0,00006(sec)	Base Adaption is active	=TRUE	2(events)	2 Trip Sim Cond
DIAGNOSIS	P10A6				No pending or confirmed DTCs	=see sheet inhibit tables		2 Trip Sim Cond
	P10A8				Basic enable conditions met	=see sheet enable tables		2 Trip Sim Cond
	P10AA							2 Trip Sim Cond
	P10AC	Monitor 4: Rationality check of the total calculated injection time correction (dti) value	f (Pulse type of current injection is ballistic	=0	20(events)	2 Trip Sim Cond
	P10AE		Desired Open time(ti) on ballisitic area for CVO base adaption	≥210(µsec)	Base Adaption is active	=TRUE		2 Trip Sim Cond
	P10B0		and		OR			2 Trip Sim Cond
	P10B2		Total calculated injection time correction (dti)	>0,0001(sec)	Number of full lift injections occured in driving cycles where no base adaption occurs	>=500		2 Trip Sim Cond
) OR ((Pause time OR	=0		
			Desired Open time(ti) on ballisitic area for CVO base adaption	<210(µsec)	Pause time	≥2(sec)		
			and Total calculated injection time correction (dti)	>0,00005(sec)) No pending or confirmed DTCs	=see sheet inhibit tables		
)		Basic enable conditions met	=see sheet enable tables		

				,			
	Monitor 5: Rationality check o	f Current Full-Lift closing time (tab)	<620(µsec)	Base Adaption is active	=FALSE	100(events)	
				No pending or confirmed DTCs	=see sheet inhibit		
				Basic enable conditions met	=see sheet enable tables		
	Monitor 7: Rationality check o the ballistic dTi at the adjustment-point	f Integrated dti value after the controller is stable during base adaption	>0,00005(sec)	Base Adaption is active	=TRUE		
				No pending or confirmed DTCs	=see sheet inhibit tables		
				Basic enable conditions met	=see sheet enable tables		
P10A3	Monitor 1: Rationality check o valve opening time delay (tantot) against default value	f Difference between current opening time delay and default opening time delay	<-0,00006(sec)	Base Adaption is active	=TRUE	2(events)	2 Trip Sim Cond
P10A5		OR		No pending or confirmed DTCs	=see sheet inhibit tables		2 Trip Sim Cond
P10A7		Opening time delay is found	=FALSE	Basic enable conditions met	=see sheet enable tables		2 Trip Sim Cond
P10A9							2 Trip Sim Cond
P10AB	Monitor 4: Rationality check o the total calculated injection time correction (dti) value	f (Pulse type of current injection is ballistic	=0	20(events)	2 Trip Sim Cond
P10AD		Desired Open time(ti) on ballisitic area for CVO base adaption	≥210(µsec)	and			2 Trip Sim Cond
P10AF		and		Base Adaption is active	=FALSE		2 Trip Sim Cond

P10B1		Total calculated injection time	<-0.00005(sec)	and			
P10B1		correction (dti)	< 0,00000(300)	anu			2 Trip Sim Cond
) OR ((Pause time OR	=0		
		Desired Open time(ti) on ballisitic area for CVO base adaption	<210(µsec)	Pause time	≥2(sec)		
		and Total calculated injection time correction (dti)	<-0,00005(sec)) No pending or confirmed DTCs	=see sheet inhibit tables		
)		Basic enable conditions met	=see sheet enable tables		_
	Monitor 5: Rationality check of the Full-Lift closing time	Current Full-Lift closing time (tab)	>200(µsec)	Base Adaption is active	=FALSE	100(events)	
				No pending or confirmed DTCs	=see sheet inhibit tables		
				Basic enable conditions met	=see sheet enable tables		
	Monitor 6: Detection of Full-lift closing time	CVO controller is faulty and full lift closing could not be detected	=TRUE	Base Adaption is active	=FALSE	20(events)	
				No pending or confirmed DTCs	=see sheet inhibit tables		
				Basic enable conditions met	=see sheet enable tables		
	Monitor 7: Rationality check of the ballistic dTi at the adjustment-point	Integrated dti value after the controller is stable during base adaption	<-0,00005(sec)	Base Adaption is active	=TRUE	20(events)	_
				No pending or confirmed DTCs	=see sheet inhibit tables		
				Basic enable conditions met	=see sheet enable tables		
P13E7	Path1:Diagnosis the CVO error during base adaption or regular operation for rich mixture	Maximum CVO error during base adaption or regular operation (rich mixture)	=TRUE	Battery Voltage	≥9000(mV)		CVO Sim Cond
				Basic enable conditions met	=see sheet enable tables		
	Path2:Diagnosis the CVO error during base adaption or regular operation for lean mixture	Minimum CVO error during base adaption or regular operation (lean mixture)	=TRUE	(
	P13E7	Monitor 5: Rationality check of the Full–Lift closing time Monitor 6: Detection of Full–lift closing time Monitor 7: Rationality check of the ballistic dTi at the adjustment–point P13E7 Path1:Diagnosis the CVO error during base adaption or regular operation for rich mixture Path2:Diagnosis the CVO error during base adaption or regular operation for lean mixture	Pesired Open time(ii) on ballisitic area for CVO base adaption and Total calculated injection time correction (dti) Jointor 5: Rationality check of Current Full-Lift closing time the Full-Lift closing time (tab) Monitor 6: Detection of Full-Lift closing time Full-lift closing time Wonitor 7: Rationality check of Integrated dti value after the controller is stable during base adaption Monitor 7: Rationality check of the ballistic dTi at the adjustment-point P13E7 Path1:Diagnosis the CVO error Maximum CVO error during during base adaption or regular operation for rich mixture Path2:Diagnosis the CVO error Minimum CVO error during during base adaption or regular operation for lean mixture	Pesired Open time(fi) on ballistic area for CVO base adaption and Total calculated injection time <-0,00005(sec) correction (dti)	Pause time basice code to CVO base adaption and -210(µsec) Pause time Total calculated injection time correction (dii)) No pending or confirmed DTCs j Basic enable conditions met Basic enable conditions met Monitor 5: Rationality check of Current Full-Lift closing time (tab) >200(µsec) Base Adaption is active No pending or confirmed DTCs Basic enable conditions met Monitor 6: Detection of Full-Lift closing time Full-Lift closing time full closing could not be detected =TRUE Base Adaption is active Monitor 7: Rationality check of Integrated dit value after the controller is stable during base adaption or regular base adaption or regular operation (rich mixture) <-0,00005(sec)	Desired Open time(i) on adaption and Total calculated injection time correction (dti) ~210(µsec) Pause time ≥2(sec) Moniter 5: Rationality check of the Full-Lift closing time) Basic enable conditions met =see sheet enable tables Moniter 5: Rationality check of the Full-Lift closing time) >200(µsec) Base Adaption is active =FALSE Monitor 6: Detection of Full-Lift closing time CVO controller is faulty and full tables =TRUE Base Adaption is active =FALSE Monitor 7: Rationality check of Full-Lift closing time CVO controller is faulty and full tables =TRUE Base Adaption is active =FALSE Monitor 7: Rationality check of Full-Lift closing time CVO controller is faulty and full tables =TRUE Base Adaption is active =FALSE Monitor 7: Rationality check of Full-Lift closing time CVO controller is faulty and full tables =TRUE Base Adaption is active =FALSE Monitor 7: Rationality check of he ballist cf 11 at the adjustment-point ontroller is stable during base adaption <-0.00005(sec)	Plase time >22(sec) ballistic area for CVO base addption and Total calculated injection time correction (dti) <-0,00005(sec)

					CVO monitoring generally active	=TRUE		
					CVO monitoring generally active and Engine temperature will be used, the next condictions need to met:	=TRUE		
					(Coolant temperature at engine output	≥-3549,94(°C)		
					Coolant temperature at engine output	≤3003,56(°C)		
					\ \			
)			
11. CHIP DIAGNPSIS OF UPSTREAM EXHAUST GAS SENSOR	P064D	ECU: Self Check for Sensor ASIC of UEGO Sensor 1 Bank 1 An error is reported if the ASIC detects it or it delivers unplausible measurement values	Monitoring of ASIC power supply: Undervoltage at UB: Battery voltage < 6V		Diagnosis register of the ASIC is valid	=TRUE	0,01(s)	2 Trip
			ASIC has shut off due to low battery voltage (failure transition into IDLE state)	=TRUE	(Battery voltage	≤16100(mV)		
			OR		Battery voltage	≥10700(mV)		
			Tests for production checks		for time	≥0,1(sec)		
			are active SPI test access port active	=TRUE	Basic enable conditions are met	=see sheet enable tables		
			OR		No pending or confirmed DTCs	=see sheet inhibit tables		
			Built-in self-test failed OR Monitoring of ASIC internal sequencing Internal sequencing does not	=TRUE				
			work Error of watchdog signal of the sequencer OR	=TRUE				
			Watchdog signal of the SP-unit Interrupt to close OR	=TRUE				
			Watchdog signal of the SP-unit reading error of the Program rom if set without Over- or Undervoltage Flags OR	=TRUE				
			Check ASIC Chip ASIC chip ID is lower than BA- step	=TRUE				

Monitoring of ASIC interrupt handling Interrupt handling at ASIC base software does not work		Validity of IRQ diagnosis information	=TRUE
Bidirectional interrupt signal between ASIC and ECU- Microcontroller: too slow- or too fast response or no response	=TRUE	(Battery voltage Battery voltage)	≤16100(mV) ≥10700(mV)
		for time Resis anoble conditions are mot	≥0,1(sec)
		No pending or confirmed DTCs	tables =see sheet inhibit tables
Monitoring of quantification of the analog digital		Cj135 is neither in IDLE nor in SWITCHON mode	=TRUE
Causes for error: ADC defect, 3,3V source not operational, low-pass defect			
Conversion value of the analog digital converter (amplifier mode 1)	<0.00040(V)	(Battery voltage Battery voltage)	≤16100(mV) ≥10700(mV)
OR Conversion value of the analog digital converter (amplifier mode 1)	>0.0007(V)	for time Basic enable conditions are met	≥0,1(sec) =see sheet enable tables
OR		No pending or confirmed DTCs	=see sheet inhibit tables
Conversion value of the analog digital converter (amplifier mode 2)	<0.00110(V)		
Conversion value of the analog digital converter (amplifier mode 2)	>0.002(V)		
Conversion value of the analog digital converter (amplifier mode 3) OR	<0.00310(V)		
Conversion value of the analog digital converter (amplifier mode 3)	>0.0054(V)		
Current source Isq/ Rgnd resistance check Causes for error: Isq defect, Rgnd damaged or wrong colibration value of Pand ECM	Section 167 of 772	Cj135 is not in IDLE mode	=TRUE

Ratio of requested amplitude of the pump current source and measured pump current	<0,81	Adjustment bits ISQ reference of sensor 1 bank 1 is same as register value of desired Isq sensor 1 bank 1	=TRUE
source OR Ratio of requested amplitude of the pump current source and measured pump current	OR Ratio of requested amplitude >1,192553 of the pump current source and measured pump current source		≤16100(mV) ≥10700(mV)
source		for time Basic enable conditions are met	≥0,1(sec) =see sheet enable tables
		No pending or confirmed DTCs	=see sheet inhibit tables
Current source Isqr/ Rcal resistance check Causes for error: Isqr defect, Real damaged		Cj135 is neither in IDLE nor in SWITCHON mode	=TRUE
Ratio of requested amplitude of the pump current source and measured pump current source	<0,81	(Battery voltage	≤16100(mV)
OR		Battery voltage	≥10700(mV)
Ratio of requested amplitude of the pump current source and measured pump current source	>1,192553	for time	≥0,1(sec)
		Basic enable conditions are met	=see sheet enable tables
		No pending or confirmed DTCs	=see sheet inhibit tables
Rmeas resistance check Since Rmeas cannot be alone measured by ECU, then the entire resistance between pin APE and MES (Rparl) will be checked here		Cj135 is in SWITCHON mode	=TRUE
		Calculated parallel resistance is valid	=TRUE
Calculated parallel resistance	<24(Ohm)	(Battery voltage	≤16100(mV)
Calculated parallel resistance between APE and MES	>360(Ohm)	Battery voltage	≥10700(mV)
		, for time	≥0,1(sec)
		Basic enable conditions are met	=see sheet enable tables
		No pending or confirmed DTCs	=see sheet inhibit tables

25OBDG07A Part 2 ECM Summary Tables									
	Monitoring of ASIC supply voltage deviations from 3.3V		(Battery voltage	≤16100(mV)					
	Measured reference voltage	<2,97(V)	Battery voltage	≥10700(mV)					
	Measured reference voltage VCC3	>3,63(V)	for time	≥0,1(sec)					
			Basic enable conditions are met	=see sheet enable tables					
			No pending or confirmed DTCs	=see sheet inhibit tables					
P064E ECU: Self Check for Sensor ASIC of UEGO Sensor 1 Bank 2 An error is reported if the ASIC detects it or it delivers unplausible measurement	Monitoring of ASIC power supply:		Diagnosis register of the ASIC is valid	=TRUE	0,01(s)	2 Trip			
	Undervoltage at UB: Battery voltage < 6V. ASIC has shut off due to low battery voltage (failure transition into IDLE state)	=TRUE	(Battery voltage	≤16100(mV)					
	OR		Battery voltage	≥10700(mV)					
	Tests for production checks are active		, for time	≥0,1(sec)					
	SPI test access port active	=TRUE	Basic enable conditions are met	=see sheet enable tables					
	OR		No pending or confirmed DTCs	=see sheet inhibit tables					
	Built-in self-test failed OR Monitoring of ASIC internal sequencing Internal sequencing does not work	=TRUE							
	Error of watchdog signal of the sequencer OR	=TRUE							
	Watchdog signal of the SP-unit Interrupt to close OR	=TRUE							
	Watchdog signal of the SP-unit reading error of the Program rom if set without Over- or Undervoltage Flags OR	=TRUE							

Monitoring of ASIC interrupt handling Interrupt handling at ASIC base software does not work		Validity of IRQ diagnosis information	=TRUE
Bidirectional interrupt signal between ASIC and ECU- Microcontroller: too slow- or too fast response or no response	=TRUE	(Battery voltage Battery voltage)	≤16100(mV) ≥10700(mV)
		for time Basic enable conditions are met	≥0,1(sec) =see sheet enable
		No pending or confirmed DTCs	tables =see sheet inhibit tables
Monitoring of quantification of the analog digital converter		Cj135 is neither in IDLE nor in SWITCHON mode	=TRUE
Causes for error: ADC defect, 3,3V source not operational, low-pass defect			
Conversion value of the analog digital converter (amplifier mode 1)	<0.00040(V)	(Battery voltage Battery voltage)	≤16100(mV) ≥10700(mV)
OR Conversion value of the analog digital converter (amplifier mode 1)	>0.0007(V)	for time Basic enable conditions are met	≥0,1(sec) =see sheet enable tables
OR		No pending or confirmed DTCs	=see sheet inhibit tables
Conversion value of the analog digital converter (amplifier mode 2)	<0.00110(V)		
Conversion value of the analog digital converter (amplifier mode 2) OR	>0.0019(V)		
Conversion value of the analog digital converter (amplifier mode 3) OR	<0.00310(V)		
Conversion value of the analog digital converter (amplifier mode 3)	>0.0054(V)		
Current source Isq/ Rgnd resistance check Causes for error: Isq defect, Rgnd damaged or wrong calibration value of Pand ECM	Section 170 of 772	Cj135 is not in IDLE mode	=TRUE

Ratio of requested amplitude of the pump current source and measured pump current	<0,81	Adjustment bits ISQ reference of sensor 1 bank 2 is same as register value of desired Isq sensor 1 bank 2	=TRUE
OR Ratio of requested amplitude of the pump current source and measured pump current	R (tio of requested amplitude >1,192553 E the pump current source) d measured pump current urce		≤16100(mV) ≥10700(mV)
Source		for time Basic enable conditions are met	≥0,1(sec) =see sheet enable tables
		No pending or confirmed DTCs	=see sheet inhibit tables
Current source Isqr/ Rcal resistance check Causes for error: Isqr defect, Real damaged		Cj135 is neither in IDLE nor in SWITCHON mode	=TRUE
Real damaged Ratio of requested amplitude of the pump current source and measured pump current source	<0,81	(Battery voltage	≤16100(mV)
OR		Battery voltage	≥10700(mV)
Ratio of requested amplitude of the pump current source and measured pump current source	>1,192553	for time	≥0,1(sec)
		Basic enable conditions are met	=see sheet enable tables
		No pending or confirmed DTCs	=see sheet inhibit tables
Rmeas resistance check Since Rmeas cannot be alone measured by ECU, then the entire resistance between pin APE and MES (Rparl) will be checked here		Cj135 is in SWITCHON mode	=TRUE
		Calculated parallel resistance is valid	=TRUE
Calculated parallel resistance	<24(Ohm)	(Battery voltage	≤16100(mV)
Calculated parallel resistance between APE and MES	>360(Ohm)	Battery voltage	≥10700(mV)
		for time	≥0,1(sec)
		Basic enable conditions are met	=see sheet enable tables
		No pending or confirmed DTCs	=see sheet inhibit tables

		250BDG	07A Part 2 ECM Summary	/ Tables			
		Monitoring of ASIC supply voltage deviations from 3.3	3V	(Battery voltage	≤16100(mV)		
		Measured reference voltage	<2.97(V)	Battery voltage	≥10700(mV)		
		Measured reference voltage	>3.63(V)	for time	≥0,1(sec)		
		1000		Basic enable conditions are met	=see sheet enable tables		
				No pending or confirmed DTCs	=see sheet inhibit tables		
P30D8	ECU: Self Check for Sensor ASIC of UEGO Sensor 1 Bank 1 An error is reported if the ASIC detects it or if it is not reacting to requests	Monitoring of diagnosis register, working registers and RAM values:		(Battery voltage	≤16100(mV)	0,01(s)	2 Trip
		SPI error during transmission of diagnosis registers for time	n ≥0,05(sec) e	Battery voltage)	≥10700(mV)		
		OR SPI error during transmissior	n ≥0,05(sec)	for time Flag locking the fault report due to	≥0,1(sec) <i>=</i> FALSE		
		of data registers for time OR		currently requested Idle mode External reset request	=FALSE		
		SPI error during transmissior of RAM data for time	n ≥0,05(sec)	Basic enable conditions are met	=see sheet enable tables		
		OR		No pending or confirmed DTCs	=see sheet inhibit tables		
		Monitoring ASIC (Chip) response/error Availability of diagnostic register	=TRUE				
		(ASIC initialization wasn't successful OR	=TRUE				
		Respond/actual state of the ASIC wasn't as expected of base software OR	=TRUE				
		The bank wasn't switched between interrupt change	=TRUE				
		OR Monitoring setting register and operation mode					
		Register could not be set	=TRUE				
		Number of rejected requests OR	>200(counts)				
		No values found in diagnosis	s =TRUE				
		register	ECM Section 172 of 772				284 0

			OR The ASIC does not switch to the requested mode for time	>2(sec)				
I	P30D9	ECU: Self Check for Sensor ASIC of UEGO Sensor 1 Bank 2 An error is reported if the ASIC detects it or if it is not reacting to requests	Monitoring of diagnosis register, working registers and RAM values:		(Battery voltage	≤16100(mV)	0,01(s)	2 Trip
		lo requests	SPI error during transmission of diagnosis registers for time	≥0,05(sec)	Battery voltage)	≥10700(mV)		
			OR SPI error during transmission of data registers for time	≥0,05(sec)	for time Flag locking the fault report due to currently requested Idle mode	≥0,1(sec) =FALSE		
			OR		External reset request	=FALSE		
			SPI error during transmission of RAM data for time	≥0,05(sec)	Basic enable conditions are met	=see sheet enable tables		
			OR		No pending or confirmed DTCs	=see sheet inhibit tables		
			Monitoring ASIC (Chip)					
			response/error Availability of diagnostic register (=TRUE				
			ASIC initialization wasn't successful OR	=TRUE				
			Respond/actual state of the ASIC wasn't as expected of base software OR	=TRUE				
			The bank wasn't switched between interrupt change) OR Monitoring setting register and operation mode	=TRUE				
			Register could not be set	=TRUE				
			Number of rejected requests OR	>200(counts)				
			No values found in diagnosis register OR	=TRUE				
			The ASIC does not switch to the requested mode for time	>2(sec)				

12. DIAGNOSIS OF O2 SENSOR HEATER	P0135	Path 1: Start diagnosis Monitoring of ceramic temperature after engine start from end of dew point onwards	Ceramic temperature of upstream O2 sensor	<735(°C)	Engine start has finished	=TRUE	70 to 70(s)	2 Trip
CIRCUIT					and Dew point end for O2 sensor 1 bank 1 has reached (heating up is released) and	=TRUE		
					(Engine is running	=TRUE		
					Coolant temperature at engine start)	≥-40,04(°C)		
					OR Engine is running (=FALSE		
					Coolant temperature at engine output)) and	≥-40,04(°C)		
					(Battery voltage	≥10700(mV)		
					and Battery voltage)	≤16100(mV)		
					for time and	≥0,1(sec)		
					Deactivation after release of Start Check Start Check will be aborted and deactivated for the rest of the driving cycle if any of the following conditions is not fulfilled for integrated sum time:	>10(sec)		
					(Battery voltage and	≤16100(mV)		
					(All injectors active in operation by running engine	=TRUE		
					Engine is running)	=FALSE		
					, Basic enable conditions are met	=see sheet enable tables		
					No pending or confirmed DTCs	=see sheet inhibit		
				ECM Section 174 of 772		tables		286

Monitoring of ceramic temperature against low rationality threshold	upstream O2 sensor	<735(°C)	(Battery voltage	≤10700(mv)	60(S)
			and Battery voltage	≥16100(mV)	
) for time	≥0,1(sec)	
			and Engine is running and	=TRUE	
			Modelled exhaust gas temperature at upstream O2 sensor bank 1	≥450(°C)	
			Fuel cut off is active	=FALSE	
			for time	≥50(sec)	
			and HO2S closed loop heating control (inaccurate), which is the following condition for time:	≥50(sec)	
			(Deviation between actual temperature value and set point)	>50(°C)	
			and Basic enable conditions are met	=see sheet enable tables	
			and No pending or confirmed DTCs	=see sheet inhibit tables	
Path 3: Low Temperature Diagnosis Monitoring of ceramic temperature against very low rationality threshold (drops quickly to a critical low level)	Temperature of ceramic upstream O2 sensor	<660(°C)	(Battery voltage	≤10700(mV)	10(s)
			and Battery voltage	≥16100(mV)	
			, for time and	≥0,1(sec)	
			Engine is running and	=TRUE	
			Modelled exhaust gas temperature at upstream O2 sensor bank 1 and	≥350(°C)	
		ECM Section 175 of 772	Fuel cut off is active	=FALSE	

			for time	≥50(sec)		
			and HO2S closed loop heating control (inaccurate), which is the following condition for time:	≥50(sec)		
			Deviation between temperature value and set point) and	>50(°C)		
			Basic enable conditions are met	=see sheet enable tables		
			No pending or confirmed DTCs	=see sheet inhibit tables		
P2243 Lambda sensor wire diagnosis	Aborted RAM check at ASIC		(Battery voltage	≤16100(mV)	0.2(s)	2 Trin
Circuit countinuity - open load at pin RE detected by means of aborted RAM check at WARMUP mode	shut-off when CJ135 in WARMUP mode Open load at pin RE detected if countinuiuty measurement was done before ASIC abort			,	0,-(0)	2 1110
	Short circuit to battery fault is detected at sensor lines IPE/APE/MES as per last accessed ASIC diagnostic register, means	=FALSE	Battery voltage)	≥10700(mV)		
	Voltage at least at one of the	≤9.1 to 10.3(V)	for time Requested mode of UEGO sensor 1	≥0,1(sec) =TRUE		
	sensor lines IPE/APE/MES Result of continuity measurement of sensor pumpcell using current source ISQ (in a state, where the ASIC-internal current source ISQr is connected to the sensor line "RE" via internal switches and the sensor line "IPE" is directly connected to RGnd) is available in RAM	=TRUE	Bank 1 is in WARMUP mode Upstream HO2S Sensor is heated up, which is the following conditions:	=TRUE		
			(Upstream HO2S Sensor ceramic temperature OR	>790(°C)		
			Heating-up phase of the sensor is completed)	=TRUE		
	_		Basic enable conditions are met	=see sheet enable tables		
No pending or confirmed DTCs

=see sheet inhibit tables

ambda sensor wire diagnosis Circuit countinuity - open load at pin RE detected by means of aborted RAM check at NORMAL mode	Aborted RAM check at ASIC shut-off when CJ135 in NORMAL mode Open load at pin RE detected if current via Nernst cell is not		(Battery voltage ≤16100(mV)		
	Current source ISQr is active:	=FALSE	Battery voltage	≥10700(mV)	
			, for time Upstream HO2S Sensor is heated up, which is the following conditions:	≥0,1(sec) =TRUE	
			(Upstream HO2S Sensor ceramic temperature OR	>790(°C)	
			Heating-up phase of the sensor is completed	=TRUE	
			, UEGO Signal ASIC mode request of sensor 1 bank 1 is in NORMAL operation mode	=TRUE	
			Validity of REFPAT register sensor 1 bank 1	=TRUE	
			Basic enable conditions are met	=see sheet enable tables	
			No pending or confirmed DTCs	=see sheet inhibit tables	
Sircuit continuity check - open ircuit by means of nernst roltage monitoring during pump current operation	Monitoring of abnormalities at sensor line IPE during normal ASIC operation Open load at pin RE detected by means of nernst voltage monitoring		(Battery voltage	≤16100(mV)	
	Electrically corrected nernst	>1,10016(V)	Battery voltage	≥10700(mV)	
	voltage		, for time Upstream HO2S Sensor is heated	≥0,1(sec) =TRUE	
			up, which is the following conditions.		
			(Upstream HO2S Sensor ceramic temperature	>790(°C)	

) UEGO Signal ASIC mode request of sensor 1 bank 1 is not in IDLE mode (pumping current is active) Counter of verifications of the actual mode of the ASIC for sensor 1 bank 1 Basic enable conditions are met No pending or confirmed DTCs	=TRUE ≥10 =see sheet enable tables =see sheet inhibit tables	
Circuit continuity check - open circuit by means of continuity measurements of sensor pumpsell respectively nernst cell during normal or aborted ASIC operation in WARMUP mode	Monitoring of abnormalities at sensor line RE during normal ASIC operation when CJ135 is in WARMUP mode Open load at pin RE detected by means of continuity measurements of sensor pumpcell and sensor nernst cell using current source ISQr		(Battery voltage	≤16100(mV)	
	Difference of voltage drop at ECU-internal resistor RG in a state, where the ASIC-internal current source ISQr is connected to the sensor line "APE" and the sensor line "IPE" is directly connected to RGnd and voltage drop at ECU-internal resistor RG in a state, where all sensor lines are opened (Uq0iai - Uq0)	≥E * F	Battery voltage)	≥10700(mV)	
	Difference of voltage drop at ECU-internal resistor RG in a state, where the ASIC-internal current source ISQr is connected to the sensor line "RE" and the sensor line "IPE" is directly connected to RGnd and voltage drop at ECU- internal resistor RG in a state, where all sensor lines are opened (Ug0iei - Ug0) (E) Measured amplitude of the	<e *="" f<br="">=measured value</e>	for time Upstream HO2S Sensor is heated up, which is the following conditions:	≥0,1(sec) =TRUE	

(F) Minimum sensitivity of the continuiuity measurements to resistance RGnd	=66(Ohm)	Upstream HO2S Sensor ceramic temperature	
		OR Heating-up phase of the sensor is completed	=TRUE
		Requested mode of UEGO sensor 1 Bank 1 is in WARMUP mode and	=TRUE
		((Last packet transfer aborted of sensor 1 bank 1	=FALSE
		Counter of verifications of the actual mode of the ASIC for sensor 1 bank 2	≥10(counts)
		Display for the validity of Isqr for UEGO sensor 1 Bank 1) OR	=TRUE
		(Last packet transfer aborted of sensor 1 bank 1	=TRUE
		Result of continuity measurement of sensor pumpcell using current source ISQ (in a state, where the ASIC- internal current source ISQr is connected to the sensor line "APE" via internal switches and the sensor line "IPE" is directly connected to RGnd) is available in RAM	=TRUE
		Short circuit to battery fault is detected at sensor lines RE/IPE/APE/MES as per last accessed ASIC diagnostic register, means	=TRUE
		Voltage at least at one of the sensor lines (RE/IPE/APE/MES))	>9.1 to 10.3(V)
		, Basic enable conditions are met	=see sheet enable tables
		No pending or confirmed DTCs	=see sheet inhibit tables

			,			
P0155	Path 1: Start diagnosis Monitoring of ceramic temperature after engine start from end of dew point onwards	Ceramic temperature of upstream O2 sensor	<735(°C)	Engine start has finished	=TRUE	70
				and Dew point end for O2 sensor 1 bank 2 has reached (heating up is released) and	=TRUE	
				(Engine is rupping		
					TROE	
				Coolant temperature at engine start)	≥-40,04(°C)	
					-FALSE	
				(
				Coolant temperature at engine output) and	≥-40,04(°C)	
				Battery voltage	≥10700(mV)	
				and Battery voltage)	≤16100(mV)	
				, for time and	≥0,1(sec)	
				Deactivation after release of Start Check Start Check will be aborted and deactivated for the rest of the driving cycle if any of the following conditions is not fulfilled for integrated sum time:	>10(sec)	
				Battery voltage and (≤16100(mV)	
				All injectors active in operation by running engine OR	=TRUE	
				Engine is running))	=FALSE	
				, Basic enable conditions are met	=see sheet enable tables	
				and No pending or confirmed DTCs	=see sheet inhibit	
		ECM Se	ction 180 of 772		tables	

temperature against	upstream O2 sensor	(-)		()	(-)
			and Battery voltage	≥16100(mV)	
) for time and	≥0,1(sec)	
			Engine is running	=TRUE	
			Modelled exhaust gas temperature at upstream O2 sensor bank 2	≥450(°C)	
			and Fuel cut off is active for time	=FALSE ≥50(sec)	
			and HO2S closed loop heating control (inaccurate), which is the following condition for time:	≥50(sec)	
			(Deviation between actual temperature value and set point)	>50(°C)	
			, and Basic enable conditions are met	=see sheet enable tables	
			and No pending or confirmed DTCs	=see sheet inhibit tables	
	Temperature of ceramic	<660(°C)	(Battery voltage	≤10700(mV)	10(s)
Path 3: Low Temperature Diagnosis Monitoring of ceramic temperature against very low rationality threshold (drops quickly to a critical low level)	upstream O2 sensor				
Path 3: Low Temperature Diagnosis Monitoring of ceramic temperature against very low rationality threshold (drops quickly to a critical low level)	upstream O2 sensor		and Battery voltage	≥16100(mV)	
Path 3: Low Temperature Diagnosis Monitoring of ceramic temperature against very low rationality threshold (drops quickly to a critical low level)	upstream O2 sensor		and Battery voltage) for time and Engine is running	≥16100(mV) ≥0,1(sec)	
Path 3: Low Temperature Diagnosis Monitoring of ceramic temperature against very low rationality threshold (drops quickly to a critical low level)	upstream O2 sensor		and Battery voltage) for time and Engine is running and Modelled exhaust gas temperature at upstream O2 sensor bank 2	≥16100(mV) ≥0,1(sec) ≥350(°C)	

			for time	≥50(sec)		
			and HO2S closed loop heating control (inaccurate), which is the following condition for time:	≥50(sec)		
			(Deviation between temperature value and set point)	>50(°C)		
			Basic enable conditions are met	=see sheet enable tables		
			and No pending or confirmed DTCs	=see sheet inhibit tables		
P2247 Lambda sensor wire diagnosis	Aborted RAM check at ASIC		(Battery voltage	≤16100(mV)	0.2(s)	2 Trip
Circuit countinuity - open load at pin RE detected by means of aborted RAM check at WARMUP mode	shut-off when CJ135 in WARMUP mode Open load at pin RE detected if countinuity measurement was done before ASIC abort			,	0,-(0)	p
	Short circuit to battery fault is detected at sensor lines IPE/APE/MES as per last accessed ASIC diagnostic register, means	=FALSE	Battery voltage)	≥10700(mV)		
	Voltage at least at one of the	≤9.1 to 10.3(V)	for time Requested mode of UEGO sensor 1	≥0,1(sec) =TRUE		
	sensor lines IPE/APE/MES Result of continuity measurement of sensor pumpcell using current source ISQ (in a state, where the ASIC-internal current source ISQr is connected to the sensor line "RE" via internal switches and the sensor line "IPE" is directly connected to RGnd) is available in RAM	=TRUE	Bank 2 is in WARMUP mode Upstream HO2S Sensor is heated up, which is the following conditions:	=TRUE		
			(Upstream HO2S Sensor ceramic temperature OR	>790(°C)		
			Heating-up phase of the sensor is completed)	=TRUE		
			Basic enable conditions are met	=see sheet enable tables		

No pending or confirmed DTCs

=see sheet inhibit tables

ambda sensor wire diagnosis Circuit countinuity - open load at pin RE detected by means of aborted RAM check at NORMAL mode	Aborted RAM check at ASIC shut-off when CJ135 in NORMAL mode Open load at pin RE detected if current via Nernst cell is not		(Battery voltage	≤16100(mV)	
	OK Current source ISQr is active:	=FALSE	Battery voltage	≥10700(mV)	
) for time Upstream HO2S Sensor is heated up, which is the following conditions:	≥0,1(sec) =TRUE	
			(Upstream HO2S Sensor ceramic temperature OR	>790(°C)	
			Heating-up phase of the sensor is completed	=TRUE	
) UEGO Signal ASIC mode request of sensor 1 bank 2 is in NORMAL	=TRUE	
			Validity of REFPAT register sensor 1 bank 2	=TRUE	
			Basic enable conditions are met	=see sheet enable tables	
			No pending or confirmed DTCs	=see sheet inhibit tables	
ircuit continuity check - open circuit by means of nernst voltage monitoring during pump current operation	Monitoring of abnormalities at sensor line IPE during normal ASIC operation Open load at pin RE detected by means of nernst voltage monitoring		(Battery voltage	≤16100(mV)	
	Electrically corrected nernst voltage	>1,10016(V)	Battery voltage	≥10700(mV)	
			for time Upstream HO2S Sensor is heated up, which is the following conditions:	≥0,1(sec) =TRUE	
			(

			Upstream HO2S Sensor ceramic temperature OR Heating-up phase of the sensor is completed	>790(°C) =TRUE	
) UEGO Signal ASIC mode request of sensor 1 bank 2 is not in IDLE mode	=TRUE	
			Counter of verifications of the actual mode of the ASIC for sensor 1 bank 2	≥10(counts)	
			Basic enable conditions are met	=see sheet enable tables	
			No pending or confirmed DTCs	=see sheet inhibit tables	
	Monitoring of obnormalities		(Potton woltage	<16100	
circuit continuity check - open circuit by means of continuity measurements of sensor pumpsell respectively nernst cell during normal or aborted ASIC operation in WARMUP mode	at sensor line RE during normal ASIC operation when CJ135 is in WARMUP mode Open load at pin RE detected by means of continuity measurements of sensor pumpcell and sensor nernst cell using current source ISQr		(ballery vollage	510100	
	Difference of voltage drop at ECU-internal resistor RG in a state, where the ASIC-internal current source ISQr is connected to the sensor line "APE" and the sensor line "IPE" is directly connected to RGnd and voltage drop at ECU-internal resistor RG in a state, where all sensor lines are opened (Ug0iai - Ug0)	≥E * F	Battery voltage)	≥10700(mV)	
			for time	≥0,1(sec)	

Difference of voltage drop at ECU-internal resistor RG in a state, where the ASIC-interna current source ISQr is connected to the sensor line "RE" and the sensor line "IPE is directly connected to RGno and voltage drop at ECU- internal resistor RG in a state where all sensor lines are opened (Ug0iei - Ug0)	<e *="" f<br="">a al E" d</e>	Upstream HO2S Sensor is heated up, which is the following conditions:	=TRUE
(E) Measured amplitude of the reference pump current source the source of the source o	ne =measured value ce	(
(F) Minimum sensitivity of the continuiuity measurements to resistance RGnd	e =66(Ohm)	Upstream HO2S Sensor ceramic temperature	>790(°C)
		OR Heating-up phase of the sensor is completed	=TRUE
) Requested mode of UEGO sensor 1 Bank 2 is in WARMUP mode and	=TRUE
		Last packet transfer aborted of	=FALSE
		Counter of verifications of the actual mode of the ASIC for sensor 1 bank	≥10(counts)
		Display for the validity of Isqr for UEGO sensor 1 Bank 2	=TRUE
		OR (Last packet transfer aborted of	=TRUE
		Result of continuity measurement of sensor pumpcell using current source ISQ (in a state, where the ASIC- internal current source ISQr is connected to the sensor line "APE" via internal switches and the sensor line "IPE" is directly connected to RGnd) is available in RAM	=TRUE
	ECM Section 185 of 772	Short circuit to battery fault is detected at sensor lines RE/IPE/APE/MES as per last accessed ASIC diagnostic register,	=TRUE

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			250BDG07/	A Part 2 ECM Summary	Tables			
					Voltage at least at one of the sensor lines (RE/IPE/APE/MES)	>9.1 to 10.3(V)		
) Basic enable conditions are met	=see sheet enable		
					No pending or confirmed DTCs	=see sheet inhibit tables		
13. UEGO HEATER CONTROL CIRCUIT	P0032	Diagnoses the UEGO heater control powerstage of bank 1 sensor 1 for short circuit to battery fault at the low side of the driver circuit	Voltage high during driver ON state (indicates short-to-power)	=Short to power: ≤ 0.5 Ω impedance between signal and controller power	Release condition of heater powerstage diagnosis is enabled	=TRUE	0,5(s)	2 Trip
DIAGNOOID					The following release condition of diagnosis report of bank 1 sensor 1 is satisfied	=TRUE		
					(Battery Voltage	≥ 10700(mV)		
					for time Battery Voltage	=1,5(sec) ≤16100(mV)		
) for time	≥0,1(sec)		
) Duty cycle control powerstage heater	≥4(%)		
					sensor 1 bank 1 Basic enable conditions met	=see sheet enable		
					No Pending or Confirmed DTCs	tables =see sheet inhibit tables		
	P0031	Diagnoses the UEGO heater control powerstage of bank 1 sensor 1 for short circuit to ground fault at the low side of the driver circuit	Voltage low during driver OFF state (indicates short-to- ground)	=Short to ground: ≤ 0.5 Ω impedance between signal and controller ground	5 Release condition of heater powerstage diagnosis is enabled	=TRUE	2(s)	2 Trip
					The following release condition of diagnosis report of bank 1 sensor 1 is satisfied (=TRUE		
					Battery Voltage	≥ 10700(mV)		
					Battery Voltage	=1,5(sec) ≤16100(mV)		
) for time	≥0,1(sec)		
) Basic enable conditions met	=see sheet enable		
					No Pending or Confirmed DTCs	=see sheet inhibit tables		

_								
	P0030	Diagnoses the UEGO heater control powerstage of bank 1 sensor 1 for open circuit faults	Voltage low during driver OFF state (indicates open circuit)	=Open Circuit:≥ 200 K Ω impedance between ECU pin and load	Release condition of heater powerstage diagnosis is enabled	=TRUE	0,5(s)	2 Trip
					The following release condition of diagnosis report of bank 1 sensor 1 is satisfied (=TRUE		
					Battery Voltage	≥ 10700(mV)		
					for time Battery Voltage	=1,5(sec)		
)	210100(IIIV)		
					for time)	≥0,1(sec)		
					Basic enable conditions met	=see sheet enable tables		
					No Pending or Confirmed DTCs	=see sheet inhibit tables		
							- / >	
	P0052	Diagnoses the UEGO heater control powerstage of bank 1 sensor 2 for short circuit to battery fault at the low side of the driver circuit	Voltage high during driver ON state (indicates short-to-power)	=Short to power: ≤ 0.5 Ω impedance between signal and controller power	Release condition of heater powerstage diagnosis is enabled	=TRUE	2(s)	2 Trip
					The following release condition of diagnosis report of bank 2 sensor 1 is satisfied (=TRUE		
					Battery Voltage	≥ 10700(mV)		
					for time Battery Voltage	=1,5(sec) <16100(m\/)		
)	10100(iiiv)		
					for time	≥0,1(sec)		
					Duty cycle control powerstage heater sensor 1 bank 2	≥4(%)		
					Basic enable conditions met	=see sheet enable		
					No Pending or Confirmed DTCs	=see sheet inhibit tables		
J,								
	P0051	Diagnoses the UEGO heater control powerstage of bank 2 sensor 1 for short circuit to ground fault at the low side of the driver circuit	Voltage low during driver OFF state (indicates short-to- ground)	=Short to ground: ≤ 0.5 Ω impedance between signal and controller ground	Release condition of heater powerstage diagnosis is enabled	=TRUE	0,5(s)	2 Trip
					The following release condition of diagnosis report of bank 2 sensor 1 is satisfied	=TRUE		
					1			

					(Battery Voltage for time Battery Voltage) for time) Basic enable conditions met No Pending or Confirmed DTCs	≥ 10700(mV) =1,5(sec) ≤16100(mV) ≥0,1(sec) =see sheet enable tables =see sheet inhibit tables		
	P0050	Diagnoses the UEGO heater control powerstage of bank 2 sensor 1 for open circuit faults	Voltage low during driver OFF state (indicates open circuit)	=Open Circuit:≥ 200 K Ω impedance between ECU pin and load	Release condition of heater powerstage diagnosis is enabled	=TRUE	0,5(s)	2 Trip
					The following release condition of diagnosis report of bank 2 sensor 1 is satisfied (=TRUE		
					Battery Voltage for time Battery Voltage	≥ 10700(mV) =1,5(sec) ≤16100(mV)		
					, for time) Basic enable conditions met	≥0,1(sec) =see sheet enable		
					No Pending or Confirmed DTCs	tables =see sheet inhibit tables		
14. WIRE DIAGNOSIS OF UPSTREAM EXHAAUST GAS SENSOR	P2237	Lambda sensor wire diagnosis for UEGO sensor 1 bank 1 Circuit continiuity - open circuit at pin Apes	Monitoring of abnormalities at sensor line Apes during normal ASIC operation when CJ135 in WARMUP mode Open load at pin Apes detected by means of continuity measurements of sensor pumpcell and sensor nernst cell using current source ISQr		(Battery voltage	≤16100(mV)	0,01(s)	2 Trip

Difference of voltage drop at ECU-internal resistor RG in a state, where the ASIC-internal current source ISQr is connected to the sensor line "APE" and the sensor line "IPE" is directly connected to RGnd and voltage drop at ECU-internal resistor RG in a state, where all sensor lines are opened (Usopia: Uso)	<e *="" f(v)<="" th=""><th>Battery voltage)</th><th>≥10700(mV)</th></e>	Battery voltage)	≥10700(mV)
Difference of voltage drop at ECU-internal resistor RG in a state, where the ASIC-internal current source ISQr is connected to the sensor line "RE" and the sensor line "IPE" is directly connected to RGnd and voltage drop at ECU- internal resistor RG in a state, where all sensor lines are opened (Uq0jej - Uq0)	≥E * F(V)	for time	≥0,1(sec)
(E) Measured amplitude of the reference pump current	=measured value(A)	Upstream HO2S Sensor is heated up, which is the following conditions:	=TRUE
source (F) Minimum sensitivity of the continuiuity measurements to resistance RGnd	=66(Ohm)	(
Aborted RAM check at ASIC shut-off when CJ135 in WARMUP mode Open load at pin Apes detected by means of continuity measurements of sensor pumpcell and sensor nernst cell using current source ISQr		Upstream HO2S Sensor ceramic temperature OR	
Result of continuity measurement of sensor pumpcell using current source ISQ (in a state, where the ASIC-internal current source ISQr is connected to the sensor line "APE" via internal switches and the sensor line "IPE" is directly connected to RGnd) is available in RAM	=TRUE	Heating-up phase of the sensor is completed	=TRUE

Short circuit to battery fault is detected at sensor lines RE/IPE/APE/MES as per last accessed ASIC diagnostic register means	=TRUE)	
Voltage at least at one of the sensor lines RE/IPE/APE/MES	>9.1 to 10.3(V)	Basic enable conditions are met	=see sheet enable tables
Difference of voltage drop at ECU-internal resistor RG in a state, where the ASIC-internal current source ISQr is connected to the sensor line "APE" and the sensor line "IPE" is directly connected to RGnd and voltage drop at ECU-internal resistor RG in a state, where all sensor lines are opened (Ug0iai - Ug0)	<d *="" f(v)<="" td=""><td>No pending or confirmed DTCs</td><td>=see sheet inhibit tables</td></d>	No pending or confirmed DTCs	=see sheet inhibit tables
Difference of voltage drop at ECU-internal resistor RG in a state, where the ASIC-internal current source ISQr is connected to the sensor line "RE" and the sensor line "IPE" is directly connected to RGnd and voltage drop at ECU- internal resistor RG in a state, where all sensor lines are opened (Ug0iei - Ug0)	≥D * F(V)		
(D) Requested amplitude of the reference pump current source	=commanded value(A)		
(F) Minimum sensitivity of the continuiuity measurements to resistance RGnd	=66(Ohm)		
Aborted RAM check at ASIC shut-off when CJ135 in NORMAL mode Open load at pin Apes detected if countinuiuty measurement was done before			

abort

250BDG07A Part	2	ECM	Summary	Tables
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		Result of continuity measurement of sensor pumpcell using current source ISQ (in a state, where the ASIC-internal current source ISQr is connected to the sensor line "APE" via internal switches and the sensor line "IPE" is directly connected to RGnd) is available in RAM					
P2237	Path 1 : Monitoring of prolonged activation of the blackening protection	Blackening protection is active for at least number of 16 successive checks	>5(counts)	(10(counts)	2 Trip
		for time	≥ 2,55(sec)	Release of diagnosis report sensor 1 bank 1 (=TRUE		
				(Battery voltage	>10700(m\/)		
				for time	≥1,5(sec)		
				Battery voltage	≤16100(mV)		
				for time	≥0,1(sec)		
) Sensor in hot state	=TRUE		
				(Sensor operation release, Sensor 1 Bank 1	=TRUE		
				(Battery voltage	≤16100(mV)		
				for time ((≥0,06(sec)		
				t End of start reached	=FALSE		
				OR Engine operation in stopping and finish state	=FALSE		
				(Heat quantity to dew-point end exceeds heat quantity threshold for dew-point end	=TRUE		
)			
				, OR			
		ECM	Section 191 of 772	(303 c

Dew point end is reset for TSP	=FALSE
Counter for repeated cold starts dew- point end not reached sensor 1	≤6(counts)
(
(Catalyst heating request by cold engine	=TRUE
Catalyst heating request in connection with engine speed	=TRUE
Ratio of heat quantity for dew-point end detection sensor 1 and heat quantity threshold for dew-point end detection sensor 1 bank 1	≥0 to 0.41
(see Look-Up-Table #32)	
) OR Ratio of heat quantity for dew-point end detection sensor 1 and heat quantity threshold for dew-point end detection sensor 1 bank 1 (see Look-Up-Table #30)	≥0 to 1
))) (
Engine in running state	=TRUE
) OR (
Status of fast light-off for Lambda sensor	=TRUE
OR Function demand for oxygen sensor heating before start	=TRUE
, OR Dew point release requested by service tester)	=TRUE
(Battery voltage for time OR	≥10700(mV) ≥1,5(sec)

Heating up of open loop completed, sensor 1, bank 1	=TRUE
Fror with heater, sensor 1, bank 1 UEGO Signal ASIC mode request of sensor 1 bank 1	=FALSE =0
Battery voltage	>9,8(V)
for time	≥0,5(sec)
Battery voltage	>8000(mV)
for time	≥0,05(sec)
Status auxillary power relay	=TRUE
ECU in drive state	=TRUE
)	
Evaluation temperature is valid,	=IRUE
Sensor i Dark i	
(
Temperature of ceramic sensor 1	>A - B(°C)
bank 1	
(A) temperature set point for heater	-800(°C)
control	-000(0)
(B) large temperature threshold of	=50(°C)
the control deviation of heater control	
OP	
UR Heating up open loop is completed	=TRUF
sensor 1, bank 1	into L
(
Open loop ramp phase finished	=TRUE
for time	≥0(sec)
OR Temperature of ceramic sensor 1	>790(°C)
bank 1	=/00(0)
)	
)	
	$\sim 0.4(\dots)$
for time Rump current operation for sensor 1	≥0,1(sec) _TPUE
bank 1 is active	-INOL
Counter of verifications of the actual	>30(counts)
mode of the ASIC for sensor 1 bank	
1	0
UEGO Signal ASIC mode request of sensor 1 bank 1	=0
Current pump package is valid	=TRUE
)	
No pending or confirmed DTCs	=see sheet inhibit table

			Basic enable conditions met	=see sheet enabl tables
Path 2: Monitoring of negative voltage drop deviation at ECU- internal resistor Rgnd by means of continuity measurements of sensor pumpcell	Negative voltage drop deviation, sensor 1 bank 1	≤-0,15008(V)	Common conditions for voltage drop deviation:	
panipoon	and Negative voltage drop deviation, sensor 1 bank 1	≥0,15008(V)	(Release of diagnosis report sensor 1 bank 1 (=TRUE
			t Battery voltage for time and	≥10700(mV) ≥1,5(sec)
			Battery voltage	≤16100(mV)
			for time	≥0,1(sec)
) Sensor in hot state	=TRUE
			(Sensor operation release, Sensor 1 Bank 1	=TRUE
			(Battery voltage for time ((≤16100(mV) ≥0,06(sec)
			(End of start reached OR	=FALSE
			Engine operation in stopping and finish state	=FALSE
			(Heat quantity to dew-point end exceeds heat quantity threshold for dew-point end	=TRUE
)) OR	
			(Dew point end is reset for TSP	=FALSE
			Counter for repeated cold starts dew- point end not reached sensor 1	≤6(counts)
			(

Catalyst heating request by cold	=TRUE
Catalyst heating request in connection with engine speed	=TRUE
(Ratio of heat quantity for dew-point end detection sensor 1 and heat quantity threshold for dew-point end detection sensor 1 bank 1 (see Look-Up-Table #32)	≥0 to 0.41
) OR Ratio of heat quantity for dew-point end detection sensor 1 and heat quantity threshold for dew-point end detection sensor 1 bank 1 (see Look-Up-Table #30)	≥0 to 1
)) (Engine in running state	=TRUE
) OR (Status of fast light-off for Lambda sensor	=TRUE
OR Function demand for oxygen sensor heating before start	=TRUE
) OR Dew point release requested by service tester)	=TRUE
(Battery voltage for time	≥10700(mV) ≥1,5(sec)
Heating up of open loop completed, sensor 1, bank 1	=TRUE
) Error with heater, sensor 1, bank 1 UEGO Signal ASIC mode request of sensor 1 bank 1	=FALSE =0
Battery voltage for time Battery voltage	>9800(mV) ≥0,5(sec) >8000(mV)

for time	≥0,05(sec)
Status auxillary power relay ECU in drive state	=TRUE =TRUE
) Evaluation temperature is valid, sensor 1 bank 1	=TRUE
(Temperature of ceramic sensor 1 bank 1 whore	>A - B(°C)
(A) temperature set point for heater	=800(°C)
(B) large temperature threshold of the control deviation of heater control	=50(°C)
OR Heating up open loop is completed, sensor 1, bank 1	=TRUE
Open loop ramp phase finished for time	=TRUE ≥0(sec)
Temperature of ceramic sensor 1 bank 1	≥790(°C)
)	
for time Pump current operation for sensor 1 bank 1 is active	≥0,1(sec) =TRUE
Counter of verifications of the actual mode of the ASIC for sensor 1 bank	>30(counts)
UEGO Signal ASIC mode request of	!=0
Current pump package is valid	=TRUE
) No pending or confirmed DTCs	=see sheet inhibit table
Basic enable conditions met	=see sheet enable tables

Path 3: Monitoring of positive voltage drop deviation at ECU- internal resistor Rgnd by means of continuity measurements of sensor pumpcell	Positive voltage drop deviation, sensor 1 bank 1	≤-0,15008(V)	Common conditions for voltage drop deviation	=TRUE
	Positive voltage drop deviation, sensor 1 bank 1	≥0,15008(V)	Basic enable conditions met	=see sheet enable tables
Path 4: Monitoring of the non- availability of the sensor signals for a prolonged duration	((
	Physical release conditions for oxygen sensor are fulfilled OR	=FALSE	Release of diagnosis report sensor 1 bank 1 (=TRUE
	Oxygen sensor signals are of high precision	=FALSE	(
) for time	≥10(sec)	Battery voltage for time Battery voltage	≥10700(mV) ≥1,5(sec) ≤16100(mV)
			for time	≥0,1(sec)
			, Sensor in hot state (=TRUE
			Sensor operation release, Sensor 1 Bank 1 (=TRUE
			Battery voltage for time ((≤16100(mV) ≥0,06(sec)
			End of start reached OR	=FALSE
			Engine operation in stopping and finish state	=FALSE
			(Heat quantity to dew-point end exceeds heat quantity threshold for dew-point end	=TRUE
)) OR	
			Dew point end is reset for TSP sensor 1	=FALSE

Counter for repeated cold starts dew-	≤6(counts)
point end not reached sensor 1	

(

Catalyst heating request by cold	=TRUE
engine	
Catalyst heating request in	=TRUE
connection with engine speed	

≥0 to 0.41

) 0

) OR Ratio of heat quantity for dew-point end detection sensor 1 and heat quantity threshold for dew-point end detection sensor 1 bank 1 (see Look-Up-Table #30)	≥0 to 1
)) (Engine in running state	=TRUE
) OR (Status of fast light-off for Lambda sensor	=TRUE
OR Function demand for oxygen sensor heating before start)	=TRUE
OR Dew point release requested by service tester)	=TRUE
Battery voltage for time	≥10700(mV) ≥1,5(sec)
Heating up of open loop completed, sensor 1, bank 1	=TRUE

=FALSE =0

Érror with heater, sensor 1, bank 1 UEGO Signal ASIC mode request of

Battery voltage for time Battery voltage for time	>9800(mV) ≥0,5(sec) >8000(mV) ≥0,05(sec)
Status auxillary power relay ECU in drive state	=TRUE =TRUE
) Evaluation temperature is valid, sensor 1 bank 1	=TRUE
(Temperature of ceramic sensor 1 bank 1 where	>A - B(°C)
(A) temperature set point for heater	=800(°C)
(B) large temperature threshold of the control deviation of heater control	=50(°C)
OR Heating up open loop is completed, sensor 1, bank 1	=TRUE
(Open loop ramp phase finished for time	=TRUE ≥0(sec)
OR Temperature of ceramic sensor 1 bank 1	≥790(°C)
))	
, for time Pump current operation for sensor 1	≥0,1(sec) =TRUE
Counter of verifications of the actual mode of the ASIC for sensor 1 bank	>30(counts)
UEGO Signal ASIC mode request of	=0
sensor 1 bank 1 Current pump package is valid	=TRUE
) No pending or confirmed DTCs	=see sheet inhibit table
Basic enable conditions met	=see sheet enable tables

P2240	Lambda sensor wire diagnosis for UEGO sensor 1 bank 2 Circuit continiuity - open circuit at pin Apes	Monitoring of abnormalities at sensor line Apes during normal ASIC operation when CJ135 in WARMUP mode Open load at pin Apes detected by means of continuity measurements of sensor pumpcell and sensor nernst cell using current source ISQr		(Battery voltage	≤16100(mV)	0,01(s)	2 Trip
		Difference of voltage drop at ECU-internal resistor RG in a state, where the ASIC-internal current source ISQr is connected to the sensor line "APE" and the sensor line "IPE" is directly connected to RGnd and voltage drop at ECU-internal resistor RG in a state, where all sensor lines are opened (Uq0iai - Uq0)	<e *="" f(v)<="" th=""><th>Battery voltage)</th><th>≥10700(mV)</th><th></th><th></th></e>	Battery voltage)	≥10700(mV)		
		Difference of voltage drop at ECU-internal resistor RG in a state, where the ASIC-internal current source ISQr is connected to the sensor line "RE" and the sensor line "IPE" is directly connected to RGnd and voltage drop at ECU- internal resistor RG in a state, where all sensor lines are opened (Ua0iei - Ua0)	≥E * F(V)	for time	≥0,1(sec)		
		(E) Measured amplitude of the reference pump current source	=measured value(A)	Upstream HO2S Sensor is heated up, which is the following conditions:	=TRUE		
		(F) Minimum sensitivity of the continuiuity measurements to resistance RGnd	=66(Ohm)	(
		Aborted RAM check at ASIC shut-off when CJ135 in WARMUP mode Open load at pin Apes detected by means of continuity measurements of sensor pumpcell and sensor nernst cell using current source ISQr		Upstream HO2S Sensor ceramic temperature OR	>790(°C)		

Result of continuity measurement of sensor pumpcell using current source ISQ (in a state, where the ASIC-internal current source ISQr is connected to the sensor line "APE" via internal switches and the sensor line "IPE" is directly connected to RGnd) is available in RAM	=TRUE	Heating-up phase of the sensor is completed	=TRUE
Short circuit to battery fault is detected at sensor lines RE/IPE/APE/MES as per last accessed ASIC diagnostic register, means	=TRUE)	
Voltage at least at one of the sensor lines RE/IPE/APE/MES	>9.1 to 10.3(V)	Basic enable conditions are met	=see sheet enable tables
Difference of voltage drop at ECU-internal resistor RG in a state, where the ASIC-internal current source ISQr is connected to the sensor line "APE" and the sensor line "IPE" is directly connected to RGnd and voltage drop at ECU-internal resistor RG in a state, where all sensor lines are opened (Ug0iai - Ug0)	<d *="" f(v)<="" td=""><td>No pending or confirmed DTCs</td><td>=see sheet inhibit tables</td></d>	No pending or confirmed DTCs	=see sheet inhibit tables
Difference of voltage drop at ECU-internal resistor RG in a state, where the ASIC-internal current source ISQr is connected to the sensor line "RE" and the sensor line "IPE" is directly connected to RGnd and voltage drop at ECU- internal resistor RG in a state, where all sensor lines are opened (Ua0iei - Ua0)	≥D * F(V)		
(D) Requested amplitude of the reference pump current source	=commanded value(A)		
(F) Minimum sensitivity of the continuiuity measurements to resistance RGnd	=66(Ohm)		

		Aborted RAM check at ASIC shut-off when CJ135 in NORMAL mode Open load at pin Apes detected if countinuiuty measurement was done before abort Result of continuity measurement of sensor pumpcell using current source ISQ (in a state, where the ASIC-internal current source ISQr is connected to the sensor line "APE" via internal switches and the sensor line "IPE" is directly connected to RGnd) is available in RAM	=TRUE				
P2240	Path 1 : Monitoring of prolonged activation of the blackening protection	Blackening protection is active for at least number of 16 successive checks	>5(counts)	(10(counts)	2 Trip
		for time	≥ 2,55(sec)	Release of diagnosis report sensor 1 bank 2 (=TRUE		
				Battery voltage for time	≥10700(mV) ≥1,5(sec)		
				Battery voltage)	≤16100(mV)		
				for time)	≥0,1(sec)		
				Sensor in hot state	=TRUE		
				Sensor operation release, Sensor 1 Bank 2	=IRUE		
				Battery voltage for time	≤16100(mV) ≥0,06(sec)		
				(
				(End of start reached OR	=FALSE		
				Engine operation in stopping and finish state	=FALSE		
				(

Heat quantity to dew-point end

=TRUE

exceeds heat quantity threshold for dew-point end	
)) OR (Dew point end is reset for TSP sensor 1 Counter for repeated cold starts dew-	=FALSE ≤6(counts)
point end not reached sensor 1	
((Catalyst heating request by cold engine and	=TRUE
Catalyst heating request in connection with engine speed	=TRUE
Ratio of heat quantity for dew-point end detection sensor 1 and heat quantity threshold for dew-point end detection sensor 1 bank 2	≥0 to 0.41
(see Look-Up-Table #33)	
) OR Ratio of heat quantity for dew-point end detection sensor 1 and heat quantity threshold for dew-point end detection sensor 1 bank 2 (see Look-Up-Table #31)	≥0 to 1
))) (Engine in running state	=TRUE
)	
OR (Status of fast light-off for Lambda sensor	=TRUE
OR Function demand for oxygen sensor heating before start)	=TRUE

Dew point release requested by service tester	=TRUE
)	
(Battery voltage for time	≥10700(mV) ≥1,5(sec)
Heating up of open loop completed, sensor 1, bank 2	=TRUE
/ Error with heater, sensor 1, bank 2 UEGO Signal ASIC mode request of sensor 1 bank 2	=FALSE =0
Battery voltage	>9800(mV)
for time	≥0,5(sec)
Battery voltage for time	>8000(mV) ≥0,05(sec)
Status auxillary power relay ECU in drive state	=TRUE =TRUE
) Evaluation temperature is valid, sensor 1 bank 2	=TRUE
(Temperature of ceramic sensor 1 bank 2 where	>A - B(°C)
(A) temperature set point for heater	=800(°C)
(B) large temperature threshold of the control deviation of heater control	=50(°C)
OR Heating up open loop is completed, sensor 1, bank 2	=TRUE
Open loop ramp phase finished for time	=TRUE ≥0(sec)
Temperature of ceramic sensor 1 bank 2	≥790(°C)
)))	
for time	≥0,1(sec)
Pump current operation for sensor 1	=TRUE
Counter of verifications of the actual mode of the ASIC for sensor 1 bank	>30(counts)
2 UEGO Signal ASIC mode request of sensor 1 bank 2	=0
Current numn nackada is valid	

) No pending or confirmed DTCs	=see sheet inhibit table
			Basic enable conditions met	=see sheet enable tables
Path 2: Monitoring of negative voltage drop deviation at ECU- internal resistor Rgnd by means of continuity measurements of sensor pumpcell	Negative voltage drop deviation, sensor 1 bank 2	≤-0,15008(V)	Common conditions for voltage drop deviation:	
	and Negative voltage drop deviation, sensor 1 bank 2	≥0,15008(V)	(Release of diagnosis report sensor 1 bank 2 (=TRUE
			(Battery voltage for time Battery voltage	≥10700(mV) ≥1,5(sec) ≤16100(mV)
) for time	≥0,1(sec)
) Sensor in hot state	=TRUE
			(Sensor operation release, Sensor 1 bank 2	=TRUE
			(Battery voltage for time ((≤16100(mV) ≥0,06(sec)
			(End of start reached	=FALSE
			OR Engine operation in stopping and finish state	=FALSE
			(Heat quantity to dew-point end exceeds heat quantity threshold for dew-point end	=TRUE
)) OR	
			(Dew point end is reset for TSP sensor 1	=FALSE

Counter for repeated cold starts dew-	≤6(counts)
point end not reached sensor 1	

(

Catalyst heating request by cold	=TRUE
engine	
Catalyst heating request in	=TRUE
connection with engine speed	

(
Ratio of heat quantity for dew-point	≥0 to 0.41
end detection sensor 1 and heat	
quantity threshold for dew-point end	
detection sensor 1 bank 2	

(see Look-Up-Table #33)

) OR

Ratio of heat quantity for dew-point	≥0 to 1
end detection sensor 1 and heat	
quantity threshold for dew-point end	
detection sensor 1 bank 2	
(see Look-Up-Table #31)	

Engine in running state =TRUE

) OR Status of fast light-off for Lambda sensor =TRUE

OR	
Function demand for oxygen sensor	=TRUE
heating before start	
)	
OR	
Dew point release requested by	=TRUE
service tester	
)	
(
Battery voltage	≥10700(mV)
for time	≥1,5(sec)
OR	
Heating up of open loop completed,	=TRUE
sensor 1, bank 2	
)	

Error with heater, sensor 1, bank 2 =FALSE

UEGO Signal ASIC mode request of sensor 1 bank 2	=0
Battery voltage	>9800(mV)
for time Battery voltage	≥0,5(sec) >8000(m\/)
for time	≥0,05(sec)
Status auvillary power relay	
ECU in drive state	=TRUE
)	
Evaluation temperature is valid,	=TRUE
Sensor i Dank 2	
(()
Temperature of ceramic sensor 1	>A - B(°C)
where	
(A) temperature set point for heater	=800(°C)
(B) large temperature threshold of	=50(°C)
the control deviation of heater control	
Heating up open loop is completed.	=TRUE
sensor 1, bank 2	
Open loop ramp phase finished for time	=TRUE ≥0(sec)
OR	_0(000)
Temperature of ceramic sensor 1	≥790(°C)
Dank 2	
)	
)	$\sim 0.4(1.1)$
for time Pump current operation for sensor 1	≥0,1(sec) =TRUF
bank 2 is active	-1102
Counter of verifications of the actual	>30(counts)
2	
UEGO Signal ASIC mode request of	!=0
sensor 1 bank 2	TDUE
)	=IRUE
No pending or confirmed DTCs	=see sheet inhibit table
	and alterative set is
Basic enable conditions met	=see sneet enable tables
	(45)00

Path 3: Monitoring of positive voltage drop deviation at ECU- internal resistor Rgnd by means of continuity measurements of sensor pumpcell	Positive voltage drop deviation, sensor 1 bank 2	≤-0,15008(V)	Common conditions for voltage drop deviation	=TRUE
	Positive voltage drop deviation, sensor 1 bank 2	≥0,15008(V)	Basic enable conditions met	=see sheet enable tables
Path 4: Monitoring of the non- availability of the sensor signals for a prolonged duration	((
	Physical release conditions for oxygen sensor are fulfilled OR	=FALSE	Release of diagnosis report sensor 1 bank 2 (=TRUE
	Oxygen sensor signals are of high precision	=FALSE	(
) for time	≥10(sec)	Battery voltage for time Battery voltage	≥10700(mV) ≥1,5(sec) ≤16100(mV)
			for time	≥0,1(sec)
			, Sensor in hot state (=TRUE
			Sensor operation release, Sensor 1 bank 2	=TRUE
			Battery voltage for time ((≤16100(mV) ≥0,06(sec)
			End of start reached OR	=FALSE
			Engine operation in stopping and finish state	=FALSE
			(Heat quantity to dew-point end exceeds heat quantity threshold for dew-point end	=TRUE
)) OR (
			Dew point end is reset for TSP sensor 1	=FALSE

Counter for repeated cold starts dew-	≤6(counts)
point end not reached sensor 1	

(Catalyst heating request by cold engine Catalyst heating request in connection with engine speed	=TRUE =TRUE
(Ratio of heat quantity for dew-point	≥0 to 0.41

Ratio of heat quantity for dew-point end detection sensor 1 and heat quantity threshold for dew-point end detection sensor 1 bank 2	≥0 to 0.41
(see Look-Up-Table #33)	
OR Ratio of heat quantity for dew-point end detection sensor 1 and heat quantity threshold for dew-point end detection sensor 1 bank 2 (see Look-Up-Table #31)	≥0 to 1
Engine in running state	=TRUE
)	
OR (
Status of fast light-off for Lambda sensor	=TRUE
OR Function demand for oxygen sensor neating before start	=TRUE
OR Dew point release requested by service tester	=TRUE
Battery voltage for time	≥10700(mV) ≥1,5(sec)
JK Heating up of open loop completed, sensor 1, bank 2	=TRUE

Error with heater, sensor 1, bank 2

=FALSE

UEGO Signal ASIC mode request of sensor 1 bank 2	=0
Battery voltage	>9800(mV)
for time	≥0,5(sec)
Battery voltage	>8000(mV)
for time	≥0,05(sec)
Status auxillary power relay	=TRUE
ECU in drive state	=TRUE
Evaluation temperature is valid, sensor 1 bank 2	=TRUE
(Temperature of ceramic sensor 1	>4 - B(°C)
bank 2	
(A) temperature set point for heater	=800(°C)
(B) large temperature threshold of	=50(°C)
the control deviation of heater control	
OR Heating up open loop is completed	
sensor 1, bank 2	
(Open loop ramp phase finished	=TRUE
for time OR	≥0(sec)
Temperature of ceramic sensor 1 bank 2	≥790(°C)
)	
) for time	>0 1(000)
Pump current operation for sensor 1	≥0, I(sec) =TRUE
bank 2 is active	00(111111)
mode of the ASIC for sensor 1 bank	>30(counts)
UEGO Signal ASIC mode request of	=0
Sensor 1 bank 2 Current pump package is valid	=TRUE
)	
No pending or confirmed DTCs	=see sheet inhibit table
Basic enable conditions met	=see sheet enable
	tables

P2251	Lambda sensor wire diagnosis for UEGO sensor 1 bank 1 Circuit countinuiuty - open circuit at pin IPE	Monitoring of abnormalities at sensor line IPE during normal ASIC operation when CJ135 is in NORMAL mode Open load at pin IPE detected by means of continuity measurements of sensor pumpcell during negative pump current pulse		(Battery voltage	≤16100(mV)	0,01(s)	2 Trip
		Result of continuity measurement of sensor pumpcell using current source ISQ (in a state, where the ASIC-internal current source ISQr is connected to the sensor line "APE" via internal switches and the sensor line "IPE" is directly connected to RGnd) is available in RAM	=FALSE	Battery voltage)	≥10700(mV)		
		(If control deviation of heater control of upstream HO2S Sensor (HO2S Sensor heater control is inaccurate)	≥49,9922(K)	for time Upstream HO2S Sensor is heated up, which is the following conditions:	≥0,1(sec) =TRUE		
		for time (≥0,1(sec)	(Upstream HO2S Sensor ceramic temperature	>790(°C)		
		Negated difference of voltage drop at ECU-internal resistor RGnd in a state, where only the sensor line "APE" is directly connected to RGnd and voltage drop at ECU- internal resistor RGnd in a state, where all sensor lines are opened (Ug0 - Uga)	>0,49984(V)	OR			
		for time	≥0,1(sec)	Heating–up phase of the sensor is completed	=TRUE		
		Negated difference of voltage drop at ECU-internal resistor RGnd in a state, where only the sensor line "IPE" is directly connected to RGnd and voltage drop at ECU-internal resistor RGnd in a state, where all sensor lines are opened (Ug0 - Ugi)	>0,49984(V)	, Basic enable conditions are met	=see sheet enable tables		

for time	≥0,1(sec)	No pending or confirmed DTCs	=see sheet inhibit tables
)			
OR If control deviation of heater control of upstream HO2S Sensor (HO2S Sensor heater control is accurate)	<50(K)		
(Negated difference of voltage drop at ECU-internal resistor RGnd in a state, where only the sensor line "APE" is directly connected to RGnd and voltage drop at ECU-internal resistor RGnd in a state, where all sensor lines are opened (Ug0 - Uga)	>A + (B * C)		
for time OR Negated difference of voltage drop at ECU-internal resistor RGnd in a state, where only the sensor line "IPE" is directly connected to RGnd and voltage drop at ECU-internal resistor RGnd in a state, where all sensor lines are opened (Ug0 - Ugi)	≥0,1(sec) >A + (B * C)		
for time)	≥0,1(sec)		
(A) Initial threshold for negative voltage deviation during Delta Ugx check	=0,08992(V)		
(B) Voltage step for negative voltage deviation in delta Ugx check	=0,08(V)		
 (C) Number of negative overshoots of continuity measurement values Ugx) 	=measured value		
Monitoring of abnormalities at sensor line IPE during normal ASIC operation when CJ135 is in WARMUP mode Open load at pin IPE detected by means of continuity measurements of sensor pumpcell and sensor nernst cell using current source ISQr			
---	-----------------------------------	--	
Difference of voltage drop at ECU-internal resistor RG in a state, where the ASIC-internal current source ISQr is connected to the sensor line "APE" and the sensor line "IPE" is directly connected to RGnd and voltage drop at ECU-internal resistor RG in a state, where all sensor lines are opened (Ua0iai - Ua0)	<e *="" f<="" th=""><th></th></e>		
Difference of voltage drop at ECU-internal resistor RG in a state, where the ASIC-internal current source ISQr is connected to the sensor line "RE" and the sensor line "IPE" is directly connected to RGnd and voltage drop at ECU- internal resistor RG in a state, where all sensor lines are opened (Ug0iei - Ug0)	<e *="" f<="" td=""><td></td></e>		
(E) Measured amplitude of the reference pump current source	=measured value		
(F) Minimum sensitivity of the continuiuity measurements to resistance RGnd	=66(Ohm)		
Aborted RAM check at ASIC shut-off when CJ135 in WARMUP mode Open load at pin IPE detected by means of continuity measurements of sensor pumpcell and sensor nernst cell using current source ISQr			

Result of continuity measurement of sensor pumpcell using current source ISQ (in a state, where the ASIC-internal current source ISQr is connected to the sensor line "APE" via internal switches and the sensor line "IPE" is directly connected to RGnd) is available in RAM	=TRUE	
Voltage at least at one of the sensor lines	>9.1 to 10.3(V)	
(RE/IPE/APE/MES) Difference of voltage drop at ECU-internal resistor RG in a state, where the ASIC-internal current source ISQr is connected to the sensor line "APE" and the sensor line "IPE" is directly connected to RGnd and voltage drop at ECU-internal resistor RG in a state, where all sensor lines are opened (Ug0iai - Ug0)	<d *="" f<="" td=""><td></td></d>	
Difference of voltage drop at ECU-internal resistor RG in a state, where the ASIC-internal current source ISQr is connected to the sensor line "RE" and the sensor line "IPE" is directly connected to RGnd and voltage drop at ECU- internal resistor RG in a state, where all sensor lines are opened (Ug0iei - Ug0) (D) Requested amplitude of the reference pump current	<d *="" f<="" td=""><td></td></d>	
source (F) Minimum sensitivity of the continuiuity measurements to resistance RGnd	=66	
Aborted RAM check at ASIC shut-off when CJ135 in NORMAL mode Open load at pin IPE detected if no countinuiuty measurement was done before ASIC abort		

		Result of continuity measurement of sensor pumpcell using current source ISQ (in a state, where the ASIC-internal current source ISQr is connected to the sensor line "APE" via interna switches and the sensor line "IPE" is directly connected to RGnd) is available in RAM	=FALSE				
P2254	Lambda sensor wire diagnosis for UEGO sensor 1 bank 2 Circuit countinuiuty - open circuit at pin IPE	Monitoring of abnormalitie at sensor line IPE during normal ASIC operation wh CJ135 is in NORMAL mode Open load at pin IPE detected by means of continuity measurements of sensor pumpcell during negative pur current pulse	en e ed imp	(Battery voltage	≤16100(mV)	0,01(s)	2 Trip
		Result of continuity measurement of sensor pumpcell using current source ISQ (in a state, where the ASIC-internal current source ISQr is connected to the sensor line "APE" via interna switches and the sensor line "IPE" is directly connected to RGnd) is available in RAM	=FALSE	Battery voltage)	≥10700(mV)		
		(If control deviation of heater control of upstream HO2S Sensor (HO2S Sensor heate control is inaccurate)	≥50(K) er	for time Upstream HO2S Sensor is heated up, which is the following conditions:	≥0,1(sec) =TRUE		
		for time (Negated difference of voltag drop at ECU-internal resisto RGnd in a state, where only the sensor line "APE" is directly connected to RGnd and voltage drop at ECU- internal resistor RGnd in a state, where all sensor lines	≥0,1(sec) je >0,49984(V) r	(Upstream HO2S Sensor ceramic temperature OR	>790(°C)		
		are opened (Ug0 - Uga) for time	≥0,1(sec)	Heating-up phase of the sensor is completed)	=TRUE		

Negated difference of voltage drop at ECU-internal resistor RGnd in a state, where only the sensor line "IPE" is directly connected to RGnd and voltage drop at ECU-internal resistor RGnd in a state, where all sensor lines are opened (Ug0 - Ugi)	>0,49984(V)	Basic enable conditions are met	=see sheet enable tables
for time	≥0,1(sec)	No pending or confirmed DTCs	=see sheet inhibit tables
) OR			
If control deviation of heater control of upstream HO2S Sensor (HO2S Sensor heater control is accurate) (<50(K)		
Negated difference of voltage drop at ECU-internal resistor RGnd in a state, where only the sensor line "APE" is directly connected to RGnd and voltage drop at ECU-internal resistor RGnd in a state, where all sensor lines are opened (Ug0 - Uga)	>A + (B * C)		
for time	≥0,1(sec)		
Negated difference of voltage drop at ECU-internal resistor RGnd in a state, where only the sensor line "IPE" is directly connected to RGnd and voltage drop at ECU-internal resistor RGnd in a state, where all sensor lines are opened (Ug0 - Ugi)	>A + (B * C)		
for time	≥0,1(sec)		
(A) Initial threshold for negative voltage deviation during Delta Ugx check	=0,08992(V)		

(B) Voltage step for negative =0,08(V) voltage deviation in delta Ugx check (C) Number of negative =measured value overshoots of continuity measurement values Ugx Monitoring of abnormalities at sensor line IPE during normal ASIC operation when CJ135 is in WARMUP mode Open load at pin IPE detected by means of continuity measurements of sensor pumpcell and sensor nernst cell using current source ISQr <E * F Difference of voltage drop at ECU-internal resistor RG in a state, where the ASIC-internal current source ISQr is connected to the sensor line "APE" and the sensor line "IPE" is directly connected to RGnd and voltage drop at ECU-internal resistor RG in a state, where all sensor lines are opened (Ug0iai - Ug0) Difference of voltage drop at <E * F ECU-internal resistor RG in a state, where the ASIC-internal current source ISQr is connected to the sensor line "RE" and the sensor line "IPE" is directly connected to RGnd and voltage drop at ECUinternal resistor RG in a state, where all sensor lines are opened (Ug0iei - Ug0) (E) Measured amplitude of the =measured value(A) reference pump current source (F) Minimum sensitivity of the =66(Ohm) continuiuity measurements to resistance RGnd

Aborted RAM check at ASIC shut-off when CJ135 in WARMUP mode Open load at pin IPE detected by means of continuity measurements of sensor pumpcell and sensor nernst cell using current source ISQr		
Result of continuity measurement of sensor pumpcell using current source ISQ (in a state, where the ASIC-internal current source ISQr is connected to the sensor line "APE" via internal switches and the sensor line "IPE" is directly connected to RGnd) is available in RAM	=TRUE	
Voltage at least at one of the sensor lines	>9.1 to 10.3(V)	
(RE/IPE/APE/MES) Difference of voltage drop at ECU-internal resistor RG in a state, where the ASIC-internal current source ISQr is connected to the sensor line "APE" and the sensor line "IPE" is directly connected to RGnd and voltage drop at ECU-internal resistor RG in a state, where all sensor lines are opened (U20ini LU0)	<d *="" f<="" td=""><td></td></d>	
Difference of voltage drop at ECU-internal resistor RG in a state, where the ASIC-internal current source ISQr is connected to the sensor line "RE" and the sensor line "IPE" is directly connected to RGnd and voltage drop at ECU- internal resistor RG in a state, where all sensor lines are opened (Ug0iei - Ug0)	<d *="" f<="" td=""><td></td></d>	
(D) Requested amplitude of the reference pump current source	=commanded value	
(F) Minimum sensitivity of the continuiuity measurements to resistance RGnd	=66(Ohm)	

		Aborted RAM check at ASIC shut-off when CJ135 in NORMAL mode Open load at pin IPE detected if no countinuiuty measurement was done before ASIC abort					
		Result of continuity measurement of sensor pumpcell using current source ISQ (in a state, where the ASIC-internal current source ISQr is connected to the sensor line "APE" via internal switches and the sensor line "IPE" is directly connected to RGnd) is available in RAM	=FALSE				
P2626	Lambda sensor wire diagnosis for UEGO sensor 1 bank 1 Circuit countinuity - open circuit at Rcmp (compensation resistor)	Calculated parallel resistance between APE and MES for t UEGO sensor 1 bank 1	>240(Ohm)	(Battery voltage	≤16100(mV)	0,01(s)	2 Trip
				Battery voltage)	≥10700(mV)		
				for time Upstream HO2S Sensor is heated up, which is the following conditions:	≥0,1(sec) =TRUE		
				(Upstream HO2S Sensor ceramic temperature OR	>790(°C)		
				Heating-up phase of the sensor is completed	=TRUE		
) Last packet transfer aborted of sensor 1 bank 1	=FALSE		
				Requested mode of UEGO sensor 1 Bank 1 is in SWITCHON mode	=TRUE		
				Counter of verifications of the actual mode of the ASIC for sensor 1 bank	≥10(counts)		
				basic enable conditions are met	=see sneet enable tables -see sheet inhibit		
					tables		

P2629	Lambda sensor wire diagnosis for UEGO sensor 1 bank 2 Circuit countinuity - open circuit at Rcmp (compensation resistor)	Calculated parallel resistance between APE and MES for t UEGO sensor 1 bank 2	>240(Ohm)	(Battery voltage	≤16100(mV)	0,01(s)	2 Trip
				Battery voltage	≥10700(mV)		
) for time Upstream HO2S Sensor is heated up, which is the following conditions:	≥0,1(sec) =TRUE		
				(Upstream HO2S Sensor ceramic temperature	>790(°C)		
				Heating-up phase of the sensor is completed	=TRUE		
) Last packet transfer aborted of	=FALSE		
				Requested mode of UEGO sensor 1	=TRUE		
				Counter of verifications of the actual mode of the ASIC for sensor 1 bank	≥10(counts)		
				Basic enable conditions are met	=see sheet enable tables		
				No pending or confirmed DTCs	=see sheet inhibit tables		
P0132	Lambda sensor wire diagnosis for sensor 1 bank 1	Path1: Monitoring of abnormalities		(Battery voltage	≤16100(mV)	0,01(s)	2 Trip
	Circuit continuity - short circuit to battery	at sensor lines RE/IPE/APE/MES during the normal ASIC operation when CJ135 is in IDLE mode Short circuit to battery detected by means of voltage monitoring at sensor lines RE/IPE/APE/MES as per last accessed ASIC diagnostic register					
		Voltage at least at one of the sensor lines RE/IPE/APE/MES	>9.1 to 10.3(V)	and			
				Battery voltage	≥10700(mV)		
				Last packet transfer aborted of sensor 1 bank 1	≥0,1(sec) =FALSE		
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	Requested mode of UEGO Sensor 1 E	=TRUE
, t	Validity of the diagnosis register of the ASIC of sensor 1 bank 1	=TRUE
	Basic enable conditions are met	=see sheet enable tables
	No pending or confirmed DTCs	=see sheet inhibit tables

Path2 : Monitoring of abnormalities at sensor lines APE/IPE during the normal ASIC operation when CJ135 is in SWITCHON or WARMUP mode		(Battery voltage	≤16100(mV)
Difference of voltage drop at ECU-internal resistor RGnd in a state, where only the sensor line "APE" is directly connected to RGnd (no current flows through the sensor) and voltage drop at ECU-internal resistor PCnd in a state, where	>0,07008(V)	and	
OR		Battery voltage	≥10700(mV)
Difference of voltage drop at ECU-internal resistor RGnd in a state, where only the sensor line "IPE" is directly connected to RGnd (no current flows through the sensor) and voltage drop at ECU-internal resistor RGnd in a state, where all sensor lines are opened (Ug0i - Ug0)	>0,07008(V)	, for time	≥0,1(sec)
OR		Last packet transfer aborted of sensor 1 bank 1	=FALSE
(Requested mode of UEGO Sensor 1 Bank 1 is in SWITCHON mode or	=TRUE

WARMUP mode

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Clamping structure of the nerst cell active for sensor 1	=TRUE	Counter of verifications of the actual mode of the ASIC for sensor 1 bank	≥10(counts)
Difference of voltage drop at ECU-internal resistor RGnd in a state, where only the sensor line "RE" is directly connected to RGnd (no current flows through the sensor) and voltage drop at ECU-internal resistor RGnd in a state, where all sensor lines are opened (Ug0e - Ug0)	>0,07008(V)	Basic enable conditions are met	=see sheet enable tables
)		No pending or confirmed DTCs	=see sheet inhibit tables
Path 3 : Aborted RAM check at ASIC shut-off when CJ135 not in IDLE mode Short circuit to battery detected by means of voltage monitoring at RGnd resistor or by means of contact measurements at sensor lines APE/IPE as per last accessed ASIC diagnostic register		(Battery voltage	≤16100(mV)
Voltage at RGnd resistor OR Difference of voltage drop at ECU-internal resistor RGnd in a state, where only the sensor line "APE" is directly connected to RGnd (no current flows through the sensor) and voltage drop at ECU-internal resistor RGnd in a state, where all sensor lines are opened (Ug0a - Ug0)	>4(V) >0,0438(V)	and Battery voltage)	≥10700(mV)
OR		for time	≥0,1(sec)

Difference of voltage drop at ECU-internal resistor RGnd in a state, where only the sensor line "IPE" is directly connected to RGnd (no current flows through the sensor) and voltage drop at ECU-internal resistor RGnd in a state, where all sensor lines are opened (Ug0i - Ug0)	>0,0438(V)	Measured CJ135 Mode sensor 1 bank 1 is not in IDLE mode	=TRUE
OR Short circuit to battery detected at sensor lines IPE/APE/MES or by checking availability of continuity measurements in last accessed ASIC diagnostic register		Last packet transfer aborted of sensor Basic enable conditions are met	=TRUE =see sheet enable tables
Voltage at least at one of the sensor lines RE/IPE/APE/MES	>9.1 to 10.3(V)	No pending or confirmed DTCs	=see sheet inhibit tables

Path 4: Aborted RAM check at ASIC shut-off when CJ135 in WARMUP mode Short circuit to battery detected at sensor lines IPE/APE/MES or by checking availability of continuity measurements in last accessed ASIC diagnostic register		(Battery voltage	≤16100(mV)
Voltage at least at one of the sensor lines IPE/APE/MES OR	>9.1 to 10.3(V)	and Battery voltage	≥10700(mV)
(Upstream HO2S Sensor is heated up, means	=TRUE)	
(Upstream HO2S Sensor ceramic temperature	>790(°C)	for time Measured CJ135 Mode sensor 1 bank 1 is in WARMUP mode	≥0,1(sec) =TRUE
OR		Last packet transfer aborted of sensor 1 bank 1	=TRUE
Heating-up phase of the sensor is completed	=TRUE	Basic enable conditions are met	=see sheet enable tables

No pending or confirmed DTCs

=see sheet inhibit tables

AND

Results of both continuity =FALSE measurements of sensor pumpcell using current source ISQr are available in RAM accessed ASIC diagnostic register OR Aborted RAM check at ASIC shut-off when CJ135 in WARMUP mode Short circuit to battery detected as per last accessed ASIC diagnostic register =TRUE Results of both continuity measurement of sensor pumpcell using current source ISQr are available in RAM accessed ASIC diagnistic register Voltage at least at one of the >9.1 to 10.3(V) sensor lines (RE/IPE/APE/MES) AND ≥D * F(V) Difference of voltage drop at ECU-internal resistor RGnd in a state, where the ASIC internal current source ISQr is connected to the sensor line "APE" and the sensor line "IPE" is directly connected to RGnd (current flows through the sensor and RGnd) and voltage drop at ECU-internal resistor RGnd in a state, where all sensor lines are opened (Ug0iai-Ug0)

AND

		Difference of voltage drop at ECU-internal resistor RGnd in a state, where the ASIC - internal current source ISQr is connected to the sensor line "RE" and the sensor line "IPE" is directly connected to RGnd (current flows through the sensor and RGnd) and voltage drop at ECU-internal resistor RGnd in a state, where all sensor lines are opened (Ug0iei-Ug0) (D) Requested amplitude of the reference pump current source ISQr (F) Minimum sensitivity of the continuiuity measurements to resistance RGnd)	≥D * F(V) =commanded value(A) =66(Ohm)				
P0152	Lambda sensor wire diagnosis for sensor 1 bank 2 Circuit continuity - short circuit to battery	Path1: Monitoring of abnormalities at sensor lines RE/IPE/APE/MES during the normal ASIC operation when CJ135 is in IDLE mode Short circuit to battery detected by means of voltage monitoring at sensor lines RE/IPE/APE/MES as per last accessed ASIC diagnostic register Voltage at least at one of the sensor lines RE/IPE/APE/MES	>9.1 to 10.3(V)	(Battery voltage	≤16100(mV)	0,5(s)	2 Trip
				Battery voltage) for time Last packet transfer aborted of sensor 1 bank 2 Requested mode of UEGO sensor 1 b Validity of the diagnosis register of the ASIC of sensor 1 bank 2 Basic enable conditions are met No pending or confirmed DTCs	≥10700(mV) ≥0,1(sec) =FALSE =TRUE =TRUE =See sheet enable tables =see sheet inhibit tables		

Path2 : Monitoring of abnormalities at sensor lines APE/IPE		(Battery voltage	≤16100(mV)
during the normal ASIC operation when CJ135 is in SWITCHON or WARMUP mode			
Short circuit to battery detected by means of contact measurements at sensor lines APE/IPE			
Difference of voltage drop at ECU-internal resistor RGnd in a state, where only the sensor line "APE" is directly connected to RGnd and voltage drop at ECU-internal resistor RGnd in a state, where all sensor lines are opened (Ug0a - Ug0)	>0,07008(V)	and	
OR		Battery voltage	≥10700(mV)
Difference of voltage drop at ECU-internal resistor RGnd in a state, where only the sensor line "IPE" is directly connected to RGnd and voltage drop at ECU-internal resistor RGnd in a state, where all sensor lines are opened (Ug0i - Ug0)	>0,07008(V)	, for time	≥0,1(sec)
		Last packet transfer aborted of sensor 1 bank 2	=FALSE
OR		Requested mode of UEGO Sensor 1 Bank 2 is in SWITCHON or WARMUP mode	=TRUE
Clamping structure of the nerst cell active for sensor 1 bank 2	=TRUE	Counter of verifications of the actual mode of the ASIC for sensor 1 bank	≥10(counts)
Difference of voltage drop at ECU-internal resistor RGnd in a state, where only the sensor line "RE" is directly connected to RGnd and voltage drop at ECU-internal resistor RGnd in a state, where all sensor lines are opened (Ug0e - Ug0)	>0,07008(V)	E Basic enable conditions are met	=see sheet enable tables

No pending or confirmed DTCs

=see sheet inhibit tables

Path 3 : Aborted RAM check at ASIC shut-off when CJ135 not in IDLE mode Short circuit to battery detected by means of voltage monitoring at RGnd resistor or by means of contact measurements at sensor lines APE/IPE as per last accessed ASIC diagnostic register		(Battery voltage	≤16100(mV)
Voltage at RGnd resistor	>4(V)	and Battery voltage)	≤10700(mV)
OR Difference of voltage drop at ECU-internal resistor RGnd in a state, where only the sensor line "APE" is directly connected to RGnd (no current flows through the sensor) and voltage drop at ECU-internal resistor RGnd in a state, where all sensor lines are opened (Ug0a - Ug0)	>0,0438(V)	['] for time Measured CJ135 Mode sensor 1 bank 2 is not in IDLE mode	≥0,1(sec) =TRUE
OR		Last packet transfer aborted of sensor 1 bank 2	=TRUE
Difference of voltage drop at ECU-internal resistor RGnd in a state, where only the sensor line "IPE" is directly connected to RGnd (no current flows through the sensor) and voltage drop at ECU-internal resistor RGnd in a state, where all sensor lines are opened (Ug0i - Ug0)	>0,0438(V)	Basic enable conditions are met	=see sheet enable tables
OR		No pending or confirmed DTCs	=see sheet inhibit tables

Short circuit to battery detected at sensor lines IPE/APE/MES or by checking availability of continuity measurements in last accessed ASIC diagnostic register			
Voltage at least at one of the sensor lines RE/IPE/APE/MES	>9.1 to 10.3(V)		
Path4: Aborted RAM check at ASIC shut-off when CJ135 in WARMUP mode Short circuit to battery detected at sensor lines IPE/APE/MES or by checking availability of continuity measurements in last accessed ASIC diagnostic register		(Battery voltage	≤16100(mV)
Voltage at least at one of the sensor lines IPE/APE/MES OR	>9.1 to 10.3(V)	and Battery voltage)	≥10700(mV)
(Upstream HO2S Sensor is heated up, means (=TRUE	for time Measured CJ135 Mode sensor 1	≥0,1(sec) =TRUE
Upstream HO2S Sensor ceramic temperature OR	>790(°C)	Last packet transfer aborted of sensor 1 bank 2 Basic enable conditions are met	=TRUE =see sheet enable
Heating-up phase of the sensor is completed	=TRUE	No pending or confirmed DTCs	tables =see sheet inhibit tables
) AND (Results of both continuity measurements of sensor pumpcell using current source ISQr are available in RAM	=FALSE		
accessed ASIC diagnostic register OR			

Aborted RAM check at ASIC shut-off when CJ135 in WARMUP mode Short circuit to battery detected as per last accessed ASIC diagnostic register =TRUE Results of both continuity measurement of sensor pumpcell using current source ISQr are available in RAM accessed ASIC diagnistic register Voltage at least at one of the >9.1 to 10.3(V) sensor lines (RE/IPE/APE/MES) AND Difference of voltage drop at ≥D * F(V) ECU-internal resistor RGnd in a state, where the ASIC internal current source ISQr is connected to the sensor line "APE" and the sensor line "IPE" is directly connected to RGnd (current flows through the sensor and RGnd) and voltage drop at ECU-internal resistor RGnd in a state, where all sensor lines are opened (Ug0iai-Ug0) OR Difference of voltage drop at ≥D * F(V) ECU-internal resistor RGnd in a state, where the ASIC internal current source ISQr is connected to the sensor line "RE" and the sensor line "IPE" is directly connected to RGnd (current flows through the sensor and RGnd) and voltage drop at ECU-internal resistor RGnd in a state, where all sensor lines are opened (Ug0iei-Ug0) (D) Requested amplitude of =commanded value(A) the reference pump current source of UEGO sensor 1 Bank 2 (F) Minimum sensitivity of the =66(Ohm) continuiuity measurements to resistance PCnd ECM Section 229 of 772

)

		/					
P0131	Lambda sensor wire diagnosis for sensor 1 bank 1 Circuit continuity - short circuit to ground	Path 1: Monitoring of abnormalities at sensor lines RE/APE/IPE during the normal ASIC operation when CJ135 in IDLE mode Short circuit to ground detected at sensor lines RE/IPE/APE/MES by means of voltage at least at one of the sensor lines RE/IPE/APE/MES	<-0,15(V)	(Battery voltage and	≥10700(mV)	0,5(s)	2 Trip
		where RE: Nernst voltage (reference voltage) IPE: Virtual ground (inner electrode) APE: Pumping current (external electrode) MES: Trim current (output sensor line trim resistance)		Battery voltage)	≤16100(mV)		
				for time Requested mode of UEGO Sensor 1	≥0,1(sec) =TRUE		
				bank 1 in IDLE mode			
				Validity of the diagnosis register of the	=TRUE		
				Last packet transfer aborted of sensor Internal Control Module O2 Sensor	=FALSE =FALSE		
				Processor Performance Bank 1			
				Control Module Processor Serial	=FALSE		
				Peripheral Interface Bus 3 Basic enable conditions are met	-see sheet enable		
					tables		
				No pending or confirmed DTCs	=see sheet inhibit tables		

Path 2: Aborted RAM check at ASIC shut-off when CJ135 in SWITCHON or WARMUP mode Short circuit to ground detected by means of voltage monitoring at sensor lines RE/IPE/APE/MES or by means of contact measurements at sensor line APE/IPE as per last accessed ASIC diagnostic register		(
(Voltage at least at one of the sensor lines RE/IPE/APE/MES	<-0,15(V)	Battery voltage	≥10700(mV)
OR Negated difference of voltage drop at ECU-internal resistor RGnd in a state, where only the sensor line "APE" is directly connected to RGnd (no current flows through the sensor) and voltage drop at ECU-internal resistor RGnd in a state, where all sensor lines are opened (Ug0 - Ug0a)	>0,0438(V)	and Battery voltage	≤16100(mV)
OR Negated difference of voltage drop at ECU-internal resistor RGnd in a state, where only the sensor line "IPE" is directly connected to RGnd (no current flows through the sensor) and voltage drop at ECU-internal resistor RGnd in a state, where all sensor lines are opened (Ug0 - Ug0i))	>0,0438(V)) for time	≥0,1(sec)
		Requested mode of UEGO Sensor 1 bank 1 in SWITCH ON mode or WARM UP mode	=TRUE
		Last packet transfer aborted of sensor Internal Control Module O2 Sensor	=TRUE =FALSE
		Processor Performance Bank 1 Control Module Processor Serial Peripheral Interface Bus 3	=FALSE
		Basic enable conditions are met	=see sheet enable tables

No pending or confirmed DTCs

=see sheet inhibit tables

Path 3: Monitoring of abnormalities at sensor lines RE/APE/IPE during the normal ASIC operation when CJ135 is in SWITCHON or WARMUP mode Short circuit to ground detected by means of contact measurements at sensor lines APE/RE//IPE		(
(Negated difference of voltage drop at ECU-internal resistor RGnd in a state, where only the sensor line "APE" is directly connected to RGnd (no current flows through the sensor) and voltage drop at ECU-internal resistor RGnd in a state, where all sensor lines are opened (Ug0 - Ug0a)	>0,07008(V)	Battery voltage	≥10700(mV)
OR Negated difference of voltage drop at ECU-internal resistor RGnd in a state, where only the sensor line "RE" is directly connected to RGnd (no current flows through the sensor) and voltage drop at ECU-internal resistor RGnd in a state, where all sensor lines are opened (Ug0 - Ug0e)	>0,07008(V)	and Battery voltage	≤16100(mV)
OR Negated difference of voltage drop at ECU-internal resistor RGnd in a state, where only the sensor line "IPE" is directly connected to RGnd (no current flows through the sensor) and voltage drop at ECU-internal resistor RGnd in a state, where all sensor lines are opened (Ug0 - Ug0i)	>0,07008(V)) for time	≥0,1(sec)
ECMS	Section 232 of 772		

Perpending are most are mathematical are shown are mathematical are shown are mathematical arematical are mathematical are mathematical are ma)		(Requested mode of UEGO Sensor 1 bank 1 in SWITCHON mode or WARMUP mode for number of counts) Last packet transfer aborted of sensor Internal Control Module O2 Sensor Processor Performance Bank 1 Control Module Processor Serial	=TRUE ≥10(counts) =FALSE =FALSE =FALSE		
P0151 Lambda sensor wire diagnosis Path 1: (0.5(s) 2 Trip for sensor 1 bank 2 Monitoring of abnormalities (0.5(s) 2 Trip for sensor 1 bank 2 Monitoring of abnormalities (0.5(s) 2 Trip for sensor 1 bank 2 Monitoring of abnormalities (0.5(s) 2 Trip divide the normal ASIC during the normal ASIC during the normal ASIC 0.5(s) 2 Trip divide the normal ASIC during the normal ASIC during the normal ASIC 0.5(s) 2 Trip Voltage at least at one of the sensor lines RE/IPE/APE/INES sensor lines RE/IPE/APE/INES Battery voltage ±10700(mV) Voltage at least at one of the sensor lines RE/IPE/APE/INES Sensor lines trip ground (inner electrode) Battery voltage ±16100(mV) Where PE: Virtual ground (inner electrode) MSE: Trin current (upput sensor line trim resistance) for time ±0.1(sec) =TRUE MSE: Trin current (control Module Processor 1 =TRUE =TRUE =TRUE =TRUE Validity of the diagnosis register of the MSE: Trin current (upput sensor line trim resistance) =TRUE =TRUE =TRUE Cortrot Module Processor 1<				Basic enable conditions are met	=see sheet enable tables =see sheet inhibit		
P0151 Lambda sensor vice diagnosis for sensor 1 bank 2 Circuit continuity - short directility - sho					tables		
voltage monitorina Battery voltage ≥10700(mV) Voltage at least at one of the sensor lines RE/IPE/APE/MES <0,15(V) and Battery voltage ≤16100(mV) where) RE: Nemst voltage (reference voltage) (reference voltage) IPE: Virtual ground (inner electrode) APE: Pumping current (external electrode) MES: Trim current (output sensor line trim resistance) for time 20,1(sec) Requested mode of UEGO Sensor 1 =TRUE bank 2 in IDLE mode Validity of the diagnosis register of the =TRUE Validity of the diagnosis register of an electrode internal Nodule 02 Sensor =FALSE Processor Performance Bank 2 Control Module Pocesor Senial =FALSE Processor Performance Bank 2 Control Module 02 Sensor =FALSE Processor Performance Bank 2 Control Module Pocesor Senial =FALSE Processor Performance Bank 2 Control Module Pocesor Senial =FALSE Peripheral Interface Bus 4 Basic enable conditions are met =see sheet enable tables tables tables tables tables tables	P0151 Lambda sensor wire diagnosis for sensor 1 bank 2 Circuit continuity - short circuit to ground	Path 1: Monitoring of abnormalities at sensor lines RE/APE/IPE during the normal ASIC operation when CJ135 in IDLE mode Short circuit to ground detected at sensor lines RE/IPE/APE/MES by means c	ſ	(0,5(s)	2 Trip
Battery voltage \$16100(mV) where) RE: Nernst voltage (reference voltage) IPE: Virtual ground (inner electrode) APE: Pumping current (external electrode) MES: Trim current (output sensor line trim resistance) for time \$20,1(sec) Requested mode of UEGO Sensor 1 =TRUE bank 2 in IDLE mode Validity of the diagnosis register of the =TRUE Last packet transfer aborted of sensor =FALSE Internal Control Module O2 Sensor =FALSE Processor Performance Bank 2 Control Module Processor Serial =FALSE Peripheral Interface Bus 4 Basic enable conditions are met =see sheet enable tables ECM Section 233 of 772 ECM Section 233 of 772 State		voltage monitoring Voltage at least at one of the sensor lines RE/IPE/APE/MES	<-0,15(V)	Battery voltage and	≥10700(mV)		
for time \$20,1(sec) Requested mode of UEGO Sensor 1 =TRUE bank 2 in IDLE mode Validity of the diagnosis register of the =TRUE Last packet transfer aborted of sensor =FALSE Internal Control Module O2 Sensor =FALSE Processor Performance Bank 2 Control Module Processor Serial =FALSE Peripheral Interface Bus 4 Basic enable conditions are met =see sheet enable tables ECM Section 233 of 772 tables		where RE: Nernst voltage (reference voltage) IPE: Virtual ground (inner electrode) APE: Pumping current (external electrode) MES: Trim current (output sensor line trim resistance)		Battery voltage)	≤16100(mV)		
Basic enable conditions are met =see sheet enable tables		sensor line trim resistance)		for time Requested mode of UEGO Sensor 1 bank 2 in IDLE mode Validity of the diagnosis register of the Last packet transfer aborted of sensor Internal Control Module O2 Sensor Processor Performance Bank 2 Control Module Processor Serial Peripheral Interface Bus 4	≥0,1(sec) =TRUE =TRUE =FALSE =FALSE =FALSE		
		F	CM Section 233 of 772	Basic enable conditions are met	=see sheet enable tables		345 (

No pending or confirmed DTCs

=see sheet inhibit tables

Path 2: Aborted RAM check at ASIC shut-off when CJ135 in SWITCHON or WARMUP mode Short circuit to ground detected by means of voltage monitoring at sensor lines RE/IPE/APE/MES or by means of contact measurements at sensor line APE/IPE as per last accessed ASIC diagnostic register		(
(Voltage at least at one of the sensor lines RE/IPE/APE/MES	<-0,15(V)	Battery voltage	≥10700(mV)
OR Negated difference of voltage drop at ECU-internal resistor RGnd in a state, where only the sensor line "APE" is directly connected to RGnd (no current flows through the sensor) and voltage drop at ECU-internal resistor RGnd in a state, where all sensor lines are opened (Ug0 - Ug0a)	>0,0438(V)	and Battery voltage	≤16100(mV)
OR Negated difference of voltage drop at ECU-internal resistor RGnd in a state, where only the sensor line "IPE" is directly connected to RGnd (no current flows through the sensor) and voltage drop at ECU-internal resistor RGnd in a state, where all sensor lines are opened (Ug0 - Ug0i))	>0,0438(V)) for time	≥0,1(sec)
		Requested mode of UEGO Sensor 1 bank 2 in SWITCH ON mode or WARM UP mode	=TRUE
		Last packet transfer aborted of sensor	=TRUE

Internal Control Module O2 Sensor	=FALSE
Processor Performance Bank 2	
Control Module Processor Serial	=FALSE
Peripheral Interface Bus 4	
Basic enable conditions are met	=see sheet enable
	tables
No pending or confirmed DTCs	=see sheet inhibit
	tables

Path 3: Monitoring of abnormalities at sensor lines RE/APE/IPE during the normal ASIC operation when CJ135 is in SWITCHON or WARMUP mode Short circuit to ground detected by means of contact measurements at sensor lines APE/RE//IPE		(
(Negated difference of voltage drop at ECU-internal resistor RGnd in a state, where only the sensor line "APE" is directly connected to RGnd (no current flows through the sensor) and voltage drop at ECU-internal resistor RGnd in a state, where all sensor lines are opened (Ug0 - Ug0a)	>0,07008(V)	Battery voltage	≥10700(mV)
OR Negated difference of voltage drop at ECU-internal resistor RGnd in a state, where only the sensor line "RE" is directly connected to RGnd (no current flows through the sensor) and voltage drop at ECU-internal resistor RGnd in a state, where all sensor lines are opened (Ug0 - Ug0e)	>0,07008(V)	and Battery voltage	≤16100(mV)
OR)	

		Negated difference of voltage drop at ECU-internal resistor RGnd in a state, where only the sensor line "IPE" is directly connected to RGnd (no current flows through the sensor) and voltage drop at ECU-internal resistor RGnd in a state, where all sensor lines are opened (Ug0 - Ug0i)	>0,07008(V)	for time	≥0,1(sec)		
)		(Requested mode of UEGO Sensor 1 bank 2 in SWITCHON mode or WARMUP mode	=TRUE		
				for number of counts	≥10(counts)		
				/ Last packet transfer aborted of sensor Internal Control Module O2 Sensor Processor Performance Bank 2	=FALSE =FALSE		
				Control Module Processor Serial Peripheral Interface Bus 4	=FALSE		
				Basic enable conditions are met	=see sheet enable		
				No pending or confirmed DTCs	=see sheet inhibit tables		
15. OXYGEN	P0133 Path 1:	Step response		Non bank-specific enabling	=TRUE	0.01(s)	1Trip
SENSOR CIRCUIT SLOW RESPONSE CHECK DIAGNOSIS	Step response/identifcation measurement of Oxygen sensor and pattern has been detected with Step-response measurement within parallelization	measurement:		conditions for continuous identification		-,- (-)	EWMA
		(Arithmetical average value of delay time from step response measurement in lean-rich direction	>0,38(sec)	(Vehicle speed	≥3,125(mph)		
		OR		Fuel purge adaptation factor	≤64		
		Arithmetical average value of transition time from step response measurement in lean- rich direction	>0,4(sec)	(
		OR		Integral of purge mass flow after a longer purge stop	≥1,998(g)		

Arithmetical average value of delay time from step response measurement in rich-lean	>0,38(sec)	OR	
direction OR		Purge mass flow for DTEV	<0(g/sec)
Arithmetical average value of transition time from step response measurement in rich- lean direction	>0,4(sec))	
) OR		(Condition gear-shift in process	=FALSE
Identification measurement:			
(Status of step response measurement (detected pattern, bank 1)	>0) End of start is reached	=TRUE
(Identified delay time in lean-	>1(sec)	for time (=5(sec)
OR Identified transition time in lean- rich direction	>1,5(sec)	Absolute value of filling gradient for time	≤12(%) =1(sec)
OR Identified delay time in rich- lean direction OR	>1(sec))	
Identified transition time in rich- lean direction	>1,5(sec)		
		Relative air mass (see Look-Up-Table #21)	>15 to 1536(%)
		for time)	=0(sec)
) Ambient pressure	>0(kPa)
) Bank-specific enabling conditions for continuous identification	=TRUE
		(Enabling conditions for lambda stability (
		(Lambda closed loop control, Bank 1	=TRUE
		(Lambda control disabled during after cylinder cut-off	=FALSE
		Lambda swtiched ON after fuel cutoff	=TRUE

1	
(Fuel cut off is active	=FALSE
(Time running down after fuel cut-off	>2(600)
for enabling lambda control	>2(Sec)
OR	
(Absolute value of difference in lembde	<0.2
of bank 1	≤0,2
Difference of counter time and plant	>0(sec)
time constant	
a-(D+C) where a is Time running down after	
fuel cut-off for enabling lambda	
control	
b is plant time constant for	
c is plant parameter for dead time for	
lambda control	
)	
)	
) LSU sensor upstream to catalyst	=TRUE
ready for operation	
(
)	2000(C)
, Lambda control disabled by a fault	=FALSE
(E41 OE
catalyst damaging mistire rate exceeded	=FALSE
Injector power stage fault is active	=FALSE
Camshaft fault in critical operating	=FALSE
range present and MAF is main air	
)	
lambda control is active since	=TRUE
warmup is finished Relative air charge	>0(%)
	20(70)
for time	≥2(sec)
Lamda control active due to GDI	=TRUE
(
GDI mode homogeneous	=TRUE
for time	≥0,8(sec)
)	
)	
Rich catalyst purge is active	=TRUE
(
ر Lambda for component protection is	=FALSE

OR

OR Number of the lambda requests determining the lambda setpoint	!=5(counts)
) for time	=1(sec)
Plant time constant of continuous af control, base value, linear quantization	≤0,15(sec)
Exhaust gas mass flow Cat 1, Bank 1	≤200(kg/h)
(Difference between exhaust gas mass flow Cat 1, Bank 1 with its filtered value	≥-20(kg/h)
Difference between exhaust gas mass flow Cat 1, Bank 1 with its filtered value	≤20(kg/h)
for time	=0,01(sec)
) Sensor LSU upstream cat ready for	=TRUE
for time Enable LSU dynamic diagnosis w.r.t. scavenging	=10(sec) =TRUE
(
Transition time from step response measurement in rich-lean direction	<0,2(sec)
Transition time from step response measurement in lean-rich direction	<0,2(sec)
(Transition time from step response	<0.1(sec)
measurement in rich-lean direction	(0,1(000)
measurement in lean-rich direction	<0,1(Sec)
) Injection valve cut-off on Bank 1	=FALSE
) Identification trigger: rate of change of modeled lambda in lean to rich	≥0,024994
direction, bank 2 Identification trigger: rate of change of modeled lambda in rich to lean direction, bank 2	≥0,024994
(Number of step response measurements in lean-rich direction for driving cylce (sensor 1, bank 1)	=0

(Time to evaluate loss function	≥30(sec)
OR Square of difference between band pass filtered reciprocal lambda and modelled reciprocal lambda values	≥100
)) OR	
Enabling conditions for step response measurement (
Lean lambda is requested and the	=TRUE
a commanded lambda active primary A/F commanded	=TRUE =1,07
for time	≥3(sec)
for time Secondary O2 sensor voltage	≥0,1(sec) ≤0,45(V)
(Rich lambda is requested and the cat is filled with rich gas due to low	=TRUE
a commanded lambda	=TRUE
primary A/F commanded	=0,87
for time	≥3(sec)
for time	≥0,1(sec)
Rich lamda is requested to empty the	=TRUE
a commanded lambda active	=TRUE
primary A/F commanded	=0,87
for time	≥3(sec)
for time	≥0,1(sec)
Secondary O2 sensor	≥0,9(V)
Or	
Secondary O2 sensor voltage	≥0,8(V)

<66 5/\//000)

Secondary O2 sensor voltage Integrated Oxygen mass flow	≥-66,5(V/sec) >250(mg)
Dank 1))	
(Primary A/F sensor lambda (a) Primary lambda control set	≤(a) + (b)
point (b) maximum lambda deviation	=0,05
Primary A/F sensor lambda (a) Primary lambda control set	≥(a) - (b)
(b) maximum lambda deviation	≤0,05
for time Integrated rich exhaust gas mass flow bank 1	≥0,1(sec) ≥0,005(kg)
)) for time where in	=A * 0.8(sec)
(A) LRS-plantparameter deadtime and	
(Reciprocal of actual lambda value where in	>(A + (B*C))
(A) Minimal or maximal value of reciprocal lambda after step	
(B) Fraction of step height to end step response measurement(C) Step height in reciprocal lambda	=0,3
OR Difference between time after step measurement and LRS- plantparameter deadtime	>1(sec)
)) OR (
(Rich lamda is requested to empty the oxygen gas from the cat	=TRUE
a commanded lambda active	=TRUE
primary A/F commanded	=0,87
for time	≥3(sec)
for time	≥0,1(sec)
Secondary O2 sensor	≥0,9(V)

_

Or	
(Secondary O2 sensor voltage	≥0,8(V)
Secondary O2 sensor voltage Secondary O2 sensor voltage Integrated Oxygen mass flow	≤66,5(V/sec) ≥-66,5(V/sec) >250(mg)
bank 1))	
(Primary A/F sensor lambda (a) Primary lambda control set	≤(a) + (b)
point (b) maximum lambda deviation	=0,05
of lean mixture Primary A/F sensor lambda (a) Primary lambda control set	≥(a) - (b)
point (b) maximum lambda deviation of rich mixture	≤0,05
for time Integrated rich exhaust gas mass flow bank 1	≥0,1(sec) ≥0,005(kg)
and (Lean lambda is requested and the cat is filled with oxygen gas due to	=TRUE
high sensor voltage a commanded lambda	=TRUE
active primary A/F commanded	=1,07
for time	≥3(sec)
for time	≥0,1(sec)
((Secondary O2 sensor voltage	≤0,07(V)
for time	≥0,1(sec)
) Or (
Secondary O2 sensor voltage	≤0,200195(V)
Secondary O2 sensor voltage	≤0,1(V/sec)
Secondary O2 sensor voltage	≥-0,09944(V/sec)
Integrated Oxygen mass flow	>150(mg)
)) /	
(Primary A/F sensor lambda	≤(a) + (b)

(a) Primary lambda control set	
point (b) maximum lambda deviation	-0.05
of lean mixture	-0,00
Primary A/F sensor lambda	≥(a) - (b)
(a) Primary lambda control set	
point	
(b) maximum lambda deviation	≤0,05
of rich mixture	>0.1(sec)
Integrated lean exhaust gas	≥0,1(sec) ≥0,005(kg)
mass flow bank 1	_0,000(9)
)	
OR	
Lean lambda is requested and the	=TRUE
cat is filled with oxygen gas	
nrimary A/F commanded	-1.07
lambda	-1,07
for time	≥3(sec)
for time	≥0,1(sec)
Secondary O2 sensor voltage	≤0,45(V)
)	
)	
for time	=A * 0.8(sec)
where in	
(A) LRS-plantparameter deadtime	
(Reciprocal of actual lambda value	$\langle \Lambda (P^{*}C) \rangle$
where in	<(A - (B C))
(A) Minimal or maximal value of	
reciprocal lambda after step	
(B) Fraction of step height to end	=0,3
step response measurement	
(C) Step height in reciprocal lambda	
OP	
Difference between time after step	>1(sec)
measurement and LRS-	
plantparameter deadtime	
)	
)	
) Abaaluta differenza batuean	• 0.0E
reciprocal of desired lamda limitation	>0,05
and reciprocal lambda setpoint in	
combustion chamber	
for time	=A * 0.8(sec)
where in	
(A) LRS-plantparameter deadtime	

(
Number of evaluated steps in lean- rich direction (sensor 1, bank 1)	<3(counts)
Number of evaluated steps in lean- rich direction (sensor 1, bank 1)	>0
(
Delay time from step response measurement in lean-rich direction (sensor 1, bank 1) where in	≤A - ((A - B)* (C / D))(sec)
(A) Delay time of best part unacceptable	=0,6(sec)
(B) Fault threshold of delay time (step response, lean to rich)	=0,38(sec)
(C) Necessary number of measurements for fault-confirmation	=3(counts)
(D) Number of evaluated steps in lean-rich direction (sensor 1, bank 1)	
Transition time from step response measurement in lean-rich direction (sensor 1, bank 1)	≤A - ((A - B)* (C / D))(sec)
(A) Transition time of best part	=0,9(sec)
(B) Fault threshold of transition time	=0,4(sec)
(C) Necessary number of measurements for fault-confirmation	=3(counts)
(D) Number of evaluated steps in lean-rich direction (sensor 1, bank 1)	
)	
Number of evaluated steps in lean- rich direction (sensor 1, bank 1)	≥3(counts)
)) OR	
Number of evaluated steps in rich-	<3(counts)
Number of evaluated steps in rich- lean direction (sensor 1, bank 1)	>0
(Delay time from step response measurement in rich-lean direction (sensor 1, bank 1) where in	≤A - ((A - B)* (C / D))(sec)
(A) Delay time of best part	=0,6(sec)

			(B) Fault threshold of delay time (step response,rich to lean)(C) Necessary number of measurements for fault-confirmation	=0,38(sec) =3(counts)	
			(D) Number of evaluated steps in rich- lean direction (sensor 1, bank 1)		
			Transition time from step response measurement in rich-lean direction (sensor 1, bank 1)	≤A - ((A - B)* (C / D))(sec)	
			(A) Transition time of best part	=0,9(sec)	
			(B) Fault threshold of transition time	=0,4(sec)	
			(C) Necessary number of measurements for fault-confirmation	=3(counts)	
			(D) Number of evaluated steps in rich- lean direction (sensor 1, bank 1)		
) OR Number of evaluated steps in rich- lean direction (sensor 1, bank 1)	≥3(counts)	
))		
Path 2: Step response/identifcation measurement of Oxygen sensor and pattern not detected with Step-response measurement within parallelization	Step response measurement:		Non bank-specific enabling conditions for continuous identification	=TRUE	
	(Arithmetical average value of delay time from step response measurement in lean-rich direction	>0,38(sec)	(Vehicle speed	≥3,125(mph)	
	OR Arithmetical average value of transition time from step response measurement in lean- rich direction	>0,4(sec)	and Factor fuel purge adaptation factor	≤64	
	OR Arithmetical evenese value of		and		
	Arithmetical average value of delay time from step response measurement in rich-lean direction	>∪,38(SeC)	(
	OR	Contine 045 -1 770	Integral of purge mass flow after a longer purge stop	≥1,998(g)	057 - 4 000
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)

Arithmetical average value of transition time from step response measurement in rich- lean direction	>0,4(sec)	OR	
)		Purge mass flow for DTEV	<0(g/sec)
OR Identification measurement:) (
(Condition gear-shift in process	=FALSE
Status of step response measurement (pattern is not detected bank 1)	=0	,	
(Sum time of identification in lean-rich direction	>1,5(sec)) End of start is reached	=TRUE
OR Sum time of identification in rich-lean direction	>1,5(sec)	for time (=5(sec)
)		Fault suspicion reported by continuous identification	=TRUE
)		(Sum of identified delay time and transition time in lean to rich direction	>0,3(sec)
		OR Sum of identified delay time and transition time in rich to lean direction	>0,3(sec)
		OR Difference between sum of delay times and transition times in lean to rich and rich to lean directions respectively where in (A) Identified transition time in lean- rich direction (bank 1) (B)Identified delay time in lean-rich direction (bank 1) (C) Identified transition time in rich- lean direction (bank 1) (D) Identified delay time in rich-lean direction (bank 1) (D) Identified delay time in rich-lean direction (bank 1) OR Negative value of the sum of delay times and transition times in rich to lean and lean to rich directions	>0,2(sec) >0,2(sec)
		respectively where in (A) Identified transition time in lean- rich direction (bank 1)	

 (B)Identified delay time in lean-rich direction (bank 1) (C) Identified transition time in richlean direction (bank 1) (D) Identified delay time in richlean direction (bank 1) 	
(Absolute value of filling gradient for time	≤12(%) =3(sec)
)) OR Fault suspicion reported by continuous identification	=FALSE
Absolute value of filling gradient for time)	≤12(%) =1(sec)
) (Relative air mass (see Look-Up-Table #21)	>15 to 1536(%)
for time)	=0(sec)
) Ambient pressure	>0(kPa)
) Bank-specific enabling conditions for continuous identification	=TRUE
(Enabling conditions for lambda stability (
(Lambda closed loop control, Bank 1	=TRUE
(Lambda control disabled during after cylinder cut-off	=FALSE
and Lambda swtiched ON after fuel cutoff	=TRUE
(Fuel cut off is active	=FALSE
(Time running down after fuel cut-off for enabling lambda control OR	>2(sec)
(Absolute value of diffence in lambda of bank 1	≤0,2

Difference of counter time and plant time constant a-(b+c) where a is Time running down after fuel cut-off for enabling lambda control b is plant time constant for continuous air/fuel control c is plant parameter for dead time for lambda control))	>0(sec)
) LSU sensor upstream to catalyst ready for operation	=TRUE
(lambda sensor 1 temperature	≥655(°C)
) Lambda control disabled by a fault (=FALSE
Catalyst damaging misfire rate	=FALSE
Injector power stage fault is active Camshaft fault in critical operating range present and MAF is main air charge sensor	=FALSE =FALSE
) lambda control is active since	=TRUE
Relative air charge	>0(%)
for time Lamda control active due to GDI mode change	≥2(sec) =TRUE
(GDI mode homogeneous for time))	=TRUE ≥0,8(sec)
) Rich catalyst purge is active	=TRUE
(Lambda for component protection is active	=FALSE
Number of the lambda requests determining the lambda setpoint	!=5
, for time	=1(sec)
, Plant time constant of continuous af control, base value, linear	≤0,15(sec)
(
---	----------------------
Exhaust gas mass flow Cat 1, Bank 1	≤200(kg/h)
(Difference between exhaust gas mass flow Cat 1, Bank 1 with its	≥-20(kg/h)
filtered value Difference between exhaust gas mass flow Cat 1, Bank 1 with its filtered value	≤20(kg/h)
) for time	=0,01(sec)
) Sensor LSU upstream cat ready for	=TRUE
operation for time (=10(sec)
(Transition time from step response measurement in rich-lean direction	<0,2(sec)
Transition time from step response measurement in lean-rich direction)	<0,2(sec)
Transition time from step response	<0,1(sec)
Transition time from step response measurement in lean-rich direction	<0,1(sec)
) Injection valve cut-off on Bank 1	-FALSE
Turn-on delay after fuel cut-off) Identification trigger: rate of change of modeled lambda in lean to rich	≥3(sec) ≥0,024994
Identification trigger: rate of change of modeled lambda in rich to lean direction, bank 2	≥0,024994
(Number of step response measurements in lean-rich direction for driving cylce (sensor 1, bank 1)	=0
(Time to evaluate loss function	≥30(sec)
OR Square of difference between band pass filtered reciprocal lambda and modelled reciprocal lambda values)) OR	≥100
Enabling conditions for step	

	(Lean lambda is requested and the cat is filled with oxygen gas	=TRUE
	a commanded lambda active primary A/F commanded	=TRUE =1,07
	lambda for time	≥3(sec)
	for time Secondary O2 sensor voltage	≥0,1(sec) ≤0,45(V)
	(Rich lambda is requested and the cat is filled with rich gas due to low	=TRUE
	a commanded lambda	=TRUE
	primary A/F commanded lambda bank1	=0,87
	for time	≥3(sec)
	for time OR	≥0,1(sec)
	Rich lamda is requested to empty the oxygen gas from the cat	=TRUE
	a commanded lambda active	=TRUE
	primary A/F commanded lambda	=0,87
	for time	≥3(sec)
	for time	≥0,1(sec)
	Secondary O2 sensor voltage Or	≥0,9(V)
	(Secondary O2 sensor voltage	≥0,8(V)
	Secondary O2 sensor voltage Secondary O2 sensor voltage Integrated Oxygen mass flow bank 1))	≤66,5(V/sec) ≥-66,5(V/sec) >250(mg)
	(Primary A/F sensor lambda (a) Primary lambda control set point	≤(a) + (b)
	(b) maximum lambda deviation	=0,05
ECM Section 250 of 772	Drimory A/E concertambde	>(a) (b)

(a) Primary lambda control set	
(b) maximum lambda deviation of rich mixture	≤0,05
for time Integrated rich exhaust gas mass flow bank 1	≥0,1(sec) ≥0,005(kg)
) for time where in (A) LRS-plantparameter deadtime	=A * 0.8(sec)
and (Reciprocal of actual lambda value where in	>(A + (B*C))
 (A) Minimal or maximal value of reciprocal lambda after step (B) Fraction of step height to end step response measurement (C) Step height in reciprocal lambda 	=0,3
OR Difference between time after step measurement and LRS- plantparameter deadtime))	>1(sec)
OR ((
Rich lamda is requested to empty the oxygen gas from the cat	=TRUE
	-0.87
lambda for time	≥3(sec)
for time	≥0,1(sec)
(Secondary O2 sensor voltage	≥0,9(V)
Or	
Secondary O2 sensor voltage	≥0,8(V)
Secondary O2 sensor voltage Secondary O2 sensor voltage Integrated Oxygen mass flow bank 1	≤66,5(V/sec) ≥-66,5(V/sec) >250(mg)
)) (Drimery A/E concertembde	

(a) Primary lambda control set	
point	
(b) maximum lambda deviation	=0,05
Primary A/E sensor lambda	>(a) - (h)
(a) Primary lambda control set	=(a) - (b)
point	
(b) maximum lambda deviation	≤0,05
of rich mixture	
for time	≥0,1(sec)
Integrated rich exhaust gas	≥0,005(kg)
and	
(
Lean lambda is requested and the	=TRUE
cat is filled with oxygen gas due to	
high sensor voltage	
a commanded lambda	=TRUE
active	-1.07
lambda	-1,07
for time	≥3(sec)
for time	>0 1(sec)
((=0,1(000)
Secondary O2 sensor voltage	≤0,07(V)
for time	≥0,1(sec)
)	
(
Secondary O2 sensor voltage	≤0,200195(V)
, ,	, ()
Secondary O2 sensor voltage	≤0,1(V/sec)
gradient over 0.05s	> 0.00044()/(acc)
aradient over 0.05s	≥-0,09944(V/Sec)
Integrated Oxygen mass flow	>150(ma)
bank 1	
))	
(
Primary A/F sensor lambda	≤(a) + (b)
(a) Primary lambda control set	
(b) maximum lambda deviation	=0.05
of lean mixture	-0,00
Primary A/F sensor lambda	≥(a) - (b)
(a) Primary lambda control set	
point	
(b) maximum lambda deviation	≤0,05
or rich mixture	>0.1(acc)
Integrated leap exhaust day	≥0,1(Sec) >0.005/kg)
megraleu lean exhaust yas	=0,000(kg)

)		
Lean I	ambda is requested and the	=TRUE
cat is t	filled with oxygen gas a commanded lambda active	=TRUE
lambd	primary A/F commanded	=1,07
lambu	for time	≥3(sec)
	for time Secondary O2 sensor voltage	≥0,1(sec) ≤0,45(V)
)		
) for tim	e	=A * 0.8(sec)
where (A) LR	in S-plantparameter deadtime	
(Recipi	rocal of actual lambda value	<(A - (B*C))
(A) Mi	nimal or maximal value of	
recipro (B) Fra	ocal lambda after step action of step height to end	=0,3
step re	esponse measurement	
(C) 50	ep neight in reciprocariambua	
OR Differe	ence between time after step	>1(sec)
measu	urement and LRS-	()
plantp)	arameter deadtime	
)		
) Absolu	ute difference between	>0,05
recipro	ocal of desired lamda limitation	
combu	ustion chamber	
for tim	ie in	=A * 0.8(sec)
(A) LR	S-plantparameter deadtime	
) (
Ì	and a share between the base	$\mathbf{O}(z,z) = \mathbf{O}(z,z)$
rich di	er of evaluated steps in lean- rection (sensor 1, bank 1)	<3(counts)
Numb	er of evaluated steps in lean-	>0
(rection (sensor 1, bank 1)	
(Delow	time from stan response	
measu	urement in lean-rich direction))(sec)
(senso	or 1, bank 1)	

where in

(A) Delay time of best part	=0,6(sec)
(B) Fault threshold of delay time (step	=0,38(sec)
(C) Necessary number of measurements for fault-confirmation	=3(counts)
(D) Number of evaluated steps in lean-rich direction (sensor 1, bank 1)	
Transition time from step response measurement in lean-rich direction (sensor 1, bank 1) where in	≤A - ((A - B)* (C / D))(sec)
(A) Transition time of best part unacceptable	=0,9(sec)
(B) Fault threshold of transition time (step response, lean to rich)	=0,4(sec)
(C) Necessary number of measurements for fault-confirmation	=3(counts)
(D) Number of evaluated steps in lean-rich direction (sensor 1, bank 1)	
) OR	
Number of evaluated steps in lean- rich direction (sensor 1, bank 1)	≥3(counts)
)) OR	
Number of evaluated steps in rich-	<3(counts)
Number of evaluated steps in rich- lean direction (sensor 1, bank 1)	>0
Delay time from step response measurement in rich-lean direction (sensor 1, bank 1)	≤A - ((A - B)* (C / D))(sec)
(A) Delay time of best part	=0,6(sec)
(B) Fault threshold of delay time (step	=0,38(sec)
(C) Necessary number of measurements for fault-confirmation	=3(counts)
(D) Number of evaluated steps in rich- lean direction (sensor 1, bank 1)	

				Transition time from step response measurement in rich-lean direction (sensor 1, bank 1) where in	≤A - ((A - B)* (C / D))(sec)		
				(A) Transition time of best part unacceptable	=0,9(sec)		
				(B) Fault threshold of transition time (step response,rich to lean)	=0,4(sec)		
				(C) Necessary number of measurements for fault-confirmation	=3(counts)		
				(D) Number of evaluated steps in rich lean direction (sensor 1, bank 1)	-		
) OR Number of evaluated steps in rich- lean direction (sensor 1, bank 1)))	≥3(counts)		
) No pending or confirmed DTCs	=see sheet inhibit table		
				Basic enable conditions met	=see sheet enable tables		
P0153	Path 1: Step response/identifcation measurement of Oxygen sensor of bank 2 and pattern has been detected with Step- response measurement within parallelization	Step response measurement:		Non bank-specific enabling conditions for continuous identification	=TRUE	0,01(s)	1Trip EWMA
		(Arithmetical average value of delay time from step response measurement in lean-rich direction (sensor 1, bank 2)	>0,38(sec)	(Vehicle speed	≥3,125(mph)		
		OR		Fuel purge adaptation factor	≤64		
		Arithmetical average value of transition time from step response measurement in lean- rich direction, (sensor 1, bank 2)	>0,4(sec)	(
		OR		Integral of purge mass flow after a longer purge stop	≥1,998(g)		

Arithmetical average value of delay time from step response measurement in rich-lean direction, (sensor 1, bank 2)	>0,38(sec)	OR	
OR		Purge mass flow for DTEV	<0(g/sec)
Arithmetical average value of transition time from step response measurement in rich- lean direction, (sensor 1, bank 2)	>0,4(sec))	
) OR		(Condition gear-shift in process	=FALSE
Identification measurement:			
(Status of step response measurement (detected pattern, bank 2)	>0)	
(Identified delay time in lean- rich direction, bank 2 OR	>1(sec)	End of start is reached for time	=TRUE =5(sec)
Identified transition time in lean- rich direction, bank 2	>1,5(sec)	Absolute value of filling gradient	≤12(%)
OR Identified delay time in rich- lean direction, bank 2 OR	>1(sec))	=1(sec)
Identified transition time in rich- lean direction, bank 2	>1,5(sec)	,	
		(Relative air mass (see Look-Up-Table #21)	>15 to 1536(%)
		for time))	=0(sec)
		Ambient pressure	>0(kPa)
) Bank-specific enabling conditions for continuous identification, bank 2	=TRUE
		C Enabling conditions for lambda stability	
		((Lambda closed loop control, Bank 2	=TRUE

(

Lambda control disabled during after	=FALSE
Lambda swtiched ON after fuel cutoff, bank 2	=TRUE
(Fuel cut off is active	=FALSE
(Time running down after fuel cut-off for enabling lambda control OR (>2(sec)
(Absolute value of diffence in lambda of bank 2	≤0,2
Difference of counter time and plant time constant a-(b+c) where a is Time running down after fuel cut-off for enabling lambda	>0(sec)
control b is plant time constant for continuous air/fuel control, bank 2 c is plant parameter for dead time for lambda control, bank 2)	
,))	
LSU sensor upstream to catalyst ready for operation, bank 2	=TRUE
(lambda sensor 1 temperature, bank 2	≥655(°C)
) Lambda control disabled by a fault, bank 2 (=FALSE
(Catalyst damaging misfire rate exceeded	=FALSE
Injector power stage fault is active Camshaft fault in critical operating range present and MAF is main air charge sensor	=FALSE =FALSE
) lambda control is active since	=TRUE
warmup is finished Relative air charge	>0(%)
for time Lamda control active due to GDI mode change	≥2(sec) =TRUE
(GDI mode homogeneous for time	=TRUE ≥0,8(sec)

)

) Rich catalyst purge is active, bank 2	=TRUE
(Lambda for component protection is active	=FALSE
OR Number of the lambda requests determining the lambda setpoint	!=5
for time	=1(sec)
) Plant time constant of continuous af control, base value, bank 2, linear quantization (≤0,15(sec)
Exhaust gas mass flow Cat 1, Bank 2	≤200(kg/h)
(Difference between exhaust gas mass flow Cat 1, Bank 2 with its filtered value	≥-20(kg/h)
Difference between exhaust gas mass flow Cat 1, Bank 2 with its filtered value	≤20(kg/h)
for time	=0,01(sec)
) Sensor LSU upstream cat ready for	=TRUE
operation for time	=10(sec)
(Transition time from step response measurement in rich-lean direction	<0,2(sec)
Transition time from step response measurement in lean-rich direction (sensor 1, bank 2)	<0,2(sec)
) (Transition time from step response measurement in rich-lean direction	<0,1(sec)
(sensor 1, bank 2) Transition time from step response measurement in lean-rich direction (sensor 1, bank 2)	<0,1(sec)
)	
Injection valve cut-off on Bank 2)	=FALSE
, Identification trigger: rate of change of modeled lambda in lean to rich	≥0,024994

Identification trigger: rate of change of modeled lambda in rich to lean direction, bank 2	≥0,024994
(Number of step response measurements in lean-rich direction for driving cylce (sensor 1, bank 2)	=0
(Time to evaluate loss function, bank 2 OR	≥30(sec)
Square of difference between band pass filtered reciprocal lambda and modelled reciprocal lambda values (sensor 1, bank 2))	≥100
OR .	
Enabling conditions for step	
(
(
(
Lean lambda is requested and the	=TRUE
a commanded lambda active	=TRUE
primary A/F commanded	=1,07
lambda for time	≥3(sec)
for time	>0.1(222)
Secondary O2 sensor voltage	≥0,1(sec) ≤0,45(V)
,	
(Rich lambda is requested and the cat is filled with rich gas due to low sensor voltage bank 2	=TRUE
a commanded lambda	=TRUE
active primary A/F commanded	=0,87
for time	≥3(sec)
for time	≥0,1(sec)
Rich lamda is requested to empty the	=TRUE
oxygen gas from the cat	
	-INOL
primary A/F commanded lambda	=0,87

Part 2 ECM Summary	ladies	
	for time	≥3(sec)
	for time	≥0,1(sec)
	Secondary O2 sensor	≥0,9(V)
	Or	
	(Secondary O2 sensor voltage	≥0,8(V)
	Secondary O2 sensor voltage Secondary O2 sensor voltage Integrated Oxygen mass flow	≤66,5(V/sec) ≥-66,5(V/sec) >250(mg)
))	
	(Primary A/F sensor lambda (a) Primary lambda control set	≤(a) + (b)
	(b) maximum lambda deviation	=0,05
	Primary A/F sensor lambda (a) Primary lambda control set	≥(a) - (b)
	(b) maximum lambda deviation	≤0,05
	for time Integrated rich exhaust gas mass flow bank 2	≥0,1(sec) ≥0,005(kg)
)) for time	=A * 0.8(sec)
	(A) LRS-plantparameter deadtime, bank 2	
	(Reciprocal of actual lambda value, sensor 1, bank 2	>(A + (B*C))
	(A) Minimal or maximal value of reciprocal lambda after step, bank 2	
	 (B) Fraction of step height to end step response measurement (C) Step height in reciprocal lambda, bank 2 	=0,3
	Difference between time after step measurement and LRS- plantparameter deadtime, bank 2)	>1(sec)
	, OR	

(
the oxygen gas from the cat, bank 2	=IRUE
a commanded lambda active	=TRUE
primary A/F commanded	=0,87
for time	≥3(sec)
for time	≥0,1(sec)
Secondary O2 sensor voltage Or	≥0,9(V)
(
Secondary O2 sensor voltage	≥0,8(V)
Secondary O2 sensor voltage Secondary O2 sensor voltage Integrated Oxygen mass flow bank 2	≤66,5(V/sec) ≥-66,5(V/sec) >250(mg)
))	
Primary A/F sensor lambda (a) Primary lambda control set	≤(a) + (b)
(b) maximum lambda deviation	=0,05
Primary A/F sensor lambda (a) Primary lambda control set	≥(a) - (b)
point (b) maximum lambda deviation	≤0,05
for time Integrated rich exhaust gas	≥0,1(sec) ≥0,005(kg)
Lean lambda is requested and the cat is filled with oxygen gas due to high conserve to tage, bank 2	=TRUE
a commanded lambda active	=TRUE
primary A/F commanded	=1,07
for time	≥3(sec)
for time	≥0,1(sec)
((Secondary O2 sensor voltage	≤0,07(V)
for time	≥0,1(sec)
)	

(
C Secondary O2 sensor voltage	≤0,200195(V)
Secondary O2 sensor voltage	≤0,1(V/sec)
Secondary O2 sensor voltage	≥-0,09944(V/sec)
gradient over 0.05s Integrated Oxygen mass flow	>150(mg)
bank 2))	
(Primary A/F sensor lambda (a) Primary lambda control set	≤(a) + (b)
point (b) maximum lambda deviation	=0,05
of lean mixture Primary A/F sensor lambda	≥(a) - (b)
(a) Primary lambda control set	-(3) (2)
(b) maximum lambda deviation	≤0,05
for time	≥0,1(sec)
Integrated lean exhaust gas mass flow bank 2	≥0,005(kg)
) OR	
Lean lambda is requested and the cat is filled with oxygen gas, bank 2	=TRUE
a commanded lambda active primary A/F commanded	=TRUE =1,07
lambda for time	≥3(sec)
for time	≥0,1(sec)
Secondary O2 sensor voltage	≤0,45(V)
)	
for time	=A * 0.8(sec)
(A) LRS-plantparameter deadtime, bank 2	
(Reciprocal of actual lambda value, bank 2	<(A - (B*C))
where in (A) Minimal or maximal value of	
reciprocal lambda after step, bank 2	
(B) Fraction of step height to end step response measurement (C) Step height in reciprocal lambda	=0,3

OR Difference between time after step measurement and LRS- plantparameter deadtime, bank 2	>1(sec)
) Absolute difference between reciprocal of desired lamda limitation of sensor 1, bank 2 and reciprocal lambda settocint in combustion	>0,05
chamber for time where in (A) LRS-plantparameter deadtime, bank 2	=A * 0.8(sec)
) ((Number of evaluated steps in lean- rich direction (sensor 1, bank 2) Number of evaluated steps in lean- rich direction (sensor 1, bank 2)	<3(counts) >0
(Delay time from step response measurement in lean-rich direction (sensor 1, bank 2)	≤A - ((A - B)* (C / D))(sec)
(A) Delay time of best part	=0,6(sec)
unacceptable (B) Fault threshold of delay time (step response, lean to rich)	=0,38(sec)
(C) Necessary number of measurements for fault-confirmation	=3(counts)
(D) Number of evaluated steps in lean-rich direction (sensor 1, bank 2)	
Transition time from step response measurement in lean-rich direction (sensor 1, bank 2)	≤A - ((A - B)* (C / D))(sec)
(A) Transition time of best part	=0,9(sec)
unacceptable (B) Fault threshold of transition time	=0,4(sec)
(step response, lean to rich) (C) Necessary number of measurements for fault-confirmation	=3(counts)
(D) Number of evaluated steps in lean-rich direction (sensor 1, bank 2)	

		Number of evaluated steps in lean- rich direction (sensor 1, bank 2)) OR	≥3(counts)
		(Number of evaluated steps in rich- lean direction (sensor 1, bank 2)	<3(counts)
		Number of evaluated steps in rich- lean direction (sensor 1, bank 2)	>0
		Delay time from step response measurement in rich-lean direction (sensor 1, bank 2) where in	≤A - ((A - B)* (C / D))(sec)
		(A) Delay time of best part unacceptable	=0,6(sec)
		(B) Fault threshold of delay time (step response,rich to lean)	=0,38(sec)
		(C) Necessary number of measurements for fault-confirmation	=3(counts)
		(D) Number of evaluated steps in rich- lean direction (sensor 1, bank 2)	
		Transition time from step response measurement in rich-lean direction (sensor 1, bank 2) where in	≤A - ((A - B)* (C / D))(sec)
		(A) Transition time of best part unacceptable	=0,9(sec)
		(B) Fault threshold of transition time (step response,rich to lean)	=0,4(sec)
		(C) Necessary number of measurements for fault-confirmation	=3(counts)
		(D) Number of evaluated steps in rich- lean direction (sensor 1, bank 2)	
) OR	
		Number of evaluated steps in rich- lean direction (sensor 1, bank 2)))	≥3(counts)
Path 2: Step response/identifcation measurement of Oxygen sensor of bank 2 and pattern not detected with Step- response measurement within parallelization	Step response measurement:	Non bank-specific enabling conditions for continuous identification	=TRUE

(

(

Arithmetical average value of delay time from step response measurement in lean-rich direction (sensor 1, bank 2)	>0,38(sec)	Vehicle speed	≥3,125(mph)
OR		Factor fuel purge adaptation factor	≤64
Arithmetical average value of transition time from step response measurement in lean- rich direction, (sensor 1, bank 2)	>0,4(sec)	(
OR		Integral of purge mass flow after a	≥1,998(g)
Arithmetical average value of delay time from step response measurement in rich-lean direction, (sensor 1, bank 2)	>0,38(sec)	OR	
OR		Purge mass flow for DTEV	<0(g/sec)
Arithmetical average value of transition time from step response measurement in rich- lean direction, (sensor 1, bank 2)	>0,4(sec))	
) OR		(Condition gear-shift in process	=FALSE
Identification measurement:			
(Status of step response measurement (pattern is not detected bank 2)	=0) End of start is reached	=TRUE
(Sum time of identification in lean-rich direction (sensor 1, hank 2)	>1,5(sec)	for time (=5(sec)
OR		Fault suspicion reported by continuous identification	=TRUE
Sum time of identification in rich-lean direction (sensor 1, bank 2)	>1,5(sec)	(
)		Sum of identified delay time and transition time in lean to rich direction, bank 2	>0,3(sec)
)		Sum of identified delay time and transition time in rich to lean direction, bank 2 OR	>0,3(sec)

Difference between sum of delay times and transition times in lean to rich and rich to lean directions respectively	>0,2(sec)
where in (A) Identified transition time in lean- rich direction (bank 2) (B)Identified delay time in lean-rich	
direction (bank 2)	
(C) Identified transition time in rich- lean direction (bank 2)	
(D) Identified delay time in rich-lean direction (bank 2)	
Negative value of the sum of delay times and transition times in rich to lean and lean to rich directions respectively	>0,2(sec)
where in (A) Identified transition time in lean	
rich direction (bank 1)	
(B)Identified delay time in lean-rich	
direction (bank 1) (C) Identified transition time in rich-	
lean direction (bank 1)	
(D) Identified delay time in rich-lean	
direction (bank 1)	
Absolute value of filling gradient for time	≤12(%) =3(sec)
)	
, OR	
Fault suspicion reported by	=FALSE
continuous identification	
Absolute value of filling gradient	≤12(%)
for time	=1(sec)
)	
(
Relative air mass (see Look-Up-Table #21)	>15 to 1536(%)
for time	=0(sec)
)	
) Ambient pressure	>0(kPa)
)	
Bank-specific enabling conditions for continuous identification, bank 2	=TRUE

(

Enabling conditions for lambda stability (
(Lambda closed loop control, Bank 2	=TRUE
(Lambda control disabled during after	=FALSE
Lambda swtiched ON after fuel cutoff, bank 2	=TRUE
(Fuel cut off is active (=FALSE
Time running down after fuel cut-off for enabling lambda control OR	>2(sec)
(Absolute value of diffence in lambda of bank 2	≤0,2
Difference of counter time and plant time constant a-(b+c)	>0(sec)
where a is Time running down after fuel cut-off for enabling lambda	
b is plant time constant for continuous air/fuel control, bank 2 c is plant parameter for dead time for lambda control, bank 2)	
) LSU sensor upstream to catalyst ready for operation, bank 2	=TRUE
(lambda sensor 1 temperature	≥655(°C)
) Lambda control disabled by a fault, bank 2 (=FALSE
Catalyst damaging misfire rate	=FALSE
Injector power stage fault is active Camshaft fault in critical operating range present and MAF is main air charge sensor	=FALSE =FALSE
<i>)</i> lambda control is active since warmun is finished	=TRUE
Relative air charge	>0(%)
for time	≥2(sec)

Lamda control active due to GDI mode change	=TRUE
(GDI mode homogeneous for time	=TRUE ≥0,8(sec)
)	
, Rich catalyst purge is active, bank 2	=TRUE
(Lambda for component protection is active OR	=FALSE
Number of the lambda requests determining the lambda setpoint	!=5
) for time	=1(sec)
Plant time constant of continuous af control, base value, bank 2, linear quantization	≤0,15(sec)
t Exhaust gas mass flow Cat 1, Bank 2	≤200(kg/h)
(Difference between exhaust gas mass flow Cat 1, Bank 2 with its	≥-20(kg/h)
Difference between exhaust gas mass flow Cat 1, Bank 2 with its filtered value	≤20(kg/h)
) for time	=0,01(sec)
) Sensor LSU upstream cat ready for	=TRUE
for time (=10(sec)
(Transition time from step response measurement in rich-lean direction (sensor 1, bank 2)	<0,2(sec)
Transition time from step response measurement in lean-rich direction (sensor 1, bank 2)	<0,2(sec)
(Transition time from step response measurement in rich-lean direction (sensor 1, bank 2)	<0,1(sec)
Transition time from step response measurement in lean-rich direction	<0,1(sec)

)	
/ Injection valve cut-off on Bank 2 Turn-on delay after fuel cut-off) Identification trigger: rate of change of modeled lambda in lean to rich	=FALSE ≥3(sec) ≥0,024994
Identification trigger: rate of change of modeled lambda in rich to lean direction, bank 2	≥0,024994
Number of step response measurements in lean-rich direction for driving cylce (sensor 1, bank 2)	=0
(Time to evaluate loss function, bank 2	≥30(sec)
OR Square of difference between band pass filtered reciprocal lambda and modelled reciprocal lambda values (sensor 1, bank 2)))	≥100
OR Enabling conditions for step response measurement ((
(Lean lambda is requested and the cat is filled with oxygen gas, bank 2	=TRUE
a commanded lambda active primary A/F commanded	=TRUE =1,07
for time	≥3(sec)
for time Secondary O2 sensor voltage	≥0,1(sec) ≤0,45(V)
(Rich lambda is requested and the cat is filled with rich gas due to low	=TRUE
a commanded lambda	=TRUE
primary A/F commanded	=0,87
for time	≥3(sec)

>0 1/000)

OR Rich lambda is requested to empty the oxygen gas from the cat, bank 2	=TRUE
a commanded lambda active	=TRUE
primary A/F commanded	=0,87
for time	≥3(sec)
for time	≥0,1(sec)
Secondary O2 sensor	≥0,9(V)
Or	
(Secondary O2 sensor voltage	≥0,8(V)
Secondary O2 sensor voltage Secondary O2 sensor voltage Integrated Oxygen mass flow bank 2))	≤66,5(V/sec) ≥-66,5(V/sec) >250(mg)
(Primary A/F sensor lambda (a) Primary lambda control set	≤(a) + (b)
(b) maximum lambda deviation	=0,05
Primary A/F sensor lambda (a) Primary lambda control set	≥(a) - (b)
(b) maximum lambda deviation	≤0,05
of rich mixture for time Integrated rich exhaust gas mass flow bank 2)	≥0,1(sec) ≥0,005(kg)
) for time where in (A) LRS-plantparameter deadtime, bank 2	=A * 0.8(sec)
and (Reciprocal of actual lambda value, sensor 1, bank 2 where in	>(A + (B*C))
(A) Minimal or maximal value of reciprocal lambda after step, bank 2	
(B) Fraction of step height to end step response measurement	=0,3

(C) Step height in reciprocal lambda, bank 2	
OR Difference between time after step measurement and LRS- plantparameter deadtime, bank 2)	>1(sec)
) OR ((Rich lambda is requested to empty	=TRUE
the oxygen gas from the cat, bank 2	
a commanded lambda active	=TRUE
primary A/F commanded	=0,87
for time	≥3(sec)
for time	≥0,1(sec)
(Secondary O2 sensor	≥0,9(V)
Or	
(Secondary O2 sensor voltage	≥0,8(V)
Secondary O2 sensor voltage Secondary O2 sensor voltage Integrated Oxygen mass flow	≤66,5(V/sec) ≥-66,5(V/sec) >250(ma)
bank 2	
(Primary A/F sensor lambda (a) Primary lambda control set	≤(a) + (b)
(b) maximum lambda deviation	=0,05
of lean mixture Primary A/F sensor lambda (a) Primary lambda control set	≥(a) - (b)
point (b) maximum lambda deviation	≤0,05
for time Integrated rich exhaust gas	≥0,1(sec) ≥0,005(kg)
(
Lean lambda is requested and the cat is filled with oxygen gas due to high	=TRUE
sensor voltage, bank 2 a commanded lambda active	=TRUE

primary A/F commanded	=1,07
lambda for time	≥3(sec)
for time	≥0,1(sec)
((Secondary O2 sensor	≤0,07(V)
for time	≥0,1(sec)
Or	
(Secondary O2 sensor	≤0,200195(V)
voltage Secondary O2 sensor	≤0,1(V/sec)
voltage gradient over 0.05s Secondary O2 sensor	≥-0,09944(V/sec)
voltage gradient over 0.05s Integrated Oxygen mass	>150(mg)
flow bank 2))	
(Primary A/F sensor lambda	u ≤(a) + (b)
(a) Primary lambda control	
set point (b) maximum lambda	=0,05
deviation of lean mixture Primary A/F sensor lambda	≥(a) - (b)
(a) Primary lambda control	
set point (b) maximum lambda	<0.05
deviation of rich mixture	-0,00 >0.1(coc)
Integrated lean exhaust gas mass flow bank 2	≥0,1(sec) ≥0,005(kg)
OR Lean lambda is requested and the cat is filled with oxygen gas, bank 2	=TRUE
a commanded lambda active primary A/F commanded	=TRUE =1,07
lambda for time	≥3(sec)
for time Secondary O2 sensor voltage	≥0,1(sec) ≤0,45(V)
)) for time	A * 0 0/)
for time	=A " U.8(SeC)

where in

(A) LRS-plantparameter deadtime, bank 2	
(Reciprocal of actual lambda value, bank 2	<(A - (B*C))
(A) Minimal or maximal value of reciprocal lambda after step, bank 2	
 (B) Fraction of step height to end step response measurement (C) Step height in reciprocal lambda, bank 2 	=0,3
Difference between time after step measurement and LRS- plantparameter deadtime, bank 2))	>1(sec)
) Absolute difference between reciprocal of desired lamda limitation of sensor 1, bank 2 and reciprocal lambda setpoint in combustion	>0,05
for time where in (A) LRS-plantparameter deadtime, bank 2) (=A * 0.8(sec)
(Number of evaluated steps in lean-	<3(counts)
rich direction (sensor 1, bank 2) Number of evaluated steps in lean- rich direction (sensor 1, bank 2)	>0
Delay time from step response measurement in lean-rich direction (sensor 1, bank 2) where in	≤A - ((A - B)* (C / D))(sec)
(A) Delay time of best part	=0,6(sec)
(B) Fault threshold of delay time (step	=0,38(sec)
(C) Necessary number of measurements for fault-confirmation	=3(counts)
(D) Number of evaluated steps in lean-rich direction (sensor 1, bank 2)	
Transition time from step response measurement in lean-rich direction (sensor 1, bank 2)	≤A - ((A - B)* (C / D))(sec)

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 where in (A) Transition time of best part unacceptable (B) Fault threshold of transition time (step response, lean to rich) (C) Necessary number of measurements for fault-confirmation 	=0,9(sec) =0,4(sec) =3(counts)
(D) Number of evaluated steps in lean-rich direction (sensor 1, bank 2)	
) OR Number of evaluated steps in lean- rich direction (sensor 1, bank 2)) OR	≥3(counts)
(Number of evaluated steps in rich- lean direction (sensor 1, bank 2) Number of evaluated steps in rich- lean direction (sensor 1, bank 2)	<3(counts) >0
Delay time from step response measurement in rich-lean direction (sensor 1, bank 2)	≤A - ((A - B)* (C / D))(sec)
(A) Delay time of best part	=0,6(sec)
(B) Fault threshold of delay time (step	=0,38(sec)
(C) Necessary number of measurements for fault-confirmation	=3(counts)
(D) Number of evaluated steps in rich- lean direction (sensor 1, bank 2)	
Transition time from step response measurement in rich-lean direction (sensor 1, bank 2) where in	≤A - ((A - B)* (C / D))(sec)
(A) Transition time of best part	=0,9(sec)
(B) Fault threshold of transition time (step response rich to lean)	=0,4(sec)
(C) Necessary number of measurements for fault-confirmation	=3(counts)
(D) Number of evaluated steps in rich- lean direction (sensor 1, bank 2)	

					Number of evaluated steps in rich- lean direction (sensor 1, bank 2)))	≥3(counts)		
					No pending or confirmed DTCs	=see sheet inhibit table		
					Basic enable conditions met	=see sheet enable tables		
16. PLAUSIBILITY DIAGNOSIS OF UPSTREAM EXHAUST GAS SENSOR	P2196	Plausibility check of upstream L exhaust gas sensor when the e lambda offset is lesser than the calibrated threshold	ambda offset of upstream xhaust gas sensor	<-0,07	Debounce condition for fault confirmation by offset adaptation (sensor 1, bank 1)	=TRUE	0,1(s)	2 Trip
					(Debouncing of offset fault by slow offset adaptation	=TRUE		
					Slow offset adaptation	=TRUE		
					(Bit p-part controlability primary control enable (=TRUE		
					(Lambda regulator setpoint active (=TRUE		
					(Lambda closed loop control (upstream catalyst), bank 1 OR	=TRUE		
					(Lambda setpoint for sensor after addition of trim control action is not equal to 0	=TRUE		
					Difference between upper limit action value lambda control and temporary value before test for enleanment protection	≥0		
					Difference between temporary value before test for enleanment protection and lower bound of dfr during enleanmant protection	≥0		
					Lambda (measured and setpoint) is below minimal measurable lambda (bank 1)	=FALSE		
					TEMIN-limitation active, bench 1))	=FALSE		

Current lowpass value of p-part control upstream primary control	>0(%)
Lambda closed loop control (upstream catalyst), bank 1	=TRUE
Lambda control disabled during or after cylinder cut-off	=FALSE
Lambda swtiched ON after fuel cutoff	=TRUE
(Fuel cut off is active	=FALSE
(Time running down after fuel cut-off for enabling lambda control OR (>2(sec)
Absolute value of control difference	≤0,2
Difference of counter time and plant time constant a-(b+c)	>0(sec)
where a is Time running down after fuel cut-off for enabling lambda	
b is plant time constant for	
c is plant parameter for dead time for lambda control	
)) LSU sensor upstream to catalyst ready for operation (=TRUE
lambda sensor 1 temperature, bank 1	≥655(°C)
) Lambda control disabled by a fault lambda control is active since warmup is finished	=FALSE =TRUE
Relative air charge	>0(%)
for time	≥2(sec)
HEM condition to block lambda closed loop control upstream catalyst	=FALSE
Lamda control active due to GDI mode change (=TRUE
GDI mode homogeneous	=TRUE ≥0,8(sec)

)	
(Lambda control enabled for Cold operation sensor 2 bank 1	=TRUE
OR HEGO sensor 2 bank 1, signal valid	=TRUE
(Status of heating enable conditions for the sensor operating readiness (=TRUE
Protective heating is finished for time	≥25(sec)
OR Internal resistance OK for operating readiness	=TRUE
Unfiltered internal resistance of	≤2000(Ohm)
Protective heating is finished Counter for valid internal resistance measurements)	≥3(counts)
) Status of sensor signal enable conditions for the sensor operating readiness	=TRUE
(Internal resistance OK for operating readiness OR (=TRUE
(≥0,552(V)
Output voltage of HEGO Sensor Output voltage of HEGO Sensor	≤1,201(V)
) OR Output voltage of HEGO Sensor	≤0,322(V)
) OR Sensor voltage stuck in countervoltage band (=TRUE
(Output voltage of HEGO Sensor Output voltage of HEGO Sensor	<0,552(V) >0,322(V)

(
Sensor open circuit fault existed in previous trip OR	-INOL
Sensor open circuit fault currently not detected	=TRUE
) Electrical diagnostics enabled	=TRUE
) for time	≥20(sec)
)) for time))	≥0,2(sec)
) Bit p-part system balanced primary control enable (=TRUE
Lambda setpoint for sensor is set equal to 1	=TRUE
Lambda setpoint for sensor is set	=FALSE
for time	≥10(sec)
) Rich catalyst purge Mass flow of exhaust gas, sensor 2	=FALSE >0(g)
) P-part active from temperature and dynamic diagnosis	=TRUE
Temperature of catalyst 1	≥250(°C)
Temperature of catalyst 1)	<900(°C)
) Bit I-part global primary control enable (=TRUE
Current lowpass value of I-part load	>-1(%)
Current lowpass value of I-part load primary control enable	≤1(%)
, Diagnosis of canister purge system is	=FALSE

Maximum value among the engine coolant temperature and model- based substitute value for engine temperature signal in case of error	>34,96(°C)
(Bit I-part global load and engine speed control enable (=TRUE
Engine speed with low resolution Engine speed with low resolution Relative air mass Relative air mass (see Look-Up-Table #95)	<5000(rpm) ≥1320(rpm) <99,8(%) ≥15.8 to 39.8(%)
))))	
Bit i-part system primary control enable	=TRUE
(Current integrator value of P-part balanced primary control enable (see Look-Up-Table #96)	>200 to 300(g)
(
Dew point end of sensor 2 Bank1 is reached	=TRUE
End of start is reached Exhaust gas mass flow sensor 2 Bank 1	=TRUE >199,82(g)
) OR (
(Dew point end of sensor 2 reached	=FALSE
End of start is reached	=FALSE
) Exhaust gas mass flow sensor 2 (see Look-Up-Table #97)	>219.73 to 320(g)
))	
) Bit i-part system temperature primary control enable	=TRUE
(Temperature of catalyst 1	>350(°C)
Temperature of catalyst 1	<900(°C)

))	
Cumulated time in which slow offset adaptation was active	≥0(sec)
) Debounce condition for fault confirmation by fast offset adaptation (sensor 1, bank 1) General enabling condition of fast offset adaptation	=TRUE
Enabling condition of fast offset adaptation due to catalyst conditioning (=TRUE
, Bit signal valid, HEGO sensor 2 bank 1	=TRUE
Flag lambda setpoint for sensor	=TRUE
Rich catalyst purge Bank-independent disabling conditions of fast offset adaptation	=FALSE =FALSE
Fuel cut-off Mass flow exhaust gas catalyst 1	=TRUE >50(g)
) OR (
(Fuel cut-off Mass flow exhaust gas catalyst 1)) (=FALSE >50(g)
(Parallelization done at least once from LSU plausibility diagnosis point of view (sensor 1, bank 1) (=TRUE
Target sensor voltage for rich during active parallelisation reached once, sensor 1 bank 2	=TRUE
Oil gas mass flow by active lambda shifting minus the maximal possible influence of LSU offset part, segment 1, bank 1	≥1800(mg)
for time) OR (≥1(sec)

Lean target sensor voltage during active parallelisation reached once,	=TRUE
Oxygen mass flow in catalyst 1, deduct from maximum present LSU	≥1600(mg)
for time	≥1(sec)
) OR Dynamic diagnosis error of upstream exhaust gas sensor is not set	=TRUE
) OR (
(lambda control is set when lambda controller reaches lower limit FRMIN	=TRUE
Lambda actual value sensor 1 bank 1	<1
Output voltage of HEGO sensor 2 bank 1	<0,4(V)
) OR	
(lambda control is set when lambda controller reaches lower limit FRMAX	=TRUE
Lambda actual value sensor 1 bank 1	
Output voltage of HEGO sensor 2 bank 1	>0,6(V)
) for time Condition for Lambda closed loop control upstream catalyst; bank 1)	≥2(sec) =TRUE
for time) (≥2(sec)
(Temperature of catalyst 1	>399,96(°C)
Temperature of catalyst 1	<799,96(°C)
) for time) (=0(sec)
(Mass flow exhaust gas catalyst 1	>20(kg/h)

Mass flow exhaust gas catalyst 1	<120(kg/h)
) OR (
Mass flow exhaust gas catalyst 1	>20(kg/h)
Mass flow exhaust gas catalyst 1	≤120(kg/h)
) for time	≥0(sec)
)) Condition for upstream cat LSU ready for operation f(lamsons_w)	=TRUE
(Sensor type sensor 1 bank 1 Lambda signal quality sensor 1 bank 1	>0 ≤12
) Hydrogen-correction-voltage, HEGO sensor 2 bank 1 with high resolution	≤80(V)
(CAT damage during past interval	=FALSE
Mass flow of exhaust gas catalyst 1	≥100(g)
Difference betweeen Lambda offset (sensor 1, bank 1) and Lambda offset (delayed by one calculation raster)	≤0,003
(Counter for no step in offset or increasing offset in a row	≥6(counts)
Counter for exhaust masses to debounce fault with fast offset adaptation	≥6(counts)
)))	
)	

No pending or confirmed DTCs =see sheet inhibit table

				Basic enable conditions met	=see sheet enable		
					tables		
P2195	Plausibility check of upstream exhaust gas sensor when the lambda offset is greater than the calibrated threshold	Lambda offset of upstream exhaust gas sensor	>0,07	Debounce condition for fault confirmation by offset adaptation (sensor 1, bank 1)	=TRUE	0,1(s)	2 Trip
				(Debouncing of offset fault by slow offset adaptation	=TRUE		
				(Slow offset adaptation	=TRUE		
				(Bit p-part controlability primary control enable (=TRUE		
				(Lambda regulator setpoint active (=TRUE		
				(Lambda closed loop control (upstream catalyst), bank 1 OR (=TRUE		
				Lambda setpoint for sensor after addition of trim control action is not eqaul to 0	=TRUE		
				Difference between upper limit action value lambda control and temporary value before test for enleanment	≥0		
				protection Difference between temporary value before test for enleanment protection and lower bound of dfr during	≥0		
				enleanmant protection Lambda (measured and setpoint) is below minimal measurable lambda (bank 1)	=FALSE		
				TEMIN-limitation active, bench 1))	=FALSE		

Current lowpass value of p-part control upstream primary control	>0(%)
Lambda closed loop control (upstream catalyst), bank 1	=TRUE
Lambda control disabled during or after cylinder cut-off	=FALSE
Lambda swtiched ON after fuel cutoff	=TRUE
(Fuel cut off is active	=FALSE
(Time running down after fuel cut-off for enabling lambda control OR	>2(sec)
Absolute value of control difference in lambda, bank 1	≤0,2
Difference of counter time and plant time constant a-(b+c)	>0(sec)
where a is Time running down after fuel cut-off for enabling lambda control	
b is plant time constant for continuous air/fuel control	
c is plant parameter for dead time for lambda control	
) LSU sensor upstream to catalyst ready for operation	=TRUE
lambda sensor 1 temperature, bank 1	≥655(°C)
) Lambda control disabled by a fault lambda control is active since warmup is finished	=FALSE =TRUE
Relative air charge	>0(%)
for time	≥2(sec)
HEM condition to block lambda closed loop control upstream catalyst	=FALSE
Lamda control active due to GDI mode change (=TRUE
GDI mode homogeneous for time	=TRUE ≥0,8(sec)
)	
--	------------------------
(Lambda control enabled for Cold operation sensor 2 bank 1	=TRUE
OR HEGO sensor 2 bank 1, signal valid	=TRUE
(Status of heating enable conditions for the sensor operating readiness (=TRUE
Protective heating is finished for time	≥25(sec)
OR Internal resistance OK for operating readiness	=TRUE
Unfiltered internal resistance of	≤2000(Ohm)
Protective heating is finished Counter for valid internal resistance measurements)	≥3(counts)
) Status of sensor signal enable conditions for the sensor operating readiness	=TRUE
(Internal resistance OK for operating readiness OR (=TRUE
(≥0,552(V)
Output voltage of HEGO Sensor Output voltage of HEGO Sensor	≤1,201(V)
) OR Output voltage of HEGO Sensor	≤0,322(V)
) OR Sensor voltage stuck in countervoltage band ((=TRUE
(Output voltage of HEGO Sensor Output voltage of HEGO Sensor	<0,552(V) >0,322(V)

(
Sensor open circuit fault existed in previous trip OR	
Sensor open circuit fault currently not detected	=TRUE
) Electrical diagnostics enabled	=TRUE
) for time	≥20(sec)
)) for time))	≥0,2(sec)
) Bit p-part system balanced primary control enable (=TRUE
Lambda setpoint for sensor is set equal to 1	=TRUE
Lambda setpoint for sensor is set	=FALSE
for time	≥10(sec)
) Rich catalyst purge Mass flow of exhaust gas, sensor 2	=FALSE >0(g)
) P-part active from temperature and dynamic diagnosis	=TRUE
Temperature of catalyst 1	≥250(°C)
Temperature of catalyst 1)	<900(°C)
) Bit I-part global primary control enable (=TRUE
Current lowpass value of I-part load	>-1(%)
Current lowpass value of I-part load primary control enable	≤1(%)
, Diagnosis of canister purge system is	=FALSE

Maximum value among the engine coolant temperature and model- based substitute value for engine temperature signal in case of error	>34,96(°C)
(Bit I-part global load and engine speed control enable (=TRUE
Engine speed with low resolution Engine speed with low resolution	<5000(rpm) ≥1320(rpm)
Relative air mass	<99,8(%)
Relative air mass (see Look-Up-Table #95)	≥15.8 to 39.8(%)
))))	
Bit i-part system primary control enable	=TRUE
(Current integrator value of P-part balanced primary control enable (see Look-Up-Table #96)	>200 to 300(g)
(
Dew point end of sensor 2 Bank1 is	=TRUE
End of start is reached	=TRUE
Bank 1	>199,62(9)
) OR (
(Dew point end of sensor 2 reached	=FALSE
OR End of start is reached	=FALSE
) Exhaust gas mass flow sensor 2 (see Look-Up-Table #97)	>219.73 to 320(g)
)	
) Bit i-part system temperature primary control enable (=TRUE

Temperature of catalyst 1	>350(°C)
Temperature of catalyst 1))	<900(°C)
) Cumulated time in which slow offset adaptation was active	≥0(sec)
) Debounce condition for fault confirmation by fast offset adaptation (sensor 1, bank 1) General enabling condition of fast offset adaptation	=TRUE
(Enabling condition of fast offset adaptation due to catalyst conditioning (=TRUE
(Bit signal valid, HEGO sensor 2 bank	=TRUE
Flag lambda setpoint for sensor	=TRUE
Rich catalyst purge Bank-independent disabling conditions of fast offset adaptation	=FALSE =FALSE
(Fuel cut-off Mass flow exhaust gas catalyst 1	=TRUE >50(g)
) OR (
(Fuel cut-off Mass flow exhaust gas catalyst 1))	=FALSE >50(g)
(Parallelization done at least once from LSU plausibility diagnosis point of view (sensor 1, bank 1) (=TRUE
(Target sensor voltage for rich during active parallelisation reached once, sensor 1 bank 2	=TRUE
Oil gas mass flow by active lambda shifting minus the maximal possible influence of LSU offset part, segment 1, bank 1	≥1800(mg)
for time	≥1(sec)

OR (
Lean target sensor voltage during active parallelisation reached once, sensor 1, bank 2	=TRUE
Oxygen mass flow in catalyst 1, deduct from maximum present LSU	≥1600(mg)
for time	≥1(sec)
) OR Dynamic diagnosis error of upstream exhaust gas sensor is not set	=TRUE
) OR (
(lambda control is set when lambda controller reaches lower limit FRMIN	=TRUE
Lambda actual value sensor 1 bank 1	<1
Output voltage of HEGO sensor 2 bank 1	<0,4
) OR	
(lambda control is set when lambda controller reaches lower limit FRMAX	=TRUE
Lambda actual value sensor 1 bank 1	
Output voltage of HEGO sensor 2 bank 1	
) for time Condition for Lambda closed loop control upstream catalyst; bank 1	≥2(sec) =TRUE
, for time) (≥2(sec)
(Temperature of catalyst 1	>399.96(°C)
Temperature of catalyst 1	<799,96(°C)
)	
for time	=0(sec)
, (

Mass flow exhaust gas catalyst 1	>20(kg/h)
Mass flow exhaust gas catalyst 1	<120(kg/h)
) OR (
Mass flow exhaust gas catalyst 1	>20(kg/h)
Mass flow exhaust gas catalyst 1	≤120(kg/h)
) for time	≥0(sec)
)) Condition for upstream cat LSU ready for operation f(lamsons_w)	=TRUE
C Sensor type sensor 1 bank 1 Lambda signal quality sensor 1 bank 1	>0 ≤12
) Hydrogen-correction-voltage, HEGO sensor 2 bank 1 with high resolution	≤80(V)
(CAT damage during past interval	=FALSE
) Mass flow of exhaust gas catalyst 1	≥100(g)
Difference betweeen Lambda offset (sensor 1, bank 1) and Lambda offset (delayed by one calculation raster)	≤0,003
(Counter for no step in offset or increasing offset in a row OR	≥6(counts)
Counter for exhaust masses to debounce fault with fast offset adaptation)	≥6(counts)
)))	

No pending or confirmed DTCs =see sheet inhibit table

			Basic enable conditions met	=see sheet enable		
				tables		
P2108	Plausibility check of unstream. Lambda offset of unstream	<-0.07	Debounce condition for fault		0.1(s)	2 Trip
12150	exhaust gas sensor when the exhaust gas sensor, bank 2	< 0,07	confirmation by offset adaptation	TROL	0,1(3)	2 1119
	lambda offset is lesser than the		(sensor 1, bank 2)			
	calibrated threshold					
			(
			Debouncing of offset fault by slow	=TRUE		
			offset adaptation, bank 2			
			Slow offset adaptation, bank 2	=TRUE		
			(
			Bit p-part controlability primary	=TRUE		
			(
			(
			Lambda regulator setpoint active,	=TRUE		
			(
			Lambda closed loop control	=TRUE		
			(upstream catalyst), bank 2 OR			
			(
			Lambda setpoint for sensor after	=TRUE		
			addition of trim control action, bank 2 is not equal to 0			
			Difference between upper limit action	≥0		
			value lambda control and temporary			
			value before test for enleanment			
			Difference between temporary value	≥0		
			before test for enleanment protection,			
			bank 2 and lower bound of dfr during			
			enleanmant protection	=FALSE		
			below minimal measurable lambda	I ALOL		
			(bank 2)			
			I EMIN-IIMITATION active, bench 2	=FALSE		
)			
			(bank 2) TEMIN-limitation active, bench 2)	=FALSE		

Current lowpass value of p-part control upstream primary control	>0(%)
Lambda closed loop control (upstream catalyst), bank 2	=TRUE
Lambda control disabled during or after cylinder cut-off bank 2	=FALSE
Lambda swtiched ON after fuel cutoff, bank 2	=TRUE
Fuel cut off is active, bank 2	=FALSE
Time running down after fuel cut-off for enabling lambda control OR	>2(sec)
Absolute value of control difference in lambda, bank 2	≤0,2
Difference of counter time and plant time constant a-(b+c) where a is Time running down after fuel cut-off for enabling lambda	>0(sec)
b is plant time constant for continuous air/fuel control, bank 2 c is plant parameter for dead time for lambda control, bank 2)	
) LSU sensor upstream to catalyst ready for operation, bank 2 (=TRUE
lambda sensor 1 temperature, bank 2	≥655(°C)
) Lambda control disabled by a fault, bank 2	=FALSE
lambda control is active since	=TRUE
Relative air charge	>0(%)
for time	≥2(sec)
HEM condition to block lambda closed loop control upstream	=FALSE
Lamda control active due to GDI mode change	=TRUE
GDI mode homogeneous	

)	
(Lambda control enabled for Cold operation sensor 2 bank 2	=TRUE
HEGO sensor 2 bank 2, signal valid	=TRUE
(Status of heating enable conditions for the sensor operating readiness (Protective heating is finished, bank 2	=TRUE
for time	≥25(sec)
OR Internal resistance OK for operating readiness, bank 2	=TRUE
(Unfiltered internal resistance of HEGO sensor, bank 2 Protective heating is finished, bank 2	≤2000(Ohm)
Counter for valid internal resistance measurements, bank 2	≥3(counts)
) Status of sensor signal enable conditions for the sensor operating readiness, bank 2	=TRUE
(Internal resistance OK for operating readiness OR	=TRUE
(
Output voltage of HEGO Sensor,	≥0,552(V)
Output voltae of HEGO Sensor, bank 2)	≤1,201(V)
OR Output voltae of HEGO Sensor, bank 2	≤0,322(V)
) OR Sensor voltage stuck in countervoltage band (=TRUE
(

Output voltage of HEGO Sensor,	<0,552(V)
Dank 2 Output voltage of HEGO Sensor, bank 2	>0,322(V)
) (
Sensor open circuit fault existed in previous trip	TRUE
Sensor open circuit fault currently not detected	=TRUE
) Electrical diagnostics enabled, bank 2	=TRUE
) for time	≥20(sec)
)) for time))	≥0,2(sec)
) Bit p-part system balanced primary control enable 2 (=TRUE
(Lambda setpoint for sensor is set equal to 1, bank 2	=TRUE
OR Lambda setpoint for sensor is set	=FALSE
for time	≥10(sec)
, Rich catalyst purge, bank 2 Mass flow of exhaust gas, sensor 1, bank 2	=FALSE >0(g)
) P-part active from temperature and dynamic diagnosis, bank 2	=TRUE
(Temperature of catalyst 1 bank 2	≥250(°C)
Temperature of catalyst 1, bank 2	<900(°C)
) Bit I-part global primary control enable	=TRUE

≤1(%) =FALSE >34,96(°C)
=FALSE >34,96(°C)
>34,96(°C)
=TRUE
<5000(rpm) ≥1320(rpm)
<99,8(%)
≥15.8 to 39.8(%)
=TRUE
>200 to 300(g)
=TRUE =TRUE >199,82(g)
=FALSE
=FALSE

	Exhaust gas mass flow sensor 2 (see Look-Up-Table #97)	>219.73 to 320(g)
)	
) Bit i-part system temperature primary control enable, bank 2	=TRUE
	(Temperature of catalyst 1 bank 2	>350(°C)
	Temperature of catalyst 1, bank 2))	<900(°C)
) Cumulated time in which slow offset adaptation was active, bank 2	≥0(sec)
) Debounce condition for fault confirmation by fast offset adaptation (sensor 1, bank 2) General enabling condition of fast	=TRUE
	(Enabling condition of fast offset adaptation due to catalyst conditioning, bank 2 (=TRUE
	(Bit signal valid, HEGO sensor 2 bank	=TRUE
	2 Flag lambda setpoint for sensor	=TRUE
	Rich catalyst purge, bank 2 Bank-independent disabling conditions of fast offset adaptation	=FALSE =FALSE
	(Fuel cut-off, bank Mass flow exhaust gas catalyst 1, bank 2)	=TRUE >50(g)
	OR (Fuel cut-off Mass flow exhaust gas catalyst 1, bank 2))	=FALSE >50(g)
70	(Parallelization done at least once from LSU plausibility diagnosis point of view (sensor 1, bank 2)	=TRUE

(
(Target sensor voltage for rich during active parallelisation reached once, sensor 1, bank 2	=TRUE
Oil gas mass flow by active lambda shifting minus the maximal possible influence of LSU offset part, segment	≥1800(mg)
1, bank 2 for time) OR	≥1(sec)
(Lean target sensor voltage during active parallelisation reached once, sensor 1, bank 2	=TRUE
Oxygen mass flow in catalyst 1, deduct from maximum present LSU Offset in a fault free system, bank 2	≥1600(mg)
for time))	≥1(sec)
OR Dynamic diagnosis error of upstream exhaust gas sensor is not set	=TRUE
) OR (
(lambda control is set when lambda controller reaches lower limit FRMIN, bank 2	=TRUE
Lambda actual value sensor 1 bank 2	<1
Output voltage of HEGO sensor 2 bank 2)	<0,4(v)
OR (
lambda control is set when lambda controller reaches lower limit FRMAX, bank 2 Lambda actual value sensor 1 bank 2	=TRUE
Output voltage of HEGO sensor 2 bank 2	
, for time Condition for Lambda closed loop control upstream catalyst; bank 2)	≥2(sec) =TRUE

) (
Temperature of catalyst 1, bank 2	>399,96(°C)
Temperature of catalyst 1, bank 2	<799,96(°C)
) for time)	=0(sec)
((Mass flow exhaust gas catalyst 1, bank 2 Mass flow exhaust gas catalyst 1,	>20(kg/h) <120(kg/h)
bank 2) OR (
Mass flow exhaust gas catalyst 1,	>20(kg/h)
Mass flow exhaust gas catalyst 1, bank 2	≤120(kg/h)
) for time	≥0(sec)
)) Condition for upstream cat LSU ready for operation f(lamsons_w), bank 2	=TRUE
(Sensor type sensor 1 bank 2 Lambda signal quality sensor 1 bank 2	>0 ≤12
) Hydrogen-correction-voltage, HEGO sensor 2 bank 2 with high resolution	≤80(V)
(CAT damage during past interval	=FALSE
) Mass flow of exhaust gas catalyst 1 bank 2	≥100(g)
Difference betweeen Lambda offset (sensor 1, bank 2) and Lambda offset (delayed by one calculation raster)	≤0,003
(Counter for no step in offset or increasing offset in a row, bank 2	≥6(counts)

				Counter for exhaust masses to debounce fault with fast offset adaptation, bank 2)))	≥6(counts)		
) No pending or confirmed DTCs	=see sheet inhibit table		
				Basic enable conditions met	=see sheet enable tables		
P2197	Plausibility check of upstream exhaust gas sensor when the lambda offset is greater than the calibrated threshold	Lambda offset of upstream exhaust gas sensor, bank 2	>0,07	Debounce condition for fault confirmation by offset adaptation (sensor 1, bank 2)	=TRUE	0,1(s)	2 Trip
				(Debouncing of offset fault by slow offset adaptation, bank 2	=TRUE		
				(Slow offset adaptation, bank 2	=TRUE		
				(Bit p-part controlability primary control enable 2 (=TRUE		
				(Lambda regulator setpoint active, bank 2 (=TRUE		
				(Lambda closed loop control (upstream catalyst), bank 2 OR	=TRUE		
				Lambda setpoint for sensor after addition of trim control action, bank 2	=TRUE		
				Difference between upper limit action value lambda control and temporary value before test for enleanment protection, bank 2	≥0		

Difference between temporary value before test for enleanment protection, bank 2 and lower bound of dfr during	≥0
enleanmant protection Lambda (measured and setpoint) is below minimal measurable lambda	=FALSE
TEMIN-limitation active, bench 2)	=FALSE
) Current lowpass value of p-part control upstream primary control enable 2	>0(%)
Lambda closed loop control (upstream catalyst), bank 2 (=TRUE
Lambda control disabled during or	=FALSE
Lambda swtiched ON after fuel cutoff, bank 2	=TRUE
(Fuel cut off is active, bank 2	=FALSE
(Time running down after fuel cut-off for enabling lambda control OR (>2(sec)
Absolute value of control difference	≤0,2
Difference of counter time and plant time constant a-(b+c) where a is Time running down after fuel cut-off for enabling lambda	>0(sec)
control b is plant time constant for continuous air/fuel control, bank 2 c is plant parameter for dead time for lambda control, bank 2)	
) LSU sensor upstream to catalyst ready for operation, bank 2	=TRUE
(lambda sensor 1 temperature, bank 2	≥655(°C)
) Lambda control disabled by a fault, bank 2	=FALSE
lambda control is active since warmup is finished	=TRUE

Relative air charge	>0(%)
for time	≥2(sec)
) HEM condition to block lambda closed loop control upstream	=FALSE
Lamda control active due to GDI mode change	=TRUE
GDI mode homogeneous for time))	=TRUE ≥0,8(sec)
Lambda control enabled for Cold operation sensor 2 bank 2	=TRUE
HEGO sensor 2 bank 2, signal valid	=TRUE
(Status of heating enable conditions for the sensor operating readiness	=TRUE
Protective heating is finished, bank 2	
for time	≥25(sec)
OR Internal resistance OK for operating readiness, bank 2	=TRUE
(Unfiltered internal resistance of HEGO sensor, bank 2 Protective heating is finished, bank 2	≤2000(Ohm)
Counter for valid internal resistance measurements, bank 2	≥3(counts)
) Status of sensor signal enable conditions for the sensor operating readiness, bank 2	=TRUE
Internal resistance OK for operating readiness OR (=TRUE
(Output voltage of HEGO Sensor,	≥0,552(V)
bank 2 Output voltae of HEGO Sensor, bank	≤1,201(V)

) OR Output voltae of HEGO Sensor, bank 2)	≤0,322(V)
OR Sensor voltage stuck in countervoltage band (=TRUE
(Output voltage of HEGO Sensor,	<0,552(V)
bank 2 Output voltage of HEGO Sensor, bank 2	>0,322(V)
) (=TRUE
Sensor open circuit fault existed in previous trip OR	
Sensor open circuit fault currently not detected	=TRUE
) Electrical diagnostics enabled, bank 2	=TRUE
) for time	≥20(sec)
)) for time))	≥0,2(sec)
) Bit p-part system balanced primary control enable 2 (=TRUE
(Lambda setpoint for sensor is set equal to 1, bank 2	=TRUE
Lambda setpoint for sensor is set	=FALSE
for time	≥10(sec)
) Rich catalyst purge, bank 2 Mass flow of exhaust gas, sensor 1, bank 2	=FALSE >0(g)

P-part active from temperature and dynamic diagnosis, bank 2	=TRUE
(Temperature of catalyst 1	≥250(°C)
Temperature of catalyst 1, bank 2	<900(°C)
) Bit I-part global primary control enable (=TRUE
Current lowpass value of I-part load	>-1(%)
Current lowpass value of I-part load primary control enable	≤1(%)
) Diagnosis of canister purge system is	=FALSE
Maximum value among the engine coolant temperature and model- based substitute value for engine temperature signal in case of error	>34,96(°C)
Bit I-part global load and engine speed control enable	=TRUE
C Engine speed with low resolution Engine speed with low resolution	<5000(rpm) ≥1320(rpm)
(Relative air mass	<99,8(%)
Relative air mass (see Look-Up-Table #95)	≥15.8 to 39.8(%)
))) (
Bit i-part system primary control enable, bank 2	=TRUE
Current integrator value of P-part balanced primary control enable (see Look-Up-Table #96)	>200 to 300(g)
(
Dew point end of sensor 1 Bank 2 is reached	=TRUE
End of start is reached	=TRUE

Exhaust gas mass flow sensor 1 Bank 2	>199,82(g)
) OR (
(Dew point end of sensor 2 reached, bank 2	=FALSE
End of start is reached	=FALSE
) Exhaust gas mass flow sensor 2 (see Look-Up-Table #97)	>219.73 to 320(g)
))	
Bit i-part system temperature primary control enable, bank 2	=TRUE
Temperature of catalyst 1 bank 2	>350(°C)
Temperature of catalyst 1, bank 2))	<900(°C)
) Cumulated time in which slow offset adaptation was active, bank 2	≥0(sec)
) Debounce condition for fault confirmation by fast offset adaptation (sensor 1, bank 2) General enabling condition of fast offset adaptation, bank 2	=TRUE
(Enabling condition of fast offset adaptation due to catalyst conditioning, bank 2 (=TRUE
(Bit signal valid, HEGO sensor 2 bank	=TRUE
Flag lambda setpoint for sensor equal to 1, bank 2	=TRUE
Rich catalyst purge, bank 2 Bank-independent disabling conditions of fast offset adaptation	=FALSE =FALSE
(Fuel cut-off, bank Mass flow exhaust gas catalyst 1, bank 2	=TRUE >50(g)

OR	
(Fuel cut-off Mass flow exhaust gas catalyst 1, bank 2	=FALSE >50(g)
) ((Parallelization done at least once from LSU plausibility diagnosis point of view (sensor 1, bank 2)	=TRUE
((Target sensor voltage for rich during active parallelisation reached once	=TRUE
sensor 1, bank 2 Oil gas mass flow by active lambda shifting minus the maximal possible	≥1800(mg)
1, bank 2 for time	≥1(sec)
OR (Lean target sensor voltage during active parallelisation reached once,	=TRUE
sensor 1, bank 2 Oxygen mass flow in catalyst 1, deduct from maximum present LSU Offset in a fault free system, bank 2	≥1600(mg)
for time	≥1(sec)
, OR Dynamic diagnosis error of upstream exhaust gas sensor is not set	=TRUE
) OR (
(lambda control is set when lambda controller reaches lower limit FRMIN, bank 2	=TRUE
Lambda actual value sensor 1 bank 2	<1
Output voltage of HEGO sensor 2 bank 2) OR (<0,4(V)

lambda control is set when lambda controller reaches lower limit FRMAX, bank 2 Lambda actual value sensor 1 bank 2	=TRUE
Output voltage of HEGO sensor 2 bank 2)	
for time Condition for Lambda closed loop control upstream catalyst; bank 2	≥2(sec) =TRUE
) for time) (≥2(sec)
(Temperature of catalyst 1, bank 2	>399,96(°C)
Temperature of catalyst 1, bank 2	<799,96(°C)
) for time) (=0(sec)
(Mass flow exhaust gas catalyst 1,	>20(kg/h)
bank 2 Mass flow exhaust gas catalyst 1, bank 2	<120(kg/h)
) OR (
(Mass flow exhaust gas catalyst 1,	>20(kg/h)
bank 2 Mass flow exhaust gas catalyst 1, bank 2	≤120(kg/h)
) for time	≥0(sec)
)) Condition for upstream cat LSU ready for operation f(lamsons_w), bank 2	=TRUE
(Sensor type sensor 1 bank 2 Lambda signal quality sensor 1 bank 2	>0 ≤12
, Hydrogen-correction-voltage, HEGO sensor 2 bank 2 with high resolution	≤80(V)

					CAT damage during past interval	=FALSE		
) Mass flow of exhaust gas catalyst 1	≥100(g)		
					Difference betweeen Lambda offset (sensor 1, bank 2) and Lambda offset (delayed by one calculation raster)	≤0,003		
					(Counter for no step in offset or increasing offset in a row, bank 2 OR	≥6(counts)		
					Counter for exhaust masses to debounce fault with fast offset adaptation, bank 2	≥6(counts)		
))) No pending or confirmed DTCs	=see sheet inhibit table		
					Basic enable conditions met	=see sheet enable tables		
17. DIAGNOSIS DF OXYGEN SENSORS	P2297 Air fuel ratio signa oxygen sensor 1 b	al check for bank 1	Lambda equivalent value based on electrically corrected pump current sensor 1 bank 1	>12	UEGO Release condition for O2 signal is fulfilled under following condition for sensor1 bank1 :	=TRUE	10(s)	2 Trip
					(Temperature of ceramic Sensor	>655(°C)		
					Calculation of reverse charge sensor 1 bank 1	=TRUE		
					Condition for pump current calculation in sync started	=TRUE		
					Reference pump current for pump current correction status	=TRUE		
					Valid status of correction for time	=TRUE =0,5(sec)		
) Validity of Reverse Pump Current Mode Sensor 1 Bank 1	=FALSE		
			_		(

				Condition for evaluation temperature valid sensor 1 bank 1	=TRUE		
				for time)	=1(sec)		
				Condition of UN0 for sensor 1 and bank 1 regulated	=TRUE		
) Injection valves are activated	=TRUE		
				End of start is reached and combustion engine runs on its own	=TRUE		
				power Required lambda referring to lambda sensor fitting location	<1,6		
				No pending or confirmed DTCs	=see sheet inhibit tables		
				Basic enable conditions met	=see sheet enable tables		
P2298	Air fuel ratio signal check for oxygen sensor 1 bank 2	Lambda equivalent value based on electrically corrected pump current sensor 1 bank 2	>12	UEGO Release condition for O2 signal is fulfilled under following condition for sensor1 bank2 :	=TRUE	10(s)	2 Trip
				(
				Temperature of ceramic Sensor 1,Bank 2	>655(°C)		
				Calculation of reverse charge sensor 1 bank 2	=TRUE		
				Condition for pump current calculation in sync started	=TRUE		
				Reference pump current for pump current correction status	=TRUE		
				Valid status of correction	=TRUE		
)	=0,5(sec)		
				Validity of Reverse Pump Current Mode Sensor 1 Bank 2	=FALSE		
				Condition for evaluation temperature valid sensor 1 bank 2	=TRUE		
				for time	=1(sec)		
) Condition of UN0 for sensor 1 and bank 2 regulated	=TRUE		
) Injection valves are activated	=TRUE		
				End of start is reached and combustion engine runs on its own	=TRUE		
				power Required lambda referring to lambda sensor fitting location	<1,6		

					No pending or confirmed DTCs	=see sheet inhibit tables		
					Basic enable conditions met	=see sheet enable tables		
18. DOWNSTREA M OXYGEN SENSOR SLOW	P013A	Compares measured transition response time of Seconday O2 sensor 2 bank 1 with the calibrated threshold when the sensor voltage changes Rich	arithmetic filtered delay response time of Secondary O2 sensor 2, bank 1, Rich to Lean: tiArth	>0,75(sec)	primary A/F commanded lambda	=1	2(counts)	1Trip EWMA
RESPONSE DIAGNOSIS		5 5	tiArth = old tiArth + ((((a) - (b)) - old tiArth) * 1/ sample order)		engine runs	=TRUE		
			(a) Raw transition response time of secondary O2 S2B1		Vehicle speed	≥9,32(mph)		
			(b) Exhaust mass flow dependent correction for transition response time of secondary O2 S2B1 Rich to Lean (see Look-Up-Table #25)	=0.04 to 0.1(sec)	engine speed	≤4000(rpm)		
					engine speed engine load (see Look-Up-Table #20)	≥1000(rpm) ≥ 12 to 1536(%)		
					Integrated air mass flow	>0,06(kg)		
					measured ambient temperatuer measured ambient pressure measured engine coolant temperature	≥-48(°C) ≥0(kPa) ≥57,96(°C)		
					no transmission gear change for time)	=TRUE ≥2(sec)		
					(integrated exhaust gas mass flow after the following operation points are in the monitoring window Bank 2	>0,06(kg)		
					(
					Change of exhaust gas mass flow Bank 2: (a) - (b)	≤32(kg/h)		
					Change of exhaust gas mass flow Bank 2: (a) - (b) (a) exhaust gas mass flow Bank 2 (b) filtered exhaust gas mass flow Bank 2	≥-32(kg/h)		

PT1 time constant Low window exhaust gas mass flow Bank 2	=0,8(sec) ≤111,11(g/sec)
Low window exhaust gas mass flow Bank 2	≥20(kg/h)
Low window exhaust gas mass flow bank 1	≥(a) - (b)
(a) minimum exhaust gas mass flow bank 1	<20(kg/h)
(b) offset exhaust gas mass flow bank 1 at tip-out	=5(g/sec)
for time	≥3(sec)
High window exhaust gas mass flow bank 1	≤0(g/sec)
High window exhaust gas mass flow bank 1)	≥6553,5(kg/h)
Modeled catalyst temperature gradient bank 1:	≤40(°C)
Modeled catalyst temperature gradient bank 1: (a) - (b) (a) Modeled catalyst temperature	≥-40(°C)
bank 1 (b) filtered modeled catalyst temperature bank 1 PT1 time constant	=5(sec)
Low window modeled catalyst Low window Modeled catalyst temperature bank 1	≤1000(°C) ≥475(°C)
High window modeled catalyst temperature bank 1	≤-273,15(°C)
High window Modeled catalyst temperature bank 1	≥1262,83(°C)
Modeled catalyst temperature bank 1 after the first engine start and driving	>350(°C)
for time))	≥60(sec)
((Integrated purge mass flow after a	≥0(g)
Ionger purge stop HC concentration factor in chacoal canister	≤64

relative fuel portion of canister purge to injected fuel mass : (a) / (b)	≤4
(a) fuel mass supplied by canisterpurge control(b) fuel mass supplied by injection	
Or	
open loop canister purge control Or canister purge control mass flow into the manifold	≤7,11(g/sec)
((integrated exhaust gas mass flow bank 1 since engine start (see Look-Up-Table #19)	>2250 to 10000(g)
integrated exhaust gas mass flow bank 1 after the following sensors's readiness (>0,1(kg)
Secondary O2 sensor readiness bank 1 Primary A/F sensor readiness bank 1	
)	≥450(°C)
temperature deviation of Primary A/F sensor heater control bank 1: (a) - (b)	<50(°C)
 (a) primary A/F sensor temperature set point for heater control (b) measured primary A/F sensor temperature for heater control) 	<800(°C)
statemachine = sm statemachine (sm =0) : inactive a commanded lambda active primary A/F commanded lambda if the following conditions are met, sm moves to sm = 2	=1
Secondary O2 sensor voltage bank1	≥0(V)
if the following conditions are met, sm moves to sm $= 1$	

Secondary O2 sensor voltage bank1	<0(V)
Secondary O2 sensor voltage bank1	≥0,45(V)
statemachine (sm=1) - rich mixture in catalyst	
a commanded lambda active primary A/F commanded lambda	=0,87
for time	≥3(sec)
for time if the following conditions are met, sm moves to sm = 2	≥0,1(sec)
Secondary O2 sensor voltage	≥0,0994(V/sec)
Secondary O2 sensor voltage bank1	≥0,68(V)
) Or Secondary O2 sensor voltage bank1	≥0(V)
) Integrated exhaust mass flow bank 1	≥0(g)
if the following conditions are met, sm moves to sm $= 3$	
(Secondary O2 sensor voltage bank 1	≥0,9(V)
Or	
Secondary O2 sensor voltage bank 1	≥0,8(V)
Secondary O2 sensor voltage	≤66,5(V/sec)
Secondary O2 sensor voltage	≥-66,5(V/sec)
Integrated Oxygen mass flow bank 1	>250(mg)
)) (Primary A/F sensor lambda bank 1 (a) Primary lambda control set point bank 1 (b) maximum lambda deviation of	=0,05
lean mixture Primary A/F sensor lambda bank 1 (a) Primary lambda control set point	

(b) maximum lambda deviation of rich	≤0,05
for time Integrated rich exhaust gas mass flow bank 1	≥0,1(sec) ≥0,005(kg)
) And (
Secondary O2 sensor voltage bank 1	>(a) + (b)
(a) minimum secondary O2 voltage (b) Offset voltage of Secondary O2 sensor	=0,019531(V)
, statemachine (sm=2) - Lean mixture in catalyst	
a commanded lambda active primary A/F commanded lambda for time	=1,07 ≥3(sec)
for time if the following conditions are met, sm moves to sm = 4	≥0,1(sec)
((Secondary O2 sensor voltage for time) Or	≤0,07(V) ≥0,1(sec)
(Secondary O2 sensor voltage	≤0,200195(V)
Secondary O2 sensor voltage	≤0,1(V/sec)
Secondary O2 sensor voltage	≥-0,09944(V/sec)
Integrated Oxygen mass flow bank 1	>150(mg)
))	
(Primary A/F sensor lambda (a) Primary lambda control set point	
(b) maximum lambda deviation of lean mixture Primary A/F sensor lambda (a) Primary lambda control set point	=0,05
(b) maximum lambda deviation of rich	≤0,05
for time Integrated lean exhaust gas mass flow bank 1	≥0,1(sec) ≥0,005(kg)

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statemachine (sm=3) - Lean mixture in catalyst	= TRUE
a commanded lambda active bank 1 primary A/F commanded lambda	=TRUE =1.07
bank 1 for time	≥3(sec)
for time if the following conditions are met, sm moves to sm = 4	≥0,1(sec)
(Secondary O2 sensor voltage bank 1	≤0,07(V)
for time Or	≥0,1(sec)
(Secondary O2 sensor voltage bank 1	≤0,200195(V)
Secondary O2 sensor voltage gradient over 0.05s	≤0,1(V/sec)
Secondary O2 sensor voltage gradient over 0.05s	≥-0,09944(V/sec)
Integrated Oxygen mass flow bank 1	>150(mg)
)) (
Primary A/F sensor lambda bank 1 (a) Primary lambda control set point	≤(a) + (b)
(b) maximum lambda deviation of	=0,05
Primary A/F sensor lambda bank 1 (a) Primary lambda control set point	≥(a) - (b)
(b) maximum lambda deviation of rich	≤0,05
for time Integrated lean exhaust gas mass flow bank 1)	≥0,1(sec) ≥0,005(kg)
(Secondary O2 sensor voltage	<0,0146(V)
(a) old Secondary O2 sensor voltage	
(b) Secondary O2 sensor voltage	
Secondary O2 sensor voltage bank 1	≤0,202637(V)

	statemachine (sm=4) - Rich mixture in catalyst a commanded lambda active primary A/F commanded lambda for time	=TRUE =TRUE =0,87 ≥3(sec)		
	for time if the following conditions are met, sm moves to sm = 3	≥0,1(sec)		
	(Secondary O2 sensor voltage bank 1	≥0,9(V)		
	Or			
	(Secondary O2 sensor voltage bank 1	≥0,8(V)		
	Secondary O2 sensor voltage	≤66,5(V/sec)		
	Secondary O2 sensor voltage	≥-66,5(V/sec)		
	Integrated Oxygen mass flow bank 1	>250(mg)		
))			
	Primary A/F sensor lambda bank 1 (a) Primary lambda control set point	≤(a) + (b)		
	(b) maximum lambda deviation of	=0,05		
	Primary A/F sensor lambda bank 1 (a) Primary lambda control set point	≥(a) - (b)		
	(b) maximum lambda deviation of rich	≤0,05		
	for time	≥0,1(sec)		
	Integrated rich exhaust gas mass flow bank 1	≥0,005(kg)		
) And (
	No pending or confirmed DTCs	=see sheet inhibit table		
	Basic enable conditions met	=see sheet enable tables		
>0,8(sec)	primary A/F commanded lambda	=1	2(counts)	1Trip EWMA
)				
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Compares measured transition arithmetic filtered delay response time of Seconday O2 response time of Secondary P013B sensor 2 bank 1 with the O2 sensor 2, bank 1, Lean to calibrated threshold when the Rich: tiArth sensor voltage changes Lean

tiArth = old tiArth + ((((a) - (b)) - old tiArth) * 1/ sample order)		engine runs	=TRUE
(a) Raw transition response time of secondary O2 S2B1		Vehicle speed	≥9,32(mph)
(b) Exhaust mass flow dependent correction for transition response time of secondary O2 S2B1 Lean to Rich (see Look-Up-Table #24)	=0.03 to 0.08(sec)	engine speed	≤4000(rpm)
		engine speed engine load (see Look-Up-Table #20)	≥1000(rpm) ≥ 12 to 1536(%)
		Integrated air mass flow	>0,06(kg)
		measured ambient temperatuer measured ambient pressure measured engine coolant temperature	≥-48(°C) ≥0(kPa) ≥57,96(°C)
		no transmission gear change for time)	=TRUE ≥2(sec)
		(integrated exhaust gas mass flow after the following operation points are in the monitoring window bank 1	>0,06(kg)
		(
		Change of exhaust gas mass flow bank 1: (a) - (b)	≤32(kg/h)
		 (a) (b) (b) (c) (c) (c) (c)	≥-32(kg/h)
		PT1 time constant Low window exhaust gas mass flow bank 1	=0,8(sec) ≤111,11(g/sec)
		Low window exhaust gas mass flow bank 1	≥20(kg/h)
		Low window exhaust gas mass flow bank 1	≥(a) - (b)
ECT	A Saction 216 of 772	(a) minimum exhaust gas mass flow bank 1	<20(kg/h)

(b) offset exhaust gas mass flow	=5(g/sec)
for time	≥3(sec)
High window exhaust gas mass flow bank 1	≤0(g/sec)
High window exhaust gas mass flow bank 1)	≥6553,5(kg/h)
(Modeled catalyst temperature gradient bank 1:	≤40(°C)
(a) - (b) Modeled catalyst temperature gradient bank 1:	≥-40(°C)
(a) Modeled catalyst temperature	
(b) filtered modeled catalyst temperature bank 1	=5(sec)
Low window modeled catalyst Low window Modeled catalyst	≤1000(°C) ≥475(°C)
High window modeled catalyst	≤-273,15(°C)
High window Modeled catalyst	≥1262,83(°C)
Modeled catalyst temperature bank 1 after the first engine start and driving	>350(°C)
for time))	≥60(sec)
((Integrated purge mass flow after a	≥0(g)
HC concentration factor in chacoal	≤64
relative fuel portion of canister purge to injected fuel mass : (a) / (b)	≤4
(a) fuel mass supplied by canisterpurge control(b) fuel mass supplied by injection	
Or	
open loop canister purge control	
canister purge control mass flow into	≤7,11(g/sec)

((integrated exhaust gas mass flow bank 1 since engine start (see Look-Up-Table #19)	>2250 to 10000(g)
integrated exhaust gas mass flow bank 1 after the following sensors's readiness	>0,1(kg)
(Secondary O2 sensor readiness	
Primary A/F sensor readiness bank 1	
)	>450/80)
	2450(°C)
temperature deviation of Primary A/F sensor heater control bank 1: (a) - (b)	<50(°C)
 (a) primary A/F sensor temperature set point for heater control (b) measured primary A/F sensor temperature for heater control) 	<800(°C)
statemachine = sm statemachine (sm =0) : inactive a commanded lambda active primary A/F commanded lambda if the following conditions are met, sm moves to sm = 2	=FALSE =1
Secondary O2 sensor voltage bank1	≥0(V)
if the following conditions are met, sm moves to sm = 1	
Secondary O2 sensor voltage bank1	<0(V)
Secondary O2 sensor voltage bank1	≥0,45(V)
statemachine (sm=1) - rich mixture	= TRUE
a commanded lambda active primary A/F commanded lambda	=TRUE =0,87
for time	≥3(sec)
for time if the following conditions are met, sm moves to sm - 2	≥0,1(sec)

((Secondary O2 sensor voltage gradient over 0.05s Secondary O2 sensor voltage bank1	≥0,09944(V/sec) ≥0,68(V)
) Or Secondary O2 sensor voltage bank1	≥0(V)
) Integrated exhaust mass flow bank 1	≥0(g)
if the following conditions are met, sm moves to sm = 3	
(Secondary O2 sensor voltage bank 1	≥0,9(V)
Or (Secondary O2 sensor voltage bank 1	≥0,8(V)
Secondary O2 sensor voltage	≤66,5(V/sec)
gradient over 0.05s Secondary O2 sensor voltage	≥-66,5(V/sec)
gradient over 0.05s Integrated Oxygen mass flow bank 1	>250(mg)
))	
(Primary A/F sensor lambda bank 1 (a) Primary lambda control set point	≤(a) + (b)
(b) maximum lambda deviation of	=0,05
Primary A/F sensor lambda bank 1 (a) Primary lambda control set point	≥(a) - (b)
(b) maximum lambda deviation of rich	≤0,05
for time Integrated rich exhaust gas mass flow bank 1	≥0,1(sec) ≥0,005(kg)
) And	
(Secondary O2 sensor voltage bank 1	>(a) + (b)
(a) minimum secondary O2 voltage(b) Offset voltage of Secondary O2 sensor	=0,019531(V)

)

statemachine (sm=2) - Lean mixture in catalyst a commanded lambda active primary A/F commanded lambda for time	=TRUE =1,07 ≥3(sec)
for time if the following conditions are met, sm moves to sm = 4	≥0,1(sec)
((Secondary O2 sensor voltage for time) Or	≤0,07(V) ≥0,1(sec)
(Secondary O2 sensor voltage	≤0,200195(V)
Secondary O2 sensor voltage	≤0,1(V/sec)
Secondary O2 sensor voltage	≥-0,09944(V/sec)
gradient over 0.05s Integrated Oxygen mass flow bank 1	>150(mg)
))	
rimary A/F sensor lambda (a) Primary lambda control set point	≤(a) + (b)
(b) maximum lambda deviation of	=0,05
Primary A/F sensor lambda (a) Primary lambda control set point	≥(a) - (b)
(b) maximum lambda deviation of rich	≤0,05
for time Integrated lean exhaust gas mass flow bank 1)	≥0,1(sec) ≥0,005(kg)
statemachine (sm=3) -	= TRUE
Lean mixture in catalyst a commanded lambda active bank 1	=TRUE
primary A/F commanded lambda	=1,07
for time	≥3(sec)
for time if the following conditions are met, sm moves to sm = 4	≥0,1(sec)
Secondary O2 sensor voltage bank 1	≤0,07(V)
---	-------------------------
for time Or	≥0,1(sec)
(Secondary O2 sensor voltage bank 1	≤0,200195(V)
Secondary O2 sensor voltage	≤0,1(V/sec)
gradient over 0.05s Secondary O2 sensor voltage gradient over 0.05s	≥-0,09944(V/sec)
Integrated Oxygen mass flow bank 1	>150(mg)
)) (
Primary A/F sensor lambda bank 1 (a) Primary lambda control set point	≤(a) + (b)
(b) maximum lambda deviation of	=0,05
Primary A/F sensor lambda bank 1 (a) Primary lambda control set point	≥(a) - (b)
(b) maximum lambda deviation of rich	≤0,05
for time Integrated lean exhaust gas mass flow bank 1	≥0,1(sec) ≥0,005(kg)
) statemachine (sm=4) - Rich mixture in catalyst	=TRUE
a commanded lambda active primary A/F commanded lambda for time	=0,87 ≥3(sec)
for time if the following conditions are met, sm moves to sm = 3	≥0,1(sec)
(Secondary O2 sensor voltage bank 1	≥0,9(V)
Or (
Secondary O2 sensor voltage bank 1	≥0,8(V)
Secondary O2 sensor voltage gradient over 0.05s	≤66,5(V/sec)
Secondary O2 sensor voltage gradient over 0.05s	≥-66,5(V/sec)
Integrated Oxygen mass flow bank 1	>250(mg)

Pri (a) ba	imary A/F sensor lambda bank 1) Primary lambda control set point ank 1	≤(a) + (b)		
(b) lea) maximum lambda deviation of an mixture	=0,05		
Pri (a)	imary A/F sensor lambda bank 1) Primary lambda control set point	≥(a) - (b)		
(b) mi:) maximum lambda deviation of rich ixture	≤0,05		
for	r time	≥0,1(sec)		
Inte flor	tegrated rich exhaust gas mass w bank 1	≥0,005(kg)		
) An	nd			
(Se	econdary O2 sensor voltage	>0,0146(V)		
diff (a)	ference: (a) - (b)) old Secondary O2 sensor voltage			
bar (b)) Secondary O2 sensor voltage			
Se	econdary O2 sensor voltage bank 1	≥0,75(V)		
)				
No	o pending or confirmed DTCs	see sheet inhibit table=		
Ba	asic enable conditions met	=see sheet enable tables		
P013C Compares measured transition arithmetic filtered delay >0,75(sec) print response time of Seconday O2 response time of Secondary O2 sensor 2, bank 2, Rich to D2 sensor 2, bank 2, Rich to Lean: tiArth	imary A/F commanded lambda	=1	2(counts)	1Trip EWMA
tiArth = old tiArth + ((((a) - (b)) - eng old tiArth) * 1/ sample order)	igine runs	=TRUE		
(a) Raw transition response Ve time of secondary O2 S2B2	ehicle speed	≥9,32(mph)		
(b) Exhaust mass flow =0.04 to 0.1(sec) end dependent correction for transition response time of secondary O2 S2B2 Rich to Lean (see Look-Up-Table #25)	ngine speed	≤4000(rpm)		
en	igine speed	≥1000(rpm)		

engine load (see Look-Up-Table #20)	≥ 12 to 1536(%)
Integrated air mass flow	>0,06(kg)
measured ambient temperatuer measured ambient pressure measured engine coolant	≥-48(°C) ≥0(kPa) ≥57,96(°C)
no transmission gear change for time)	=TRUE ≥2(sec)
(integrated exhaust gas mass flow after the following operation points are in the monitoring window Bank 2	>0,06(kg)
(
Change of exhaust gas mass flow Bank 2:	≤32(kg/h)
 (a) - (b) Change of exhaust gas mass flow Bank 2: (a) - (b) (a) exhaust gas mass flow Bank 2 (b) filtered exhaust gas mass flow Bank 2 	≥-32(kg/h)
PT1 time constant Low window exhaust gas mass flow Bank 2	=0,8(sec) ≤111,11(g/sec)
Low window exhaust gas mass flow Bank 2	≥20(kg/h)
Low window exhaust gas mass flow	≥(a) - (b)
(a) minimum exhaust gas mass flow	<20(kg/h)
(b) offset exhaust gas mass flow	=5(g/sec)
for time	≥3(sec)
High window exhaust gas mass flow bank 2	≤0(g/sec)
High window exhaust gas mass flow bank 2) (≥6553,5(kg/h)

Modeled catalyst temperature gradient bank 2:	≤40(°C)
Modeled catalyst temperature gradient bank 2:	≥-40(°C)
(a) - (b) (a) Modeled catalyst temperature	
bank 2 (b) filtered modeled catalyst temperature bank 2	=5(sec)
Low window modeled catalyst Low window Modeled catalyst	≤1000(°C) ≥475(°C)
High window modeled catalyst	≤-273,15(°C)
High window Modeled catalyst	≥1262,83(°C)
Modeled catalyst temperature bank 2 after the first engine start and driving	>350(°C)
for time))	≥60(sec)
((Integrated purge mass flow after a	≥0(g)
HC concentration factor in chacoal	≤64
relative fuel portion of canister purge to injected fuel mass : (a) / (b)	≤4
(a) fuel mass supplied by canisterpurge control(b) fuel mass supplied by injection	
Or	
open loop canister purge control	=TRUE
Or canister purge control mass flow into the manifold	≤7,11(g/sec)
((integrated exhaust gas mass flow bank 2 since engine start (see Look-Up-Table #19)	>2250 to 10000(g)
integrated exhaust gas mass flow bank 2 after the following sensors's readiness	>0,1(kg)

Secondary O2 sensor readiness bank 2 Primary A/F sensor readiness bank 2

)	≥450(°C)
temperature deviation of Primary A/F sensor heater control bank 2: (a) - (b)	<50(°C)
 (a) primary A/F sensor temperature set point for heater control (b) measured primary A/F sensor temperature for heater control) 	<800(°C)
statemachine = sm statemachine (sm =0) : inactive a commanded lambda active primary A/F commanded lambda if the following conditions are met, sm moves to sm = 2	=1
Secondary O2 sensor voltage bank1	≥0(V)
if the following conditions are met, sm moves to sm = 1	
Secondary O2 sensor voltage bank1	<0(V)
Secondary O2 sensor voltage bank1	≥0,45(V)
statemachine (sm=1) - rich mixture in catalyst	= TRUE
a commanded lambda active primary A/F commanded lambda	=TRUE =0,87
for time	≥3(sec)
for time if the following conditions are met, sm moves to sm = 2	≥0,1(sec)
((Secondary O2 sensor voltage gradient over 0.05s	≥0,09944(V/sec)
Secondary O2 sensor voltage bank1	≥0,68(V)
) Or Secondary O2 concer valtage hardet	20/1/1
Secondary OZ Sensor Voltage Dark I	∠0(V)

)

≥0(g)

>250(mg)

if the following conditions are met,
sm moves to sm = 3

Integrated Oxygen mass flow bank 2

(Secondary O2 sensor voltage bank 2	≥0,9(V)
Or (Secondary O2 sensor voltage bank 2	≥0,8(V)
Secondary O2 sensor voltage	≤66,5(V/sec)
Secondary O2 sensor voltage gradient over 0.05s	≥-66,5(V/sec)

)) (

Primary A/F sensor lambda bank 2 (a) Primary lambda control set point bank 2	≤(a) + (b)
(b) maximum lambda deviation of lean mixture	=0,05
Primary A/F sensor lambda bank 2 (a) Primary lambda control set point	≥(a) - (b)
(b) maximum lambda deviation of rich mixture	≤0,05
for time Integrated rich exhaust gas mass flow bank 2	≥0,1(sec) ≥0,005(kg)
) And (
Secondary O2 sensor voltage bank 2	>(a) + (b)
 (a) minimum secondary O2 voltage (b) Offset voltage of Secondary O2 sensor 	=0,019531(V)
∫statemachine (sm=2) - Lean mixture in catalyst	
a commanded lambda active primary A/F commanded lambda for time	=1,07 ≥3(sec)
for time if the following conditions are met, sm moves to sm = 4	≥0,1(sec)

((Secondary O2 sensor voltage for time) Or	≤0,07(V) ≥0,1(sec)
(Secondary O2 sensor voltage	≤0,200195(V)
Secondary O2 sensor voltage	≤0,1(V/sec)
Secondary O2 sensor voltage	≥-0,09944(V/sec)
Integrated Oxygen mass flow bank 2	>150(mg)
))	
(Primary A/F sensor lambda (a) Primary lambda control set point	≤(a) + (b)
(b) maximum lambda deviation of	=0,05
Primary A/F sensor lambda (a) Primary lambda control set point	
(b) maximum lambda deviation of rich	≤0,05
for time Integrated lean exhaust gas mass flow bank 2)	≥0,1(sec) ≥0,005(kg)
statemachine (sm=3) - Lean mixture in catalyst	= TRUE
a commanded lambda active bank 2	=TRUE
primary A/F commanded lambda	=1,07
for time	≥3(sec)
for time if the following conditions are met, sm moves to sm = 4	≥0,1(sec)
(Secondary O2 sensor voltage bank 2	≤0,07(V)
for time Or	≥0,1(sec)
(Secondary O2 sensor voltage bank 2	≤0,200195(V)
Secondary O2 sensor voltage gradient over 0.05s	≤0,1(V/sec)

Secondary O2 sensor voltage	≥-0,09944(V/sec)
Integrated Oxygen mass flow bank 2	>150(mg)
)) (Primary A/F sensor lambda bank 2 (a) Primary lambda control set point	≤(a) + (b)
	0.05
(b) maximum lambda deviation of lean mixture	=0,05
Primary A/F sensor lambda bank 2 (a) Primary lambda control set point	≥(a) - (b)
(b) maximum lambda deviation of rich mixture	≤0,05
for time	≥0,1(sec)
Integrated lean exhaust gas mass flow bank 2	≥0,005(kg)
)	
Secondary O2 sensor voltage	<0,0146(V)
difference: (a) - (b) (a) old Secondary O2 sensor voltage	
bank 2 (b) Secondary O2 sensor voltage	
bank 2 Secondary O2 concer voltage bank 2	
Secondary OZ Sensor Voltage Dank Z	≤0,202037(V)
) statemachine (sm=4) -	=TRUE
Rich mixture in catalyst	=TRUF
primary A/F commanded lambda	=0,87
for time	≥3(sec)
for time	≥0,1(sec)
if the following conditions are met, sm moves to sm = 3	
(Secondary O2 sensor voltage bank 2	≥0,9(V)
Or	
(Secondary O2 sensor voltage bank 2	≥0,8(V)
Secondary O2 sensor voltage	≤66,5(V/sec)
Secondary O2 sensor voltage	≥-66,5(V/sec)
Integrated Oxygen mass flow bank 2	>250(mg)

				(Primary A/F sensor lambda bank 2 (a) Primary lambda control set point bank 2 (b) maximum lambda deviation of lean mixture Primary A/F sensor lambda bank 2 (a) Primary lambda control set point	≤(a) + (b) =0,05 ≥(a) - (b)		
				 (b) maximum lambda deviation of rich mixture for time Integrated rich exhaust gas mass flow bank 2) (≤0,05 ≥0,1(sec) ≥0,005(kg)		
				No pending or confirmed DTCs	=see sheet inhibit table		
				Basic enable conditions met	=see sheet enable tables		
P013D	Compares measured transition response time of Seconday O2 sensor 2 bank 2 with the calibrated threshold when the sensor voltage changes Lean	arithmetic filtered delay response time of Secondary O2 sensor 2, bank 2, Lean to Rich: tiArth	>0,8(sec)	primary A/F commanded lambda	=1	2(counts)	1Trip EWMA
		tiArth = old tiArth + ((((a) - (b)) - old tiArth) * 1/ sample order)		engine runs	=TRUE		
		(a) Raw transition response time of secondary O2 S2B2		Vehicle speed	≥9,32(mph)		
		Lean to Rich (b) Exhaust mass flow dependent correction for transition response time of secondary O2 S2B2 Lean to Rich (see Look-Up-Table #24)	=0.03 to 0.08(sec)	engine speed	≤4000(rpm)		
				engine speed engine load (see Look-Up-Table #20)	≥1000(rpm) ≥ 12 to 1536(%)		
				Integrated air mass flow	>0,06(kg)		
				measured ambient temperatuer measured ambient pressure measured engine coolant temperature	≥-48(°C) ≥0(kPa) ≥57,96(°C)		
				no transmission gear change	=TRUE		

)	
(integrated exhaust gas mass flow after the following operation points are in the monitoring window bank 2	>0,06(kg)
(
Change of exhaust gas mass flow bank 2: (a) - (b)	≤32(kg/h)
Change of exhaust gas mass flow bank 2: (a) - (b)	≥-32(kg/h)
(a) exhaust gas mass flow bank 2(b) filtered exhaust gas mass flow bank 2	
PT1 time constant Low window exhaust gas mass flow bank 2	=0,8(sec) ≤111,11(g/sec)
Low window exhaust gas mass flow bank 2	≥20(kg/h)
Low window exhaust gas mass flow	≥(a) - (b)
(a) minimum exhaust gas mass flow	<20(kg/h)
(b) offset exhaust gas mass flow	=5(g/sec)
for time	≥3(sec)
High window exhaust gas mass flow bank 2	≤0(g/sec)
High window exhaust gas mass flow bank 2)	≥6553,5(kg/h)
(Modeled catalyst temperature gradient bank 2:	≤40(°C)
(a) - (b) Modeled catalyst temperature gradient bank 2:	≥-40(°C)
(a) - (b) (a) Modeled catalyst temperature bank 2	
(b) filtered modeled catalyst temperature bank 2 PT1 time constant	=5(sec)

Low window modeled catalyst

≤1000(°C)

Low window Modeled catalyst	≥475(°C)
High window modeled catalyst temperature bank 2	≤-273,15(°C)
High window Modeled catalyst	≥1262,83(°C)
Modeled catalyst temperature bank 2 after the first engine start and driving	>350(°C)
for time))	≥60(sec)
((Integrated purge mass flow after a	≥0(g)
longer purge stop HC concentration factor in chacoal	≤64
canister relative fuel portion of canister purge to injected fuel mass : (a) / (b)	≤4
(a) fuel mass supplied by canister purge control (b) fuel mass supplied by injection	
Or	
open loop canister purge control Or	=TRUE
canister purge control mass flow into the manifold	≤7,11(g/sec)
((integrated exhaust gas mass flow bank 2 since engine start (see Look-Up-Table #19)	>2250 to 10000(g)
integrated exhaust gas mass flow bank 2 after the following sensors's readiness	>0,1(kg)
Secondary O2 sensor readiness bank 2 Primary A/F sensor readiness bank 2	
)	
	≥450(°C)
temperature deviation of Primary A/F sensor heater control bank 2: (a) - (b)	<50(°C)
(a) primary A/F sensor temperature set point for heater control	<800(°C)

(b) measured primary A/F sensor temperature for heater control)

,	
statemachine = sm statemachine (sm =0) : inactive a commanded lambda active primary A/F commanded lambda if the following conditions are met, sm moves to sm = 2	=FALSE =1
Secondary O2 sensor voltage bank1	≥0(V)
if the following conditions are met, sm moves to sm = 1	
Secondary O2 sensor voltage bank1	<0(V)
Secondary O2 sensor voltage bank1	≥0,45(V)
statemachine (sm=1) - rich mixture	= TRUE
a commanded lambda active primary A/F commanded lambda bank1	=TRUE =0,87
for time	≥3(sec)
for time if the following conditions are met, sm moves to sm = 2	≥0,1(sec)
Secondary O2 sensor voltage gradient over 0.05s	≥0,09944(V/sec)
Secondary O2 sensor voltage bank1	≥0,68(V)
) Or Secondary O2 sensor voltage bank1	≥0(∨)
) Integrated exhaust mass flow bank 2	≥0(g)
if the following conditions are met, sm moves to sm = 3	
(Secondary O2 sensor voltage bank 2	≥0,9(V)
Or (Secondary O2 sensor voltage bank 2	≥0,8(V)

Secondary O2 sensor voltage	≤66,5(V/sec)
Secondary O2 sensor voltage	≥-66,5(V/sec)
Integrated Oxygen mass flow bank 2	>250(mg)
))	
(Primary A/F sensor lambda bank 2 (a) Primary lambda control set point bank 2	≤(a) + (b)
(b) maximum lambda deviation of	=0,05
Primary A/F sensor lambda bank 2 (a) Primary lambda control set point	≥(a) - (b)
(b) maximum lambda deviation of rich	=0,05
for time Integrated rich exhaust gas mass flow bank 2)	≥0,1(sec) ≥0,005(kg)
(Secondary O2 sensor voltage bank 2	>(a) + (b)
(a) minimum secondary O2 voltage (b) Offset voltage of Secondary O2 sensor	=0,019531(V)
statemachine (sm=2) -	
Lean mixture in catalyst a commanded lambda active primary A/F commanded lambda	=TRUE =1.07
for time	≥3(sec)
for time if the following conditions are met, sm moves to sm = 4	≥0,1(sec)
((
Secondary O2 sensor voltage for time) Or	≤0,07(V) ≥0,1(sec)
(Secondary O2 sensor voltage	≤0,200195(V)
Secondary O2 sensor voltage	≤0,1(V/sec)
Secondary O2 sensor voltage	≥-0,09944(V/sec)
Integrated Oxygen mass flow bank 2	>150(mg)

(
Primary A/F sensor lambda (a) Primary lambda control set point	≤(a) + (b)
(b) maximum lambda deviation of lean mixture Primary A/F sensor lambda (a) Primary lambda control set point	=0,05
(b) maximum lambda deviation of rich	≤0,05
for time Integrated lean exhaust gas mass flow bank 2)	≥0,1(sec) ≥0,005(kg)
statemachine (sm=3) -	= TRUE
a commanded lambda active bank 2	=TRUE
primary A/F commanded lambda	=1,07
for time	≥3(sec)
for time if the following conditions are met, sm moves to sm = 4	≥0,1(sec)
(Secondary O2 sensor voltage bank 2	≤0,07(V)
for time Or	≥0,1(sec)
(Secondary O2 sensor voltage bank 2	≤0,200195(V)
Secondary O2 sensor voltage	≤0,1(V/sec)
Secondary O2 sensor voltage	≥-0,09944(V/sec)
gradient over 0.05s Integrated Oxygen mass flow bank 2	>150(mg)
))	
Primary A/F sensor lambda bank 2 (a) Primary lambda control set point	≤(a) + (b)
(b) maximum lambda deviation of	=0,05
Primary A/F sensor lambda bank 2 (a) Primary lambda control set point	≥(a) - (b)
(b) maximum lambda deviation of rich	≤0,05

for time Integrated lean exhaust gas mass flow bank 2	≥0,1(sec) ≥0,005(kg)
) statemachine (sm=4) - Bich mixture in catalyst	=TRUE
a commanded lambda active primary A/F commanded lambda for time	=TRUE =0,87 ≥3(sec)
for time if the following conditions are met, sm moves to sm = 3	≥0,1(sec)
(Secondary O2 sensor voltage bank 2	≥0,9(V)
Or (Secondary O2 sensor voltage bank 2	≥0,8(V)
Secondary O2 sensor voltage	≤66.5(V/sec)
gradient over 0.05s Secondary O2 sensor voltage gradient over 0.05s	≥-66,5(V/sec)
Integrated Oxygen mass flow bank 2	>250(mg)
))	
Primary A/F sensor lambda bank 2 (a) Primary lambda control set point	≤(a) + (b)
(b) maximum lambda deviation of	=0,05
Primary A/F sensor lambda bank 2 (a) Primary lambda control set point	
(b) maximum lambda deviation of rich	≤0,05
for time Integrated rich exhaust gas mass flow bank 2	≥0,1(sec) ≥0,005(kg)
) (
Secondary O2 sensor voltage difference: (a) - (b)	>0,0146(V)
(a) old Secondary O2 sensor voltage bank 2	
(b) Secondary O2 sensor voltage	
Secondary O2 sensor voltage bank 2	≥0,75(V)

)

					No pending or confirmed DTCs	=see sheet inhibit table		
					Basic enable conditions met	=see sheet enable tables		
19. DOWNSTREA M OXYGEN SENSOR DELAYED	P013E	Compares measured delayed response time of Seconday O2 sensor 2 bank 1 with the calibrated threshold when the sensor voltage changes Rich	Ewma filtered delay response time of Secondary O2 sensor 2, bank 1, Rich to Lean	>0,75(sec)	primary A/F commanded lambda	=1	2(counts)	1Trip EWMA
RESPONSE DIAGNOSIS			(a) Raw delay response time of secondary O2 S2B1 Rich to		engine runs	=TRUE		
BANK 2)			Lean (b) Exhaust mass flow dependent correction for delay response time of secondary O2 sensor Rich to Lean (see Look-Up-Table #23)	=0.04 to 0.08(sec)	Vehicle speed	≥9,32(mph)		
					engine speed engine speed engine load (see Look-Up-Table #20)	≤4000(rpm) ≥1000(rpm) ≥ 12 to 1536(%)		
					Integrated air mass flow	>0,06(kg)		
					measured ambient temperatuer measured ambient pressure measured engine coolant temperature	≥-48(°C) ≥0(kPa) ≥57,96(°C)		
					no transmission gear change for time	=TRUE ≥2(sec)		
)			
					(integrated exhaust gas mass flow after the following operation points are in the monitoring window bank 1	>0,06(kg)		
					(
					Change of exhaust gas mass flow bank 1:	≤32(kg/h)		
					 (a) - (b) Change of exhaust gas mass flow bank 1: (a) - (b) (a) exhaust gas mass flow bank 1 (b) filtered exhaust gas mass flow bank 1 	≥-32(kg/h)		
					PT1 time constant	=0,8(sec)		

Low window exhaust gas mass flow bank 1	≤111,11(g/sec)
Low window exhaust gas mass flow bank 1	≥20(kg/h)
Low window exhaust gas mass flow	≥(a) - (b)
(a) minimum exhaust gas mass flow bank 1	<20(kg/h)
(b) offset exhaust gas mass flow bank 1 at tip-out	=5(g/sec)
for time	≥3(sec)
High window exhaust gas mass flow bank 1	≤0(g/sec)
High window exhaust gas mass flow bank 1)	≥6553,5(kg/h)
(Modeled catalyst temperature gradient bank 1:	≤40(°C)
(a) (b) Modeled catalyst temperature gradient bank 1: (a) - (b)	≥-40(°C)
bank 1	
(b) filtered modeled catalyst temperature bank 1 PT1 time constant	=5(sec)
Low window modeled catalyst	≤1000(°C)
Low window Modeled catalyst temperature bank 1	≥475(°C)
High window modeled catalyst temperature bank 1	≤-273,15(°C)
High window Modeled catalyst temperature bank 1	≥1262,83(°C)
Modeled catalyst temperature bank 1 after the first engine start and driving	>350(°C)
for time))	≥60(sec)
((Integrated purge mass flow after a	≥0(g)
Ionger purge stop HC concentration factor in chacoal canister	≤64

~1
<u>~</u> Δ

(a) fuel mass supplied by canister	
purge control	
(b) fuel mass supplied by injection	

relative fuel portion of canister purge to injected fuel mass : (a) / (b)

Or

open loop canister purge control	=TRUE
Or	
canister purge control mass flow into	≤7,11(g/sec)
the manifold	

((

integrated exhaust gas mass flow bank 1 since engine start (see Look-Up-Table #19)	>2250 to 10000(g)
integrated exhaust gas mass flow bank 1 after the following sensors's readiness (>0,1(kg)
Secondary O2 sensor readiness	
bank 1 Primary A/F sensor readiness bank 1	
)	
	≥450(°C)
temperature deviation of Primary A/F sensor heater control bank 1: (a) - (b)	<50(°C)
 (a) primary A/F sensor temperature set point for heater control (b) measured primary A/F sensor temperature for heater control) 	<800(°C)
statemachine = sm statemachine (sm =0) : inactive a commanded lambda active primary A/F commanded lambda if the following conditions are met, sm moves to sm = 2	=FALSE =1
Secondary O2 sensor voltage Bank 1	≥0(V)
if the following conditions are met, sm moves to sm = 1	

Secondary O2 sensor voltage Bank 1	<0(V)
Secondary O2 sensor voltage Bank 1	≥0,45(V)
statemachine (sm=1) - rich mixture	= TRUE
a commanded lambda active primary A/F commanded lambda Bank 1	=TRUE =0,87
for time	≥3(sec)
for time if the following conditions are met, sm moves to sm = 2 ((≥0,1(sec)
Secondary O2 sensor voltage gradient over 0.05s	≥0,09944(V/sec)
Secondary O2 sensor voltage Bank 1	≥0,68(V)
) Or Secondary O2 sensor voltage Bank 1	≥0(V)
) Integrated exhaust mass flow bank 1	≥0(g)
if the following conditions are met, sm moves to sm = 3	
1	
(Secondary O2 sensor voltage bank 1	≥0,9(V)
Cor	≥0,9(V)
Contemporary O2 sensor voltage bank 1 Or Secondary O2 sensor voltage bank 1	≥0,9(V) ≥0,8(V)
Contemporary O2 sensor voltage bank 1 Or Secondary O2 sensor voltage bank 1 Secondary O2 sensor voltage gradient over 0.05s	≥0,9(V) ≥0,8(V) ≤66,5(V/sec)
Contemporal Secondary O2 sensor voltage bank 1 Or Secondary O2 sensor voltage bank 1 Secondary O2 sensor voltage gradient over 0.05s Secondary O2 sensor voltage gradient over 0.05s	≥0,9(V) ≥0,8(V) ≤66,5(V/sec) ≥-66,5(V/sec)
Cor Secondary O2 sensor voltage bank 1 Or Secondary O2 sensor voltage bank 1 Secondary O2 sensor voltage gradient over 0.05s Secondary O2 sensor voltage gradient over 0.05s Integrated Oxygen mass flow bank 1	≥0,9(V) ≥0,8(V) ≤66,5(V/sec) ≥-66,5(V/sec) >250(mg)
Contemporal Secondary O2 sensor voltage bank 1 Or Secondary O2 sensor voltage bank 1 Secondary O2 sensor voltage gradient over 0.05s Secondary O2 sensor voltage gradient over 0.05s Integrated Oxygen mass flow bank 1	≥0,9(V) ≥0,8(V) ≤66,5(V/sec) ≥-66,5(V/sec) >250(mg)
Contemporal Secondary O2 sensor voltage bank 1 Or (Secondary O2 sensor voltage bank 1 Secondary O2 sensor voltage gradient over 0.05s Secondary O2 sensor voltage gradient over 0.05s Integrated Oxygen mass flow bank 1)) (Primary A/F sensor lambda bank 1 (a) Primary lambda control set point bank 1	≥0,9(V) ≥0,8(V) ≤66,5(V/sec) ≥-66,5(V/sec) >250(mg) ≤(a) + (b)
(Secondary O2 sensor voltage bank 1 Or (Secondary O2 sensor voltage bank 1 Secondary O2 sensor voltage gradient over 0.05s Secondary O2 sensor voltage gradient over 0.05s Integrated Oxygen mass flow bank 1)) (Primary A/F sensor lambda bank 1 (a) Primary lambda control set point bank 1 (b) maximum lambda deviation of lean mixture	≥0,9(V) ≥0,8(V) ≤66,5(V/sec) ≥-66,5(V/sec) >250(mg) ≤(a) + (b) =0,05

(b) maximum lambda deviation of rich	≤0,05
for time Integrated rich exhaust gas mass flow bank 1	≥0,1(sec) ≥0,005(kg)
) And (
Secondary O2 sensor voltage bank 1	>(a) + (b)
(a) minimum secondary O2 voltage(b) Offset voltage of Secondary O2 sensor	=0,019531(V)
statemachine (sm=2) - Lean mixture in catalyst a commanded lambda active primary A/F commanded lambda for time	=TRUE =1,07 ≥3(sec)
for time if the following conditions are met, sm moves to sm = 4	≥0,1(sec)
((Secondary O2 sensor voltage for time) Or	≤0,07(V) ≥0,1(sec)
(Secondary O2 sensor voltage	≤0,200195(V)
Secondary O2 sensor voltage	≤0,1(V/sec)
Secondary O2 sensor voltage	≥-0,09944(V/sec)
Integrated Oxygen mass flow bank 1	>150(mg)
)) (
Primary A/F sensor lambda (a) Primary lambda control set point	≤(a) + (b)
(b) maximum lambda deviation of	=0,05
Primary A/F sensor lambda (a) Primary lambda control set point	≥(a) - (b)
(b) maximum lambda deviation of rich	≤0,05
for time Integrated lean exhaust gas mass flow bank 1	≥0,1(sec) ≥0,005(kg)

statemachine (sm=3) -	= TRUE
a commanded lambda active bank 1	=TRUE
primary A/F commanded lambda	=1,07
for time	≥3(sec)
for time if the following conditions are met, sm moves to sm = 4	≥0,1(sec)
(Secondary O2 sensor voltage bank 1	≤0,07(V)
for time Or	≥0,1(sec)
Secondary O2 sensor voltage bank 1	≤0,200195(V)
Secondary O2 sensor voltage	≤0,1(V/sec)
Secondary O2 sensor voltage	≥-0,09944(V/sec)
Integrated Oxygen mass flow bank 1	>150(mg)
))	
Primary A/F sensor lambda bank 1 (a) Primary lambda control set point	≤(a) + (b)
(b) maximum lambda deviation of	=0,05
Primary A/F sensor lambda bank 1 (a) Primary lambda control set point	≥(a) - (b)
(b) maximum lambda deviation of rich	≤0,05
for time Integrated lean exhaust gas mass flow bank 1)	≥0,1(sec) ≥0,005(kg)
Primary A/F commanded lambda bank 1	≤(a) + (b)
(a) Primary A/F commanded lambda bank 1	
(b) offset to the commanded lambda bank 1	=0,08
Secondary O2 sensor voltage bank 1	>(a) + (b)

(b) Offset voltage of Secondary O2 sensor	=0,019531(V)
) statemachine (sm=4) -	=TRUE
a commanded lambda active	=TRUE
primary A/F commanded lambda for time	=0,87 ≥3(sec)
for time if the following conditions are met, sm moves to sm = 3	≥0,1(sec)
(Secondary O2 sensor voltage bank 1	≥0,9(V)
Or	
(Secondary O2 sensor voltage bank 1	≥0,8(V)
Secondary O2 sensor voltage	≤66,5(V/sec)
Secondary O2 sensor voltage gradient over 0.05s	≥-66,5(V/sec)
Integrated Oxygen mass flow bank 1	>250(mg)
)) (
Primary A/F sensor lambda bank 1 (a) Primary lambda control set point	≤(a) + (b)
(b) maximum lambda deviation of	=0,05
Primary A/F sensor lambda bank 1 (a) Primary lambda control set point	≥(a) - (b)
(b) maximum lambda deviation of rich	=0,05
for time Integrated rich exhaust gas mass flow bank 1)	≥0,1(sec) ≥0,005(kg)
EWMA filter strategy	
Fast initialization mode (FIR) EWMA filter initial value for FIR	=1 RUE =0(sec)
mode EWMA filter constant	=0,3516
Maximum number of samples per trip	=2(counts)
Total number of samples for FIR mode	=3(counts)

				Response to Step Change mode (RSC) Response to Step Change mode inactive absolute difference : ABS((a) - (b)) (a) measured delayed response time	=TRUE =TRUE >(b) * (c)		
				(b) EWMA filtered normalized monitoring result (c) Step change detection factor	=0,25(sec)		
				EWMA filter constant	=0,3516		
				Maximum number of samples per trip	=2(counts)		
				Total number of samples for RSC mode	=3(counts)		
				EWMA filter constant	=0,3516		
				Total number of samples for stablilized mode	=1(counts)		
				No pending or confirmed DTCs	=see sheet inhibit table		
				Basic enable conditions met	=see sheet enable tables		
P013F	Compares measured delay response time of Seconday O2 sensor 2 bank 1 with the calibrated threshold when the sensor voltage changes Lean to Rich	arithmetic filtered delay response time tiArth of Secondary O2 sensor 2, bank 1, Lean to Rich: tiArth	>0,75(sec)	primary A/F commanded lambda	=1	2(counts)	1Trip EWMA
		tiArth = old tiArth + ((((a) - (b)) - old tiArth) * 1/ sample order)		engine runs	=TRUE		
		(a) Raw delay response time of secondary O2 S2B1 Lean to		Vehicle speed	≥9,32(mph)		
		Rich					
		Rich (b) Exhaust mass flow dependent correction for delay response time of secondary O2 sensor Lean to Rich (see Look-Up-Table #22)	=0 to 0.04(sec)	engine speed	≤4000(rpm)		

Integrated air mass flow	>0,06(kg)
measured ambient temperatuer measured ambient pressure measured engine coolant	≥-48(°C) ≥0(kPa) ≥57,96(°C)
no transmission gear change for time)	=TRUE ≥2(sec)
(integrated exhaust gas mass flow after the following operation points are in the monitoring window bank 1	>0,06(kg)
(
Change of exhaust gas mass flow bank 1: (a) - (b)	≤32(kg/h)
Change of exhaust gas mass flow bank 1: (a) - (b)	≥-32(kg/h)
(a) exhaust gas mass flow bank 1(b) filtered exhaust gas mass flow bank 1	
PT1 time constant Low window exhaust gas mass flow bank 1	=0,8(sec) ≤111,11(g/sec)
Low window exhaust gas mass flow bank 1	≥20(kg/h)
Low window exhaust gas mass flow bank 1	≥(a) - (b)
(a) minimum exhaust gas mass flow	<20(kg/h)
(b) offset exhaust gas mass flow	=5(g/sec)
for time	≥3(sec)
High window exhaust gas mass flow bank 1	≤0(g/sec)
High window exhaust gas mass flow bank 1) (≥6553,5(kg/h)
Modeled catalyst temperature gradient bank 1: (a) - (b)	≤40(°C)

Modeled catalyst temperature gradient bank 1: (a) - (b) (a) Modeled catalyst temperature	≥-40(°C)
bank 1 (b) filtered modeled catalyst temperature bank 1	=5(sec)
Low window modeled catalyst	≤1000(°C)
Low window Modeled catalyst	≥475(°C)
temperature bank 1 High window modeled catalyst	≤-273,15(°C)
temperature bank 1 High window Modeled catalyst	≥1262,83(°C)
temperature bank 1 Modeled catalyst temperature bank 1 after the first engine start and driving	>350(°C)
for time))	≥60(sec)
((Integrated purge mass flow after a	≥0(g)
HC concentration factor in chacoal	≤64
relative fuel portion of canister purge to injected fuel mass : (a) / (b)	≤4
(a) fuel mass supplied by canisterpurge control(b) fuel mass supplied by injection	
Or	
open loop canister purge control	=TRUE
canister purge control mass flow into the manifold	≤7,11(g/sec)
((integrated exhaust gas mass flow bank 1 since engine start (see Look-Up-Table #19)	>2250 to 10000(g)
integrated exhaust gas mass flow bank 1 after the following sensors's readiness (>0,1(kg)
Secondary O2 sensor readiness	

Primary A/F sensor readiness bank 1

)		
)		≥450(°C)
temperature dev sensor heater co	iation of Primary A/F ntrol bank 1: (a) - (b)	<50(°C)
(a) primary A/F set set point for heate (b) measured prir temperature for h)	ensor temperature er control nary A/F sensor eater control	<800(°C)
statemachine = s statemachine (s a commanded lar primary A/F comr if the following o sm moves to sm	m m =0) : inactive mbda active manded lambda conditions are met, n = 2	=FALSE =1
Secondary O2 se	ensor voltage Bank 1	≥0(V)
if the following o sm moves to sm	conditions are met, n = 1	
Secondary O2 se	ensor voltage Bank 1	<0(V)
Secondary O2 se	ensor voltage Bank 1	≥0,45(V)
statemachine (s	m=1) - rich mixture	= TRUE
a commanded lar primary A/F comr Bank 1	mbda active nanded lambda	=TRUE =0,87
for time		≥3(sec)
for time if the following o sm moves to sm	conditions are met, n = 2	≥0,1(sec)
Secondary O2 se	ensor voltage	≥0,09944(V/sec)
Secondary O2 se	ensor voltage Bank 1	≥0,68(V)
) Or Secondary O2 se	ensor voltage Bank 1	≥0(V)
) Integrated exhau	st mass flow bank 1	≥0(g)

if the following conditions are met, sm moves to sm = 3

(Secondary O2 sensor voltage bank 1	≥0,9(V)
Or (Secondary O2 sensor voltage bank 1	>0 8(\/)
Secondary O2 concer voltage	
gradient over 0.05s	≤00,5(V/Sec)
gradient over 0.05s	≥-66,5(V/sec)
Integrated Oxygen mass flow bank 1	>250(mg)
)) (Primary A/F sensor lambda bank 1 (a) Primary lambda control set point	≤(a) + (b)
(b) maximum lambda deviation of	=0,05
lean mixture Primary A/F sensor lambda bank 1 (a) Primary lambda control set point	≥(a) - (b)
(b) maximum lambda deviation of rich	≤0,05
for time Integrated rich exhaust gas mass flow bank 1	≥0,1(sec) ≥0,005(kg)
(Secondary O2 sensor voltage bank 1	>(a) + (b)
(a) minimum secondary O2 voltage(b) Offset voltage of Secondary O2 sensor	=0,019531(V)
) statemachine (sm=2) - Lean mixture in catalyst a commanded lambda active primary A/F commanded lambda for time	=TRUE =1,07 ≥3(sec)
for time if the following conditions are met, sm moves to sm = 4	≥0,1(sec)
((Secondary O2 sensor voltage for time)	≤0,07(V) ≥0,1(sec)

(Secondary O2 sensor voltage	≤0,200195(V)
Secondary O2 sensor voltage	≤0,1(V/sec)
Secondary O2 sensor voltage	≥-0,09944(V/sec)
gradient over 0.05s Integrated Oxygen mass flow bank 1	>150(mg)
)) (
Primary A/F sensor lambda (a) Primary lambda control set point	≤(a) + (b)
(b) maximum lambda deviation of lean mixture	=0,05
Primary A/F sensor lambda (a) Primary lambda control set point	≥(a) - (b)
(b) maximum lambda deviation of rich	≤0,05
for time Integrated lean exhaust gas mass flow bank 1)	≥0,1(sec) ≥0,005(kg)
statemachine (sm=3) -	= TRUE
Lean mixture in catalyst a commanded lambda active bank 1	=TRUE
primary A/F commanded lambda	=1,07
for time	≥3(sec)
for time if the following conditions are met, sm moves to sm = 4	≥0,1(sec)
(Secondary O2 sensor voltage bank 1	≤0,07(V)
for time Or	≥0,1(sec)
(Secondary O2 sensor voltage bank 1	≤0,200195(V)
Secondary O2 sensor voltage	≤0,1(V/sec)
Secondary O2 sensor voltage	≥-0,09944(V/sec)
Integrated Oxygen mass flow bank 1	>150(mg)

Primary A/F sensor lambda bank 1 (a) Primary lambda control set point	≤(a) + (b)
(b) maximum lambda deviation of	=0,05
Primary A/F sensor lambda bank 1 (a) Primary lambda control set point	≥(a) - (b)
(b) maximum lambda deviation of rich mixture	≤0,05
for time Integrated lean exhaust gas mass flow bank 1	≥0,1(sec) ≥0,005(kg)
statemachine (sm=4) - Rich mixture in catalyst	=TRUE
a commanded lambda active	=TRUE
primary A/F commanded lambda	=0,87
for time	≥3(sec)
for time if the following conditions are met, sm moves to sm = 3	≥0,1(sec)
,	
(Secondary O2 sensor voltage bank 1	≥0,9(V)
Or	
(Secondary O2 sensor voltage bank 1	≥0,8(V)
Secondary O2 sensor voltage	≤66,5(V/sec)
Secondary O2 sensor voltage	≥-66,5(V/sec)
Integrated Oxygen mass flow bank 1	>250(mg)
))	
(Primary A/F sensor lambda bank 1 (a) Primary lambda control set point	≤(a) + (b)
(b) maximum lambda deviation of	=0,05
Primary A/F sensor lambda bank 1 (a) Primary lambda control set point	≥(a) - (b)
(b) maximum lambda deviation of rich mixture	≤0,05
for time	≥0,1(sec)
Integrated rich exhaust gas mass flow bank 1	≥0,005(kg)

)

				Primary A/F commanded lambda bank 1 (a) Primary A/F commanded lambda bank 1 (b) offset to the commanded lambda bank 1	≤(a) + (b) =0,1001		
				Secondary O2 sensor voltage bank 1 (a) minimum secondary O2 voltage	>(a) + (b)		
				(b) Offset voltage of Secondary O2 sensor	=0,0146(V)		
) No pending or confirmed DTCs	=see sheet inhibit table		
				Basic enable conditions met	=see sheet enable tables		
P014A	Compares measured delay response time of Seconday O2 sensor 2 bank 2 with the calibrated threshold when the sensor voltage changes Rich	Ewma filtered delay response time of Secondary O2 sensor 2, bank 2, Rich to Lean	>0,75(sec)	primary A/F commanded lambda Bank 2	=1	2(counts)	1Trip EWMA
		(a) Raw delay response time of secondary O2 S2B2 Rich to Lean		engine runs	=TRUE		
		(b) Exhaust mass flow dependent correction for delay response time of secondary O2 sensor Rich to Lean (see Look-Up-Table #23)	=0.04 to 0.08(sec)	Vehicle speed	≥9,32(mph)		
				engine speed	≤4000(rpm)		
				engine speed engine load (see Look-Up-Table #20)	≥1000(rpm) ≥ 12 to 1536(%)		
				Integrated air mass flow	>0,06(kg)		
				measured ambient temperatuer	≥-48(°C)		
				measured ambient pressure measured engine coolant	≥0(kPa) ≥57,96(°C)		
				temperature	=TRUF		
				for time)	≥2(sec)		
				(integrated exhaust gas mass flow after the following operation points are in the monitoring window bank 2	>0,06(kg)		

Change of exhaust gas mass flow bank 2:	≤32(kg/h)
(a) - (b) Change of exhaust gas mass flow bank 2:	≥-32(kg/h)
 (a) - (b) (a) exhaust gas mass flow bank 2 (b) filtered exhaust gas mass flow bank 2 	
PT1 time constant	=0,8(sec)
Low window exhaust gas mass flow bank 2	≤111,11(g/sec)
Low window exhaust gas mass flow bank 2	≥20(kg/h)
Low window exhaust gas mass flow bank 2	≥(a) - (b)
(a) minimum exhaust gas mass flow bank 2	<20(kg/h)
(b) offset exhaust gas mass flow	=5(g/sec)
bank 2 at tip-out	
for time	≥3(sec)
High window exhaust gas mass flow bank 2	≤0(g/sec)
High window exhaust gas mass flow bank 2)	≥6553,5(kg/h)
(
Modeled catalyst temperature gradient bank 2:	≤40(°C)
Modeled catalyst temperature gradient bank 2:	≥-40(°C)
(a) - (b)	
(a) Modeled catalyst temperature	
bank 2 (b) filtered modeled catalyst	-5(600)
temperature bank 2	-3(360)
PT1 time constant	
Low window modeled catalyst	≤1000(°C)
Low window Modeled catalyst	≥475(°C)
temperature bank 2	<-273 15(°C)
temperature bank 2	= 270, 10(0)
High window Modeled catalyst	≥1262,83(°C)
temperature bank 2	

after the first engine start and driving	>350(°C)
for time))	≥60(sec)
((Integrated purge mass flow after a longer purge stop	≥0(g)
HC concentration factor in chacoal	≤64
relative fuel portion of canister purge to injected fuel mass : (a) / (b)	≤4
(a) fuel mass supplied by canister purge control(b) fuel mass supplied by injection	
Or	
open loop canister purge control	=TRUE
Cr canister purge control mass flow into the manifold	≤7,11(g/sec)
((integrated exhaust gas mass flow bank 2 since engine start (see Look-Up-Table #19)	>2250 to 10000(g)
((integrated exhaust gas mass flow bank 2 since engine start (see Look-Up-Table #19) integrated exhaust gas mass flow bank 2 after the following sensors's readiness	>2250 to 10000(g) >0,1(kg)
((integrated exhaust gas mass flow bank 2 since engine start (see Look-Up-Table #19) integrated exhaust gas mass flow bank 2 after the following sensors's readiness (Secondary O2 sensor readiness bank 2	>2250 to 10000(g) >0,1(kg)
((integrated exhaust gas mass flow bank 2 since engine start (see Look-Up-Table #19) integrated exhaust gas mass flow bank 2 after the following sensors's readiness (Secondary O2 sensor readiness bank 2 Primary A/F sensor readiness bank 2	>2250 to 10000(g) >0,1(kg)
((integrated exhaust gas mass flow bank 2 since engine start (see Look-Up-Table #19) integrated exhaust gas mass flow bank 2 after the following sensors's readiness (Secondary O2 sensor readiness bank 2 Primary A/F sensor readiness bank 2)	>2250 to 10000(g) >0,1(kg) ≥450(°C)
((integrated exhaust gas mass flow bank 2 since engine start (see Look-Up-Table #19) integrated exhaust gas mass flow bank 2 after the following sensors's readiness (Secondary O2 sensor readiness bank 2 Primary A/F sensor readiness bank 2) temperature deviation of Primary A/F sensor heater control bank 2: (a) - (b)	>2250 to 10000(g) >0,1(kg) ≥450(°C) <50(°C)
((integrated exhaust gas mass flow bank 2 since engine start (see Look-Up-Table #19) integrated exhaust gas mass flow bank 2 after the following sensors's readiness (Secondary O2 sensor readiness bank 2 Primary A/F sensor readiness bank 2) temperature deviation of Primary A/F sensor heater control bank 2: (a) - (b) (a) primary A/F sensor temperature set point for heater control	>2250 to 10000(g) >0,1(kg) ≥450(°C) <50(°C) <800(°C)
<pre>((integrated exhaust gas mass flow bank 2 since engine start (see Look-Up-Table #19) integrated exhaust gas mass flow bank 2 after the following sensors's readiness (Secondary O2 sensor readiness bank 2 Primary A/F sensor readiness bank 2) temperature deviation of Primary A/F sensor heater control bank 2: (a) - (b) (a) primary A/F sensor temperature set point for heater control (b) measured primary A/F sensor temperature for heater control</pre>	>2250 to 10000(g) >0,1(kg) ≥450(°C) <50(°C) <800(°C)

statemachine = sm

a commanded lambda active primary A/F commanded lambda if the following conditions are met, sm moves to sm = 2	=FALSE =1
Secondary O2 sensor voltage Bank 2	≥0(V)
if the following conditions are met, sm moves to sm = 1	
Secondary O2 sensor voltage Bank 2	<0(V)
Secondary O2 sensor voltage Bank 2	≥0,45(V)
statemachine (sm=1) - rich mixture	= TRUE
a commanded lambda active primary A/F commanded lambda Bank 2	=TRUE =0,87
for time	≥3(sec)
for time if the following conditions are met, sm moves to sm = 2	≥0,1(sec)
Secondary O2 sensor voltage	≥0,09944(V/sec)
Secondary O2 sensor voltage Bank 2	≥0,68(V)
) Or Secondary O2 sensor voltage Bank 2	≥0(V)
) Integrated exhaust mass flow bank 2	≥0(g)
if the following conditions are met, sm moves to sm = 3	
(Secondary O2 sensor voltage bank 2	≥0,9(V)
Or (
Secondary O2 sensor voltage bank 2	≥0,8(V)
Secondary O2 sensor voltage	≤66,5(V/sec)
Secondary O2 sensor voltage	≥-66,5(V/sec)
Integrated Oxygen mass flow bank 2	>250(mg)

(Primary A/F sensor lambda bank 2 (a) Primary lambda control set point	≤(a) + (b)
bank 2 (b) maximum lambda deviation of	=0,05
Primary A/F sensor lambda bank 2 (a) Primary lambda control set point	≥(a) - (b)
(b) maximum lambda deviation of rich	≤0,05
for time Integrated rich exhaust gas mass flow bank 2	≥0,1(sec) ≥0,005(kg)
) And	
(Secondary O2 sensor voltage bank 2	>(a) + (b)
(a) minimum secondary O2 voltage(b) Offset voltage of Secondary O2 sensor	=0,019531(V)
) statemachine (sm=2) - Lean mixture in catalyst a commanded lambda active primary A/F commanded lambda for time	=TRUE =1,07 ≥3(sec)
for time if the following conditions are met, sm moves to sm = 4	≥0,1(sec)
((Secondary O2 sensor voltage for time) Or	≤0,07(V) ≥0,1(sec)
Secondary O2 sensor voltage	≤0,200195(V)
Secondary O2 sensor voltage	≤0,1(V/sec)
Secondary O2 sensor voltage	≥-0,09944(V/sec)
Integrated Oxygen mass flow bank 2	>150(mg)
))	
rimary A/F sensor lambda (a) Primary lambda control set point	≤(a) + (b)
(b) maximum lambda deviation of	=0,05

Primary A/F sensor lambda (a) Primary lambda control set point	≥(a) - (b)
(b) maximum lambda deviation of rich mixture for time Integrated lean exhaust gas mass flow bank 2)	≤0,05 ≥0,1(sec) ≥0,005(kg)
statemachine (sm=3) - Lean mixture in catalyst a commanded lambda active bank 2	= TRUE =TRUE
primary A/F commanded lambda bank 2 for time	=1,07 ≥3(sec)
for time if the following conditions are met, sm moves to sm = 4	≥0,1(sec)
(Secondary O2 sensor voltage bank 2	≤0,07(V)
for time Or (≥0,1(sec)
Secondary O2 sensor voltage bank 2	≤0,200195(V)
Secondary O2 sensor voltage gradient over 0.05s	≤0,1(V/sec)
Secondary O2 sensor voltage gradient over 0.05s	≥-0,09944(V/sec)
Integrated Oxygen mass flow bank 2	>150(mg)
))	
Primary A/F sensor lambda bank 2 (a) Primary lambda control set point	≤(a) + (b)
(b) maximum lambda deviation of	=0,05
Primary A/F sensor lambda bank 2 (a) Primary lambda control set point	≥(a) - (b)
(b) maximum lambda deviation of rich	≤0,05
for time Integrated lean exhaust gas mass flow bank 2) (≥0,1(sec) ≥0,005(kg)

Primary A/F commanded lambda	≤(a) + (b)						
bank 2 (a) Primary A/F commanded lambda							
(b) offset to the commanded lambda	=0,08						
Secondary O2 sensor voltage bank 2	>(a) + (b)						
(a) minimum secondary O2 voltage Bank 2							
(b) Offset voltage of Secondary O2 sensor	=0,019531(V)						
, statemachine (sm=4) - Rich mixture in catalyst	=TRUE						
a commanded lambda active primary A/F commanded lambda for time	=TRUE =0,87 ≥3(sec)						
for time if the following conditions are met, sm moves to sm = 3	≥0,1(sec)						
(
C Secondary O2 sensor voltage bank 2	≥0,9(V)						
Or (
Secondary O2 sensor voltage bank 2	≥0,8(V)						
Secondary O2 sensor voltage gradient over 0.05s	≤66,5(V/sec)						
Secondary O2 sensor voltage gradient over 0.05s	≥-66,5(V/sec)						
Integrated Oxygen mass flow bank 2	>250(mg)						
))							
Primary A/F sensor lambda bank 2 (a) Primary lambda control set point	≤(a) + (b)						
(b) maximum lambda deviation of	=0,05						
Primary A/F sensor lambda bank 2 (a) Primary lambda control set point	≥(a) - (b)						
(b) maximum lambda deviation of rich	≤0,05						
for time Integrated rich exhaust gas mass flow bank 2)	≥0,1(sec) ≥0,005(kg)						
				Fast initialization mode (FIR) EWMA filter initial value for FIR mode	=TRUE =0(sec)		
-------	--	--	------------	---	-----------------------------	-----------	---------------
				EWMA filter constant	=0,3516		
				Maximum number of samples per trip	=2(counts)		
				Total number of samples for FIR	=3(counts)		
				Response to Step Change mode (RSC)	=TRUE		
				Response to Step Change mode	=TRUE		
				absolute difference : ABS((a) - (b))	>(b) * (c)		
				(a) measured delayed response time			
				(b) EWMA filtered normalized			
				(c) Step change detection factor	=0,25(sec)		
				EWMA filter constant	=0,3516		
				Maximum number of samples per trip	=2(counts)		
				Total number of samples for RSC mode	=3(counts)		
				EWMA filter constant	=0,3516		
				Total number of samples for stablilized mode	=1(counts)		
				No pending or confirmed DTCs	=see sheet inhibit table		
				Basic enable conditions met	=see sheet enable tables		
P014B	Compares measured delay response time of Seconday O2 sensor 2 bank 2 with the calibrated threshold when the sensor voltage changes Lean to Rich	arithmetic filtered delay response time tiArth of Secondary O2 sensor 2, bank 2, Lean to Rich: tiArth	>0,75(sec)	primary A/F commanded lambda Bank 2	=1	2(counts)	1Trip EWMA
		tiArth = old tiArth + ((((a) - (b)) - old tiArth) * 1/ sample order)		engine runs	=TRUE		
		(a) Raw delay response time of secondary O2 S2B2 Lean to Rich		Vehicle speed	≥9,32(mph)		

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	=0 to 0.04(sec)	engine speed	
or delay			

(b) Exhaust mass flowdependent correction for delayresponse time of secondaryO2 sensor Lean to Rich(see Look-Up-Table #22)	=0 to 0.04(sec)	engine speed	≤4000(rpm)
		engine speed engine load (see Look-Up-Table #20)	≥1000(rpm) ≥ 12 to 1536(%)
		Integrated air mass flow	>0,06(kg)
		measured ambient temperatuer measured ambient pressure measured engine coolant temperature	≥-48(°C) ≥0(kPa) ≥57,96(°C)
		no transmission gear change for time)	=TRUE ≥2(sec)
		(integrated exhaust gas mass flow after the following operation points are in the monitoring window bank 2	>0,06(kg)
		(
		Change of exhaust gas mass flow bank 2: (a) - (b)	≤32(kg/h)
		Change of exhaust gas mass flow bank 2: (a) - (b) (a) exhaust gas mass flow bank 2 (b) filtered exhaust gas mass flow bank 2	≥-32(kg/h)
		PT1 time constant Low window exhaust gas mass flow bank 2	=0,8(sec) ≤111,11(g/sec)
		Low window exhaust gas mass flow bank 2	≥20(kg/h)
		Low window exhaust gas mass flow	≥(a) - (b)
		(a) minimum exhaust gas mass flow bank 2	<20(kg/h)
		(b) offset exhaust gas mass flow bank 2 at tip-out	=5(g/sec)
		for time	≥3(sec)

High window exhaust gas mass flow bank 2	≤0(g/sec)
High window exhaust gas mass flow bank 2)	≥6553,5(kg/h)
(Modeled catalyst temperature gradient bank 2:	≤40(°C)
(a) - (b) Modeled catalyst temperature gradient bank 2:	≥-40(°C)
(a) - (b) (a) Modeled catalyst temperature bank 2	
(b) filtered modeled catalyst temperature bank 2 PT1 time constant	=5(sec)
Low window modeled catalyst	≤1000(°C)
Low window Modeled catalyst	≥475(°C)
High window modeled catalyst	≤-273,15(°C)
High window Modeled catalyst	≥1262,83(°C)
Modeled catalyst temperature bank 2 after the first engine start and driving	>350(°C)
for time))	≥60(sec)
((Integrated purge mass flow after a	≥0(g)
longer purge stop HC concentration factor in chacoal	≤64
canister relative fuel portion of canister purge to injected fuel mass : (a) / (b)	≤4
(a) fuel mass supplied by canisterpurge control(b) fuel mass supplied by injection	
Or	
open loop canister purge control	=TRUE
Or canister purge control mass flow into the manifold	≤7,11(g/sec)

integrated exhaust gas mass flow bank 2 since engine start (see Look-Up-Table #19)	>2250 to 10000(g)
integrated exhaust gas mass flow bank 2 after the following sensors's readiness (>0,1(g)
Secondary O2 sensor readiness bank 2 Primary A/F sensor readiness bank 2	
)	≥450(°C)
temperature deviation of Primary A/F sensor heater control bank 2: (a) - (b)	<50(°C)
 (a) primary A/F sensor temperature set point for heater control (b) measured primary A/F sensor temperature for heater control) 	<800(°C)
statemachine = sm statemachine (sm =0) : inactive a commanded lambda active primary A/F commanded lambda if the following conditions are met, sm moves to sm = 2	=FALSE =1
Secondary O2 sensor voltage Bank 2	≥0(V)
if the following conditions are met, sm moves to sm = 1	
Secondary O2 sensor voltage Bank 2	<0(V)
Secondary O2 sensor voltage Bank 2	≥0,45(V)
statemachine (sm=1) - rich mixture	= TRUE
a commanded lambda active primary A/F commanded lambda Bank 2	=TRUE =0,87
for time	≥3(sec)
for time if the following conditions are met, sm moves to sm = 2	≥0,1(sec)
رر Secondary O2 sensor voltage gradient over 0.05s	≥0,09944(V/sec)

Secondary O2 sensor voltage Bank 2	≥0,68(V)
) Or	
Secondary O2 sensor voltage Bank 2	≥0(V)
) Integrated exhaust mass flow bank 2	≥0(g)
if the following conditions are met, sm moves to sm = 3	
(Secondary O2 sensor voltage bank 2	≥0,9(V)
Or	
(Secondary O2 sensor voltage bank 2	≥0,8(V)
Secondary O2 sensor voltage	≤66,5(V/sec)
Secondary O2 sensor voltage	≥-66,5(V/sec)
Integrated Oxygen mass flow bank 2	>250(mg)
))	
Primary A/F sensor lambda bank 2 (a) Primary lambda control set point	≤(a) + (b)
(b) maximum lambda deviation of	=0,05
Primary A/F sensor lambda bank 2 (a) Primary lambda control set point	≥(a) - (b)
(b) maximum lambda deviation of rich	≤0,05
for time Integrated rich exhaust gas mass flow bank 2	≥0,1(sec) ≥0,005(kg)
) And	
(Secondary O2 sensor voltage bank 2	>(a) + (b)
(a) minimum secondary O2 voltage (b) Offset voltage of Secondary O2 sensor	=0,019531(V)
) statemachine (sm=2) -	
Lean mixture in catalyst a commanded lambda active	=TRUE

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for time	≥3(sec)
for time if the following conditions are met, sm moves to sm = 4	≥0,1(sec)
((Secondary O2 sensor voltage for time) Or	≤0,07(V) ≥0,1(sec)
Secondary O2 sensor voltage	≤0,200195(V)
Secondary O2 sensor voltage	≤0,1(V/sec)
Secondary O2 sensor voltage	≥-0,09944(V/sec)
Integrated Oxygen mass flow bank 2	>150(mg)
)) (Primary A/F sensor lambda (a) Primary lambda control set point	≤(a) + (b)
(b) maximum lambda deviation of	=0,05
lean mixture Primary A/F sensor lambda (a) Primary lambda control set point	≥(a) - (b)
(b) maximum lambda deviation of rich mixture	≤0,05
for time Integrated lean exhaust gas mass flow bank 2)	≥0,1(sec) ≥0,005(kg)
statemachine (sm=3) -	= TRUE
a commanded lambda active bank 2	=TRUE
primary A/F commanded lambda	=1,07
for time	≥3(sec)
for time if the following conditions are met, sm moves to sm = 4	≥0,1(sec)
(Secondary O2 sensor voltage bank 2	≤0,07(V)
for time	≥0,1(sec)

(Secondary O2 sensor voltage bank 2	≤0,200195(V)
Secondary O2 sensor voltage	≤0,1(V/sec)
Secondary O2 sensor voltage	≥-0,09944(V/sec)
Integrated Oxygen mass flow bank 2	>150(mg)
))	
(Primary A/F sensor lambda bank 2 (a) Primary lambda control set point	≤(a) + (b)
(b) maximum lambda deviation of	=0,05
Primary A/F sensor lambda bank 2 (a) Primary lambda control set point	≥(a) - (b)
(b) maximum lambda deviation of rich	≤0,05
for time	≥0,1(sec) >0.005/kg)
flow bank 2	≥0,003(kg)
) statemachine (sm=4) -	=TRUE
a commanded lambda active	=TRUE
for time	=0,87 ≥3(sec)
for time	≥0,1(sec)
sm moves to sm $= 3$	
(Secondary O2 sensor voltage bank 2	≥0,9(V)
Or (
Contemporary O2 sensor voltage bank 2	≥0,8(V)
Secondary O2 sensor voltage	≤66,5(V/sec)
Secondary O2 sensor voltage	≥-66,5(V/sec)
Integrated Oxygen mass flow bank 2	>250(mg)
))	
(Primary A/F sensor lambda bank 2 (a) Primary lambda control set point bank 2	≤(a) + (b)

				(b) maximum lambda deviation of lean mixture Primary A/F sensor lambda bank 2 (a) Primary lambda control set point	=0,05 ≥(a) - (b)			
				(b) maximum lambda deviation of rich mixture for time Integrated rich exhaust gas mass flow bank 2	≤0,05 ≥0,1(sec) ≥0,005(kg)			
) (Primary A/F commanded lambda bank 2 (a) Primary A/F commanded lambda bank 2	≤(a) + (b)			
				(b) offset to the commanded lambda bank 2 Secondary O2 sensor voltage bank 2	=0,1001 >(a) + (b)			
				 (a) minimum secondary O2 voltage Bank 2 (b) Offset voltage of Secondary O2 sensor) 	=0,0146(V)			
				(Secondary O2 sensor voltage bank 2	>(a) + (b)			
				 (a) minimum secondary O2 voltage Bank 2 (b) Offset voltage of Secondary O2 sensor 	=0,0146(V)			
				/ No pending or confirmed DTCs	=see sheet inhibit table			
				Basic enable conditions met	=see sheet enable tables			
20. OWNSTREA M OXYGEN SENSOR RANGE CHECK	P2270	Compare maximum secondary Maximum Secondary O2 O2 sensor voltage bank 1 with a calibrated threshold during intrusive commanded rich lambda	<0,8(V)			0,1(s)	2 Trip	
DIAGNOSIS				primary A/F commanded lambda	=1			
				engine runs	=TRUE			
			ECM Section 364 of 772	Deceleration Fuel Cut-Off (DFCO) for time	=FALSE ≥10(sec)		476 o	1,098

Vehicle speed	≥9,32(mph)
engine speed engine speed engine load (see Look-Up-Table #20)	≤4000(rpm) ≥1000(rpm) ≥ 12 to 1536(%)
Integrated air mass flow	>0,06(kg)
measured ambient temperatuer measured ambient pressure measured engine coolant temperature no transmission gear change for time	≥-48(°C) ≥0(kPa) ≥57,96(°C) =TRUE ≥2(sec)
)	
(integrated exhaust gas mass flow after the following operation points are in the monitoring window bank 1	>0,06(kg)
(
Change of exhaust gas mass flow bank 1: (a) - (b)	≤32(kg/h)
Change of exhaust gas mass flow bank 1: (a) - (b) (a) exhaust gas mass flow bank 1 (b) filtered exhaust gas mass flow	≥-32(kg/h)
Dank 1 PT1 time constant Low window exhaust gas mass flow bank 1	=0,8(sec) ≤111,11(g/sec)
Low window exhaust gas mass flow bank 1	≥20(kg/h)
Low window exhaust gas mass flow	≥(a) - (b)
(a) minimum exhaust gas mass flow	<20(kg/h)
(b) offset exhaust gas mass flow	=5(g/sec)
bank 1 at tip-out for time	≥3(sec)
High window exhaust gas mass flow bank 1	≤0(g/sec)
High window exhaust gas mass flow	≥6553,5(kg/h)

)	
(Modeled catalyst temperature gradient bank 1:	≤40(°C)
(a) - (b) Modeled catalyst temperature gradient bank 1:	≥-40(°C)
(a) - (b)(a) Modeled catalyst temperaturebank 1	
(b) filtered modeled catalyst temperature bank 1	=5(sec)
Low window modeled catalyst	≤1000(°C)
Low window Modeled catalyst temperature bank 1	≥475(°C)
High window modeled catalyst temperature bank 1	≤-273,15(°C)
High window Modeled catalyst temperature bank 1	≥1262,83(°C)
Modeled catalyst temperature bank 1 after the first engine start and driving	>350(°C)
for time))	≥60(sec)
((Integrated purge mass flow after a	≥0(g)
HC concentration factor in chacoal	≤64
relative fuel portion of canister purge to injected fuel mass : (a) / (b)	≤4
(a) fuel mass supplied by canisterpurge control(b) fuel mass supplied by injection	
Or	
open loop canister purge control Or	=TRUE
canister purge control mass flow into the manifold	≤7,11(g/sec)
((integrated exhaust gas mass flow bank 1 since engine start (see Look-Up-Table #19)	>2250 to 10000(g)

integrated exhaust gas mass flow bank 1 after the following sensors's readiness	>0,1(kg)
(Secondary O2 sensor readiness bank 1	=TRUE
Primary A/F sensor readiness bank 1	=TRUE
)	≥450(°C)
temperature deviation of Primary A/F sensor heater control bank 1: (a) - (b)	<50(°C)
 (a) primary A/F sensor temperature set point for heater control (b) measured primary A/F sensor temperature for heater control) 	<800(°C)
statemachine = sm statemachine (sm =0) : inactive a commanded lambda active primary A/F commanded lambda if the following conditions are met, sm moves to sm = 2	=FALSE =1
Secondary O2 sensor voltage bank1	≥0(V)
if the following conditions are met, sm moves to sm = 1	
Secondary O2 sensor voltage bank1	<0(V)
Secondary O2 sensor voltage bank1	≥0,45(V)
statemachine (sm=1) - rich mixture	= TRUE
a commanded lambda active primary A/F commanded lambda	=TRUE =0,87
for time	≥3(sec)
for time	≥0,1(sec)
Integrated Rich Gas Storage Capacity	≥1800(mg)
Primary A/F commanded lambda	≤0,8
Integreted Exhaust mass flow for time	≥0,2(kg) ≥0(sec)

-	if the following conditions are met, sm moves to sm = 2	
	((Secondary O2 sensor voltage gradient over 0.05s	≥0,09944(V/sec)
	Secondary O2 sensor voltage bank1	≥0,68(V)
) Or Secondary O2 sensor voltage bank1	≥0(V)
) Integrated exhaust mass flow bank 1	≥0(g)
	if the following conditions are met, sm moves to sm = 3	
	(Secondary O2 sensor voltage bank 1	≥0,9(V)
	Or (Secondary O2 sensor voltage bank 1	≥0,8(V)
	Secondary O2 sensor voltage	≤66,5(V/sec)
	gradient over 0.05s Secondary O2 sensor voltage	≥-66,5(V/sec)
	gradient over 0.05s Integrated Oxygen mass flow bank 1	>250(mg)
))	
	Primary A/F sensor lambda bank 1 (a) Primary lambda control set point	≤(a) + (b)
	(b) maximum lambda deviation of	=0,05
	Primary A/F sensor lambda bank 1 (a) Primary lambda control set point	≥(a) - (b)
	(b) maximum lambda deviation of rich	≤0,05
	for time Integrated rich exhaust gas mass flow bank 1	≥0,1(sec) ≥0,005(kg)
	, (Secondary O2 sensor voltage bank 1	>(a) + (b)
	(a) minimum secondary O2 voltage(b) Offset voltage of Secondary O2 sensor	=0,019531(V)

statemachine (sm=2) - Lean mixture in catalyst a commanded lambda active primary A/F commanded lambda for time	=TRUE =1,07 ≥3(sec)
for time if the following conditions are met, sm moves to sm = 4	≥0,1(sec)
((Secondary O2 sensor voltage bank 1	≤0,07(V)
for time) Or	≥0,1(sec)
Secondary O2 sensor voltage	≤0,200195(V)
Secondary O2 sensor voltage	≤0,1(V/sec)
Secondary O2 sensor voltage	≥-0,09944(V/sec)
Integrated Oxygen mass flow bank 1	>150(mg)
))	
(Primary A/F sensor lambda (a) Primary lambda control set point	≤(a) + (b)
(b) maximum lambda deviation of	=0,05
Primary A/F sensor lambda (a) Primary lambda control set point	≥(a) - (b)
(b) maximum lambda deviation of rich	≤0,05
for time Integrated lean exhaust gas mass flow bank 1)	≥0,1(sec) ≥0,005(kg)
statemachine (sm=3) -	= TRUE
a commanded lambda active bank 1	=TRUE
primary A/F commanded lambda	=1,07
for time	≥3(sec)
for time if the following conditions are met, sm moves to sm = 4	≥0,1(sec)

Secondary O2 sensor voltage bank 1	≤0,07(V)
or time Dr	≥0,1(sec)
Secondary O2 sensor voltage bank 1	≤0,200195(V)
Secondary O2 sensor voltage	≤0,1(V/sec)
Secondary O2 sensor voltage	≥-0,09944(V/sec)
ntegrated Oxygen mass flow bank 1	>150(mg)
)	
Primary A/F sensor lambda bank 1 a) Primary lambda control set point	≤(a) + (b)
b) maximum lambda deviation of	=0,05
Primary A/F sensor lambda bank 1 (a) Primary lambda control set point	≥(a) - (b)
b) maximum lambda deviation of rich nixture	≤0,05
or time ntegrated lean exhaust gas mass low bank 1	≥0,1(sec) ≥0,005(kg)
statemachine (sm=4) -	
Rich mixture in catalyst	
primary A/F commanded lambda	=0,87
or time	≥3(sec)
or time	≥0,1(sec)
ntegrated Rich Gas Storage Capacity or time	≥1800(mg)
Primary A/F commanded lambda	≤0,8
ntegreted Exhaust mass flow or time	≥0,2(kg) ≥0(sec)

if the following conditions are met, sm moves to sm = 3

≥0,9(V)

				Or (Secondary O2 sensor voltage bank 1 Secondary O2 sensor voltage gradient over 0.05s Secondary O2 sensor voltage gradient over 0.05s Integrated Oxygen mass flow bank 1)) (Primary A/F sensor lambda bank 1 (a) Primary lambda control set point bank 1 (b) maximum lambda deviation of lean mixture Primary A/F sensor lambda bank 1 (a) Primary lambda control set point (b) maximum lambda deviation of rich mixture for time Integrated rich exhaust gas mass flow bank 1) No pending or confirmed DTCs	$\geq 0,8(\vee)$ $\leq 66,5(\vee/\operatorname{sec})$ $\geq -66,5(\vee/\operatorname{sec})$ $>250(\operatorname{mg})$ $\leq (a) + (b)$ $=0,05$ $\geq (a) - (b)$ $\leq 0,05$ $\geq 0,1(\operatorname{sec})$ $\geq 0,005(\operatorname{kg})$ =see sheet inhibit table		
				Basic enable conditions met	=see sheet enable tables		
P2271 Compare max O2 sensor vo a calibrated th intrusive com	(imum secondary Itage bank 1 with preshold during manded rich	Minimum secondary O2 sensor voltage bank 1 during lambda shifting to lean	>0,200195(V)	primary A/F commanded lambda	=1	0,1(s)	2 Trip
iambua				engine runs	=TRUE		
				(Deceleration Fuel Cut-Off (DFCO) for time Vehicle speed	=FALSE ≥10(sec) ≥9,32(mph)		
				engine speed engine speed engine load (see Look-Up-Table #20)	≤4000(rpm) ≥1000(rpm) ≥ 12 to 1536(%)		
				Integrated air mass flow	>0,06(kg)		

measured ambient temperatuer measured ambient pressure measured engine coolant temperature	≥-48(°C) ≥0(kPa) ≥57,96(°C)
no transmission gear change for time)	=TRUE ≥2(sec)
(integrated exhaust gas mass flow after the following operation points are in the monitoring window bank 1	>0,06(kg)
(
Change of exhaust gas mass flow bank 1: (a) - (b)	≤32(kg/h)
Change of exhaust gas mass flow bank 1: (a) - (b)	≥-32(kg/h)
 (a) exhaust gas mass flow bank 1 (b) filtered exhaust gas mass flow bank 1 	
PT1 time constant Low window exhaust gas mass flow bank 1	=0,8(sec) ≤111,11(g/sec)
Low window exhaust gas mass flow bank 1	≥20(kg/h)
Low window exhaust gas mass flow bank 1	≥(a) - (b)
(a) minimum exhaust gas mass flow	<20(kg/h)
(b) offset exhaust gas mass flow	=5(g/sec)
for time	≥3(sec)
High window exhaust gas mass flow bank 1	≤0(g/sec)
High window exhaust gas mass flow bank 1)	≥6553,5(kg/h)
Modeled catalyst temperature gradient bank 1:	≤40(°C)
 (a) - (b) Modeled catalyst temperature gradient bank 1: (a) - (b) 	≥-40(°C)

(a) Modeled catalyst temperature bank 1 (b) filtered medaled establish	
(b) filtered modeled catalyst temperature bank 1	=5(SeC)
Low window modeled catalyst	≤1000(°C)
Low window Modeled catalyst	≥475(°C)
High window modeled catalyst	≤-273,15(°C)
High window Modeled catalyst	≥1262,83(°C)
Modeled catalyst temperature bank 1 after the first engine start and driving	>350(°C)
for time))	≥60(sec)
((Integrated purge mass flow after a	≥0(g)
HC concentration factor in chacoal	≤64
relative fuel portion of canister purge to injected fuel mass : (a) / (b)	≤4
(a) fuel mass supplied by canister purge control (b) fuel mass supplied by injection	
Or	
open loop canister purge control	=TRUE
canister purge control mass flow into the manifold	≤7,11(g/sec)
((integrated exhaust gas mass flow bank 1 since engine start (see Look-Up-Table #19)	>2250 to 10000(g)
integrated exhaust gas mass flow bank 1 after the following sensors's readiness	>0,1(kg)
l Secondary O2 sensor readiness	=TRUE
Primary A/F sensor readiness bank 1	=TRUE

)

	≥450(°C)
temperature deviation of Primary A/F sensor heater control bank 1: (a) - (b)	<50(°C)
 (a) primary A/F sensor temperature set point for heater control (b) measured primary A/F sensor temperature for heater control) 	<800(°C)
statemachine = sm statemachine (sm =0) : inactive a commanded lambda active primary A/F commanded lambda if the following conditions are met, sm moves to sm = 2	=FALSE =1
Secondary O2 sensor voltage bank1	≥0(V)
if the following conditions are met, sm moves to sm = 1	
Secondary O2 sensor voltage bank1	<0(V)
Secondary O2 sensor voltage bank1	≥0,45(V)
statemachine (sm=1) - rich mixture	= TRUE
a commanded lambda active primary A/F commanded lambda	=TRUE =0,87
for time	≥3(sec)
for time if the following conditions are met, sm moves to sm = 2	≥0,1(sec)
Secondary O2 sensor voltage	≥0,09944(V/sec)
Secondary O2 sensor voltage bank1	≥0,68(V)
) Or	
Secondary O2 sensor voltage bank1	≥0(V)
) Integrated exhaust mass flow bank 1	≥0(g)
if the following conditions are met, sm moves to sm $= 3$	

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Secondary O2 sensor voltage bank 1 ≥0,9(V)

Or (
Secondary O2 sensor voltage bank 1	≥0,8(V)
Secondary O2 sensor voltage	≤66,5(V/sec)
Secondary O2 sensor voltage gradient over 0.05s	≥-66,5(V/sec)
Integrated Oxygen mass flow bank 1	>250(mg)
))	
V Primary A/F sensor lambda bank 1 (a) Primary lambda control set point bank 1	≤(a) + (b)
(b) maximum lambda deviation of lean mixture	=0,05
Primary A/F sensor lambda bank 1 (a) Primary lambda control set point	≥(a) - (b)
(b) maximum lambda deviation of rich	≤0,05
for time Integrated rich exhaust gas mass flow bank 1	≥0,1(sec) ≥0,005(kg)
, (Secondary O2 sensor voltage bank 1	>(a) + (b)
(a) minimum secondary O2 voltage (b) Offset voltage of Secondary O2 sensor	=0,019531(V)
) statemachine (sm=2) -	
Lean mixture in catalyst a commanded lambda active primary A/F commanded lambda for time	=TRUE =1,07 ≥3(sec)
for time	≥0,1(sec)
(Integrated Oxygen Storage Capacity	≥1600(mg)
for time Primary A/F commanded lambda bank 1	≥1(sec) ≥1,1499
Integreted Exhaust mass flow for time	≥0,2(kg) ≥0(sec)

)

if the following conditions are met, sm moves to sm = 4

((Secondary O2 sensor voltage bank 1	≤0,07(V)
for time	≥0,1(sec)
Or	
(Secondary O2 sensor voltage	≤0,200195(V)
Secondary O2 sensor voltage	≤0,1(V/sec)
Secondary O2 sensor voltage gradient over 0.05s	≥-0,09944(V/sec)
Integrated Oxygen mass flow bank 1	>150(mg)
))	
Primary A/F sensor lambda (a) Primary lambda control set point	≤(a) + (b)
(b) maximum lambda deviation of	=0,05
Primary A/F sensor lambda (a) Primary lambda control set point	≥(a) - (b)
(b) maximum lambda deviation of rich	≤0,05
for time	≥0,1(sec)
flow bank 1)	≥0,005(kg)
statemachine (sm=3) -	= TRUE
a commanded lambda active bank 1	=TRUE
primary A/F commanded lambda	=1,07
for time	≥3(sec)
for time Integrated Oxygen Storage Capacity	≥0,1(sec) ≥1600(mg)
for time Primary A/F commanded lambda	≥1(sec) ≥1,1499
Integreted Exhaust mass flow for time	≥0,2(kg) ≥0(sec)

)

if the following conditions are met, sm moves to sm = 4

(Secondary O2 sensor voltage bank 1	≤0,07(V)
for time Or	≥0,1(sec)
(Secondary O2 sensor voltage bank 1	≤0,200195(V)
Secondary O2 sensor voltage	≤0,1(V/sec)
Secondary O2 sensor voltage	≥-0,09944(V/sec)
Integrated Oxygen mass flow bank 1	>150(mg)
)) (Primary A/F sensor lambda bank 1 (a) Primary lambda control set point	≤(a) + (b)
(b) maximum lambda deviation of	=0,05
Primary A/F sensor lambda bank 1 (a) Primary lambda control set point	≥(a) - (b)
(b) maximum lambda deviation of rich mixture	≤0,05
for time Integrated lean exhaust gas mass flow bank 1)	≥0,1(sec) ≥0,005(kg)
statemachine (sm=4) -	=TRUE
a commanded lambda active	=TRUE
for time	≥3(sec)
for time if the following conditions are met, sm moves to sm = 3	≥0,1(sec)
(Secondary O2 sensor voltage bank 1	≥0,9(V)
Or (
Secondary O2 sensor voltage bank 1	≥0,8(V)
Secondary O2 sensor voltage gradient over 0.05s	≤66,5(V/sec)

				Secondary O2 sensor voltage	≥-66,5(V/sec)		
				Integrated Oxygen mass flow bank 1	>250(mg)		
))			
				(Primary A/F sensor lambda bank 1 (a) Primary lambda control set point bank 1	≤(a) + (b)		
				(b) maximum lambda deviation of lean mixture	=0,05		
				Primary A/F sensor lambda bank 1 (a) Primary lambda control set point	≥(a) - (b)		
				(b) maximum lambda deviation of rich mixture	≤0,05		
				for time	≥0,1(sec)		
				Integrated rich exhaust gas mass flow bank 1)	≥0,005(kg)		
				No pending or confirmed DTCs	=see sheet inhibit table		
				Basic enable conditions met	=see sheet enable tables		
P2272	Compare maximum secondary O2 sensor voltage bank 1 with a calibrated threshold during intrusive commanded rich lambda	Maximum Secondary O2 sensor voltage bank 1 during lambda shifting to rich	<0,8(V)			0,1(s)	2 Trip
				primary A/F commanded lambda	=1		
				primary A/F commanded lambda engine runs (=1 =TRUE		
				primary A/F commanded lambda engine runs (Deceleration Fuel Cut-Off (DFCO)	=1 =TRUE =FALSE		
				primary A/F commanded lambda engine runs (Deceleration Fuel Cut-Off (DFCO) for time	=1 =TRUE =FALSE ≥10(sec)		
				primary A/F commanded lambda engine runs (Deceleration Fuel Cut-Off (DFCO) for time Vehicle speed	=1 =TRUE =FALSE ≥10(sec) ≥9,32(mph)		
				primary A/F commanded lambda engine runs (Deceleration Fuel Cut-Off (DFCO) for time Vehicle speed engine speed	=1 =TRUE =FALSE ≥10(sec) ≥9,32(mph) ≤4000(rpm)		
				primary A/F commanded lambda engine runs (Deceleration Fuel Cut-Off (DFCO) for time Vehicle speed engine speed engine speed engine load (see Look-Up-Table #20)	=1 =TRUE =FALSE ≥10(sec) ≥9,32(mph) ≤4000(rpm) ≥1000(rpm) ≥ 12 to 1536(%)		
				primary A/F commanded lambda engine runs (Deceleration Fuel Cut-Off (DFCO) for time Vehicle speed engine speed engine speed engine load (see Look-Up-Table #20) Integrated air mass flow	=1 =TRUE =FALSE ≥10(sec) ≥9,32(mph) ≤4000(rpm) ≥1000(rpm) ≥ 12 to 1536(%) >0,06(kg)		
				primary A/F commanded lambda engine runs (Deceleration Fuel Cut-Off (DFCO) for time Vehicle speed engine speed engine load (see Look-Up-Table #20) Integrated air mass flow measured ambient temperatuer measured ambient pressure measured engine coolant temperature	=1 =TRUE =FALSE ≥10(sec) ≥9,32(mph) ≤4000(rpm) ≥1000(rpm) ≥12 to 1536(%) >0,06(kg) ≥-48(°C) ≥0(kPa) ≥57,96(°C)		

no transmission gear change for time)	=TRUE ≥2(sec)
(integrated exhaust gas mass flow after the following operation points are in the monitoring window bank 1	>0,06(kg)
(
Change of exhaust gas mass flow bank 1:	≤32(kg/h)
(a) - (b) Change of exhaust gas mass flow bank 1:	≥-32(kg/h)
(a) - (b) (a) exhaust gas mass flow bank 1 (b) filtered exhaust gas mass flow bank 1	
PT1 time constant Low window exhaust gas mass flow bank 1	=0,8(sec) ≤111,11(g/sec)
Low window exhaust gas mass flow bank 1	≥20(kg/h)
Low window exhaust gas mass flow	≥(a) - (b)
(a) minimum exhaust gas mass flow	<20(kg/h)
(b) offset exhaust gas mass flow bank 1 at tip-out	=5(g/sec)
for time	≥3(sec)
High window exhaust gas mass flow bank 1	≤0(g/sec)
High window exhaust gas mass flow bank 1)	≥6553,5(kg/h)
(Modeled catalyst temperature gradient bank 1:	≤40(°C)
(a) - (b) Modeled catalyst temperature gradient bank 1:	≥-40(°C)
(a) - (b) (a) Modeled catalyst temperature bank 1	
(b) filtered modeled catalyst temperature bank 1	=5(sec)

Low window modeled catalyst	≤1000(°C)
Low window Modeled catalyst	≥475(°C)
High window modeled catalyst	≤-273,15(°C)
High window Modeled catalyst	≥1262,83(°C)
Modeled catalyst temperature bank 1 after the first engine start and driving	>350(°C)
for time))	≥60(sec)
((
Integrated purge mass flow after a longer purge stop	≥0(g)
HC concentration factor in chacoal	≤64
relative fuel portion of canister purge to injected fuel mass : (a) / (b)	≤4
(a) fuel mass supplied by canister	
purge control (b) fuel mass supplied by injection	
Or	
open loop canister purge control	=TRUE
canister purge control mass flow into the manifold	≤7,11(g/sec)
((
integrated exhaust gas mass flow bank 1 since engine start (see Look-Up-Table #19)	>2250 to 10000(g)
integrated exhaust gas mass flow bank 1 after the following sensors's readiness	>0,1(kg)
(Secondary O2 sensor readiness	=TRUE
bank 1 Primary A/F sensor readiness bank 1	=TRUE
1	≥450(°C)
temperature deviation of Primary A/F sensor heater control bank 1: (a) - (b)	<50(°C)

 (a) primary A/F sensor temperature set point for heater control (b) measured primary A/F sensor temperature for heater control) 	<800(°C)
statemachine = sm statemachine (sm =0) : inactive a commanded lambda active primary A/F commanded lambda if the following conditions are met, sm moves to sm = 2	=FALSE =1
Secondary O2 sensor voltage bank1	≥0(V)
if the following conditions are met, sm moves to sm = 1	
Secondary O2 sensor voltage bank1	<0(V)
Secondary O2 sensor voltage bank1	≥0,45(V)
statemachine (sm=1) - rich mixture	= TRUE
a commanded lambda active primary A/F commanded lambda	=TRUE =0,87
for time	≥3(sec)
for time	≥0,1(sec)
Integrated Rich Gas Storage Capacity	≥1800(mg)
Primary A/F commanded lambda	≤0,8
Integreted Exhaust mass flow for time	≥0,2(kg) ≥0(sec)
if the following conditions are met, sm moves to sm = 2	
Secondary O2 sensor voltage	≥0,09944(V/sec)
Secondary O2 sensor voltage bank1	≥0,68(V)
) Or	
Secondary O2 sensor voltage bank1	≥0(V)
) Integrated exhaust mass flow bank 1	≥0(g)

if the following conditions are met,		
sm moves to sm = 3		

(Secondary O2 sensor voltage bank 1	≥0,9(V)
Or (
Secondary O2 sensor voltage bank 1	≥0,8(V)
Secondary O2 sensor voltage gradient over 0.05s	≤66,5(V/sec)
Secondary O2 sensor voltage gradient over 0.05s	≥-66,5(V/sec)
Integrated Oxygen mass flow bank 1	>250(mg)
))	
V Primary A/F sensor lambda bank 1 (a) Primary lambda control set point bank 1	≤(a) + (b)
(b) maximum lambda deviation of	=0,05
Primary A/F sensor lambda bank 1 (a) Primary lambda control set point	≥(a) - (b)
(b) maximum lambda deviation of rich mixture	≤0,05
for time Integrated rich exhaust gas mass flow bank 1)	≥0,1(sec) ≥0,005(kg)
(Secondary O2 sensor voltage bank 1	>(a) + (b)
 (a) minimum secondary O2 voltage (b) Offset voltage of Secondary O2 sensor 	=0,019531(V)
) statemachine (sm=2) - Lean mixture in catalyst a commanded lambda active primary A/F commanded lambda for time	=TRUE =1,07 ≥3(sec)
for time if the following conditions are met, sm moves to sm = 4	≥0,1(sec)
((Secondary O2 sensor voltage bank 1	≤0,07(V)

>1/000)

) Or	
(Secondary O2 sensor voltage	≤0,200195(V)
Secondary O2 sensor voltage	≤0,1(V/sec)
Secondary O2 sensor voltage	≥-0,09944(V/sec)
Integrated Oxygen mass flow bank 1	>150(mg)
)) (
V Primary A/F sensor lambda (a) Primary lambda control set point	≤(a) + (b)
(b) maximum lambda deviation of	=0,05
Primary A/F sensor lambda (a) Primary lambda control set point	≥(a) - (b)
(b) maximum lambda deviation of rich mixture	≤0,05
for time Integrated lean exhaust gas mass flow bank 1)	≥0,1(sec) ≥0,005(kg)
statemachine (sm=3) -	= TRUE
Lean mixture in catalyst a commanded lambda active bank 1	=TRUE
primary A/F commanded lambda	=1,07
for time	≥3(sec)
for time if the following conditions are met, sm moves to sm = 4	≥0,1(sec)
(Secondary O2 sensor voltage bank 1	≤0,07(V)
for time Or	≥0,1(sec)
(Secondary O2 sensor voltage bank 1	≤0,200195(V)
Secondary O2 sensor voltage	≤0,1(V/sec)
Secondary O2 sensor voltage	≥-0,09944(V/sec)
Integrated Oxygen mass flow bank 1	>150(ma)

))	
(Primary A/F sensor lambda bank 1 (a) Primary lambda control set point	≤(a) + (b)
(b) maximum lambda deviation of	=0,05
Primary A/F sensor lambda bank 1 (a) Primary lambda control set point	≥(a) - (b)
(b) maximum lambda deviation of rich	≤0,05
for time Integrated lean exhaust gas mass flow bank 1)	≥0,1(sec) ≥0,005(kg)
statemachine (sm=4) -	=TRUE
a commanded lambda active primary A/F commanded lambda for time	=TRUE =0,87 ≥3(sec)
for time	≥0,1(sec)
Integrated Rich Gas Storage Capacity for time	≥1800(mg)
Primary A/F commanded lambda	≤0,8
Integreted Exhaust mass flow for time	≥0,2(kg) ≥0(sec)
if the following conditions are met, sm moves to sm = 3	
(Secondary O2 sensor voltage bank 1	≥0,9(V)
Or (
(Secondary O2 sensor voltage bank 1	≥0,8(V)
Secondary O2 sensor voltage	≤66,5(V/sec)
Secondary O2 sensor voltage	≥-66,5(V/sec)
Integrated Oxygen mass flow bank 1	>250(mg)
))	
, Primary A/F sensor lambda bank 1	≤(a) + (b)

				 (a) Primary lambda control set point bank 1 (b) maximum lambda deviation of lean mixture Primary A/F sensor lambda bank 1 (a) Primary lambda control set point 	=0,05 ≥(a) - (b)		
				(b) maximum lambda deviation of rich mixture	≤0,05		
				for time Integrated rich exhaust gas mass flow bank 1)	≥0,1(sec) ≥0,005(kg)		
				No pending or confirmed DTCs	=see sheet inhibit table		
				Basic enable conditions met	=see sheet enable tables		
P2273	Compare maximum secondary O2 sensor voltage bank 2 with a calibrated threshold during intrusive commanded rich lambda	Minimum secondary O2 sensor voltage bank 2 during lambda shifting to lean	>0,200195(V)	primary A/F commanded lambda	=1	0,1(s)	2 Trip
				engine runs	=TRUE		
				Deceleration Fuel Cut-Off (DFCO)	=FALSE		
				for time	≥10(sec)		
				venicie speed	≥9,32(mpn)		
				engine speed	≤4000(rpm)		
				engine speed	≥1000(rpm)		
				(see Look-Up-Table #20)	2 12 10 1550(%)		
				Integrated air mass flow	>0,06(kg)		
				measured ambient temperatuer	≥-48(°C)		
				measured ambient pressure	≥0(kPa)		
				measured engine coolant	≥57,96(°C)		
				no transmission gear change	=TRUE		
				for time)	≥2(sec)		
				(integrated exhaust gas mass flow after the following operation points are in the monitoring window bank 2	>0,06(kg)		

Change of exhaust gas mass flow bank 2:	≤32(kg/h)
(a) - (b) Change of exhaust gas mass flow bank 2: (a) - (b)	≥-32(kg/h)
 (a) exhaust gas mass flow bank 2 (b) filtered exhaust gas mass flow bank 2 	
PT1 time constant Low window exhaust gas mass flow bank 2	=0,8(sec) ≤111,11(g/sec)
Low window exhaust gas mass flow bank 2	≥20(kg/h)
Low window exhaust gas mass flow	≥(a) - (b)
(a) minimum exhaust gas mass flow	<20(kg/h)
(b) offset exhaust gas mass flow	=5(g/sec)
for time	≥3(sec)
High window exhaust gas mass flow bank 2	≤0(g/sec)
High window exhaust gas mass flow bank 2)	≥6553,5(kg/h)
/ (Modeled catalyst temperature gradient bank 2:	≤40(°C)
(a) - (b) Modeled catalyst temperature gradient bank 2:	≥-40(°C)
(a) - (b) (a) Modeled catalyst temperature	
bank 2 (b) filtered modeled catalyst temperature bank 2	=5(sec)
Low window modeled catalyst	≤1000(°C)
temperature bank 2 Low window Modeled catalyst	≥475(°C)
temperature bank 2 High window modeled cotolyst	<_273 15/°C)
temperature bank 2	≥-213,13(C)
High window Modeled catalyst temperature bank 2	≥1262,83(°C)

Modeled catalyst temperature bank 2 after the first engine start and driving	>350(°C)
for time))	≥60(sec)
((Integrated purge mass flow after a	≥0(g)
HC concentration factor in chacoal	≤64
relative fuel portion of canister purge to injected fuel mass : (a) / (b)	≤4
(a) fuel mass supplied by canister purge control	
(b) fuel mass supplied by injection	
Or	
open loop canister purge control	=TRUE
canister purge control mass flow into the manifold	≤7,11(g/sec)
((integrated exhaust gas mass flow bank 2 since engine start (see Look-Up-Table #19)	>2250 to 10000(g)
integrated exhaust gas mass flow	>0,1(kg)
bank 2 after the following sensors's readiness	
bank 2 after the following sensors's readiness (Secondary O2 sensor readiness	=TRUE
bank 2 after the following sensors's readiness (Secondary O2 sensor readiness bank 2 Primary A/F sensor readiness bank 2	=TRUE =TRUE
bank 2 after the following sensors's readiness (Secondary O2 sensor readiness bank 2 Primary A/F sensor readiness bank 2)	=TRUE =TRUE
bank 2 after the following sensors's readiness (Secondary O2 sensor readiness bank 2 Primary A/F sensor readiness bank 2)	=TRUE =TRUE ≥450(°C)
<pre>bank 2 after the following sensors's readiness (Secondary O2 sensor readiness bank 2 Primary A/F sensor readiness bank 2) temperature deviation of Primary A/F sensor heater control bank 2: (a) - (b)</pre>	=TRUE =TRUE ≥450(°C) <50(°C)
 bank 2 after the following sensors's readiness (Secondary O2 sensor readiness bank 2 Primary A/F sensor readiness bank 2) temperature deviation of Primary A/F sensor heater control bank 2: (a) - (b) (a) primary A/F sensor temperature set point for heater control (b) measured primary A/F sensor temperature for heater control) 	=TRUE =TRUE ≥450(°C) <50(°C) <800(°C)

primary A/F commanded lambda if the following conditions are met, sm moves to sm = 2	=1
Secondary O2 sensor voltage bank1	≥0(V)
if the following conditions are met, sm moves to sm = 1	
Secondary O2 sensor voltage bank1	<0(V)
Secondary O2 sensor voltage bank1	≥0,45(V)
statemachine (sm=1) - rich mixture	= TRUE
a commanded lambda active primary A/F commanded lambda bank1	=TRUE =0,87
for time	≥3(sec)
for time if the following conditions are met, sm moves to sm = 2	≥0,1(sec)
Secondary O2 sensor voltage gradient over 0.05s	≥0,09944(V/sec)
Secondary O2 sensor voltage bank1	≥0,68(V)
) Or Secondary O2 sensor voltage bank1	≥0(V)
) Integrated exhaust mass flow bank 2	≥0(g)
if the following conditions are met, sm moves to sm = 3	
(Secondary O2 sensor voltage bank 2	≥0,9(V)
Or (Secondary O2 sensor voltage bank 2	≥0,8(V)
Secondary O2 sensor voltage	≤66,5(V/sec)
gradient over 0.05s Secondary O2 sensor voltage gradient over 0.05s	≥-66,5(V/sec)
Integrated Oxygen mass flow bank 2	>250(mg)

Primary A/F sensor lambda bank 2 (a) Primary lambda control set point	≤(a) + (b)
b) maximum lambda deviation of ean mixture	=0,05
Primary A/F sensor lambda bank 2 (a) Primary lambda control set point	≥(a) - (b)
b) maximum lambda deviation of rich	≤0,05
for time ntegrated rich exhaust gas mass flow bank 2	≥0,1(sec) ≥0,005(kg)
Secondary O2 sensor voltage bank 2	>(a) + (b)
(a) minimum secondary O2 voltage (b) Offset voltage of Secondary O2 sensor	=0,019531(V)
statemachine (sm=2) - Lean mixture in catalyst a commanded lambda active primary A/F commanded lambda for time	=TRUE =1,07 ≥3(sec)
or time	≥0,1(sec)
ntegrated Oxygen Storage Capacity	≥1600(mg)
or time Primary A/F commanded lambda pank 2	≥1(sec) ≥1,1499
ntegreted Exhaust mass flow for time	≥0,2(kg) ≥0(sec)
f the following conditions are met, sm moves to sm = 4	
(Secondary O2 sensor voltage bank 2	≤0,07(V)
or time	≥0,1(sec)
) Dr	
Secondary O2 sensor voltage	≤0,200195(V)
Secondary O2 sensor voltage gradient over 0.05s	≤0,1(V/sec)

Secondary O2 sensor voltage gradient over 0.05s	≥-0,09944(V/sec)		
Integrated Oxygen mass flow bank 2	>150(mg)		
))			
(Primary A/F sensor lambda (a) Primary lambda control set point	≤(a) + (b)		
(b) maximum lambda deviation of lean mixture	=0,05		
Primary A/F sensor lambda (a) Primary lambda control set point	≥(a) - (b)		
(b) maximum lambda deviation of rich mixture	≤0,05		
for time Integrated lean exhaust gas mass flow bank 2)	≥0,1(sec) ≥0,005(kg)		
statemachine (sm=3) -	= TRUE		
a commanded lambda active bank 2	=TRUE		
primary A/F commanded lambda	=1,07		
for time	≥3(sec)		
for time	≥0,1(sec)		
Integrated Oxygen Storage Capacity	≥1600(mg)		
for time Primary A/F commanded lambda	≥1(sec) ≥1,1499		
Integreted Exhaust mass flow for time	≥0,2(kg) ≥0(sec)		
) if the following conditions are met, sm moves to sm = 4			
(Secondary O2 sensor voltage bank 2	≤0,1(V)		
for time Or	≥0,1(sec)		
(Secondary O2 sensor voltage bank 2	≤0,200195(V)		
Secondary O2 sensor voltage gradient over 0.05s	≤0,1(V/sec)		

Secondary O2 sensor voltage gradient over 0.05s	≥-0,09944(V/sec)		
Integrated Oxygen mass flow bank 2	>150(mg)		
)) (
Primary A/F sensor lambda bank 2 (a) Primary lambda control set point	≤(a) + (b)		
(b) maximum lambda deviation of lean mixture	=0,05		
Primary A/F sensor lambda bank 2 (a) Primary lambda control set point	≥(a) - (b)		
(b) maximum lambda deviation of rich mixture	≤0,05		
for time Integrated lean exhaust gas mass flow bank 2)	≥0,1(sec) ≥0,005(kg)		
statemachine (sm=4) - Bich mixturo in catalyst	=TRUE		
a commanded lambda active	=TRUE		
primary A/F commanded lambda for time	=0,87 ≥3(sec)		
for time if the following conditions are met, sm moves to sm = 3	≥0,1(sec)		
(Secondary O2 sensor voltage bank 2	≥0,9(V)		
Or			
(Secondary O2 sensor voltage bank 2	≥0,76(V)		
Secondary O2 sensor voltage gradient over 0.05s	≤66,5(V/sec)		
Secondary O2 sensor voltage gradient over 0.05s	≥-66,5(V/sec)		
Integrated Oxygen mass flow bank 2	>250(g)		
))			
(Primary A/F sensor lambda bank 2 (a) Primary lambda control set point bank 2	≤(a) + (b)		
(b) maximum lambda deviation of	=0,05		
Primary A/F sensor lambda bank 2 (a) Primary lambda control set point	≥(a) - (b)		

					(b) maximum lambda deviation of rich mixture for time Integrated rich exhaust gas mass flow bank 2)	≤0,05 ≥0,1(sec) ≥0,005(kg)		
					No pending or confirmed DTCs	=see sheet inhibit table		
					Basic enable conditions met	=see sheet enable tables		
21. IPSTREAM/D OWNSTREA M OXYGEN SENSOR CIRCUIT	P0140	Path 1: Signal range check - open circuit	Mean value of difference between loaded and unloaded sensor voltage for 3 load pulses	≥3,598633(V)	Fault suspicion is active for time, which is the following:	≥3(sec)	0(s)	2 Trip
			for time	≥5(sec)	(Output voltage of O2 sensor Output voltage of O2 sensor)	≥0,322(V) ≤0,552(V)		
					/ Enable conditions for operating readiness of O2 sensor 2 bank 1(refer above common conditions)	=TRUE		
		Path 2: Internal resistance plausibility - interrupted ground wire	Internal resistance of O2 sensor	>40000(Ohm)	Exhaust gas temperature at O2 sensor	>600(°C)		
					Enable conditions for operating readiness of O2 sensor 2 bank 1 (refer above common conditions)	=TRUE		
					Basic enable conditions met	=see sheet enable tables		
					No pending or confirmed DTCs	=see sheet inhibit tables		
	P0160	Path 1: Signal range check - open circuit	Mean value of difference between loaded and unloaded sensor voltage for 3 load pulses	≥3,598633(V)	Fault suspicion is active for time, which is the following:	≥3(sec)	0(s)	2 Trip
			for time	≥5(sec)	(Output voltage of O2 sensor	≥0.322(V)		
					Output voltage of O2 sensor)	≤0,552(V)		
					Enable conditions for operating readiness of O2 sensor 2 bank 2 (refer above common conditions)	=TRUE		
			ECN	Section 392 of 772				504 o
	250BDG07	7A Part 2 ECM Summary	r Tables					
--	---------------------------------------	-----------------------	---	-----------------------------	--------	--------------		
Path 2: Internal resistance plausibility	Internal resistance of O2 - sensor	>40000(Ohm)	Exhaust gas temperature at O2 sensor	>600(°C)				
interrupted ground wire			Enable conditions for operating readiness of O2 sensor 2 bank 2 (refer above common conditions)	=TRUE				
			Basic enable conditions met	=see sheet enable tables				
			No pending or confirmed DTCs	=see sheet inhibit tables				
P0138 Signal range check - short circuit to battery	Set point lambda	>0,995	Common Conditions: Enable conditions for operating	=TRUE	0,2(s)	2 Trip		
	Output voltage of O2 sensor	>1.201172(V)	readiness of O2 sensor 2 bank 1					
			Battery voltage Enable conditions for the status of signal fault in the previous driving with the availablilty of internal	>10,7(V) =TRUE				
			(
			Internal resistance is valid	=TRUE				
			(Internal resistance is valid after X measurements	=TRUE				
			X = counter for validating internal resistance	>10(counts)				
) O2 Sensor open circuit fault detected	=FALSE				
) (
			Expected downstream O2 sensor readiness					
			(Protective heating is finished	=TRUE				
			Status of downstream O2 sensor heating for hot engine conditions					
			C Engine coolant temperature Conditions for enabling sensor heating for O2 sensor	>-48(°C) =TRUE				
			(ECU is not in POST DRIVE state Battery Voltage	=TRUE				
			Engine start is completed	=TRUE				
) Dew point end is reached (=TRUE				
			(
	E	CM Section 393 of 772	a ≥ (b) * (((c) * (d)) + 1)			505 of 1,098		

Where: (a) Integrated heat release since engine start (b) Downstream O2 sensor heat threshold for release of heating (kJ) (see Look-Up-Table #15)	=200 to 2200(kJ)
(c) Instance of dew point end class of sensor 2 at bank 1 / Factor to adjust the heat energy threshold depending on the could start counter and the start temperature (see Look-Up-Table #16)	=0 to 0.5
(d) Number of drive cycles without reaching dew point end of downstream sensor (limited to max of 4)	
) Dew point end is reached at upstream of catalyst	
$a \ge (b) * (((c) * (d)) + 1)$ Where: (a) Integrated heat release since	
engine start (b) Upstream O2 sensor heat threshold for release of heating (kJ) (see Look-Up-Table #11)	=10 to 500(kJ)
(c) Instance of dew point end class of sensor 1 at bank 1 / Factor to adjust the heat energy threshold depending on the could start counter and the start temperature (see Look-Up-Table #12)	=0 to 0.5
 (d) Number of drive cycles without reaching dew point end of downstream sensor (limited to max of 3) 	
) for time	≥A+B(sec)

where A: Operating readiness, HEGO	=25(sec)
bank 1 / Debouncing time protective heating finished B: Operating readiness, HEGO sensor 2 bank 1 / Debouncing time for expected operating readiness	=30(sec)
) OR Exhaust gas sensor ready for operation	=TRUE
Status of heating enable conditions for the sensor operating readiness	=TRUE
(Protective heating is finished for time	≥25(sec)
OR Internal resistance OK for operating readiness	=TRUE
(Unfiltered internal resistance of	≤2000(Ohm)
HEGO sensor Protective heating is finished Counter for valid internal resistance measurements)	≥3(counts)
) Status of sensor signal enable conditions for the sensor operating readiness	=TRUE
(Internal resistance OK for operating readiness OR (=TRUE
(≥0,552(V)
Output voltage of HEGO Sensor and	
Output voltage of HEGO Sensor	≤1,201(V)
) OR Output voltage of HEGO Sensor	≤0,322(V)
) OR Sensor voltage stuck in	=TRUE

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					((Output voltage of HEGO Sensor Output voltage of HEGO Sensor	<0,552(V) >0,322(V)		
					(Sensor open circuit fault existed in	=TRUE		
					previous trip OR Sensor open circuit fault currently not detected	=TRUE		
) Electrical diagnostics enabled	=TRUE		
) for time	≥20(sec)		
) for time)	≥0,2(sec)		
) Basic enable conditions met	=see sheet enable tables		
					No pending or confirmed DTCs	=see sheet inhibit		
						tables		
I	P0158	Signal range check - short circuit to battery	Set point lambda	>0,995	<u>Common Conditions:</u> Enable conditions for operating readiness of O2 sensor 2 bank 2	tables =TRUE	0,2(s)	2 Trip
l	P0158	Signal range check - short circuit to battery	Set point lambda Output voltage of O2 sensor	>0,995 >1,201172(V)	<u>Common Conditions:</u> Enable conditions for operating readiness of O2 sensor 2 bank 2 (Battery voltage Enable conditions for the status of signal fault in the previous driving with the availablilty of internal resistance value	tables =TRUE >10,7(V) =TRUE	0,2(s)	2 Trip
I	P0158	Signal range check - short circuit to battery	Set point lambda Output voltage of O2 sensor	>0,995 >1,201172(V)	Common Conditions: Enable conditions for operating readiness of O2 sensor 2 bank 2 (Battery voltage Enable conditions for the status of signal fault in the previous driving with the availablilty of internal resistance value (Internal resistance is valid (=TRUE >10,7(V) =TRUE	0,2(s)	2 Trip
I	P0158	Signal range check - short circuit to battery	Set point lambda Output voltage of O2 sensor	>0,995 >1,201172(V)	Common Conditions: Enable conditions for operating readiness of O2 sensor 2 bank 2 (Battery voltage Enable conditions for the status of signal fault in the previous driving with the availability of internal resistance value (Internal resistance is valid (Internal resistance is valid after X measurements	=TRUE >10,7(V) =TRUE =TRUE =TRUE	0,2(s)	2 Trip
I	P0158	Signal range check - short circuit to battery	Set point lambda Output voltage of O2 sensor	>0,995 >1,201172(V)	Common Conditions: Enable conditions for operating readiness of O2 sensor 2 bank 2 (Battery voltage Enable conditions for the status of signal fault in the previous driving with the availability of internal resistance value (Internal resistance is valid (Internal resistance is valid after X measurements X = counter for validating internal resistance	tables =TRUE >10,7(V) =TRUE =TRUE =TRUE >10(counts)	0,2(s)	2 Trip
	P0158	Signal range check - short circuit to battery	Set point lambda Output voltage of O2 sensor	>0,995 >1,201172(V)	Common Conditions: Enable conditions for operating readiness of O2 sensor 2 bank 2 (Battery voltage Enable conditions for the status of signal fault in the previous driving with the availability of internal resistance value (Internal resistance is valid (Internal resistance is valid after X measurements X = counter for validating internal resistance) O2 Sensor open circuit fault detected	=TRUE >10,7(V) =TRUE =TRUE =TRUE >10(counts) =FALSE	0,2(s)	2 Trip

Expected downstream O2 sensor readiness	
(Protective heating is finished	=TRUE
(Status of downstream O2 sensor	
heating for hot engine conditions (
Engine coolant temperature Conditions for enabling sensor heating for O2 sensor	>-48(°C) =TRUE
ECU is not in POST DRIVE state Battery Voltage Engine start is completed	=TRUE ≤16,5(V) =TRUE
) Dew point end is reached ((=TRUE
(a ≥ (b) * (((c) * (d)) + 1) Where:	
(a) Integrated heat release since engine start	
(b) Downstream O2 sensor heat threshold for release of heating (kJ) (see Look-Up-Table #17)	=200 to 2200(kJ)
(c) Instance of dew point end class of sensor 2 at bank 2 / Factor to adjust the heat energy threshold depending on the could start counter and the start temperature (see Look-Up-Table #18)	=0 to 0.5
 (d) Number of drive cycles without reaching dew point end of downstream sensor (limited to max of 4) 	
) Dew point end is reached at upstream of catalyst (
a ≥ (b) * (((c) * (d)) + 1) Where:	
(a) Integrated heat release since engine start	
 (b) Upstream O2 sensor heat threshold for release of heating (kJ) (see Look-Up-Table #13) 	=10 to 500(kJ)

(c) Instance of dew point end class of sensor 1 at bank 2 / Factor to adjust the heat energy threshold depending on the could start counter and the start temperature (see Look-Up-Table #14)	=0 to 0.5
 (d) Number of drive cycles without reaching dew point end of downstream sensor (limited to max of 3)) 	
) for time	≥A+B(sec)
where A: Operating readiness, HEGO sensor 2 bank 1 / Debouncing time	=25(sec)
heating finished B: Operating readiness, HEGO sensor 2 bank 1 / Debouncing time for expected operating readiness	=30(sec)
) OR Exhaust gas sensor ready for operation	=TRUE
Status of heating enable conditions for the sensor operating readiness	=TRUE
Protective heating is finished for time	≥25(sec)
OR Internal resistance OK for operating readiness	=TRUE
(Unfiltered internal resistance of HEGO sensor	≤2000(Ohm)
Protective heating is finished Counter for valid internal resistance measurements)	≥3(counts)
) Status of sensor signal enable conditions for the sensor operating readiness	=TRUE
1	

			Internal resistance OK for operating readiness OR ((Output voltage of HEGO Sensor Output voltage of HEGO Sensor	=TRUE ≥0,552(V) ≤1,201(V)		
) OR Output voltage of HEGO Sensor	≤0,322(V)		
) OR Sensor voltage stuck in countervoltage band ((=TRUE		
			(Output voltage of HEGO Sensor Output voltage of HEGO Sensor	<0,552(V) >0,322(V)		
) (Sensor open circuit fault existed in previous trip	=TRUE		
			OR Sensor open circuit fault currently not detected	=TRUE		
) Electrical diagnostics enabled	=TRUE		
) for time	≥20(sec)		
) for time))	≥0,2(sec)		
) Basic enable conditions met	=see sheet enable tables		
			No pending or confirmed DTCs	=see sheet inhibit tables		
Signal range check - short circuit to ground	Mean value of difference between loaded and unloade sensor voltage for 3 load	<0,014648(V) ed	Fault suspicion is active when the following conditions are satisfied for time	≥3(sec)	0(s)	2 Trip

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		for time	≥5(sec)	(Output voltage of O2 sensor Catalyst purge active Deceleration Fuel Cut-Off Battery voltage) Basic enable conditions met No pending or confirmed DTCs	<0,058(V) =FALSE =FALSE >10,7(V) =see sheet enable tables =see sheet inhibit tables		
P0157	Signal range check - short circuit to ground	Mean value of difference between loaded and unloaded sensor voltage for 3 load pulses for time	<0,014648(V) ≥5(sec)	Fault suspicion is active when the following conditions are satisfied for time (Output voltage of O2 sensor Catalyst purge active Deceleration Fuel Cut-Off Battery voltage) Basic enable conditions met No pending or confirmed DTCs	≥3(sec) <0,058(V) =FALSE =FALSE >10,7(V) =see sheet enable tables =see sheet inhibit tables	0(s)	2 Trip
P2232	Heater Coupling- Short Circuit between the sensor signal wire and the sensor heater	Difference of the present and the previous output voltage of O2 sensor	>2,001953(V)	Time frame for checking heater coupling is active (<0,04(sec)	4(events)	2 Trip
		Counter for Heater turn off events	≥6(events)	Dew point end is reached for time Sensor heating is turned on) Enable conditions for operating readiness of O2 sensor 2 bank 1 (refer above common conditions) Basic enable conditions met	≥10(sec) =FALSE =TRUE =see sheet enable tables		
P2235	Heater Coupling- Short Circuit between the sensor signal wire	Difference of the present and the previous output voltage of	>2,001953(V)	No pending or confirmed DTCs Time frame for checking heater coupling is active	=see sheet inhibit tables <0,04(sec)	4(events)	2 Trip
	and the sensor heater	O2 sensor Counter for Heater turn off events	≥6(events)	(Dew point end is reached for time Sensor heating is turned on)	≥10(sec) =FALSE		

					Enable conditions for operating readiness of O2 sensor 2 bank 2 (refer above common conditions) Basic enable conditions met No pending or confirmed DTCs	=TRUE =see sheet enable tables =see sheet inhibit tables		
22. HO2S HEATER DIAGNOSIS	P0141	Compares the measured Secondary HO2S sensor internal resistance with a calibrated threshold*	Internal resistance of Secondary HO2S sensor bank 1 (see Look-Up-Table #45)	>500 to 10000(Ohm)			6(s)	2 Trip
					(Filtered normalized heating power for Secondary HO2S sensor bank 1	>0.6		
					engine stop time copied at the time of first engine start in the driving cycle	>120(sec)		
		calibrated threshold* = the criteria required to be met by the component vendor for heater circuit performance at biob mileage			state of variable TiEngOff_tiFirstStrt (formerly tengszlst)	=TRUE		
		ngrimicage			intake air temperature	>-39,75(°C)		
					state of start temperatures in dew point end calculated for Secondary HO2S sensor bank 1	=TRUE		
					Battery Voltage	≤16,1(V)		
					Battery Voltage	≥10,7(V)		
					state for end of start	= TRUE		
					engine speed engine speed for normal, non- repeated, key starts (see Look-Up-Table #84)	>40(rpm) >600 to 700(rpm)		
)			
					(Filtered-modeled exhaust gas temperature for Secondary HO2S sensor bank 1 beating	≤700(°C)		
					Filtered-modeled exhaust gas temperature for Secondary HO2S	≥350(°C)		
					Bit heater power stage diagnostics	=TRUE		
					enable condition for heater performance diagnosis after stop- phase	=TRUE		
					state for end of start	=FALSE		
			EC	M Section 401 of 772				513 of

for time state for end of start for time	≥0(sec) =TRUE ≥0(sec)
internal resistance measurement valid if the following conditions are met:	=TRUE
Number of calculations of the internal resistance	>10(counts)
Secondary HO2S sensor voltage	≤0,41(V)
Secondary HO2S sensor voltage bank 1 Or	≥0(V)
Secondary HO2S sensor voltage bank 1	>0,49(V)
absolute sensor voltage difference: ABS((a) - (b)) (a) Secondary HO2S sensor voltage bank 1	≤0.025(V)
(b) Prior Secondary HO2S sensor voltage bank 1	
Secondary HO2S sensor bank 1 heater control on	=TRUE
for time	≥30(sec)
Internal resistance measurement active of Secondary HO2S sensor bank 1 with	=TRUE
Absolute Secondary HO2S sensor bank 1 voltage difference: ABS((a) - (b))	≤0,2(V)
(a) Secondary HO2S sensor bank 1 voltage after freeze for measurement of the internal resistance	
(b) Secondary HO2S sensor bank 1 voltage without load for the measurement of the internal resistance	
Absolute Secondary HO2S sensor bank 1 voltage difference: ABS((a) - (b))	≥0.0(V)
(a) Secondary HO2S sensor bank 1 voltage with load for the measurement of the internal resistance	

					(b) Secondary HO2S sensor bank 1 voltage without load for the measurement of the internal resistance			
					no electrical sensor diagnostic faults of implausible high internal resistance	=TRUE		
					no DFCO	=TRUE		
					Minimum heater performance	≥120(sec)		
					Filtered-modeled exhaust gas temperature for Secondary HO2S	≥630(°C)		
					Internal resistance of Secondary	<10000(Ohm)		
					No pending or confirmed DTCs	=see sheet inhibit table		
					Basic enable conditions met	=see sheet enable tables		
F	P0161	Compares the measured Secondary HO2S sensor internal resistance with a calibrated threshold*	Internal resistance of Secondary HO2S sensor bank 2 (see Look-Up-Table #46)	>500 to 10000(Ohm)			6(s)	2 Trip
					(Filtered normalized heating power for Secondary HO2S sensor bank 2 engine stop time copied at the time of first engine start in the driving cycle	>120(sec)		
		calibrated threshold* = the criteria required to be met by the component vendor for heater circuit performance at high mileage			state of variable TiEngOff_tiFirstStrt (formerly tengszlst)	=TRUE		
					state of start temperatures in dew point end calculated for Secondary HO2S sensor bank 2 Battery Voltage	<16 1(V)		
					Battery Voltage state for end of start	≥10,7(V) = TRUE		
					engine speed engine speed for normal, non- repeated, key starts (see Look-Up-Table #84)	>40(rpm) >600 to 700(rpm)		
)			
					,			

Filtered-modeled exhaust gas temperature for Secondary HO2S	≤700(°C)
Filtered-modeled exhaust gas temperature for Secondary HO2S sensor bank 2 heating	≥350(°C)
enable condition for heater performance diagnosis after stop- phase	=TRUE
state for end of start for time state for end of start for time	=FALSE ≥0(sec) =TRUE ≥0(sec)
internal resistance measurement valid if the following conditions are met:	=TRUE
Number of calculations of the internal resistance	>10(counts)
Secondary HO2S sensor voltage	≤0,41(V)
Secondary HO2S sensor voltage bank 2	≥0(V)
Secondary HO2S sensor voltage bank 2	>0,49(V)
, absolute sensor voltage difference: ABS((a) - (b)) (a) Secondary HO2S sensor voltage bank 2	≤0.025(V)
(b) Prior Secondary HO2S sensor voltage bank 2	
Secondary HO2S sensor bank 2	=TRUE
for time	≥30(sec)
Internal resistance measurement active of Secondary HO2S sensor bank 2 with	=TRUE
Absolute Secondary HO2S sensor bank 2 voltage difference: ABS((a) - (b))	≤0,2(V)
(a) Secondary HO2S sensor bank 2 voltage after freeze for measurement of the internal resistance	

					 (b) Secondary HO2S sensor bank 2 voltage without load for the measurement of the internal resistance Absolute Secondary HO2S sensor bank 2 voltage difference: ABS((a) - (b)) (a) Secondary HO2S sensor bank 2 voltage with load for the measurement of the internal resistance (b) Secondary HO2S sensor bank 2 voltage without load for the measurement of the internal resistance 	≥0.0(V)		
					no electrical sensor diagnostic faults of implausible high internal resistance	=TRUE		
					no DFCO	=TRUE		
					Minimum heater performance	≥120(sec)		
					Filtered-modeled exhaust gas temperature for Secondary HO2S sensor bank 2 beating	≥630(°C)		
					Internal resistance of Secondary	<10000(Ohm)		
					No pending or confirmed DTCs	=see sheet inhibit table		
					Basic enable conditions met	=see sheet enable tables		
23. HO2S HEATER CONTROL CIRCUIT DIAGNOSIS	P0036	Diagnoses the HO2S Heater Control Bank 1 Sensor 2 low side driver circuit for open circuit faults	Voltage low during driver off state (indicates open circuit)	Open Circuit:≥ 200 K Ω impedance between ECU pin and load	2 General enabling condition for powerstage diagnosis	=TRUE	0,1(s)	2 Trip
					(Battery voltage Battery voltage Engine speed	<25500(mV) >10900(mV) ≥80(rpm)		
					Conditions for enabling sensor heating for O2 sensor	=TRUE		
					(ECU is not in POST DRIVE state	=TRUE		
					Battery Voltage	≤16,5(V)		
					Engine start is completed	=TRUE		
				FOM 0	, and			547

	(
	Dew point end is reached	=TRUE
	Integrated heat release since engine start	≥(b) * (((c) * (d)) + 1)
	(b) Downstream O2 sensor heat threshold for release of heating (kJ) (see Look-Up-Table #15)	=200 to 2200(kJ)
	(c) Instance of dew point end class of sensor 2 at bank 1 / Factor to adjust the heat energy threshold depending on the could start counter and the start temperature (see Look-Up-Table #16)	=0 to 0.5
	 (d) Number of drive cycles without reaching dew point end of downstream sensor (limited to max of 4)) 	
	and Dew point end is reached at upstream of catalyst	
	Integrated heat release since engine	≥(b) * (((c) * (d)) + 1)
	(b) Upstream O2 sensor heat threshold for release of heating (kJ) (see Look-Up-Table #11)	=10 to 500(kJ)
	 (c) Instance of dew point end class of sensor 1 at bank 1 / Factor to adjust the heat energy threshold depending on the could start counter and the start temperature (see Look-Up-Table #12) (d) Number of drive cycles without reaching dew point end of downstream sensor (limited to max of 3) 	=0 to 0.5
) for time)	≥10(sec)
	OR (
	Battery voltage OR (<15(V)
2	Environmental temperature	>3003,56(°C)

				and Ignition is ON for time) for time) Basic enable conditions met No Pending or Confirmed DTCs	=TRUE ≥0(sec) ≥0(sec) =see sheet enable tables =see sheet inhibit tables		
P0037	Diagnoses the HO2S Heater Control Bank 1 Sensor 2 low side driver circuit for circuit low faults	Voltage low during driver off state (indicates short-to- ground)	Short-to-ground: ≤ 0.5 Ω impedance between signal and controller ground(-)	General enabling condition for powerstage diagnosis	=TRUE	0,1(s)	2 Trip
				(Battery voltage Battery voltage Engine speed	<25500(mV) >10900(mV) ≥80(rpm)		
				Conditions for enabling sensor heating for O2 sensor	=TRUE		
				ECU is not in POST DRIVE state	=TRUE		
				Battery Voltage and	≤16,5(V)		
				Engine start is completed) and (=TRUE		
				Dew point end is reached (=TRUE		
				Integrated heat release since engine start	≥(b) * (((c) * (d)) + 1)		
				(b) Downstream O2 sensor heat threshold for release of heating (kJ) (see Look-Up-Table #15)	=200 to 2200(kJ)		
				(c) Instance of dew point end class of sensor 2 at bank 1 / Factor to adjust the heat energy threshold depending on the could start counter and the start temperature (see Look-Up-Table #16)	=0 to 0.5		

P0038

			 (d) Number of drive cycles without reaching dew point end of downstream sensor (limited to max of 4)) and Dew point end is reached at upstream of catalyst (Integrated heat release since engine start (b) Upstream O2 sensor heat threshold for release of heating (kJ) (see Look-Up-Table #11) 	≥(b) * (((c) * (d)) + 1) =10 to 500(kJ)		
			 (c) Instance of dew point end class of sensor 1 at bank 1 / Factor to adjust the heat energy threshold depending on the could start counter and the start temperature (see Look-Up-Table #12) (d) Number of drive cycles without reaching dew point end of downstream sensor (limited to max of 3) 	=0 to 0.5		
) for time) OR	≥10(sec)		
			(Battery voltage OR (<15(V)		
			Environmental temperature	>3003,56(°C)		
			and Ignition is ON for time)	=TRUE ≥0(sec)		
) for time	≥0(sec)		
) Basic enable conditions met	=see sheet enable		
			No Pending or Confirmed DTCs	esee sheet inhibit tables		
Diagnoses the HO2S Heater Control Bank 1 Sensor 2 low side driver circuit for circuit high faults	Voltage high during driver on state (indicates short-to-power)	Short-to-power: ≤ 0.5 Ω impedance between signal and controller power	General enabling condition for powerstage diagnosis	=TRUE	0,1(s)	2 Trip
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Battery voltage Engine speed	>10900(mV) ≥80(rpm)
) Conditions for enabling sensor heating for O2 sensor	=TRUE
(ECU is not in POST DRIVE state	=TRUE
and Battery Voltage	≤16,5(V)
Engine start is completed	=TRUE
) and (
Dew point end is reached	=TRUE
(Integrated heat release since engine start	≥(b) * (((c) * (d)) + 1)
(b) Downstream O2 sensor heat threshold for release of heating (kJ) (see Look-Up-Table #15)	=200 to 2200(kJ)
(c) Instance of dew point end class of sensor 2 at bank 1 / Factor to adjust the heat energy threshold depending on the could start counter and the start temperature (see Look-Up-Table #16)	=0 to 0.5
 (d) Number of drive cycles without reaching dew point end of downstream sensor (limited to max of 4) and Dew point end is reached at upstream of catalyst 	
(Integrated heat release since engine	≥(b) * (((c) * (d)) + 1)
start (b) Upstream O2 sensor heat threshold for release of heating (kJ) (see Look-Up-Table #11)	=10 to 500(kJ)
(c) Instance of dew point end class of sensor 1 at bank 1 / Factor to adjust the heat energy threshold depending on the could start counter and the start temperature (see Look-Up-Table #12)	=0 to 0.5

				 (d) Number of drive cycles without reaching dew point end of downstream sensor (limited to max of 3)) 			
) for time) OR	≥10(sec)		
				(Battery voltage OR (<15(V)		
				Environmental temperature and	>3003,56(°C)		
				Ignition is ON	=TRUE		
				tor time)	≥0(sec)		
				for time	≥0(sec)		
) Basic enable conditions met	=see sheet enable tables		
				No Pending or Confirmed DTCs	=see sheet inhibit tables		
P0056	Diagnoses the HO2S Heater Control Bank 2 Sensor 2 low side driver circuit for open circuit faults	Voltage low during driver off state (indicates open circuit)	Open Circuit:≥ 200 K Ω impedance between ECU pin and load	General enabling condition for powerstage diagnosis	=TRUE	0,1(s)	2 Trip
P0056	Diagnoses the HO2S Heater Control Bank 2 Sensor 2 low side driver circuit for open circuit faults	Voltage low during driver off state (indicates open circuit)	Open Circuit:≥ 200 K Ω impedance between ECU pin and load	General enabling condition for powerstage diagnosis (Battery voltage Battery voltage Engine speed)	=TRUE <25500(mV) >10900(mV) ≥80(rpm)	0,1(s)	2 Trip
P0056	Diagnoses the HO2S Heater Control Bank 2 Sensor 2 low side driver circuit for open circuit faults	Voltage low during driver off state (indicates open circuit)	Open Circuit:≥ 200 K Ω impedance between ECU pin and load	General enabling condition for powerstage diagnosis (Battery voltage Battery voltage Engine speed) Conditions for enabling sensor heating for O2 sensor	=TRUE <25500(mV) >10900(mV) ≥80(rpm) =TRUE	0,1(s)	2 Trip
P0056	Diagnoses the HO2S Heater Control Bank 2 Sensor 2 low side driver circuit for open circuit faults	Voltage low during driver off state (indicates open circuit)	Open Circuit:≥ 200 K Ω impedance between ECU pin and load	General enabling condition for powerstage diagnosis (Battery voltage Battery voltage Engine speed) Conditions for enabling sensor heating for O2 sensor (ECU is not in POST DRIVE state and	=TRUE <25500(mV) >10900(mV) ≥80(rpm) =TRUE =TRUE	0,1(s)	2 Trip
P0056	Diagnoses the HO2S Heater Control Bank 2 Sensor 2 low side driver circuit for open circuit faults	Voltage low during driver off state (indicates open circuit)	Open Circuit:≥ 200 K Ω impedance between ECU pin and load	General enabling condition for powerstage diagnosis (Battery voltage Battery voltage Engine speed) Conditions for enabling sensor heating for O2 sensor (ECU is not in POST DRIVE state and Battery Voltage	=TRUE <25500(mV) >10900(mV) ≥80(rpm) =TRUE =TRUE ≤16,5(V)	0,1(s)	2 Trip
P0056	Diagnoses the HO2S Heater Control Bank 2 Sensor 2 low side driver circuit for open circuit faults	Voltage low during driver off state (indicates open circuit)	Open Circuit:≥ 200 K Ω impedance between ECU pin and load	General enabling condition for powerstage diagnosis (Battery voltage Battery voltage Engine speed) Conditions for enabling sensor heating for O2 sensor (ECU is not in POST DRIVE state and Battery Voltage and Engine start is completed	=TRUE <25500(mV) >10900(mV) ≥80(rpm) =TRUE =TRUE ≤16,5(V) =TRUE	0,1(s)	2 Trip
P0056	Diagnoses the HO2S Heater Control Bank 2 Sensor 2 low side driver circuit for open circuit faults	Voltage low during driver off state (indicates open circuit)	Open Circuit:≥ 200 K Ω impedance between ECU pin and load	General enabling condition for powerstage diagnosis (Battery voltage Battery voltage Engine speed) Conditions for enabling sensor heating for O2 sensor (ECU is not in POST DRIVE state and Battery Voltage and Engine start is completed) and (=TRUE <25500(mV) >10900(mV) ≥80(rpm) =TRUE =TRUE ≤16,5(V) =TRUE	0,1(s)	2 Trip

Integrated heat release since engine start	≥(b) * (((c) * (d)) + 1)
(b) Downstream O2 sensor heat threshold for release of heating (kJ) (see Look-Up-Table #17)	=200 to 2200(kJ)
(c) Instance of dew point end class of sensor 2 at bank 2 / Factor to adjust the heat energy threshold depending on the could start counter and the start temperature (see Look-Up-Table #18)	=0 to 0.5
 (d) Number of drive cycles without reaching dew point end of downstream sensor (limited to max of 4) 	
and Dew point end is reached at upstream of catalyst	
Integrated heat release since engine	≥(b) * (((c) * (d)) + 1)
(b) Downstream O2 sensor heat threshold for release of heating (kJ) (see Look-Up-Table #13)	=10 to 500(kJ)
(c) Instance of dew point end class of sensor 1 at bank 2 / Factor to adjust the heat energy threshold depending on the could start counter and the start temperature (see Look-Up-Table #14)	=0 to 0.5
(d) Number of drive cycles without reaching dew point end of downstream sensor	
)) for time	>10(sec)
) OR	-10(300)
(Battery voltage OR	<15(V)
(Environmental temperature	>3003,56(°C)
Ignition is ON for time	=TRUE ≥0(sec)

)

)			
			for time	≥0(sec)		
) Basic enable conditions met	=see sheet enable		
			No Donding on Confirmed DTCo	tables		
			No Pending of Confirmed DTCs	tables		
D0057	Diagnosos the HO2S Hostor Voltage low during driver off	Short to ground: < 0.5	Conoral anabling condition for		0.1(a)	2 Trip
P0057	Control Bank 2 Sensor 2 low state (indicates short-to- side driver circuit for circuit low ground) faults	Short-to-ground. ≤ 0.5 Ω impedance between signal and controller ground	powerstage diagnosis	=IRUE	0, I(S)	2 111p
			(Rottory voltage	<25500(m)()		
			Battery voltage	<25500(mV)		
			Engine speed	≥80(rpm)		
) Conditions for enabling sensor heating for O2 sensor	=TRUE		
			CU is not in POST DRIVE state	=TRUE		
			and Battery Voltage	<16.5(V)		
			and	=10,0(1)		
			Engine start is completed	=TRUE		
) and			
			(
			(Dew point end is reached	-TRUE		
			(Integrated heat release since engine	>(b) * (((c) * (d)) + 1)		
			start			
			(b) Downstream O2 sensor heat threshold for release of heating (kJ) (see Look-Up-Table #17)	=200 to 2200(kJ)		
			(c) Instance of dew point end class of sensor 2 at bank 2 / Factor to adjust the heat energy threshold depending on the could start counter and the start temperature (see Look-Lin-Table #18)	=0 to 0.5		
			(d) Number of drive cycles without reaching dew point end of downstream sensor (limited to max of			
			4)			
) and			
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				Dew point end is reached at upstream of catalyst (Integrated heat release since engine	≥(b) * (((c) * (d)) + 1)		
				start (b) Downstream O2 sensor heat threshold for release of heating (kJ) (see Look-Up-Table #13)	=10 to 500(kJ)		
				(c) Instance of dew point end class of sensor 1 at bank 2 / Factor to adjust the heat energy threshold depending on the could start counter and the start temperature (see Look-Up-Table #14)	=0 to 0.5		
				 (d) Number of drive cycles without reaching dew point end of downstream sensor (limited to max of 3) 			
) for time) OR	≥10(sec)		
				(Battery voltage OR (<15(V)		
				Environmental temperature and	>3003,56(°C)		
				Ignition is ON for time)	=TRUE ≥0(sec)		
) for time	≥0(sec)		
				, Basic enable conditions met	=see sheet enable tables		
				No Pending or Confirmed DTCs	=see sheet inhibit tables		
P0058	Diagnoses the HO2S Heater Control Bank 2 Sensor 2 low side driver circuit for circuit high faults	Voltage high during driver on state (indicates short-to-power)	Short-to-power: ≤ 0.5 Ωimpedance between signal and controller power	General enabling condition for powerstage diagnosis	=TRUE	0,1(s)	2 Trip
				(Battery voltage Battery voltage Engine speed)	<25500(mV) >10900(mV) ≥80(rpm)		

Conditions for enabling sensor heating for O2 sensor	=TRUE
(ECU is not in POST DRIVE state and	=TRUE
Battery Voltage	≤16,5(V)
Engine start is completed	=TRUE
) and	
(
Dew point end is reached	=TRUE
(Integrated heat release since engine start	≥(b) * (((c) * (d)) + 1)
(b) Downstream O2 sensor heat threshold for release of heating (kJ) (see Look-Up-Table #17)	=200 to 2200(kJ)
(c) Instance of dew point end class of sensor 2 at bank 2 / Factor to adjust the heat energy threshold depending on the could start counter and the start temperature (see Look-Up-Table #18)	=0 to 0.5
 (d) Number of drive cycles without reaching dew point end of downstream sensor (limited to max of 4) and 	
Dew point end is reached at upstream of catalyst	
Integrated heat release since engine	≥(b) * (((c) * (d)) + 1)
(b) Downstream O2 sensor heat threshold for release of heating (kJ) (see Look-Up-Table #13)	=10 to 500(kJ)
(c) Instance of dew point end class of sensor 1 at bank 2 / Factor to adjust the heat energy threshold depending on the could start counter and the start temperature (see Look-Up-Table #14)	=0 to 0.5

					 (d) Number of drive cycles without reaching dew point end of downstream sensor (limited to max of 3)) for time) OR 	≥10(sec)		
					(Battery voltage OR (<15(V)		
					(Environmental temperature and	>3003,56(°C)		
					Ignition is ON for time)	=TRUE ≥0(sec)		
) for time)	≥0(sec)		
					Basic enable conditions met	=see sheet enable tables		
					No Pending or Confirmed DTCs	=see sheet inhibit tables		
24. ENGINE COOLING SYSTEM	P0128 Compares engine coc with the mo coolant ter engine war	the measured blant temperature odeled engine nperature during rm-up	Engine coolant temperature difference between the model and the measured: (a) - (b)	>5(°C)	measured engine coolant temperature	<59,86(°C)	20(s)	2 Trip
24. ENGINE COOLING SYSTEM	P0128 Compares engine coo with the mo coolant ter engine wat	the measured blant temperature odeled engine nperature during rm-up	Engine coolant temperature difference between the model and the measured: (a) - (b) (a) the modeled engine coolant temperature	>5(°C)	measured engine coolant temperature Ignition key on	<59,86(°C) =TRUE	20(s)	2 Trip
24. ENGINE COOLING SYSTEM	P0128 Compares engine coc with the mo coolant ter engine war	the measured blant temperature odeled engine nperature during rm-up	Engine coolant temperature difference between the model and the measured: (a) - (b) (a) the modeled engine coolant temperature (b) the measured engine coolant temperature	>5(°C)	measured engine coolant temperature Ignition key on Time since engine running	<59,86(°C) =TRUE >5000(msec)	20(s)	2 Trip
24. ENGINE COOLING SYSTEM	P0128 Compares engine coo with the mo coolant ter engine wat	the measured plant temperature odeled engine nperature during rm-up	Engine coolant temperature difference between the model and the measured: (a) - (b) (a) the modeled engine coolant temperature (b) the measured engine coolant temperature	>5(°C)	measured engine coolant temperature Ignition key on Time since engine running Minium engine coolant temperature for the current trip	<59,86(°C) =TRUE >5000(msec) ≤39,06(°C)	20(s)	2 Trip
24. ENGINE COOLING SYSTEM	P0128 Compares engine coc with the mo coolant ter engine wat	the measured plant temperature odeled engine nperature during rm-up	Engine coolant temperature difference between the model and the measured: (a) - (b) (a) the modeled engine coolant temperature (b) the measured engine coolant temperature	>5(°C)	measured engine coolant temperature Ignition key on Time since engine running Minium engine coolant temperature for the current trip measured ambient temperature Engine running time	<59,86(°C) =TRUE >5000(msec) ≤39,06(°C) ≥-7,04(°C)	20(s)	2 Trip
24. ENGINE COOLING SYSTEM	P0128 Compares engine coo with the mo coolant ter engine wat Regulating temperatur	the measured olant temperature odeled engine nperature during rm-up	Engine coolant temperature difference between the model and the measured: (a) - (b) (a) the modeled engine coolant temperature (b) the measured engine coolant temperature	>5(°C)	measured engine coolant temperature Ignition key on Time since engine running Minium engine coolant temperature for the current trip measured ambient temperature Engine running time monitoring delay time since engine start (see Look-Up-Table #10)	<59,86(°C) =TRUE >5000(msec) ≤39,06(°C) ≥-7,04(°C) <2400(sec) ≥10 to 60(sec)	20(s)	2 Trip
24. ENGINE COOLING SYSTEM	P0128 Compares engine coo with the mo coolant ter engine wat Regulating temperatur	the measured plant temperature odeled engine nperature during rm-up	Engine coolant temperature difference between the model and the measured: (a) - (b) (a) the modeled engine coolant temperature (b) the measured engine coolant temperature	>5(°C)	measured engine coolant temperature Ignition key on Time since engine running Minium engine coolant temperature for the current trip measured ambient temperature Engine running time monitoring delay time since engine start (see Look-Up-Table #10) Engine coolant temperature increase	<59,86(°C) =TRUE >5000(msec) ≤39,06(°C) ≥-7,04(°C) <2400(sec) ≥10 to 60(sec) ≥0,3(°C)	20(s)	2 Trip
24. ENGINE COOLING SYSTEM	P0128 Compares engine coo with the mo coolant ter engine wat Regulating temperatur	the measured plant temperature odeled engine nperature during rm-up	Engine coolant temperature difference between the model and the measured: (a) - (b) (a) the modeled engine coolant temperature (b) the measured engine coolant temperature	>5(°C)	measured engine coolant temperature Ignition key on Time since engine running Minium engine coolant temperature for the current trip measured ambient temperature Engine running time monitoring delay time since engine start (see Look-Up-Table #10) Engine coolant temperature increase PT1 filtered average vehicle speed PT1 time constant	<59,86(°C) =TRUE >5000(msec) ≤39,06(°C) ≥-7,04(°C) <2400(sec) ≥10 to 60(sec) ≥0,3(°C) >6,21(mph) =100(sec)	20(s)	2 Trip

			calculation of the model temperature: ((a) + ((b) * (c)) + (d))	=((a) + ((b) * (c)) + (d))
			(a) temperature increment depending on inner torque and ambient temperature (see Look-Up-Table #8)	=0 to 0.27(deg C/sec)
			(b) Correction factor dependent on vehicle speed and ambient temperature (see Look-Up-Table #9)	=1 to 1.16
			(c) correction factor for temperature difference over the radiator (see Look-Up-Table #7)	=0 to 0.1(deg C/sec)
			(d) temperature model correction during DFCO	=(d1) * (d2)
			(d1) temperatue model correction dependent on vehicle speed and ambient temperature (see Look-Up-Table #6)	=-0.081 to - 0.0000488(deg C/sec)
			(d2) correction factor	=1
Or				
Continuously compares the measured engine coolant temperature with the modeled engine coolant temperature after warm-up monitoring	Engine coolant temperature difference between the model and the measured: (a) - (b)	>5(°C)	measured engine coolant temperature	<59,86(°C)
	(a) the modeled engine coolant		Ignition key on	=TRUE
	(b) the measured engine		Time since engine running	>5000(msec)
	coolant temperature		Minium engine coolant temperature for the current trip	≤39,06(°C)
Regulating engine coolant temperature : 70 degC			measured ambient temperature monitoring delay time since engine start (see Look-Up-Table #10)	≥-7,04(°C) ≥10 to 60(sec)
			PT1 filtered average vehicle speed PT1 time constant Heat to engine coolant calculation of the model	>6,21(mph) =100(sec) >6(°C) =((a) + ((b) * (c)) + (d))

				(a) temperature increment depending on inner torque and ambient temperature (see Look-Up-Table #8)	=0 to 0.27(deg C/sec)		
				(b) Correction factor dependent on vehicle speed and ambient temperature (see Look-Up-Table #9)	=1 to 1.16		
				(c) correction factor for temperature difference over the radiator (see Look-Up-Table #7)	=0 to 0.1(deg C/sec)		
				(d) temperature model correction	=(d1) * (d2)		
				(d1) temperatue model correction dependent on vehicle speed and ambient temperature (see Look-Up-Table #6)	=-0.081 to - 0.0000488(deg C/sec)		
				(d2) correction factor	=1		
				No pending or confirmed DTCs	=see sheet inhibit table		
				Basic enable conditions met	=see sheet enable tables		
P0118	Detects if the measured Engine Coolant Temperature sensor voltage is greater than a calibrated threshold for calibrated time.	Engine Coolant Temperature sensor voltage	≥4914,2(mV)	Ignition is ON	=TRUE	2(s)	2 Trip
		Same as		Basic enable conditions met	=see sheet enable tables		
		Engine Coolant Temperature	≤-46,6(°C)				
P0117	Detects if the measured Engine Coolant Temperature sensor voltage is less than a calibrated threshold for calibrated time.	Engine Coolant Temperature sensor voltage	≤103,4(mV)	Ignition is ON	=TRUE	2(s)	2 Trip
		Same as		Basic enable conditions met	=see sheet enable tables		
		Engine Coolant Temperature	≥156(°C)				

	P0119	Engine Coolant Temperature Sensor 1 - Circuit continuity	Difference between raw sensor value and	≥200(mV)	Engine Coolant Temperature Sensor	=FALSE	20(s)	2 Trip
		check - loose contact detection	low-pass filtered raw sensor value of engine coolant tempearture sensor 1		Circuit Low			
					Engine Coolant Temperature Sensor	=FALSE		
					1 Circuit High and			
					Basic enable conditions are met	=see sheet enable tables		
ľ	P0116	Detects if the difference between mean valve and filetered valve of engine coolant tempearture sensor during cold start is greater than a calibrated threshold for a	Difference between mean value and filtered value of engine coolant temperature sensor 1	>14,96(°C)	Ignition is on	=TRUE	1(s)	1 Trip
					for time Combustion engine is running	≥1(sec) =TRUE		
					(Engine is in synchronised state and engine is rotating	=TRUE		
					for time	=1(sec)		
					(Measured engine stop time	≥28800(sec)		
					(Calculated engine stop time is exact value	=TRUE		
					Minimum engine off time is calculated)	=TRUE		
					for time)	<3(sec)		
					((Block heater is activated	=FALSE		
					Diagnosis is inhibited by other temperature	=FALSE		
					sensor errors) for time)	≥0(sec)		
					No pending or confirmed DTCs	=see sheet Inhibit tables		
					Basic enable conditions are met	=see sheet enable tables		
	P0116	Detects if the difference between filetered valve and mean valve of engine coolant tempearture sensor during cold start greator than calibrated threshold for an calibrated time	Difference between filtered value and mean value of engine coolant temperature sensor 1	>14,96(°C)	Ignition is on	=TRUE	1(s)	1 Trip

				for time Combustion engine is running	≥1(sec) =TRUE		
				(Engine is in synchronised state and engine is	=TRUE		
				rotating for time	=1(sec)		
) ((Measured engine stop time	≥28800(sec)		
				(Calculated engine stop time is exact value	=TRUE		
				Minimum engine off time is calculated)	=TRUE		
) for time	<3(sec)		
				(Block heater is activated Diagnosis is inhibited by other temperature sensor errors	=FALSE =FALSE		
) for time	≥0(sec)		
				No pending or confirmed DTCs	=see sheet Inhibit tables		
				Basic enable conditions are met	=see sheet enable tables		
P01E7	Monitoring ECT Sensor 3 for circuit Intermittent	Loss connection error for Coolant Tempeture counter	≥5(sec)) Ignition is ON	=TRUE	0,1(s)	2 Trip
				Basic enable conditions met	=see sheet enable		
				Max Error in Signal Range Check diagnosis	=FALSE		
				Max Healing in Signal Range Check diagnosis	=FALSE		
				Auxiliary coolant temperature sensor Signal Availability	=TRUE		
P01E6	Monitoring ECT Sensor 3 for circuit High	Sensor voltage value of coolant upstream temperature at Auxiliary Radiator Outlet	>4960,4(mV)	Ignition is ON	=TRUE	0,1(s)	2 Trip
				Basic enable conditions met	=see sheet enable tables		

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	P01E5	Monitoring ECT Sensor 3 for circuit Low	Sensor voltage value of coolant upstream temperature at Auxiliary Radiator Outlet	<78,8(mV)	Ignition is ON	=TRUE	0,1(s) 0,1(s) 0,1(s) 0,1(s) 10(s)	2 Trip
					Basic enable conditions met	=see sheet enable tables		
	P2186	Monitoring ECT Sensor 3 for circuit Intermittent	Loss connection error for Coolant Tempeture counter	≥5(sec)	Ignition is ON	=TRUE	0,1(s)	2 Trip
					Basic enable conditions met	=see sheet enable tables		
					Max Error in Signal Range Check diagnosis	=FALSE		
					Max Healing in Signal Range Check diagnosis	=FALSE		
					Auxiliary coolant temperature sensor Signal Availability	=TRUE		
	P2185	Monitoring ECT Sensor 3 for circuit High	Sensor voltage value of coolant upstream temperature at Auxiliary Radiator Outlet	>4960,4(mV)	Ignition is ON	=TRUE	0,1(s)	2 Trip
					Basic enable conditions met	=see sheet enable tables		
	P2184	Monitoring ECT Sensor 3 for circuit Low	Sensor voltage value of coolant upstream temperature at Auxiliary Radiator Outlet	<78,8(mV)	Ignition is ON	=TRUE	0,1(s)	2 Trip
					Basic enable conditions met	=see sheet enable tables		
25. COLD START STRATEGY	P050A	Path 1: Monitoring of idle control for overspeed during catalyst heating	Deviation of idle speed precontrol (set point - current) (see Look-Up-Table #54)	<-200(rpm)	ECU Sub-State in DRIVE	=TRUE	10(s)	2 Trip
			For time (see Look-Up-Table #55)	≥10(sec)	Engine start has finished	=TRUE		
			,		Limp-home operation is not active	=TRUE		
					Safety fuel cut off is not active	=TRUE		
					Valid crankshaft signal is present	=1RUE		
					Vehicle speed	=0(mph)		
					CSERS relevant catalyst heating is	=TRUE		
					active			
					The difference between the desired			
					and the idle speed setpoint without			
					catalyst heating			
					No torque demand active	=TRUE		
					For time (see Look-Up-Table #64)	>=0(sec)		
					Engine coolant temperature	≤66(°C)		
					Engine coolant temperature	≥-12(°C)		
					Time after end of start (see Look-Up-	<∠(sec)		

				Difference between idle speed during catalyst heating and idle speed without catalyst heating No pending or confirmed DTCs	>0(rpm) =see sheet inhibit		
				Basic enabling conditions are met	tables =see sheet enable tables		2 Trip 2 Trip
P050A	Path 2: Monitoring of idle control for underspeed during	Deviation of idle speed precontrol (set point - current) (see Look-Lip-Table #56)	>100(rpm)	ECU Sub-State in DRIVE	=TRUE	10(s)	2 Trip
	Catalyst heating	For time (see Look-Up-Table #50) #57)	≥10(sec)	Engine start has finished	=TRUE		
				Limp-home operation is not active	=TRUE		
				Safety fuel cut off is not active	=TRUE		
				Valid crankshaft signal is present	=TRUE		
				Altitude correction factor	>0.688		
				Vehicle speed	=0(mph)		
				CSERS relevant catalyst heating is	=TRUE		
				active			
				The difference between the desired			
				idling speed during catalyst beating			
				and the idle speed setpoint without			
				and the fulle speed setpoint without			
				No torque demand active			
				For time (and Look Lin Table #64)	= I RUE		
				For time (see Look-Op-rable #64)	>=0(sec)		
				Engine coolant temperature	<66(°C)		
				Engine coolant temperature	= 00(0)		
				Time after and of start (see Look-Up-	>2(sec)		
				Table #60)	=2(Sec)		
				Difference between idle encod during			
				Difference between late speed during	>0(ipin)		
				catalyst heating and lole speed			
				without catalyst heating			
				No pending or confirmed DTCs	=see sheet inhibit		
					tables		
				Basic enabling conditions are met	=see sheet enable		
					tables		
P050B	Path 1 : Diagnosis of Cold Start Ignition Timing Performance in Engine Idle Mode	Mean deviation of actual ignition effciency and desired catalyst heating ignition efficiency during idle (see Look-	>0,27 to 0,999	Catalyst heating activated	=TRUE	2(s)	2 Trip
		Up-Table #70)					
		current time for catalyst heating during cold start during	>10(sec)	(
		IGIE		End of start is reached			
				Linu of Statt IS feactied			
				nomogenous mode of operation is	=IKUE		
				Autivateu Dobust ongino run ofter isitial			
					=FALOE		
				Engine coolant temperature	>39,75(°C)		
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			Time counter at end of start OR (Absolute value of fuel rail pressure Engine is running for time) OR Vehicle speed OR Initial fuelling stopped) Catalyst heating request for end of line test OR Catalyst heating request by cold engine No pending or confirmed DTCs Basic enabling conditions are met	>120(sec) >4(MPa) =TRUE =5(sec) >0(mph) =TRUE =TRUE =TRUE =see sheet inhibit tables =see sheet enable tables		
I	P2C20	Detects if High Pressure fuel system control deviation of rail pressure during cold start is less than maximum threshold for calibrated period of timeFiltered value of rail pressure control deviation<-3(MPa)	Conditions for Plausibility check of Fuel supply system (=TRUE	7(s)	1 Trip
	P32AB		Airbag is activated Rail pressure sensor voltage is not plausible Battery voltage Mean value of effective relative volumetric injected fuel mass Mean value of effective relative volumetric injected fuel mass Initial fueling mode is active) Time counter at end of start Conditions for reset of high-pressure regulation (((Actual number of cylinders with injection cut-off Desired number of cylinders with injection cut-off	=FALSE =FALSE ≤655340(mV) ≥7,5(%) ≤3072(%) =FALSE ≥2(sec) =FALSE <8 <8	7(s)	1 Trip
						0040

End of start is reached	=FALSE
) OR Difference between the actual rail pressure and filtered rail pressure setpoint (A+B) where in:	>(A+B)(MPa)
	=1(MPa)
 (A) rail pressure offset during fuel cutoff for activation demand control (B) maximum difference between actual rail pressure and set rail pressure for deactivation of MSV if fuel cutt off is active 	=1(MPa)
)	
(
High pressure pump is active	=TRUE
Engine is in running state	=TRUE
Crankshaft signal is detected	=TRUE
) for time	=0,04(sec)
) OR	
(High pressure pump is not active End of start is reached))	=FALSE =TRUE
(Start of injection enabled (=TRUE
(Engine start is in pre-injection	=TRUE
mode Injection counter	≥(A+B)
(A+B) where in:	. ,
(A) Number of injections for	=2
(B) Number of cylinders	=8
) OR	
(Engine start is not in pre-injection	=FALSE
mode	20
injection counter))	22
)″	
(200
Engine state of synchronisation for rail pressure control activation	230

í.

Engine is in running state	=TRUE
OR Crankshaft signal is detected	=TRUE
) for time	=0,04(sec)
) for time Conditions for high pressure fuel system diagnosis during cold start (=2(sec)
Rail pressure setpoint Rail pressure setpoint	<36(MPa) >6(MPa)
) for time	=0(sec)
Absolute of difference between rail pressure set point and its filtered value	<15(MPa)
for time	=0(sec)
Engine speed Coolant temperature at engine output	>500(rpm) >-25,04(°C)
) Catalyst heating activated	=TRUE
End of start is reached Homogenous mode of operation is	=TRUE =TRUE
Robust engine run after initial fuelling	=FALSE
(Engine coolant temperature	>39,75(°C)
Time counter at end of start OR	>120(sec)
Absolute value of fuel rail	>4(MPa)
Engine is running) for time	=TRUE =5(sec)
Vehicle speed	>0(mph)
Initial fuelling stopped	=TRUE
, Catalyst heating request for end of line test OR	=TRUE
Catalyst heating request by cold	=TRUE

				No pending or confirmed DTCs	=see sheet inhibit table		
				Basic enable conditions met	=see sheet enable table		
P2C1F	Detects if High Pressure fuel system control deviation of rail pressure during cold start is greater than minimum threshold for calibrated period of time	Filtered value of rail pressure control deviation	>3(MPa)	Airbag is activated	=FALSE	5(s)	1 Trip
P32AA				Rail pressure sensor voltage is not plausible Battery voltage Mean value of effective relative volumetric injected fuel mass Mean value of effective relative volumetric injected fuel mass	=FALSE ≤655340(mV) ≥7,5(%) ≤3072(%)	5(s)	1 Trip
				Initial fueling mode is active Time counter at end of start Conditions for reset of high-pressure regulation (((=FALSE ≥2(sec) =FALSE		
				Actual number of cylinders with injection cut-off Desired number of cylinders with injection cut-off) OR	<8 <8		
				End of start is reached) OR Difference between the actual rail pressure and filtered rail pressure setpoint	=FALSE >(A+B)(MPa)		
				 (A+B) where in: (A) rail pressure offset during fuel cutoff for activation demand control (B) maximum difference between actual rail pressure and set rail pressure for deactivation of MSV if 	=1(MPa) =1(MPa)		
				fuel cutt off is active) ((

(
Engine is in running state	=TRUE
Crankshaft signal is detected	=TRUE
) for time	=0,04(sec)
)	
High pressure pump is not active	=FALSE
End of start is reached	=TRUE
)	
Start of injection enabled	=TRUE
Engine start is in pre-injection	=TRUE
mode Injection counter	≥(A+B)
(A+B) where in:	
(A) Number of injections for	=2
enabling high-pressure controller	
(B) Number of cylinders	=8
Engine start is not in pre-injection	=FALSE
mode Injection counter	≥2
)	
)	
Engine state of synchronisation for rail pressure control activation	≥30
(
Engine is in running state	=TRUE
Crankshaft signal is detected	=TRUE
) for time	=0,04(sec)
)	
) for time	=2(sec)
Conditions for high pressure fuel	
system diagnosis during cold start	
(
Rail pressure setpoint	<36(MPa)
)	>6(MPa)
for time	=0(sec)
Absolute of difference between rail	<15(MPa)
pressure set point and its filtered	
for time	=0(sec)

				Engine speed Coolant temperature at engine output) Catalyst heating activated (End of start is reached Homogenous mode of operation is activated Robust engine run after initial fuelling (Engine coolant temperature OR Time counter at end of start OR (Absolute value of fuel rail pressure Engine is running) for time OR Vehicle speed OR Initial fuelling stopped) Catalyst heating request for end of line test OR Catalyst heating request by cold engine No pending or confirmed DTCs	>500(rpm) >-25,04(°C) =TRUE =TRUE =TRUE =FALSE >39,75(°C) >120(sec) >4(MPa) =TRUE =5(sec) >0(mph) =TRUE =TRUE =TRUE =TRUE		
				engine No pending or confirmed DTCs Basic enable conditions are met	=see sheet Inhibit tables =see sheet enable tables		
P2B95	Path 2: Detecting abnormal injector closing time delay	Error ratio calculated with correctly measured injector closing event per injection for diagnosis of catalyst heating with multiple injections	>0,1	ECU is in drive state	=TRUE	0,02(s)	2 Trip
		injector closing delay of last CVO measurement injector closing delay of last CVO measurement	≥620(µsec) ≤200(µsec)	(Catalyst heating activated OR	=FALSE		
				Catalyst heating request by cold engine)	=FALSE		

				Condition catalyst heating with desired operation mode for Cold start emission reduction strategy diagnosis time with status of catalyst heating with multiple injections	=FALSE ≥10(sec)		
) Counter of CVO-measurements during catalyst heating	≥800(counts)		
				Monitor has not completed this drive cycle (i.e. monitor runs once per trip)	=TRUE		
				No pending or confirmed DTCs	=see sheet Inhibit tables		
				Basic enable conditions are met	=see sheet enable tables		
P2B96	Detection of number of injection output while catalyst heating with multiple injections	Ratio of total number of faulty combustion over total number of cumbustion (during CSERS)	>0	ECU is in drive state	=TRUE	0,02(s)	2 Trip
				(
				Catalyst heating activated (see parameter definition)	=FALSE		
				Catalyst heating request by cold engine (see parameter definition)	=FALSE		
) Condition catalyst heating with desired operation mode for Cold start emission	=FALSE		
				reduction strategy diagnosis Number of combustions under condition catalyst heating with multiple injection)	≥100(counts)		
				Monitor has not completed this drive cycle (i.e. monitor runs once per trip)	=TRUE		
				No pending or confirmed DTCs	=see sheet Inhibit tables		
				Basic enable conditions are met	=see sheet enable tables		
26. VVT SYSTEM	P0011	Monitoring of intake camshaft bank 1 position - Target error	(Actual angle has not reached target value threshold for allowed time within running monitoring cycle	=TRUE	Ignition is on	=TRUE	2 Trip
-------------------	-------	--	--	-------------	---	-----------------------------	--------
			For time to reach setpoint	>1(sec)	(Oil temperature cylinder head	≥-20,04(°C)	
			and		Oil temperature cylinder head	≤179,96(°C)	
			Absolute deviation between the highest (max) / lowest (min) camshaft position and the stored setpoint value at the beginning of the monitoring	<3(deg CrS)	Engine speed (see Look-Up-Table #43)	>520(rpm)	
)		Engine speed	≤10200(rpm)	
			for a number of events	≥4(events)) (State governor intake camshaft bank1 is working in closed loop	=TRUE	
					Diagnosis is released after engine start for time	≥0(sec)	
					Battery voltage	≥10900(mV)	
					No pending or confirmed DTCs	=see sheet inhibit	
					Basic enable conditions met	=see sheet enable tables	
	P0014	Monitoring of outlet camshaft bank 1 position - Target error	(Actual angle has not reached target value threshold within running monitoring cycle	=TRUE	Ignition is on	=TRUE	2 Trip
			For time to reach setpoint	>1(sec)	(Oil tomporature outinder bood	≥-20,04(°C)	
			AND		Oil temperature cylinder head	≤179,96(°C)	
			Absolute deviation between the highest (max) / lowest (min) camshaft position and the stored setpoint value at the beginning of the monitoring	<3(deg CrS)	Engine speed (see Look-Up-Table #44)	>520(rpm)	
)		Engine speed)	≤10200(rpm)	

			for a number of events	≥4(events)	(State governor outlet camshaft bank1 is working in closed loop operation	=TRUE	
					Diagnosis is released after engine start for time	≥0(sec)	
					Battery voltage) No pending or confirmed DTCs	≥10900(mV) =see sheet inhibit	
					Basic enable conditions met	tables =see sheet enable tables	
ľ	P0021	Monitoring of intake camshaft bank 2 position - Target error	(Actual angle has not reached target value threshold within running monitoring cycle	=TRUE	Ignition is on	=TRUE	2 Trip
			For time to reach setpoint	>1(sec)	(Oil temperature cylinder head	≥-20,04(°C)	
			AND		Oil temperature cylinder head	≤179,96(°C)	
			Absolute deviation between the highest (max) / lowest (min) camshaft position and the stored setpoint value at the beginning of the monitoring	<3(deg CrS)	Engine speed (see Look-Up-Table #43)	>520(rpm)	
)		Engine speed	≤10200(rpm)	
			for a number of events	≥4(events)	, (State governor intake camshaft bank2 is working in closed loop operation	=TRUE	
					Diagnosis is released after engine start for time	≥0(sec)	
					Battery voltage)	≥10900(mV)	
					No pending or confirmed DTCs	=see sheet inhibit tables	
					Basic enable conditions met	=see sheet enable tables	
	P0024	Monitoring of outlet camshaft bank 2 position - Target error	(Actual angle has not reached target value threshold within running monitoring cycle	=TRUE	Ignition is on	=TRUE	2 Trip

		For time to reach setpoint	>1(sec)	(Oil temperature cylinder head	≥-20,04(°C)	
		AND		Oil temperature cylinder head	≤179,96(°C)	
		Absolute deviation between the highest (max) / lowest (min) camshaft position and the stored setpoint value at the beginning of the monitoring	<3(deg CrS)	Engine speed (see Look-Up-Table #44)	>520(rpm)	
)		Engine speed	≤10200(rpm)	
		for a number of events	≥4(events)	/ (State governor outlet camshaft bank2 is working in closed loop operation	=TRUE	
				Diagnosis is released after engine start for time	≥0(sec)	
				Battery voltage	≥10900(mV)	
				No pending or confirmed DTCs	=see sheet inhibit tables	
				Basic enable conditions met	=see sheet enable tables	
P000A	Monitoring of intake camshaft	(=TRUE	Ignition is on	=TRUE	2 Trip
P000A	Monitoring of intake camshaft bank 1 position - slow response fault	(Actual angle has not reached target value threshold for allowed time within running monitoring cycle	=TRUE	Ignition is on	=TRUE	2 Trip
P000A	Monitoring of intake camshaft bank 1 position - slow response fault	(Actual angle has not reached target value threshold for allowed time within running monitoring cycle For time to reach setpoint	=TRUE >1(sec)	Ignition is on (Oil temperature cylinder head	=TRUE ≥-20,04(°C)	2 Trip
P000A	Monitoring of intake camshaft bank 1 position - slow response fault	(Actual angle has not reached target value threshold for allowed time within running monitoring cycle For time to reach setpoint and	=TRUE >1(sec)	Ignition is on (Oil temperature cylinder head Oil temperature cylinder head	=TRUE ≥-20,04(°C) ≤179,96(°C)	2 Trip
P000A	Monitoring of intake camshaft bank 1 position - slow response fault	(Actual angle has not reached target value threshold for allowed time within running monitoring cycle For time to reach setpoint and Absolute deviation between the highest (max) / lowest (min) camshaft position and the stored setpoint value at the beginning of the monitoring	=TRUE >1(sec) >3(deg CrS)	Ignition is on (Oil temperature cylinder head Oil temperature cylinder head Engine speed (see Look-Up-Table #43)	=TRUE ≥-20,04(°C) ≤179,96(°C) >520(rpm)	2 Trip
P000A	Monitoring of intake camshaft bank 1 position - slow response fault	(Actual angle has not reached target value threshold for allowed time within running monitoring cycle For time to reach setpoint and Absolute deviation between the highest (max) / lowest (min) camshaft position and the stored setpoint value at the beginning of the monitoring	=TRUE >1(sec) >3(deg CrS)	Ignition is on (Oil temperature cylinder head Oil temperature cylinder head Engine speed (see Look-Up-Table #43) Engine speed	=TRUE ≥-20,04(°C) ≤179,96(°C) >520(rpm)	2 Trip
P000A	Monitoring of intake camshaft bank 1 position - slow response fault	(Actual angle has not reached target value threshold for allowed time within running monitoring cycle For time to reach setpoint and Absolute deviation between the highest (max) / lowest (min) camshaft position and the stored setpoint value at the beginning of the monitoring) for a number of events	=TRUE >1(sec) >3(deg CrS) ≥4(events)	Ignition is on ((Oil temperature cylinder head Oil temperature cylinder head Engine speed (see Look-Up-Table #43) Engine speed) (State governor intake camshaft bank1 is working in closed loop operation	=TRUE ≥-20,04(°C) ≤179,96(°C) >520(rpm) ≤10200(rpm) =TRUE	2 Trip
P000A	Monitoring of intake camshaft bank 1 position - slow response fault	(Actual angle has not reached target value threshold for allowed time within running monitoring cycle For time to reach setpoint and Absolute deviation between the highest (max) / lowest (min) camshaft position and the stored setpoint value at the beginning of the monitoring) for a number of events	=TRUE >1(sec) >3(deg CrS) ≥4(events)	Ignition is on ((Oil temperature cylinder head Oil temperature cylinder head Engine speed (see Look-Up-Table #43) Engine speed) (State governor intake camshaft bank1 is working in closed loop operation Diagnosis is released after engine start for time	=TRUE ≥-20,04(°C) ≤179,96(°C) >520(rpm) ≤10200(rpm) =TRUE ≥0(sec)	2 Trip

				No pending or confirmed DTCs Basic enable conditions met	=see sheet inhibit tables =see sheet enable	
					tables	
POC	00B Monitoring of outlet camshaft bank 1 position - slow response fault	(Actual angle has not reached target value threshold within running monitoring cycle	=TRUE	Ignition is on	=TRUE	2 Trip
		For time to reach setpoint	>1(sec)	(Oil temperature cylinder head	≥-20,04(°C)	
		AND		Oil temperature cylinder head	≤179,96(°C)	
		Absolute deviation between the highest (max) / lowest (min) camshaft position and the stored setpoint value at the beginning of the monitoring	>3(deg CrS)	Engine speed (see Look-Up-Table #44)	>520(rpm)	
)		Engine speed	≤10200(rpm)	
		for a number of events	≥4(events)) (State governor outlet camshaft bank1 is working in closed loop operation	=TRUE	
				and Diagnosis is released after engine start for time	≥0(sec)	
				Battery voltage	≥10900(mV)	
				No pending or confirmed DTCs	=see sheet inhibit tables	
				Basic enable conditions met	=see sheet enable tables	
POC	0C Monitoring of intake camshaft bank 2 position - slow response fault	(Actual angle has not reached target value threshold within running monitoring cycle	=TRUE	Ignition is on	=TRUE	2 Trip
		For time to reach setpoint	>1(sec)	(Oil temperature cylinder head	≥-20,04(°C)	
		AND		Oil temperature cylinder head	≤179,96(°C)	
		Absolute deviation between the highest (max) / lowest (min) camshaft position and the stored setpoint value at the beginning of the monitoring	>3(deg CrS)	Engine speed (see Look-Up-Table #43)	>520(rpm)	
)		Engine speed	≤10200(rpm)	
		EC	M Section 432 of 772)		544 o

			for a number of events	≥4(events)	(State governor intake camshaft bank2 is working in closed loop operation Diagnosis is released after engine start for time Battery voltage) No pending or confirmed DTCs Basic enable conditions met	=TRUE ≥0(sec) ≥10900(mV) =see sheet inhibit tables =see sheet enable tables			
1	P000D	Monitoring of outlet camshaft bank 2 position - slow response fault	(Actual angle has not reached target value threshold within running monitoring cycle For time to reach setpoint AND	=TRUE n >1(sec)	Ignition is on (Oil temperature cylinder head Oil temperature cylinder head	=TRUE ≥-20,04(°C) ≤179,96(°C)		2 Trip	
			Absolute deviation between highest (max) / lowest (min) camshaft position and the stored setpoint value at the beginning of the monitoring	the >3(deg CrS)	Engine speed (see Look-Up-Table #44)	>520(rpm)			
) for a number of events	≥4(events)	Engine speed) (State governor outlet camshaft bank2 is working in closed loop operation	≤10200(rpm) =TRUE			
					Diagnosis is released after engine start for time Battery voltage	≥0(sec) ≥10900(mV)			
) No pending or confirmed DTCs Basic enable conditions met	=see sheet inhibit tables =see sheet enable tables			
27. CCM – CIRCUIT DIAGNOSIS OF MAF	P0103	Path 1: Signal range check - out of range high	High range SENT data	>16375	Ignition is on	=TRUE	1,5(s)	2 Trip	
SENSORS - AIRFLOW				ECM Section 433 of 772	Battery voltage Battery voltage Error in the sensor self diagnosis Error in the electric line diagnosis Error in the electric line diagnosis	>10900(mV) <655340(mV) =FALSE =FALSE =FALSE		545 of 1	1,098

				No pending or confirmed DTCs	=see sheet inhibit tables		
				Basic enable conditions met	=see sheet enable tables		
P010D	Path 1: Signal range check - out of range high	High range SENT data	>16375	Ignition is on	=TRUE	1,5(s)	2 Trip
				Battery voltage Battery voltage Error in the sensor self diagnosis Error in the electric line diagnosis Error in the electric line diagnosis No pending or confirmed DTCs	>10900(mV) <655340(mV) =FALSE =FALSE =FALSE =see sheet inhibit tables		
				Basic enable conditions met	=see sheet enable tables		
P0102	Path 2: Signal range check - out of range low	Low range SENT data	<2	Ignition is on	=TRUE	1,5(s)	2 Trip
				Battery voltage Battery voltage Error in the electric line diagnosis Error in the sensor self diagnosis Error in the sensor self diagnosis No pending or confirmed DTCs	>10900(mV) <655340(mV) =FALSE =FALSE =FALSE =see sheet inhibit		
				Basic enable conditions met	tables =see sheet enable tables		
P010C	Path 2: Signal range check - out of range low	Low range SENT data	<2	Ignition is on	=TRUE	1,5(s)	2 Trip
	J			Battery voltage Battery voltage Error in the sensor self diagnosis Error in the electric line diagnosis Error in the electric line diagnosis No pending or confirmed DTCs	>10900(mV) <655340(mV) =FALSE =FALSE =FALSE =see sheet inhibit tables		
				Basic enable conditions met	=see sheet enable tables		
U1319	Path 3: Sensor self diagnosis - MAF frequency in default range which indicates MAF has detected an internal error	Data value of the SENT Fast channel	≥Number of bits in SENT	Ignition is on	=TRUE	0,5(s)	1 Trip
		or E	CM Section 434 of 772	Rattery voltage	>10900(m\/)		546

			250BDG074	A Part 2 ECM Summary	/ Tables			
			Data value of the SENT Fast channel	=0	Battery voltage	<655340(mV)		
					No pending or confirmed DTCs	=see sheet inhibit tables		
					Basic enable conditions met	=see sheet enable tables		
	U131A	Path 3: Sensor self diagnosis - MAF frequency in default range which indicates MAF has detected an internal error	Data value of the SENT Fast channel	≥Number of bits in SENT	Ignition is on	=TRUE	1,5(s)	1 Trip
			or Data value of the SENT Fast channel	=0	Battery voltage Battery voltage	>10900(mV) <655340(mV)		
					No pending or confirmed DTCs	=see sheet inhibit tables		
					Basic enable conditions met	=see sheet enable tables		
28. MAF SESNORS LOW SIDE SWITCH DIAGNOSIS	P0F51	MAF sensor low side switch controlled by chip heating / standby function (Bank 1)	Line low is detected (Bank 1)	=FALSE	Ignition is ON	=TRUE	0,5(s)	2 Trip
					Basic enable conditions met	=see sheet enable tables		
					Battery Voltage	≥9000(mV)		
					Line high is detected (Bank 1)	=TRUE		
	P0F54	MAF sensor low side switch controlled by chip heating / standby function (Bank 2)	Line low is detected (Bank 2)	=FALSE			0,5(s)	2 Trip
	P0F51	MAF sensor low side switch controlled by chip heating / standby function (Bank 1)	Open Load error of low side switch detected (Bank1)	=TRUE			0,5(s)	2 Trip
	P0F54	MAF sensor low side switch controlled by chip heating / standby function (Bank 2)	Open Load error of low side switch detected (Bank2)	=TRUE			0,5(s)	2 Trip

	P0F53	Diagnosis of Short Circuit to Battery error of low side switch controlled by chip heating or standby function for Bank1	Low side switch short to battery detected (Bank1)	=TRUE			0,5(s)	2 Trip
	P0F56	Diagnosis of Short Circuit to Battery error of low side switch controlled by chip heating or standby function for Bank2	Low side switch short to battery detected (Bank2)	=TRUE		I	0,5(s)	2 Trip
29. MAF SENSORS CIRCUIT CONTINUITY DIAGNOSIS	U1319	Monitoring of MAF sensor signal - MAF sensor signal permanently low	(Time overflow error reported by MAF sensor	=TRUE	Ignition is on	=TRUE	1(s)	1 Trip
			OR Maximum period violation error reported by MAF sensor)	=TRUE	Battery voltage Battery voltage	>10900(mV) <655340(mV)		
			,		No pending or confirmed DTCs	=see sheet inhibit tables		
			Pinpointing		Basic enable conditions met	=see sheet enable tables		
			Current level of the PWM signal	=LOW				
	U131A	Monitoring of MAF sensor signal - MAF sensor signal permanently low	(Time overflow error reported by MAF sensor	=TRUE	Ignition is on	=TRUE	1,5(s)	1 Trip
			OR Maximum period violation error reported by MAF sensor	=TRUE	Battery voltage Battery voltage	>10900(mV) <655340(mV)		
			,		No pending or confirmed DTCs	=see sheet inhibit tables		
			Pinpointing		Basic enable conditions met	=see sheet enable tables		
			Current level of the PWM signal	=LOW				
	U060F	Monitoring of MAF sensor signal - MAF sensor signal permanently low	(Time overflow error reported by MAF sensor	=TRUE	Ignition is on	=TRUE	1,5(s)	2 Trip
			OR		Battery voltage	>10900(mV)		

			250BDG074	A Part 2 ECM Summary	Tables			
			Maximum period violation error reported by MAF sensor	=TRUE	Battery voltage	<655340(mV)		
)		No pending or confirmed DTCs	=see sheet inhibit tables		
			Pinpointing		Basic enable conditions met	=see sheet enable tables		
			Current level of the PWM signal	=HIGH				
	U0610	Monitoring of MAF sensor signal - MAF sensor signal permanently low	(Time overflow error reported by MAF sensor	=TRUE	Ignition is on	=TRUE	1,5(s)	2 Trip
			OR Maximum period violation error reported by MAF sensor)	=TRUE	Battery voltage Battery voltage	>10900(mV) <655340(mV)		
			,		No pending or confirmed DTCs	=see sheet inhibit tables		
			Pinpointing		Basic enable conditions met	=see sheet enable tables		
			Current level of the PWM signal	=HIGH				
30. CCM – RATIONAILIT DIAGNOSIS OF MAF SENSORS –	P0101	Path 4: Comparison of Maximum Modelled and actual Air Mass Flow (Plausibility Check)	Measured MAF from bank 1 sensor	>(A) / (B)(g/sec)	Engine is rotating forwards	=TRUE	10(s)	1 Trip
AIRFLOW			with (A) Maximum modelled MAF at throttle body (B) Factor MAF sensor tolerance for min value	=calculated parameter =0,920013	and Measured air mass flow sensor signal is invalid and	=FALSE		
					Delta mass flow between compressor and DK through Delta pressure is valid for bank1 and	=TRUE		
					Air mass flow through throttle valve for MAF diagnosis is valid	=TRUE		
					Basic enable conditions met	=see sheet inhibit tables =see sheet enable tables		

		20000017		1 4 5 1 5 5			
P010B	Path 4: Comparison of Maximum Modelled and actual Air Mass Flow (Plausibility Check)	Measured MAF from bank 2 sensor	>(A) / (B)(g/sec)	Engine is rotating forwards	=TRUE	10(s)	1 Trip
		with (A) Maximum modelled MAF at throttle body (B) Factor MAF sensor tolerance for min value	=calculated parameter(g/sec) =0,920013	and Measured air mass flow sensor signal at bank 2 is invalid and	=FALSE		
				Delta mass flow between compressor and DK through Delta pressure is valid for bank2 and	=TRUE		
				Air mass flow through throttle valve for MAF diagnosis is valid for bank 2	=TRUE		
				No pending or confirmed DTCs	=see sheet inhibit tables		
				Basic enable conditions met	=see sheet enable tables		
P0101	Path 5: Comparison of Minimum Modelled and actual Air Mass Flow (Plausibility Check)	Measured MAF from bank 1 sensor	<(C) / (D)(g/sec)	Engine is rotating forwards	=TRUE	10(s)	1 Trip
		with (A) Minimum modelled MAF at throttle body (B) Factor MAF sensor tolerance for max value	=calculated parameter(g/sec) =1,079987	and Measured air mass flow sensor signal is invalid and	=FALSE		
				Delta mass flow between compressor	=TRUE		
				and DK through Delta pressure is valid for bank1			
				and DK through Delta pressure is valid for bank1 and Air mass flow through throttle valve for MAF diagnosis is valid	=TRUE		
				and DK through Delta pressure is valid for bank1 and Air mass flow through throttle valve for MAF diagnosis is valid No pending or confirmed DTCs	=TRUE =see sheet inhibit tables		
	P010B	P010B Path 4: Comparison of Maximum Modelled and actual Air Mass Flow (Plausibility Check) P0101 Path 5: Comparison of Minimum Modelled and actual Air Mass Flow (Plausibility Check)	P010B Path 4: Comparison of Maximum Modelled and actual Air Mass Flow (Plausibility Check) Measured MAF from bank 2 sensor with (A) Maximum modelled MAF at throttle body (B) Factor MAF sensor tolerance for min value P0101 Path 5: Comparison of Minimum Modelled and actual Air Mass Flow (Plausibility Check) Measured MAF from bank 1 sensor P0101 Path 5: Comparison of Minimum Modelled and actual Air Mass Flow (Plausibility Check) Measured MAF from bank 1 sensor with (A) Minimum modelled MAF at throttle body (B) Factor MAF sensor tolerance for max value with (A) Minimum modelled MAF at throttle body (B) Factor MAF sensor tolerance for max value	P010B Path 4: Comparison of Maximum Modelled and actual Air Mass Flow (Plausibility Check) Measured MAF from bank 2 >(A) / (B)(g/sec) with (A) Maximum modelled MAF at throttle body (B) Factor MAF sensor tolerance for min value =calculated parameter(g/sec) =0.920013 P0101 Path 5: Comparison of Minimum Modelled and actual Air Mass Flow (Plausibility Check) Measured MAF from bank 1 sensor <(C) / (D)(g/sec)	P010B Path 4: Comparison of Maximum Modelled and actual Air Mass Flow (Plausibility Check) Measured MAF from bank 2 sensor >(A) / (B)(g/sec) Engine is rotating forwards with (A) Maximum modelled MAF at throttle body (B) Factor MAF sensor tolerance for min value =calculated parameter(g/sec) =0.920013 and Measured air mass flow sensor signal at bank 2 is invalid and P0101 Path 5: Comparison of Minimum Modelled and actual Air Mass Flow (Plausibility Check) Measured MAF from bank 1 sensor <(C) / (D)(g/sec)	P010B Path 4: Comparison of Maximum Mediola dan actual kir Mass Flow (Plausibility Check) Measured MAF from bank 2 sensor ><(A) / (B)(g/sec)	P010B Path 4: Comparison of Maximum Modelled and actual kir Mass Flow (Plausibility Check) Measured MAF from bank 2 sensor ->(A) / (B)(g/sec) Engine is rotating forwards =TRUE 10(s) with (A) Maximum modelled MAF at throttle body (B) Factor MAF sensor blerance for min value with (A) Maximum modelled MAF at throttle body (B) Factor MAF sensor blerance for min value ->(A) / (B)(g/sec) Engine is rotating forwards =FALSE =FALSE P010F Path 5: Flow (Plausibility Check) Measured MAF from bank 1 (A) Minimum modelled MAF at throttle body (B) Factor MAF sensor blerance for min value -<(C) / (D)(g/sec)

			250BDG07A	Part 2 ECM Summar	y Tables			
	P010B	Path 5: Comparison of Minimum Modelled and actual Air Mass Flow (Plausibility Check)	Measured MAF from bank 2 sensor	<(C) / (D)(g/sec)	Engine is rotating forwards	=TRUE	10(s)	1 Trip
			with (A) Minimum modelled MAF at throttle body	=calculated parameter(g/sec)	and Measured air mass flow sensor signal at bank 2 is invalid	=FALSE		
			(B) Factor MAF sensor tolerance for max value	=1,08	and			
					Delta mass flow between compressor and DK through Delta pressure is valid for bank2 and	=TRUE		
					Air mass flow through throttle valve for MAF diagnosis is valid for bank 2	=TRUE		
					No pending or confirmed DTCs	=see sheet inhibit		
					Basic enable conditions met	=see sheet enable tables		
31. BOOST PRESSURE SENSOR	P0238	SRC Error High Bank 1	Raw voltage of pressure sensor throttle valve upstream	>4,85(V)	Ignition is ON	=TRUE		2 Trip
			For time	1,5(sec)	Basic enable conditions are met	=see sheet enable tables		
	P0242	SRC Error High Bank 2	Raw voltage of pressure sensor throttle valve upstream	>4,85(V)	Ignition is ON	=TRUE		2 Trip
			For time	1,5(sec)	Basic enable conditions are met	=see sheet enable tables		
	P0237	SRC Error Low Bank 1	Raw voltage of pressure sensor throttle valve upstream	<0,15(V)	Ignition is ON	=TRUE		2 Trip
			For time	1,5(sec)	Basic enable conditions are met	=see sheet enable tables		
	P0241	SRC Error Low Bank 2	Raw voltage of pressure sensor throttle valve upstream	<0,15(V)	Ignition is ON	=TRUE		2 Trip
			For time	1,5(sec)	Basic enable conditions are met	=see sheet enable tables		

		25OBDG07A Pa	art 2 ECM Summary	/ Tables			
P0238	Physical Range high fault boost pressure sensor bank1	Raw throttle valve pressure - Bank 1	<5000(hPa)	Valid raw signal of pressure throttle valve upstream - Bank 1	=TRUE	400(msec)	1 Trip
				Basic enable conditions are met	=see sheet enable tables		
P0242	Physical Range high fault boost pressure sensor bank2	Raw throttle valve pressure - Bank 2	<5000(hPa)	Valid raw signal of pressure throttle valve upstream - Bank 2	=TRUE	400(msec)	1 Trip
				Basic enable conditions are met	=see sheet enable tables		
P0237	Physical Range low fault boost pressure sensor bank1	Raw throttle valve pressure - Bank 1	>250(hPa)	Valid raw signal of pressure throttle valve upstream - Bank 1	=TRUE	400(msec)	1 Trip
				Basic enable conditions are met	=see sheet enable tables		
P0241	Physical Range low fault boost pressure sensor bank2	Raw throttle valve pressure - Bank 2	>250(hPa)	Valid raw signal of pressure throttle valve upstream - Bank 2	=TRUE	400(msec)	1 Trip
				Basic enable conditions are met	=see sheet enable tables		
P0236	Fault boost pressure sensor high through sensor cross check bank1	Raw throttle valve pressure - Bank 1	≤1150(hPa)	Engine Speed	=0(rpm)		1 Trip
		Raw throttle valve pressure -	>(A + B)	For time	≥5(sec)		
		A: Tolerance of the pressure sensor upstream of the throttle valve in the start at the ambient	=60(hPa)	Throttle Valve Actuatorposition	≥0(%)		
		B: maximum reference		Throttle Valve Actuatorposition	≤100(%)		
		pressure] For time	0,4(sec)	Current ECU state "Drive"	=TRUE		
P0240	Fault boost pressure sensor high through sensor cross check bank2	Raw throttle valve pressure - Bank 2	≤1150(hPa)	Engine Speed	=0(rpm)		1 Trip
		Raw throttle valve pressure -	>(A + B)	For time	≥5(sec)		
		Bank 2 A: Tolerance of the pressure sensor upstream of the throttle valve in the start at the ambient	=60(hPa)	Throttle Valve Actuatorposition	≥0(%)		
		ECM S	Section 440 of 772				552 of

			B: maximum reference pressure]		Throttle Valve Actuatorposition	≤100(%)		
			For time	0,4(sec)	Current ECU state "Drive"	=TRUE		
	P0236	Fault boost pressure sensor low through sensor cross check bank1	Raw throttle valve pressure - Bank 1	<(A + B)	Engine Speed	=0(rpm)		1 Trip
			A: Tolerance of the pressure sensor upstream of the throttle valve in the start at the ambient pressure	=60(hPa)	For time	≥5(sec)		
			B: maximum reference pressure]		Throttle Valve Actuatorposition	≥0(%)		
			For time	0,4(sec)	Throttle Valve Actuatorposition	≤100(%)		
					Current ECU state "Drive"	=TRUE		
	P0240	Fault boost pressure sensor low through sensor cross check bank2	Raw throttle valve pressure - Bank 2	<(A + B)	Engine Speed	=0(rpm)		1 Trip
			A: Tolerance of the pressure sensor upstream of the throttle valve in the start at the ambient	=60(hPa)	For time	≥5(sec)		
			B: maximum reference		Throttle Valve Actuatorposition	≥0(%)		
			For time	0,4(sec)	Throttle Valve Actuatorposition	≤100(%)		
					Current ECU state "Drive"	=TRUE		
32. ALTERNATO R CONTROL	P2DCA	Starter/Generator Excitation Current Intermittent	The absolute difference of alternator excitation current measured and the previous value of alternator excitation current measured	>0,4	Ignition is ON	=TRUE		2 Trip
					Basic enable conditions are met	=see sheet enable tables		
	P2DC7	Starter/Generator Excitation Current	Rotor coil resistance	<0,51	Ignition is ON	=TRUE	1000(events)	2 Trip
			OR		Basic enable conditions are met	=see sheet enable tables		
			Rotor coil resistance					
	P2DC9	Starter/Generator Excitation Current High	Alternator excitation current		Ignition is ON	=TRUE	1000(events)	2 Trip
					Battery voltage			
					Battery voltage			

Voltage set point for lin generator

			Basic enable conditions are met	=see sheet enable tables		
P2DC8	Starter/Generator Excitation Current Low	Alternator excitation current	Ignition is ON	=TRUE	1000(events)	2 Trip
			Battery voltage			
			Battery voltage			
			Engine is running			
			Voltage set point for lin generator			
			Basic enable conditions are met	=see sheet enable tables		
P2950	Starter/Generator Output Shaf - Crankshaft Speed Correlation	t Alternator speed ratio n	Ignition is ON	=TRUE	1000(events)	2 Trip
			Battery voltage			
			Battery voltage			
			Engine is running			
			Voltage set point for lin generator			
			Basic enable conditions are met	=see sheet enable tables		
P065A	Generator System Performance	Alternator Battery voltage difference	Ignition is ON	=TRUE	1000(events)	2 Trip
			Battery voltage			
			Battery voltage			

- ·		
Engine	IS	running

|--|

					Voltage set point for in generator			
					Basic enable conditions are met	=see sheet enable tables		
I	P1C4A	Starter/Generator Voltage/Battery Monitor	The absolute difference between the battery voltage		Ignition is ON	=TRUE	1000(events)	2 Trip
		Module voltage Correlation	and the alternator measured		Basic enable conditions are met	=see sheet enable tables		
I	P2951	Starter/Generator Voltage Performance	The absolute difference between the alternator setpoint		Ignition is ON	=TRUE	1000(events)	2 Trip
			voltage received and the		Basic enable conditions are met	=see sheet enable tables		
33. INJECTOR CIRCUIT CHECKS	P21DC	Injector 1:electrical fault, short to supply voltage	Output current	>3,8(A)	Engine speed	>=80(rpm)	3(events)	2 Trip
			Power stage status is active	=TRUE(-)	Battery Voltage Battery Voltage No pending or confirmed DTCs	<25500(mV) >10900(mV) =see sheet inhibit tables(-)		
	P21DB	Injector 1:electrical fault, short to ground	Output voltage	>5(V)	Engine speed	>=80(rpm)	3(events)	2 Trip
			Power stage status is not active	=TRUE(-)	Battery Voltage	<25500(mV)		
					Battery Voltage No pending or confirmed DTCs	>10900(mV) =see sheet inhibit tables(-)		
	P21CF	Injector 1:electrical fault, OL	Output voltage	<5(V)	Engine speed	>=80(rpm)	3(events)	2 Trip
			Output voltage Power stage status is not active	>=3(V) =TRUE(-)	Battery Voltage Battery Voltage	<25500(mV) >10900(mV)		
					No pending or confirmed DTCs	=see sheet inhibit tables(-)		
	P21E3	Injector 2:electrical fault, short to supply voltage	Output current	>3,8(A)	Engine speed	>=80(rpm)	3(events)	2 Trip
			Power stage status is active	=TRUE(-) / Section 443 of 772	Battery Voltage Battery Voltage	<25500(mV) >10900(mV)		555 o

				No pending or confirmed DTCs	=see sheet inhibit tables(-)		
P21E2	Injector 2:electrical fault, short to ground	Output voltage	>5(V)	Engine speed	>=80(rpm)	3(events)	2 Trip
		Power stage status is not active	=TRUE(-)	Battery Voltage	<25500(mV)		
				Battery Voltage No pending or confirmed DTCs	>10900(mV) =see sheet inhibit tables(-)		
P21D2	Injector 2:electrical fault, OL	Output voltage	<5(V)	Engine speed	>=80(rpm)	3(events)	2 Trip
		Output voltage Power stage status is not active	>=3(V) =TRUE(-)	Battery Voltage Battery Voltage	<25500(mV) >10900(mV)		
				No pending or confirmed DTCs	=see sheet inhibit tables(-)		
P21E1	Injector 3:electrical fault, short to supply voltage	Output current	>3,8(A)	Engine speed	>=80(rpm)	3(events)	2 Trip
		Power stage status is active	=TRUE(-)	Battery Voltage Battery Voltage No pending or confirmed DTCs	<25500(mV) >10900(mV) =see sheet inhibit tables(-)		
P21E0	Injector 3:electrical fault, short to ground	Output voltage	>5(V)	Engine speed	>=80(rpm)	3(events)	2 Trip
		Power stage status is not active	=TRUE(-)	Battery Voltage	<25500(mV)		
				Battery Voltage No pending or confirmed DTCs	>10900(mV) =see sheet inhibit tables(-)		
P21D1	Injector 3:electrical fault, OL	Output voltage	<5(V)	Engine speed	>=80(rpm)	3(events)	2 Trip
		Output voltage Power stage status is not active	>=3(V) =TRUE(-)	Battery Voltage Battery Voltage	<25500(mV) >10900(mV)		
				No pending or confirmed DTCs	=see sheet inhibit tables(-)		
P21EB	Injector 4:electrical fault, short to supply voltage	Output current	>3,8(A)	Engine speed	>=80(rpm)	3(events)	2 Trip
		Power stage status is active	=TRUE(-)	Battery Voltage Battery Voltage No pending or confirmed DTCs	<25500(mV) >10900(mV) =see sheet inhibit tables(-)		

			2500000	JOINT AILZ LOW Summary	Tables			
	P21EA	Injector 4:electrical fault, short to ground	Output voltage	>5(V)	Engine speed	>=80(rpm)	3(events)	2 Trip
			Power stage status is not active	=TRUE(-)	Battery Voltage	<25500(mV)		
l					Battery Voltage No pending or confirmed DTCs	>10900(mV) =see sheet inhibit tables(-)		
ſ	P21D6	Injector 4:electrical fault, OL	Output voltage	<5(V)	Engine speed	>=80(rpm)	3(events)	2 Trip
			Output voltage Power stage status is not active	>=3(V) =TRUE(-)	Battery Voltage Battery Voltage	<25500(mV) >10900(mV)		
L					No pending or confirmed DTCs	=see sheet inhibit tables(-)		
	P21E9	Injector 5:electrical fault, short to supply voltage	Output current	>3,8(A)	Engine speed	>=80(rpm)	3(events)	2 Trip
			Power stage status is active	e =TRUE(-)	Battery Voltage Battery Voltage No pending or confirmed DTCs	<25500(mV) >10900(mV) =see sheet inhibit tables(-)		
ſ	P21E8	Injector 5:electrical fault, short to ground	Output voltage	>5(V)	Engine speed	>=80(rpm)	3(events)	2 Trip
			Power stage status is not active	=TRUE(-)	Battery Voltage	<25500(mV)		
					Battery Voltage No pending or confirmed DTCs	>10900(mV) =see sheet inhibit tables(-)		
ľ	P21D5	Injector 5:electrical fault, OL	Output voltage	<5(V)	Engine speed	>=80(rpm)	3(events)	2 Trip
			Output voltage Power stage status is not active	>=3(V) =TRUE(-)	Battery Voltage Battery Voltage	<25500(mV) >10900(mV)		
					No pending or confirmed DTCs	=see sheet inhibit tables(-)		
ľ	P21E7	Injector 6:electrical fault, short to supply voltage	Output current	>3,8(A)	Engine speed	>=80(rpm)	3(events)	2 Trip
			Power stage status is active	e =TRUE(-)	Battery Voltage Battery Voltage No pending or confirmed DTCs	<25500(mV) >10900(mV) =see sheet inhibit tables(-)		
	P21E6	Injector 6:electrical fault, short to ground	Output voltage	>5(V)	Engine speed	>=80(rpm)	3(events)	2 Trip
			Power stage status is not active	=TRUE(-) ECM Section 445 of 772	Battery Voltage	<25500(mV)		557 o

				Battery Voltage No pending or confirmed DTCs	>10900(mV) =see sheet inhibit tables(-)		
P21D4	Injector 6:electrical fault, OL	Output voltage	<5(V)	Engine speed	>=80(rpm)	3(events)	2 Trip
		Output voltage Power stage status is not active	>=3(V) =TRUE(-)	Battery Voltage Battery Voltage	<25500(mV) >10900(mV)		
				No pending or confirmed DTCs	=see sheet inhibit tables(-)		
P21E5	Injector 7:electrical fault, short to supply voltage	Output current	>3,8(A)	Engine speed	>=80(rpm)	3(events)	2 Trip
		Power stage status is active	=TRUE(-)	Battery Voltage Battery Voltage No pending or confirmed DTCs	<25500(mV) >10900(mV) =see sheet inhibit tables(-)		
P21E4	Injector 7:electrical fault, short to ground	Output voltage	>5(V)	Engine speed	>=80(rpm)	3(events)	2 Trip
		Power stage status is not active	=TRUE(-)	Battery Voltage	<25500(mV)		
				Battery Voltage No pending or confirmed DTCs	>10900(mV) =see sheet inhibit tables(-)		
P21D3	Injector 7:electrical fault, OL	Output voltage	<5(V)	Engine speed	>=80(rpm)	3(events)	2 Trip
		Output voltage Power stage status is not active	>=3(V) =TRUE(-)	Battery Voltage Battery Voltage	<25500(mV) >10900(mV)		
				No pending or confirmed DTCs	=see sheet inhibit tables(-)		
P21DF	Injector 8:electrical fault, short to supply voltage	Output current	>3,8(A)	Engine speed	>=80(rpm)	3(events)	2 Trip
		Power stage status is active	=TRUE(-)	Battery Voltage Battery Voltage No pending or confirmed DTCs	<25500(mV) >10900(mV) =see sheet inhibit tables(-)		
P21DE	Injector 8:electrical fault, short to ground	Output voltage	>5(V)	Engine speed	>=80(rpm)	3(events)	2 Trip
		Power stage status is not active	=TRUE(-)	Battery Voltage	<25500(mV)		
				Battery Voltage No pending or confirmed DTCs	>10900(mV) =see sheet inhibit tables(-)		

			250000077		Ty Tables			
	P21D0	Injector 8:electrical fault, OL	Output voltage	<5(V)	Engine speed	>=80(rpm)	3(events)	2 Trip
			Output voltage Power stage status is not	>=3(V) =TRUE(-)	Battery Voltage Battery Voltage	<25500(mV) >10900(mV)		
			active		No pending or confirmed DTCs	=see sheet inhibit tables(-)		
34. CCM – BRAKE PEDAL POSITION SENSOR - POWER STAGE	P057D	Detects if the brake pedal position sensor voltage is higher than calibrated threshold for calibrated amount of time	Brake pedal position sensor voltage	>4750(mV)	Ignition is on	=TRUE	0,5(s)	1 Trip
					Basic enable conditions met	=see sheet enable tables		
	P057C	Detects if the brake pedal position sensor voltage is lower than calibrated threshold for calibrated amount of time	Brake pedal position sensor voltage	<250(mV)	Ignition is on	=TRUE	0,5(s)	1 Trip
					Basic enable conditions met	=see sheet enable tables		
35. CCM – BRAKE PEDAL POSITION SENSOR -	P057B	Path 1: Detects when brake pedal position ratio is higher than calibrated threshold for calibrated amount of time	Brake pedal ratio	>110(%)	Ignition is on	=TRUE	1(s)	1 Trip
CE					No pending or confirmed DTCs	=see sheet inhibit		
					Basic enable conditions met	tables =see sheet enable tables		
	P057B	Path 2: Detects when brake pedal position ratio is lower than calibrated threshold for	Brake pedal ratio	<-18(%)	Ignition is on	=TRUE	1(s)	1 Trip
					No pending or confirmed DTCs Basic enable conditions met	=see sheet inhibit tables =see sheet enable tables		

Ρ	057B	Path 3: Detects when brake pedal switch EWMA(Exponentially Weighted Moving Average) factor is less than calibrated	EWMA filtered test result based on the difference of (a) - (b)	≤0,4	Battery voltage	>10900(mV)	2(events)	1 Trip
			where (a) maximum analog brake sensor raw voltage during test	=calculated parameter(V)	Control for starter powerstage for time	≥40(msec)		
			(b) minimum analog brake sensor raw voltage during test	=calculated parameter(V)	Conditions for fast test scheduler			
			where difference of the brake sensor voltage corresponds to a corrected value (see Look I b-Table #2)	=0 to 1	(Number of reference voltage samples considered for fast EWMA calculation	>50(events)		
			(See Look-op-Table #2)		Absolute difference between maximum and minimum voltage obtained during the EWMA calculation in fast test scheduler) Conditions for slow test scheduler	>51(mV)		
					Slow test completion cycle	=FALSE =TRUE		
					(Gear position in case of automatic transmission system is in parking	=TRUE		
					/ Number of reference voltage samples considered for slow EWMA	>200		
					Gear position in case of automatic transmission system is not in parking	=TRUE		
					Vehicle speed Accelerator pedal position	≥4,35(mph) <5(%)		
) Number of successful EWMA test	≥2(events)		
					No pending or confirmed DTCs	=see sheet inhibit tables		
					Basic enable conditions met	=see sheet enable tables		
Ρ	138B	Checks if the voltage of the released brake pedal is within the zero point range	Brake pedal position sensor voltage	>1550(mV)	Conditions for first zero point learning		1,5(s)	1 Trip
			OR		(

		Brake pedal position sensor voltage	<575(mV)	Brake pedal released (Detection through pedal switch)) OR	=TRUE		
				Brake stroke sensor learning Continuous zero point learning conditions (=TRUE		
				Accelerator pedal position	<70(%)		
				Accelerator pedal position	>10(%)		
				Vehicle speed	<74,56(mph)		
				Vehicle speed	>7,46(mph)		
				Vehicle acceleration	<2(m/sec^2)		
				Vehicle acceleration	>1,3(m/sec^2)		
				brake pedal volatge and raw value	<30(mv)		
				brake pedal position voltage			
				Starter is not engaged	=TRUE		
) No pending or confirmed DTCs	=see sheet inhibit tables		
				Basic enable conditions met	=see sheet enable tables		
P057B	Monitoring of main brake pedal	Value of the main broke quitab	EALOE	Detter unelle ne	40000()/)	1(c)	4 Trim
10076	switch	changes	=FALSE	Battery voltage	>10900(mv)	1(5)	ттр
10575	switch	(for time (when brake pedal is pressed)	=FALSE 3600(sec)	Control for starter powerstage for time	>10900(mv) ≥40(msec)	1(5)	ттр
10075	switch	(for time (when brake pedal is pressed) or for time (when brake pedal is not pressed)	=FALSE 3600(sec) 36000(sec)	Control for starter powerstage for time Conditions for fast test scheduler (>10900(mv) ≥40(msec)	1(5)	ттр
	switch	(for time (when brake pedal is pressed) or for time (when brake pedal is not pressed))	=FALSE 3600(sec) 36000(sec)	Control for starter powerstage for time Conditions for fast test scheduler (Number of reference voltage samples considered for fast EWMA calculation	>10900(mv) ≥40(msec) >50(events)	1(5)	ттр
	switch	(for time (when brake pedal is pressed) or for time (when brake pedal is not pressed))	=FALSE 3600(sec) 36000(sec)	Control for starter powerstage for time Conditions for fast test scheduler (Number of reference voltage samples considered for fast EWMA calculation Absolute difference between maximum and minimum voltage obtained during the EWMA calculation in fast test scheduler	>10900(mv) ≥40(msec) >50(events) >51(mV)	1(5)	1 Inp
	switch	(for time (when brake pedal is pressed) or for time (when brake pedal is not pressed))	=FALSE 3600(sec) 36000(sec)	Control for starter powerstage for time Conditions for fast test scheduler (Number of reference voltage samples considered for fast EWMA calculation Absolute difference between maximum and minimum voltage obtained during the EWMA calculation in fast test scheduler) Conditions for slow test scheduler (>10900(mv) ≥40(msec) >50(events) >51(mV)		1 Inp

					Gear position in case of automatic transmission system is in parking) Number of reference voltage samples considered for slow EWMA Gear position in case of automatic transmission system is not in parking Vehicle speed Accelerator pedal position) Number of successful EWMA test completed No pending or confirmed DTCs Basic enable conditions met	=TRUE >200 =TRUE ≥4,35(mph) <5(%) ≥2(events) =see sheet inhibit tables =see sheet enable tables		
36. CCM - AMBIENT AIR TEMPERATU RE AND HUMIDITY	P0073	Detection of ambient temperature sensor voltage exceeding the maximum threshold	Raw voltage of the Ambient temperature sensor	>4870(mV)	Ignition is ON	=TRUE	2(s)	2 Trip
SENSORS			Same as:		No pending or confirmed DTCs	=see sheet inhibit		
			Ambient air temperature	<-40(°C)	Basic enable conditions met	=see sheet enable tables		
	P0072	Detection of ambient temperature sensor voltage falling below the minimum threshold	Raw voltage of the Ambient temperature sensor	<102,2(mV)	Ignition is ON	=TRUE	2(s)	2 Trip
			Same as:		No pending or confirmed DTCs	=see sheet inhibit tables		
			Ambient air temperature	>150(°C)	Basic enable conditions met	=see sheet enable tables		
	P0071	Plausibility check of Ambient Temperature sensor when compared with model temperature value higher than maximum threshold	Difference between ambient temperature sensor value and model temperature	>19,96(°C)	Errors with ambient temperature sensor (=FALSE	5(s)	2 Trip
					Signal Range check : out of range low error for ambient air temperature sensor (P0072)	=FALSE		
					Signal Range check : out of range high error for ambient air temperature sensor (P0073)	=FALSE		
			E	CM Section 450 of 772	(F0073)			562 of 1,098

) (Ambient temperature model released and updated on the current drive cycle) Basic enable conditions met No pending or confirmed DTCs	=see sheet enable tables =see sheet inhibit tables		
P0071	Plausibility check of Ambient Temperature sensor when compared with model temperature value higher than minimum threshold	Difference between model temperature and ambient temperature sensor value	<19,96(°C)	Errors with ambient temperature sensor (Signal Range check : out of range	=FALSE	5(s)	2 Trip
				low error for ambient air temperature sensor (P0072) Signal Range check : out of range high error for ambient air temperature sensor (P0073))	=FALSE		
				Ambient temperature model released and updated on the current drive cycle)			
				No pending or confirmed DTCs	=see sheet inhibit =see sheet inhibit tables		
P0074	Detects Environment Air Temperature implausible / Environmental temperature	Absolute difference between measured and filtered ambient temperatures	>10,06(°C)	Ignition ON	=TRUE	5(s)	2 Trip
	orginal orraits	for time	≥20(sec)	No pending or confirmed DTCs	=see sheet inhibit tables		
				Basic enable conditions met	tables		

	25OBDG07A Part 2 ECM Summary Tables												
F	200F5	Humidity sensor short to power (Bank 1)	Raw sensor value indicating relative humidity of fresh air	>110,5(%)	Ignition is on	=TRUE	1(s)	2 Trip					
					Battery Voltage Basic enable conditions met	≥9000(mV) =see sheet enable tables							
F	200F4	Humidity sensor short to ground (Bank 1)	Raw sensor value indicating relative humidity of fresh air				1(s)	2 Trip					
F	200F6	Humidity sensor intermittent check (Bank 1)	Absolute differences between 2 consecutive measurements	≥75(%)	Ignition is on	=TRUE	1(s)	2 Trip					
			Number of differeneces between the current and previous value	≥25()	Battery Voltage	≥9000(mV)							
			Window width - maximum number of events in window	≥16()	Basic enable conditions met	=see sheet enable tables							
					Circuit fault	P00F4=FALSE							
					Circuit fault	P00F5=FALSE							
	_												
F	20098	Air temperature sensor short to ground (Bank 1)	Air temperature indicated by sensor	>124,96(°C)	Ignition is on	=TRUE	1(s)	2 Trip					
					Battery Voltage	≥9000(mV)							
					Basic enable conditions met	=see sheet enable tables							
F	P0097	Air temperature sensor short to ground (Bank 1)	Air temperature indicated by sensor	<-40,04(°C)	_		1(s)	2 Trip					
U	J0693	Sensor's max error reported via SENT (Bank 1)		=TRUE	Ignition is on	=TRUE	1(s)	2 Trip					
L					Battery Voltage Basic enable conditions met	≥9000(mV) =see sheet enable tables							

250BDG074	Part 2	FCM	Summary	/ Tables
ZJUDDGUIA	r ai i z		Summary	

		2506DG07A F	an 2 ECivi Summai	y Tables			
U0693	Sensor's min error reported via SENT (Bank 1)	a	=TRUE			1(s)	2 Trip
				_	I		
U13D5	Invalid data received from humidity sensor		=TRUE	_		1(s)	2 Trip
and							
U13D4	Invalid data received from air temperature sensor						
U13D5	Invalid data received from air temperature sensor		=TRUE	-		1(s)	2 Trip
and							
U13D4	Invalid data received from air temperature sensor						
P0099	Loose connection error of humdity sensor temperature	Absolute differences between air temperature at the sensor and filtered air temperature at the sensor	≥29,96(°C)	Ignition is on	=TRUE	0,1(s)	2 Trip
		for time	≥2(sec)	Battery Voltage	≥9000(mV)		
		for time	≥5(sec)	Basic enable conditions met	=see sheet enable tables		
				Circuit fault	P0098=FALSE		
				Circuit fault	P0097=FALSE		
P0096	Diagnostic fault Check for reference sensor of humdity sensor temperature	Temperature difference between intake air temperature and temperature at humidity sensor	≥50(°C)	Ignition is on	=TRUE	0,1(s)	2 Trip
				Battery Voltage	≥9000(mV)		
							,

					Basic enable conditions met	=see sheet enable tables		
					Integrated air mass	>2000(kg/h)		
37. CCM - BAROMETRI C PRESSURE SENSOR DIAGNOSIS	P2229	Monitoring of Barometric Pressure Sensor for Signal range check - High	Error information message A fom digital ambient air pressure sensor returns a CRC (Cyclical Redundancy Checking) error	=TRUE	Reading message A fom digital ambient air pressure sensor has been successful and has delivered valid values	=TRUE	2(s)	1 Trip
			or		Ambient pressure sensor boot is done	=TRUE		
			Error information message A fom digital ambient air pressure sensor returns a short circuit to VDD	=TRUE	ECU is in drive state	=TRUE		
					No pending or confirmed DTCs	=see sheet inhibit tables		
					Basic enable conditions met	=see sheet enable tables		
	P2228	Monitoring of Barometric Pressure Sensor for Signal range check - Low	Error information message A fom digital ambient air pressure sensor returns a short circuit to ground	=TRUE	Reading message A fom digital ambient air pressure sensor has been successful and has delivered valid values	=TRUE	2(s)	1 Trip
					Ambient pressure sensor boot is done ECU is in drive state	=TRUE =TRUE		
					Basic enable conditions met	=see sneet innibit tables =see sheet enable tables		
38. CCM - BAROMETRI C PRESSURE SENSOR DIAGNOSIS	P2227	Path 1: Continuity check - positive deviation too high	Difference between filtered ambient air pressure raw value and its delayed value (20s)	>50(hPa)	Ambient pressure sensor valid, which is the following condition:	=TRUE	2(s)	1 Trip
					(Ambient pressure sensor raw value	=TRUE		
					for time	≥0,2(sec)		
					, No pending or confirmed DTCs Basic enable conditions met	=see sheet inhibit tables =see sheet enable		
						tables		

Difference between measured ambient air pressure raw value and maximum modeled ambient pressure	>15(hPa)	Threshold model for ambient pressure valid, which is the following condition for time	≥2,6(sec)	2(s)	2 Trip
		(
		`(
		Throttle valve/actuator position Engine speed	<8,01(%) <1000(rpm)		
)			
		OR	$\mathbf{O}(\mathbf{x},\mathbf{y})$		
		Engine speed	=0(rpm)		
		ECU IS III DRIVE State			
		valve is valid	-1102		
		/ Ambient pressure sensor valid which	=TRUF		
		is the following condition:			
		Ambient pressure sensor raw value exceeded	=TRUE		
		for time	≥0,2(sec)		
) Error suspision from contionious	-TRUF		
		check, which is the following	-1102		
		condition: (
		Difference between measured	>50(hPa)		
		ambient air pressure raw value and its delayed value (20s)			
		Fault suspicion from continuity	=TRUF		
		check between the drives, which is the following condition:			
		(
		Absolute value of difference	<100(hPa)		
		between ambient pressure from			
		actual driving cycle and ambient			
		pressure from last driving cycle			
		Zyklus flag for diagnosis by	=TRUE		
		comparing actual and last driving			
		cycle ambient pressure			
		(Ambient pressure from last driving			
		cycle valid	-INOL		
		Cycle flag ambient pressure from	=TRUE		
)			
		UR Healing of continuity check with			
		additional value	=IKUE		
		(

				Condition threshold modells for ambient pressure valid Difference between ambient air pressure raw value measured and maximum modelled ambient pressure	=TRUE <15(hPa)		
				Difference between minimal modelled ambient pressure and ambient air pressure raw value measured)	<15(hPa)		
				OR Condition deadlock threshold modells for ambient pressure valid	=TRUE		
				Condition for error suspision from contionious check	=TRUE		
				Validity of the pressure sensor of the intake manifold - bank 1)	=TRUE		
) No pending or confirmed DTCs	=see sheet inhibit tables		
				Basic enable conditions met	=see sheet enable tables		
P2227	Path 2: Continuity check - negative deviation too high	Difference between delayed (20s) ambient air pressure and measured ambient air pressure raw value	>50(hPa)	Ambient pressure sensor valid, which is the following condition:	=TRUE	2(s)	1 Trip
				(Ambient pressure sensor raw value exceeded	=TRUE		
				for time	≥0,2(sec)		
				, No pending or confirmed DTCs	=see sheet inhibit tables		
				Basic enable conditions met	=see sheet enable tables		
		Difference between minimum modeled ambient pressure and measured ambient air pressure raw value	>15(hPa)	Threshold model for ambient pressure valid, which is the following condition for time	≥2,6(sec)	2(s)	2 Trip
				((Throttle valve/actuator position Engine speed)	<8,01(%) <1000(rpm)		
				OK Engine speed	=0(rpm)		
		ГОМ	0	ECILis in DRIVE state			500

Measured pressure upstream throttle valve is valid	=TRUE
) Ambient pressure sensor valid, which is the following condition:	=TRUE
(Ambient pressure sensor raw value	=TRUE
for time	≥0,2(sec)
Error suspision from contionious check, which is the following condition:	=TRUE
Difference between measured ambient air pressure raw value and its delayed value (20s)	>50(hPa)
Fault suspicion from continuity check between the drives, which is the following condition:	=TRUE
(Absolute value of difference between ambient pressure from actual driving cycle and ambient	<100(hPa)
pressure from last driving cycle Zyklus flag for diagnosis by comparing actual and last driving cycle ambient pressure	=TRUE
(Ambient pressure from last driving	=TRUE
Cycle valid Cycle flag ambient pressure from current driving cycle adopted	=TRUE
) OR	
Healing of continuity check with additional value	=TRUE
Condition threshold modells for	=TRUE
Difference between ambient air pressure raw value measured and maximum modelled ambient pressure	<15(hPa)
Difference between minimal modelled ambient pressure and ambient air pressure raw value measured) OR	<15(hPa)

No pending or confirmed DTCs =see sheet inhibit tables		
Basic enable conditions met =see sheet enable tables		
P2227 Path 3: Difference between measured ambient pressure and the maximal reference pressure for delta pressure sensor diagnosis >2,23(kPa) ECU is in DRIVE state =TRUE 2	s) 1 ⁻	Trip
(Engine is not running =TRUE		
for time ≥5(sec)) ((
Condition ambient pressure sensor =TRUE valid		
Sensor valid		
for time >0,2(sec)) OR (
Condition ambient pressure sensor =TRUE valid		
Condition ambient pressure from =TRUE sensor valid		
for time =0,2(sec)		
Ambient pressure sensor reference =FALSE for delta pressure sensor is stable		
Ambient pressure sensor measured =TRUE is valid		

		25OBDG07A F	Part 2 ECM Summa	ary Tables			
				No pending or confirmed DTCs	=see sheet inhibit tables		
				Basic enable conditions met	=see sheet enable tables		
P2227	Path 4: Rationality check - out of range low	Difference between the e minimal reference pressure for delta pressure sensor diagnosis and the measured ambient pressure	>2,23(kPa)	ECU is in DRIVE state	=TRUE	2(s)	1 Trip
				(Engine is not running for time) ((=TRUE ≥5(sec)		
				(Condition ambient pressure sensor valid	=TRUE		
				Condition ambient pressure from sensor valid	=TRUE		
				for time) OR (>0,2(sec)		
				(Condition ambient pressure sensor valid	=TRUE		
				Condition ambient pressure from sensor valid	=TRUE		
) for time)	=0,2(sec)		
				Ambient pressure sensor reference for delta pressure sensor is stable	=FALSE		
) Ambient pressure sensor measured is valid	=TRUE		
				No pending or confirmed DTCs	=see sheet inhibit tables		
				Basic enable conditions met	=see sheet enable tables		
P2227	Path 5:	Information from digital	=TRUE	Sensor reset is triggered	=TRUE	2(s)	1 Trip

			250BDG07	7A Part 2 ECM Summary	Tables			
			OR Information from digital ambient pressure sensor for SENSOR DEFECT	=TRUE	(Ambient pressure sensor boot done	=TRUE		
			OR Information from digital ambient pressure sensor for VALUE TOO LOW	=TRUE	ECU Sub-State in DRIVE)	=TRUE		
			OR		No pending or confirmed DTCs	=see sheet inhibit tables		
			Information from digital ambient pressure sensor for VALUE TOO HIGH	=TRUE	Basic enable conditions met	=see sheet enable tables		
39. CCM – FUEL RAIL PRESSURE SENSOR –	P128A	Diagnosis of Fuel Rail Pressure Sensor1 Bank1 - Out of Range Error	Raw pressure data of SENT rail pressure sensor channel 1	>4087	Ignition is on	=FALSE	0,5(s)	1 Trip
DUAL PRESSURE – PRIMARY VALUE (SENT)			OR Raw pressure data of SENT rail pressure sensor channel 1	<2	Loss due to high level on SENT sensor signal line of SENT Rail Loss due to low level on SENT sensor signal line of SENT Rail pressure sensor	=FALSE =FALSE		
					Error in SENT rail pressure sensor No pending or confirmed DTCs	=FALSE =see sheet inhibit tables		
					basic enable conditions are met	tables		
	U101B	Path1: Diagnosis of message loss due to sensor signal line on high level (Bank 1)	Loss due to high level on SENT sensor signal line of SENT rail pressure sensor	=TRUE	Ignition is on	=FALSE	0,5(s)	1 Trip
	and				Loss due to low level on SENT sensor signal line of SENT rail	=FALSE		
	U0625				No pending or confirmed DTCs	=see sheet inhibit tables		1 Trip
					Basic enable conditions are met	=see sheet enable tables		
	U101B	Path2: Diagnosis of message loss due to sensor signal line on low level (Bank 1)	Loss due to low level on SENT sensor signal line of SENT rail pressure sensor	=TRUE	Ignition is on	=FALSE	0,5(s)	1 Trip
	and				Loss due to high level on SENT	=FALSE		
	U0625		E	CM Section 460 of 772	No pending or confirmed DTCs	=see sheet inhibit tables		1 Trip 572 of 1,098

				Basic enable conditions are met	=see sheet enable tables		
U1374	Diagnosis of Fuel Rail Pressure Protocol Error (Sensor 1)	Protocol error for SENT rail pressure sensor detected	=TRUE	Ignition is on	=FALSE	0,5(s)	1 Trip
and				Loss due to high level on SENT sensor signal line of SENT Rail pressure sensor	=FALSE		
U1375				Loss due to low level on SENT sensor signal line of SENT Rail pressure sensor	=FALSE		1 Trip
				No pending or confirmed DTCs	=see sheet inhibit tables		
				Basic enable conditions are met	=see sheet enable tables		
P312B	Diagnosis of Fuel Rail Pressure Sensor1 Bank2 - Out of Range Error	Raw pressure data of SENT rail pressure sensor channel 1	>4087	Ignition is on	=FALSE	0,5(s)	1 Trip
		OR		Loss due to high level on SENT sensor signal line of SENT Rail	=FALSE		
		Raw pressure data of SENT rail pressure sensor channel 1	<2	Loss due to low level on SENT sensor signal line of SENT Rail pressure sensor	=FALSE		
				Error in SENT rail pressure sensor No pending or confirmed DTCs	=FALSE =see sheet inhibit tables		
				Basic enable conditions are met	=see sheet enable tables		
U101C	Path1: Diagnosis of message loss due to sensor signal line on high level (Bank 2)	Loss due to high level on SENT sensor signal line of SENT rail pressure sensor	=TRUE	Ignition is on	=FALSE	0,5(s)	1 Trip
and				Loss due to low level on SENT	=FALSE		
U0665				No pending or confirmed DTCs	=see sheet inhibit tables		
				Basic enable conditions are met	=see sheet enable tables		

			25OBDG07A	Part 2 ECM Summar	ry Tables			
	U101C	Path2: Diagnosis of message loss due to sensor signal line on low level (Bank 2)	Loss due to low level on SENT sensor signal line of SENT rail pressure sensor	=TRUE	Ignition is on	=FALSE	0,5(s)	1 Trip
	and				Loss due to high level on SENT sensor signal line of SENT rail	=FALSE		
	U0665				No pending or confirmed DTCs	=see sheet inhibit tables		
					Basic enable conditions are met	=see sheet enable tables		
	U13D2	Diagnosis of Fuel Rail Pressure Protocol Error Bank 2	Protocol error for SENT rail 2 pressure sensor detected	=TRUE	Ignition is on	=FALSE	0,5(s)	1 Trip
	and				Loss due to high level on SENT sensor signal line of SENT Rail	=FALSE		1 Trip
	U13D3				Loss due to low level on SENT sensor signal line of SENT Rail pressure sensor	=FALSE		1 Trip
					No pending or confirmed DTCs	=see sheet inhibit tables		
					Basic enable conditions are met	=see sheet enable tables		
40. CCM - RATIONALITY DIAGNOSIS OF FUEL RAII	P0191	Path 1: Rationality Diagnosis of Fuel Rail Pressure Sensor	The low-pass filtered absolute value of the difference of the two rail pressure data values (see Look-Up-Table #42)	>241 to 290	Raw data for rail pressure from SENT	≤2	1(s)	1 Trip
PRESSURE					Raw data for rail pressure from SENT	≥4087		
					Raw data for rail pressure from SENT sensor channel 2	≤2		
					Raw data for rail pressure from SENT sensor channel 2	≥4087		
					Message loss due to high level on SENT sensor signal line of SENT Rail pressure sensor	=FALSE		
					Message loss due to low level on SENT sensor signal line of SENT Rail pressure sensor	=FALSE		
					Protocol error of SENT rail pressure sensor	=FALSE		
					No pending or confirmed DTCs	=see sheet inhibit tables		
					Basic enable conditions are met	=see sheet enable tables		

P0191 Path 2: high pressure sensor digital raw value is lesser than calculated previous los on a sensor digital raw value is lesser than calculated previous of time is lesser to the calculated previous of the calculated previous of time is lesser to the calculated previous of the calculated previous of the calculated previous of time is lesser to the calculated previous of the calculate			25OBDG0	7A Part 2 ECM Summar	y Tables			
Rall pressure sensor voltage is not plausible =FRUE (=FALSE (Condition error in stuck check, no voltage voltage difference, which is the following conditions (Rall pressure sensor voltage is not police (Rall pressure sensor voltage is not police (Diveori minimum and maximum value corrections (=FALSE (Diveori minimum and maximum value corrections (Rall pressure sensor voltage is is more police (Rall pressure sensor voltage is a mTRUE (Rall pressure sensor voltage is a mTRUE (Rave data for rall pressure from SENT is not plausible (Rave data for rall pressure from SENT is not plausible (Rave data for rall pressure from SENT is not plausible (Data for rall pressure from SENT is not plausible charmel 2 (Data for rall pressure from SENT is 22 (Data for rall pressure from SENT is 22 (Data for rall pressure from SENT is 23 (Data for rall pressure from SENT is 24087 (Data for rall pressure from SENT is 24087 (Data for rall pressure from SENT is 2	P0191	Path 2: High pressure sensor digital raw value is lesser than calibrated threshold for a calibrated period of time	High pressure sensor digital raw value	<0,002(MPa)	Fuel pre-supply pump is ON	=TRUE	1(s)	1 Trip
Condition error in stuck check, no voltage difference, which is the following conditions error in stuck check, no voltage difference, which is the following conditions (fall pressure sensor voltage > 1 difference between minimum and maxmum value over one cycle (Number of injections = 4 ECU is in drive state = FALSE) Rail pressure sensor voltage is = TRUE) Rail pressure sensor voltage is = TRUE) Rail pressure sensor voltage is = FALSE) Rail pressure from SENT is not plausible (Far death for rail pressure from SENT is not plausible (Fressure from SENT is not plausible (Fressure from SENT is not plausible for rail pressure from SENT is not plausible for rail pressure from SENT is not pressure from SENT is not pressure from SENT sensor (Pressure from SENT is not plausible for rail pressure from SENT is not pressure from SENT sensor (Pressure from SENT is not pressure from SENT is not pressure from SENT sensor (Pressure from SENT is not pressure from SENT is not pressure from SENT sensor (Pressure from SENT is not pressure from SENT is not pressure from SENT is not pressure from SENT sensor (Pressure from SENT is not pressure from SENT is not pressure from SENT is not pressure from SENT sensor (Pressure from SENT is not pressure from SE					(Rail pressure sensor voltage is not plausible	=TRUE		
<pre>C Real pressure sensor voltage 1 difference between minituum and maximum value over one cycle (Number of injections = -8 ECU is in drive state = FALSE)) Rail pressure sensor voltage is = TRUE plausible (Pressure from SENT is not plausible = FALSE (Raw data for rail pressure from 12 SENT Raw data for rail pressure from 22 SENT O O R Pressure from SENT is not = FALSE (Data for rail pressure from SENT 4087 SENT Sensor C Data for rail pressure from SENT 4087 Sensor C Data for rail pressure from SENT 22 S</pre>					(Condition error in stuck check, no voltage difference, which is the following	=FALSE		
Number of injections -8 ECU is in drive state =FALSE) Rail pressure sensor voltage is =TRUE plausible ((Pressure from SENT is not plausible =FALSE (Raw data for rail pressure from \$2 SENT 3 0 Raw data for rail pressure from \$2 SENT 0 0 OR =FALSE (Data for rail pressure from SENT is not =FALSE (Data for rail pressure from SENT \$4087 Sensor channel 2 ((Data for rail pressure from SENT \$4087 Sensor channel 2 2 (Data for rail pressure from SENT \$2087 Sensor channel 2 2 (Data for rail pressure from SENT \$2 Sensor channel 2 2)) > 2 (Data for rail pressure from SENT \$2 (Condition for initial fuelling of fuel =FALSE) > > </td <td></td> <td></td> <td></td> <td></td> <td>(Rail pressure sensor voltage difference between minimum and maximum value over one cycle</td> <td>>1</td> <td></td> <td></td>					(Rail pressure sensor voltage difference between minimum and maximum value over one cycle	>1		
Rail pressure sensor voltage is =TRUE plausible (Pressure from SENT is not plausible =FALSE (Raw data for rail pressure from \$4087 SENT Raw data for rail pressure from \$2 SENT) OR Pressure from SENT is not =FALSE plausible, channel 2 (Data for rail pressure from SENT \$4087 Sensor channel 2) Data for rail pressure from SENT \$2 Sensor channel 2) Data for rail pressure from SENT \$2 Sensor channel 2) Condition for initial fuelling of fuel) Condition for initial fuelling of fuel) Condition for initial fuelling of fuel) Condition for initial fuelling of fuel) ECM Section 463 of 772 Sensor					(Number of injections ECU is in drive state	<8 =FALSE		
Pressure from SENT is not plausible =FALSE (Raw data for rail pressure from \$4087 SENT Raw data for rail pressure from \$2 SENT) OR Pressure from SENT is not =FALSE plausible, channel 2 (Data for rail pressure from SENT \$4087 Sensor channel 2 Data for rail pressure from SENT \$4087 Sensor channel 2) Stensor channel 2) ECM Section 463 of 772 Sensor)) Rail pressure sensor voltage is plausible	=TRUE		
(Raw data for rail pressure from \$4087 SENT Raw data for rail pressure from ≥2 SENT) OR Pressure from SENT is not =FALSE plausible, channel 2 (Data for rail pressure from SENT \$4087 Sensor channel 2 Data for rail pressure from SENT ≥2 Sensor channel 2))) Condition for initial fuelling of fuel) Condition for initial fuelling of fuel supply system is active ECM Section 463 of 772) Sensor					(Pressure from SENT is not plausible	=FALSE		
Raw data for rail pressure from ≥2 SENT) OR =FALSE plausible, channel 2 (Data for rail pressure from SENT ≤4087 Sensor channel 2 Data for rail pressure from SENT ≥2 Sensor channel 2)))					(Raw data for rail pressure from SENT	≤4087		
OR Pressure from SENT is not =FALSE plausible, channel 2 (Data for rail pressure from SENT ≤4087 Sensor channel 2 Data for rail pressure from SENT ≥2 Sensor channel 2))))) Condition for initial fuelling of fuel =FALSE supply system is active ECM Section 463 of 772					Raw data for rail pressure from SENT)	≥2		
Condition for initial fuelling of fuel =FALSE supply system is active ECM Section 463 of 772					OR Pressure from SENT is not plausible, channel 2	=FALSE		
ECM Section 463 of 772 Chainel 2 Data for rail pressure from SENT ≥2 Sensor channel 2)))))))))) Sensor (Condition for initial fuelling of fuel = FALSE supply system is active Supply system is active 575 cm					(Data for rail pressure from SENT Sensor	≤4087		
))))) Condition for initial fuelling of fuel =FALSE supply system is active ECM Section 463 of 772					Data for rail pressure from SENT Sensor channel 2	≥2		
) Condition for initial fuelling of fuel =FALSE supply system is active ECM Section 463 of 772)))			
ECM Section 463 of 772 [\]) Condition for initial fuelling of fuel	=FALSE		
			E	CM Section 463 of 772	Supply System is active			575 c

				No pending or confirmed DTCs Basic enable conditions met	=see sheet inhibit tables =see sheet enable tables		
P0191	Path 3: Signal stuck check	Rail pressure sensor voltage difference between minimum and maximum value over one cycle	≤1	Condition error in stuck check, no voltage difference, which is the following conditions	=TRUE	2(s)	1 Trip
				(Number of injections ECU is in drive state	≥8 =TRUE		
) Rail pressure sensor voltage is plausible	=TRUE		
				(Pressure from SENT is not plausible	=FALSE		
				(Raw data for rail pressure from SENT	≤4087		
				Raw data for rail pressure from SENT)	≥2		
				OR Pressure from SENT is not plausible, channel 2	=TRUE		
				(Data for rail pressure from SENT,	≤4087		
				channel 2 Data for rail pressure from SENT, channel 2	≥2		
))			
				No pending or confirmed DTCs	=see sheet inhibit tables		
				Basic enable conditions met	=see sheet enable tables		
P01BF	Path 1: Rationality Diagnosis of Fuel Rail Pressure Sensor	The low-pass filtered absolute value of the difference of the two rail pressure data values (see Look-Up-Table #42)	>241 to 290	Raw data for rail pressure from SENT	≤2	1(s)	1 Trip
				Raw data for rail pressure from	≥4087		
				Raw data for rail pressure from	≤2		
				Raw data for rail pressure from SENT sensor channel 2	≥4087		
				Message loss due to high level on SENT sensor signal line of SENT Rail pressure sensor Message loss due to low level on SENT sensor signal line of SENT Rail pressure sensor Protocol error of SENT rail pressure sensor No pending or confirmed DTCs Basic enable conditions are met	=FALSE =FALSE =FALSE =see sheet inhibit tables =see sheet enable tables		
-------	--	--	----------------------	--	---	------	--------
P01BF	Path 2: High pressure sensor digital raw value is lesser than	High pressure sensor digital raw value	<0,002(MPa)	Fuel pre-supply pump is ON	=TRUE	1(s)	1 Trip
	calibrated threshold for a calibrated period of time						
				(Rail pressure sensor voltage is not plausible (=TRUE		
				Condition error in stuck check, no voltage difference, which is the following	=FALSE		
				(Rail pressure sensor voltage difference between minimum and maximum value over one cycle	>1		
				Number of injections	<8(count) =FALSE		
)			
				Rail pressure sensor voltage is plausible	=TRUE		
				Pressure from SENT is not plausible	=FALSE		
				(Raw data for rail pressure from	≤4087		
				Raw data for rail pressure from SENT)	≥2		
				OR Pressure from SENT is not plausible, channel 2	=FALSE		
		EC	M Santian AGE of 772	(577 0

				Data for rail pressure from SENT Sensor channel 2 Data for rail pressure from SENT	≤4087 ≥2		
				Sensor channel 2))))			
				Condition for initial fuelling of fuel supply system is active)	=FALSE		
				No pending or confirmed DTCs Basic enable conditions met	=see sheet inhibit tables =see sheet enable tables		
P01BF	Path 3: Signal stuck check	Rail pressure sensor voltage difference between minimum and maximum value over one cycle	≤1	Condition error in stuck check, no voltage difference, which is the following conditions	=TRUE	2(s)	1 Trip
				(Number of iniections	≥8(count)		
				ECU is in drive state	=TRUE		
) Rail pressure sensor voltage is plausible (=TRUE		
				Pressure from SENT is not plausible	=FALSE		
				(Raw data for rail pressure from SENT	≤4087		
				Raw data for rail pressure from SENT)	≥2		
				OR Pressure from SENT is not plausible, channel 2	=TRUE		
				(Data for rail pressure from SENT, channel 2	≤4087		
				Data for rail pressure from SENT, channel 2)	≥2		
) No pending or confirmed DTCs	=see sheet inhibit tables		

					Basic enable conditions met	=see sheet enable tables		
41. FUEL RAIL SENSORS'	P312B	Monitoring the range of the Raw Presure Data	Raw pressure data of SENT rail pressure sensor channel 1 bank 2	>4087	Sensor supply voltage error is not reported.	=FALSE	0,5(s)	1 Trip
SENT SIGNALS			or		Basic enable conditions met	=see sheet enable tables		
DIAGNOSIS			Raw pressure data of SENT rail pressure sensor channel 1 bank 2	<2	Message loss due high level on sensor signal line is not reported.	=FALSE		
					Message loss due to low level on sensor signal line is not reported.	=FALSE		
					Error in received data (e.g. wrong checksum) or an error in SENT Protocol is not reported.	=FALSE		
	P128B	Monitoring the range of the Raw Presure Data	Raw pressure data of SENT rail pressure sensor channel 2 bank 1	>4087	Sensor supply voltage error is not reported.	=FALSE	0,5(s)	1 Trip
			or		Basic enable conditions met	=see sheet enable tables		
			Raw pressure data of SENT rail pressure sensor channel 2 bank 1	<2	Message loss due high level on sensor signal line is not reported.	=FALSE		
					Message loss due to low level on	=FALSE		
					Error in received data (e.g. wrong checksum) or an error in SENT Protocol is not reported.	=FALSE		
	P312C	Monitoring the range of the Raw Presure Data	Raw pressure data of SENT rail pressure sensor channel 2 bank 2	>4087	Sensor supply voltage error is not reported.	=FALSE	0,5(s)	1 Trip
			or		Basic enable conditions met	=see sheet enable tables		
			Raw pressure data of SENT rail pressure sensor channel 2 bank 2	<2	Message loss due high level on sensor signal line is not reported.	=FALSE		
					Message loss due to low level on sensor signal line is not reported.	=FALSE		
					Error in received data (e.g. wrong checksum) or an error in SENT Protocol is not reported.	=FALSE		
	U13D2	Monitoring the protocol error of the Fuel Supply System	An error in received data (e.g. wrong checksum) or an error in	=TRUE	Sensor supply voltage error is not reported.	=FALSE	0,5(s)	1 Trip
	and	Gasoline Bank 2.	(Sensor 1)		Basic enable conditions met	=see sheet enable tables		
	U13D3		An error in received data (e.g. wrong checksum) or an error in SENT Protocol is reported		Message loss due high level on sensor signal line is not reported. Message loss due to low level on	=FALSE =FALSE		1 Trip
			(Sensor 2) ECM S	Section 467 of 772	sensor signal line is not reported.			579 o

42. CCM – DIAGNOSIS OF FUEL TANK PRESSURE SENSOR	P0453	Detects if the fuel tank pressure sensor voltage is higher than a calibrated threshold for a calibrated period of time	Fuel tank pressure sensor voltage	>4,8486(V)	(Engine start is finished	=TRUE	10(s)	2 Trip
CLICON			same as Fuel tank pressure	<-4,2(kPa)	means: (Engine speed	>200(rpm)		
) Engine speed ECU is in pre-drive state	=0(rpm) =FALSE		
					No pending or confirmed DTCs	=See sheet inhibit tables		
					Basic enable conditions met	=See sneet enable tables		
	P0452	Detects if the fuel tank pressure sensor voltage is lower than a calibrated threshold for a calibrated period of time	Fuel tank pressure sensor voltage	<0,1514(V)	(Engine start is finished	=TRUE	10(s)	2 Trip
			same as Fuel tank pressure	>1,63(kPa)	means: (Engine speed)	>200(rpm)		
					Engine speed ECU is in pre-drive state	=0(rpm) =FALSE		
					No pending or confirmed DTCs	=See sheet inhibit tables		
					Basic enable conditions met	=See sheet enable tables		
	P0451	Absolute value of Pressure difference for check of tank pressure sensor for drift is greater than the threshold for a calibrated period of time	Absolute value of Pressure difference for check of tank pressure sensor for drift	>8,125(hPa)	Tank pressure sensor for start check for drift is fulfilled, which is the following conditions for time	≥3(sec)	7(s)	2 Trip
					(Canister vent valve (CVV) commanded open (=TRUE		
					EVAP purge flow (Vehicle speed	≤0,00195(kg/h) <0(mph)		
				FOM Soction 400 -4 770	Vehicle speed Purge mass for tank pressure sensor ((a/36)+b)	>0(mph) ≥0,3(g)		F00
				ECIVI SECTION 468 OF //2				580 0

where a - EVAP purge flow where b - Integrated CPV - mass flow for tank pressure sensor	
) for time	≥30(sec)
) OR	
	=TRUE
ECU control for ECU switch off delay is	
available	
(Condition refugling in recognized	
Condition refueling is recognized	=FALSE >1.2(hPa)
`(
Filtered tank pressure	
Band pass filtered tank pressure	>0,3(hPa)
refueling or cap opening	
detection	
)	
OR Absolute band pass filtered tank	>0.4(hPa)
pressure	20,4(m u)
. signal for refueling or cap opening	
detection	
)	=FALSE
Condition refueling is detected	
(=FALSE
Condition refueling possible OR	
Difference between unfiltered fuel	≤6(I)
volume	
)	
))	
OR	
(Condition refueling hit valid	=FALSE
(=TRUE
Condition refueling possible	_
OR	
Refuel indication is active	=TRUE
volume	>0(1)
and stopped fuel level	
)	
)	
, for time	>300(sec)
)	

Ambient pressure (Condition maximum fuel level for	≥700(hPa) =FALSE
diagnostic function	
fuel level	<63(l)
Condition minimum fuel level for diagnostic function	=FALSE
`fuel level))	<7(I)
Fuel level	<63(l)
Ambient air temperature	<u>≤</u> 33,20(°C)
Ambient air temperature)	≥-7,04(°C)
Reference value for check of tank pressure sensor for drift stored in this driving	=TRUE
cycle	
(Engine not stopped after first start	>5(sec)
(Engine not stopped after first start	>=4,5(sec)
Fuel level	<=63(l)
Ambient air temperature sensor model is error	=TRUE
Temperature difference for cold start detection	≤9,86(°C)
for drift))	
No pending or confirmed DTCs	=See sheet inhibit tables
Basic enable conditions met	=See sheet enable tables

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P0451	Absolute value of tank pressure filtered for offset- diagnosis tank pressure sensor is greater than calibrated threshold	Absolute fuel tank pressure filtered for offset-diagnosis tank pressure sensor	>10(hPa)	Tank pressure sensor start check for offset is fulfilled, which is the following conditions for time (≥2(sec)	0,1(s)	2 Trip				
				Ambient pressure for offset	=TRUE						
					≤35,26(°C)						
				Ambient air temperature Ambient air temperature)	≥-7,04(°C)						
				(Ambient pressure (≥700(hPa) =FALSE						
				diagnostic function							
				(fuel level	<63(l)						
) Condition minimum fuel level for diagnostic function	=FALSE						
				(fuel level))	<7(1)						
) Vehicle speed conditions are fulfilled for offset diagnosis	=TRUE						
				(Absolute vehicle acceleration for offset-diagnosis of tank pressure	≤1,997(m/sec^2)						
				sensor (≤0(mph)						
				Vehicle speed)	≥0(mph)						
) Tank pressure is stable for offset diagnosis	=TRUE						
				Fuel tank ventilation adaption factor	≤5						
				(Integrated mass flow for release of offset	≥34,987(g)						
				check tank pressure sensor Engine not stopped after first start							
) (
				(Condition refueling is detected	=FALSE						

(Condition refueling possible	=FALSE
OR Difference between unfiltered fuel	≤6(I)
volume and stopped fuel level	
))	
OR (=FALSE
Condition refueling bit valid	=TRUE
Condition refueling possible	
Refuel indication is active	=TRUE
volume	>0(I)
)	
) Internal error flag CCV error	=FALSE
(Difference between filtered tank pressure for	≥0
offset diagnosis and filtered tank pressure	
due to no mass flow	
)	
) CPV plausibility check is successful	=TRUE
(
((Absolute unbials assolute tion for	≤1,997(m/sec^2)
offset-diagnosis tank pressure	
canister vent valve (CVV)	=TRUE
commanded open Low manifold ambient pressure	
Internal error flag CCV error	=FALSE
) for time	≥5(sec)
) Timer for calculation of reference	≥3(sec)
tank pressure (<5(counts)
Counter CPV-plausibility-checks (=FALSE
CPV active for plausibility check	

				Pressure from open CPV max. deviation 1. reference value to 2. reference value tank pressure minimum change for pressure because of CPV open and close))	=TRUE ≤0,5(hPa) ≥0,5(hPa)		
				No pending or confirmed DTCs	=See sheet inhibit tables		
				Basic enable conditions met	=See sheet enable tables		
P0451	Difference between Max and Min purge mass flow for incremental check of tank pressure sensor greater than a calibrated threshold	Difference between Max and Min purge mass flow for incremental check of tank pressure sensor	≥1,5(kg/h)	Condition start increment check of tank pressure sensor (0,1(s)	2 Trip
		and Difference between Max and Min fuel tank pressure during incremental check of tank pressure sensor	<0(kPa)	Vehicle speed (Ambient air temperature	≥0(mph) ≤49,96(°C)		
				Ambient air temperature) (≥-7,04(°C)		
				Ambient pressure (Condition maximum fuel level for diagnostic function	≥700(hPa) =FALSE		
				Fuel level	<63(l)		
				Condition minimum fuel level for diagnostic function	=FALSE		
				Fuel level	<7(l)		
				ÉVAP purge flow Manifold ambient pressure (>0 ≤0,804(hPa) ≤13(hPa)		
				Measured tank pressure Measured tank pressure)	≥-12(hPa)		
				No pending or confirmed DTCs	=See sheet inhibit tables		

					Basic enable conditions met	=See sheet enable tables		
	P0454	Tank pressure difference in tank leak diagnosis greater than a calibrated threshold for a calibrated period of time	Tank pressure difference in tank leak diagnosis	≥10(hPa)	(Canister vent valve (CVV) commanded open	=TRUE	20(s)	2 Trip
					for time	≥4(sec)		
) Vehicle idle speed control condition ((Engine speed deviation	=TRUE		
					OR Vehicle is in idle condition which is the following conditions for time (≥0,5(sec)		
					Difference between propulsion torque of cruise control and driver torque propulsion after step limitation	<3(Nm)		
					Coordinated status of acceleration request	=FALSE		
) Difference between minimum wheel torque with internal combustion engine firing and driver torque value after limitation	≥0(Nm)		
)			
) Overrun fuel cutoff is released	=FALSE		
) (Ambient air temperature	≤49,96(°C)		
					Ambient air temperature	≥-7,04(°C)		
					, Vehicle speed No pending or confirmed DTCs	≤3,11(mph) =See sheet inhibit		
					Basic enable conditions met	tables =See sheet enable tables		
43. FAUL LEVEL SENSOR IAGNOSIS	P0461	Diagnosis for the Fuel Level Sender Performance	Calculated fuel consumption (based on injected fuel) since start of test	≥9(I)	Distance traveled	≥0(m)	0,6(s)	1 Trip

					Basic enable conditions met	=see sheet enable tables		
					Enable condition for zone2 stuck diagnosis	=TRUE		
	U2200	Monitoring when there is no reception of Fuel Level.	Ultrasonic Fuel Level Data Received	=FALSE	Ignition is ON	=TRUE	0,6(s)	2 Trip
					Basic enable conditions met	=see sheet enable tables		
	P0463	Monitoring when there is no error either in ADC module or supply voltage of Fault level - Circuit High.	Ultrasonic Fuel Level Raw Value	>600(mm)	Ignition is ON	=TRUE	2(s)	1 Trip
					Basic enable conditions met	=see sheet enable tables		
	P0462	Monitoring when there is no error either in ADC module or supply voltage of Fault level - Circuit Low.	Ultrasonic Fuel Level Raw Value	<10(mm)	Ignition is ON	=TRUE	2(s)	1 Trip
					Basic enable conditions met	=see sheet enable tables		
44. CCM – FUEL PRESSURE	P196D	Detects Fuel Pressure Sensor Signal range check - High	Average raw voltage value of low pressure fuel pressure sensor	>4,75(V)	Ignition ON	=TRUE	1(s)	2 Trip
SENSOR			Same as: Low fuel pressure value	>843(kPa)	Basic enable conditions met	=see sheet enable tables		
	P196C	Detects Fuel Pressure Sensor Signal range check - Low	Average raw voltage value of low pressure fuel pressure	<0,25(V)	Ignition ON	=TRUE	1(s)	2 Trip
			Same as: Low pressure fuel value	<7,05(kPa)	Basic enable conditions met	=see sheet enable tables		
	P018D	Signal range check - high	Raw ADC value of the fuel pressure	>4,75(V)	Ignition is on	=TRUE()	1000(msec)	2 Trip

ĺ	P018C	Signal range check - low	Raw ADC value of the fuel pressure	<0,25(V)	Ignition is on	=TRUE()	1000(msec)	2 Trip
١.					Enabled by diagnostic scheduler	()		
	P196B	Monitoring the fuel low pressure to detect stuck error	((Ignition is on	=TRUE()	50(msec)	2 Trip
			Absolute Fuel pressure deviation in the low pressure system	>20(kPa)	Primary low pressure fuel sensor condition is enabled	=TRUE()		
			For time	>=10(sec)		()		
			OR		Fuel low pressure sensor signal is valid	=TRUE()		
			Difference of raw low pressure governor maximum set point and minimum set point	<4(kPa)	Engine run time	>=15(sec)		
)	0	Dynamic fuel pressure sensor test was aborted	=FALSE ()		
			For time	>=A+B+C()	Fuel pump is closed loop controlled	=TRUE ()		
			A: Holding time of maximum test set value for dynamic diagnosis	=2000(msec)	First engine start in lifetime is finished	=TRUE ()		
			B: Holding time of minimum test set value for dynamic diagnosis	=10000(msec))	0		
			C: Holding time of safe test set value for dynamic diagnosis	=2000(msec)	(0		
)	0	Fuel flow demand of electrical fuel pump	<=100(l/h)		
					Fuel flow demand of electrical fuel pump	>=1(I/h)		
					Fuel tank level for fuel pressure sensor diagnosis	>=2(l)		
)))	0		
ľ	P018B	Monitoring the fuel low pressure secondary sensor to detect stuck error	((Ignition is on	=TRUE()	50(msec)	2 Trip
			Absolute Fuel pressure deviation in the low pressure	>20(kPa)	Primary low pressure fuel sensor condition is enabled	=TRUE()		
			system	10()		^		
			OR	>=1U(SEC)	((Fuel low pressure sensor signal is valid	() =TRUE()		

			Difference of secondary raw low pressure governor maximum set point and minimum set point	<4(kPa)	Engine run time	>=15(sec)	
)	()	Dynamic fuel pressure sensor test was aborted	=FALSE ()	
			For time A: Holding time of maximum test set value for dynamic diagnosis	>=A+B+C() =2000(msec)	Fuel pump is closed loop controlled First engine start in lifetime is finished	=TRUE () =TRUE ()	
			B: Holding time of minimum test set value for dynamic	=10000(msec))	0	
			C: Holding time of safe test set value for dynamic diagnosis	=2000(msec)	(0	
)	0	Fuel flow demand of electrical fuel pump	<=100(I/h)	
					Fuel flow demand of electrical fuel pump	>=0(l/h)	
					sensor diagnosis	>=2(1)	
)))	0	
45. CCM – DIAGNOSIS OF CAMSHAFT POSITION SENSOR	P0343	Camshaft sensor signal circuit high - Detects no signal error - high level at the inlet camshaft sensor at bank 1 by monitoring camshaft revolutions when there is no new edges detected and the signal level during transition to no signal state is high	Crankshaft signals	≥4(revs)	Ignition ON	=TRUE	1 Trip
		·	Camshaft signal level when there is a transition to no signal state	=permanently high	Crankshaft signal with gap is detected	=TRUE	
					Back rotating engine is not detected	=TRUE	
					No pending or confirmed DTCs	=See sheet inhibit tables	
					Basic enable conditions met	=See sheet enable tables	
	P0342	Camshaft sensor signal circuit low - Detects no signal error - low level at the inlet camshaft sensor at bank 1 by monitoring camshaft revolutions when	Crankshaft signals	≥4(revs)	Ignition ON	=TRUE	1 Trip
			Camshaft signal level when there is a transition to no signal state	=permanently low	Crankshaft signal with gap is detected	=TRUE	
			ECM	M Section 477 of 772	Back rotating engine is not detected	=TRUE	589 of 1,098

				No pending or confirmed DTCs	=See sheet inhibit tables	
				Basic enable conditions met	=See sheet enable tables	
P0341	Camshaft sensor signal rationality check - Detection of implausible crankshaft sensor operation by detecting incorrect camshaft sensor signal patterns - inlet camshaft sensor bank 1	(Length of the acquired camshaft segment is wrong	=TRUE	Ignition ON	=TRUE	1 Trip
		OR		Crankshaft signal with gap is detected	=TRUE	
		No matching of camshaft signal table and reference table found because of disturbances	=TRUE	Back rotating engine is not detected	=TRUE	
		OR		No pending or confirmed DTCs	=See sheet inhibit tables	
		Sequence of entries in the signal table does not match with the reference table	=TRUE	Basic enable conditions met	=See sheet enable tables	
		OR Number of erroneous edge positions has exceeded the maximum tolerance)	=TRUE			
		AND Defect counter	≥4(revs)			
P0348	Camshaft sensor signal circuit high - Detects no signal error - high level at the inlet camshaft sensor at bank 2 by monitoring camshaft revolutions when there is no new edges detected and the signal level during transition to no signal state is high	Crankshaft signals	≥4(revs)	Ignition ON	=TRUE	1 Trip
		Camshaft signal level when there is a transition to no signal	=permanently high	Crankshaft signal with gap is detected	=TRUE	
		0.000		Back rotating engine is not detected	=TRUE	
				No pending or confirmed DTCs	=See sheet inhibit tables	
				Basic enable conditions met	=See sheet enable tables	

P0347	Camshaft sensor signal circuit low - Detects no signal error - low level at the inlet camshaft sensor at bank 2 by monitoring camshaft revolutions when there is no new edges detected	Crankshaft signals	≥4(revs)	Ignition ON	=TRUE	1 Trip
	and the signal level during	Camshaft signal level when there is a transition to no signal	=permanently low	Crankshaft signal with gap is detected	=TRUE	
		Sidle		Back rotating engine is not detected	=TRUE	
				No pending or confirmed DTCs	=See sheet inhibit	
				Basic enable conditions met	=See sheet enable tables	
P0346	Camshaft sensor signal rationality check - Detection of implausible crankshaft sensor operation by detecting incorrect camshaft sensor signal patterns - inlet camshaft sensor bank 2	(Length of the acquired camshaft segment is wrong	=TRUE	Ignition ON	=TRUE	1 Trip
		OR		Crankshaft signal with gap is detected	=TRUE	
		No matching of camshaft signal table and reference table found because of disturbances	=TRUE	Back rotating engine is not detected	=TRUE	
		OR		No pending or confirmed DTCs	=See sheet inhibit tables	
		Sequence of entries in the signal table does not match with the reference table OR	=TRUE	Basic enable conditions met	=See sheet enable tables	
		Number of erroneous edge positions has exceeded the maximum tolerance	=TRUE			
		AND Defect counter	≥4(revs)			
P0368	Camshaft sensor signal circuit high - Detects no signal error - high level at the outlet camshaft sensor at bank 1 by monitoring camshaft revolutions when there is no new edges detected and the signal level during transition to no signal state is high	Crankshaft signals	≥4(revs)	Ignition ON	=TRUE	1 Trip

		25OBDG0	7A Part 2 ECM Summary	y Tables		
		Camshaft signal level when there is a transition to no sign	=permanently high al	Crankshaft signal with gap is detected	=TRUE	
		State		Back rotating engine is not detected	=TRUE	
				No pending or confirmed DTCs	=See sheet inhibit tables	
				Basic enable conditions met	=See sheet enable tables	
P0367	Camshaft sensor signal circuit low - Detects no signal error - low level at the outlet camshaft sensor at bank 1 by monitoring camshaft revolutions when there is no new edges detected and the signal level during transition to no signal state is low	Crankshaft signals	≥4(revs)	Ignition ON	=TRUE	1 Trip
		Camshaft signal level when there is a transition to no sign	=0 al	Crankshaft signal with gap is detected	=TRUE	
		Sidle		Back rotating engine is not detected	=TRUE	
				No pending or confirmed DTCs	=See sheet inhibit tables	
				Basic enable conditions met	=See sheet enable tables	
P0366	Camshaft sensor signal	(=TRUE	Ianition ON	=TRUE	1 Trip
	rationality check - Detection of implausible crankshaft sensor operation by detecting incorrect camshaft sensor signal patterns - outlet camshaft sensor bank 1	Length of the acquired camshaft segment is wrong		5		
		OR		Crankshaft signal with gap is detected	=TRUE	
		No matching of camshaft signal table and reference table found because of disturbances	=TRUE	Back rotating engine is not detected	=TRUE	
		OR		No pending or confirmed DTCs	=See sheet inhibit tables	
		Sequence of entries in the signal table does not match with the reference table OR	=TRUE	Basic enable conditions met	=See sheet enable tables	
		Number of erroneous edge positions has exceeded the maximum tolerance	=TRUE			
		, ΔΝΠ	ECM Section 480 of 772			592

		Counter for signal disturbance error after pattern matching	≥4(revs)			
P0393	Camshaft sensor signal circuit high - Detects no signal error - high level at the outlet camshaft sensor at bank 2 by monitoring camshaft revolutions when there is no new edges detected and the signal level during transition to no signal state is high	Crankshaft signals	≥4(revs)	Ignition ON	=TRUE	1 Trip
		Camshaft signal level when there is a transition to no signal state	=permanently high	Crankshaft signal with gap is detected	=TRUE	
				Back rotating engine is not detected	=TRUE	
				No pending or confirmed DTCs	=See sheet inhibit	
				Basic enable conditions met	=See sheet enable tables	
P0392	Camshaft sensor signal circuit low - Detects no signal error - low level at the outlet camshaft sensor at bank 2 by monitoring camshaft revolutions when there is no new edges detected and the signal level during transition to no signal state is	Crankshaft signals	≥4(revs)	Ignition ON	=TRUE	1 Trip
		Camshaft signal level when there is a transition to no signal		Crankshaft signal with gap is detected	=TRUE	
		State		Back rotating engine is not detected	=TRUE	
				No pending or confirmed DTCs	=See sheet inhibit	
				Basic enable conditions met	=See sheet enable tables	
P0391	Camshaft sensor signal rationality check - Detection of	(Length of the acquired	=TRUE	Ignition ON	=TRUE	1 Trip
	implausible crankshaft sensor operation by detecting incorrect camshaft sensor signal patterns - outlet camshaft sensor bank 2	camshaft segment is wrong				

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			No matching of camshaft signal table and reference table found because of	=TRUE	Back rotating engine is not detected	=TRUE		
			OR		No pending or confirmed DTCs	=See sheet inhibit tables		
			Sequence of entries in the signal table does not match with the reference table	=TRUE	Basic enable conditions met	=See sheet enable tables		
			Number of erroneous edge positions has exceeded the maximum tolerance)	=TRUE				
			AND Defect counter	≥4(revs)				
46. CCM – CRANKSHAF T POSITION	P0335	Crankshaft signal rationality check - monitoring of crankshaft missing signal	Crankshaft signal is not available	=TRUE	Engine speed based on camshaft is above the lower plausible limit	=FALSE	3(camshaft revolutions)	1Trip- 200ms
SENSOR		against camsualt signal			Engine speed based on camshaft is	=FALSE		
					Engine speed based on camshaft is	=FALSE		
					below maximum engine speed Camshaft signal is valid ((=TRUE		
					(Vehicle speed Vehicle speed)	<0,62(mph) >15,5(mph)		
					OR (
					Engine speed)) (>550(rpm)		
					C Engine speed Synchronization check is completed	>550(rpm) =TRUE		
) OR			
					(Engine speed	=0(rpm)		
					Engine is ready and waiting for engine speed)))	=TRUE		
					OR			

		25OBDG07A F	Part 2 ECM Summa	ry Tables			
				Starter is active and starter signal is available) No pending or confirmed DTCs	=see sheet inhibit		
				Basic enable conditions met	tables =see sheet enable tables		
P0336	Path 1: Crankshaft signal rationality check - detection of implausible crankshaft sensor operation by detecting incorrect crank sensor signal patterns	Gap found in crankshaft signal	=FALSE	(20(events)	1Trip- 200ms
		Crankshaft signal disturbance is found	=TRUE	(
		Engine is in backup crankshaft mode	=TRUE	(
				Vehicle speed Vehicle speed) OR (>0,62(mph) <15,5(mph)		
				(Engine speed)) (>550(rpm)		
				Engine speed Synchronization check is completed) OR	>550(rpm) =TRUE		
				(Engine speed	=0(rpm)		
				Engine is ready and waiting for engine speed))) OR Starter is active and starter signal is available)	=TRUE		
				No pending or confirmed DTCs Basic enable conditions met	=see sheet inhibit tables =see sheet enable tables		

	P0336	Path 2: Crankshaft signal rationality check - Range check of DGI pulse width	Error detected in the range of pulse width from DGI sensor	=TRUE	Ignition is ON	=TRUE	10(events)	1Trip- 200ms
					Basic enable conditions met	=see sheet enable tables		
	P2619	Replicated Crank short circuit to battery	Powerstage reported short circuit to battery	=TRUE	Ignition is ON	=TRUE	1(s)	2 Trip
					Battery Voltage	≥9000(mV)		
	P2618	Replicated Crank short circuit to ground	Powerstage reported short circuit to ground	=TRUE	Basic enable conditions are met	=see sheet enable tables	1(s)	2 Trip
47. CCM – CRANKSHAF T TO CAMSHAFT – INTAKE / EXHAUST / BANK 1 / 2	P0016	Rationality check: Crankshaft position - intake camshaft position allocation Bank 1	(Average of angular offset between camshaft and crankshaft	>12,59(deg CrS)	Number of camshaft revolutions	≥2(counts)	2(CaS revs)	1 Trip
CORRELATIO			OR		Back rotating engine	=FALSE		
N			Average of angular offset between camshaft and crankshaft)	<-8,79(deg CrS)	NOTE: Pulse length indicates the direction of rotation:			
					45µs forward rotating shaft, 90µs backward rotating shaft Four crankshaft revolutions are complete without any error on crankshaft or camshaft signal and no sync lost	=TRUE		
					Monitoring is calibrated as active	=TRUE		
					No signal loss failure or signal disturbance is stored for the	=TRUE		
					Intake camshaft: Edge adaptation request	=TRUE		
	P0018	Rationality check: Crankshaft position - intake camshaft position allocation Bank 2	(Average of angular offset between camshaft and crankshaft	>12,59(deg CrS)	Number of camshaft revolutions	≥2(counts)	2(CaS revs)	1 Trip
			OR		Back rotating engine	=FALSE		

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		Average of angular offset between camshaft and crankshaft)	<-8,79(deg CrS)	NOTE: Pulse length indicates the direction of rotation: 45µs forward rotating shaft, 90µs backward rotating shaft Four crankshaft revolutions are complete without any error on crankshaft or camshaft signal and no sync lost Monitoring is calibrated as active No signal loss failure or signal disturbance is stored for the camshaft in question Intake camshaft: Edge adaptation request	=TRUE =TRUE =TRUE =TRUE		
P0017	Rationality check: Crankshaft position - exhaust camshaft position allocation Bank 1	(Average of angular offset between camshaft and crankshaft	>12,59(deg CrS)	Number of camshaft revolutions	≥2(counts)	2(CaS revs)	1 Trip
		OR		Back rotating engine	=FALSE		
		Average of angular offset between camshaft and crankshaft)	<-8,79(deg CrS)	NOTE: Pulse length indicates the direction of rotation:			
				45µs forward rotating shaft, 90µs backward rotating shaft Four crankshaft revolutions are complete without any error on crankshaft or camshaft signal and no sync lost	=TRUE		
				Monitoring is calibrated as active	=TRUE		
				No signal loss failure or signal disturbance is stored for the camshaft in question	=TRUE		
				Exhaust camshaft: Edge adaptation request	=TRUE		
P0019	Rationality check: Crankshaft position - exhaust camshaft position allocation Bank 2	(Average of angular offset between camshaft and crankshaft	>12,59(deg CrS)	Number of camshaft revolutions	≥2(counts)	2(CaS revs)	1 Trip
		OR		Back rotating engine	=FALSE		
		Average of angular offset between camshaft and	<-8,79(deg CrS)	NOTE: Pulse length indicates the direction of rotation:			
		crankehaft)	ECM Section 485 of 772				597 o

					45µs forward rotating shaft, 90µs backward rotating shaft Four crankshaft revolutions are complete without any error on crankshaft or camshaft signal and no sync lost Monitoring is calibrated as active	=TRUE =TRUE		
					No signal loss failure or signal disturbance is stored for the	=TRUE		
					Exhaust camshaft: Edge adaptation request	=TRUE		
48. CCM – IGNITION COIL SUPPLY VOLTAGE	P135A	Diagnoses Ignition Coil External Fuse open circuit Bank 1	Voltage at ignition coil side of fuse	=0(V)	Ignition is ON	=TRUE	40(events)	1 Trip
FEEDBACK - B1 / B2					Basic enable conditions met	=see sheet enable tables		
	P135B	Diagnoses Ignition Coil External Fuse open circuit Bank 2	Voltage at ignition coil side of fuse	=0(V)	Ignition is ON	=TRUE	40(events)	1 Trip
					Basic enable conditions met	=see sheet enable tables		
49. CCM – DIAGNOSIS OF KNOCK SENSOR 1 / 2 – BANK 1/ 2	P0328	Knock sensor 1 short circuit to battery	Filtered knock sensor output	>4,7(V)	Engine speed	>500(rpm)	3(events)	2 Trip
		Runs every 15-120 sec (as a function of Engine Speed)	Where Low pass filter gain – Integration result for short circuit to battery diagnosis	=0,5				
	P0327	Knock sensor 1 short circuit to ground	Filtered knock sensor output	<0,2(V)	Engine speed	>500(rpm)	3(events)	2 Trip
		Runs every 15-120 sec (as a function of Engine Speed)	Where Low pass filter gain – Integration result for short circuit to ground diagnosis	=0,5				

P0325	Knock sensor 1 open circuit	Integration result for open load detection	>2147483647	Knock sensor PWM duty cycle applied	>50(%)	30(events)	2 Trip
	Runs every 15-120 sec (as a function of Engine Speed)	Where Low pass filter gain – Integration result for open load diagnosis	0,5	Engine speed	>800(rpm)		
				Engine speed	<5000(rpm)		
				Engine load	>13(%)		
				Engine load SCG & SCB diagnostic enabled	<160(%) =TRUE		
P0326	Knock sensor 1 reference signal rationality check	Normalized reference level of knock control	>0.67109 to 2,5(V*msec)	Engine coolant temperature at engine start	>34,96(°C)	0,1(s)	2 Trip
		(see Look-Up-Table #48)					
		Debounce counter for knock sensor diagnosis	>30(Counts)	Knock control active (=TRUE		
		J		(Relative charge of air in the cylinder (see Look-Up-Table #53)	≥50 to 55(%)		
				OR			
P1982	Knock sensor 1 reference signal rationality check	Normalized reference level of knock control	<0.00156 to 0.00586(V*msec)	(Engine load dynamic for	=FALSE	0,1(s)	2 Trip
		(see Look-Up-Table #47)		detection active (*)			
		Debounce counter for knock sensor diagnosis	>30(Counts)	maintained active for time	≥0.29 to 0.5(sec)		
				(Knock control: time for dynamic adaptation) (see Look-Up-Table #52)			
)			
) Engine Speed Engine start is finished	>800(rpm) =TRUE		
				number of combustions to deactivate	>20(Counts)		
				Fuel Cut off	=FALSE		
		EC	M Section 487 of 772	GDI mode stratified is active	=FALSE		599 c

	Dallery					
P032D	Knock sensor 3 short circuit to Filtered k	nock sensor output >4,7	(V) Engine speed	>500(rpm)	3(events)	2 Trip
			Basic enable conditions met	=see sneet enable tables		
				tables		
			Engine Speed No pending or confirmed DTCs	>1400(rpm) =see sheet inhibit		
			for time	>0.25(sec)		
			(see Look-Up-Table #50)			
			Engine speed gradient averaged	≥400 to 3000(1/min/s)		
			(
			Engine speed dynamic for knock detection active	=FALSE		
			(see Look-Up-Table #51)			
			dynamic action on knock detection)			
			maintained active for time (Knock control: time for load-	≥0.29 to 0.44(sec)		
)			
			Engine in idle condition	=FALSE		
			Delay for dynamic detection			
			(see Look-Up-Table #49)			
			Intake manifold pressure	≥200 to 400(hPa)		
			detection active	=FALOE		
) Engine lead dynamic far knock			
			have valid crankshaft signal			
			State of EPM operation mode should not	=FALSE		
			pnase error OR			
			error at			
			(Knock control synchronization			
			Enable knock sensor diagnosis			
)	=TRUE		
			for time	>0(sec)		

	Runs every 15-120 sec (as a function of Engine Speed)	Where Low pass filter gain – Integration result for short circuit to battery diagnosis	=0,5				
P032C	Knock sensor 3 short circuit to ground	Filtered knock sensor output	<0,2(V)	Engine speed	>500(rpm)	3(events)	2 Trip
	Runs every 15-120 sec (as a function of Engine Speed)	Where Low pass filter gain – Integration result for short circuit to ground diagnosis	=0,5				
P032A	Knock sensor 3 open circuit	Integration result for open load detection	>2147483647	Knock sensor PWM duty cycle applied	>50(%)	30(events)	2 Trip
	Runs every 15-120 sec (as a function of Engine Speed)	Where Low pass filter gain – Integration result for open load diagnosis	=0,5	Engine speed	>800(rpm)		
				Engine speed	<5000(rpm)		
				Engine load	>13(%)		
				Engine load SCG & SCB diagnostic enabled	<160(%) =TRUE		
P032B	Knock sensor 3 reference signal rationality check	Normalized reference level of knock control	>0.67109 to 2,5(V*msec)	Engine coolant temperature at engine start	>34,96(°C)	0,1(s)	2 Trip
		(see Look-Up-Table #48)					
		Debounce counter for knock sensor diagnosis	>30(Counts)	Knock control active ((=TRUE		
				((Relative charge of air in the cylinder (see Look-Up-Table #53)	≥50 to 55(%)		
				OR			
P1984	Knock sensor 3 reference signal rationality check	Normalized reference level of knock control	<0.00156 to 0.00586(V*msec)	(Engine load dynamic for knock	=FALSE	0,1(s)	2 Trip
		(see Look-Up-Table #47)		detection active (*)			

Debounce counter for knock sensor diagnosis	>30(Counts)	maintained active for time	≥0.29 to 0.5(sec)
		(Knock control: time for dynamic adaptation) (see Look-Up-Table #52)	
)) Engine Speed	>800(rpm)
		Engine start is finished	=TRUE
		for number of combustions to deactivate	>20(Counts)
		knock control after start end Fuel Cut off)	=FALSE
		GDI mode stratified is active	=FALSE
		for time	>0(sec)
		Enable knock sensor diagnosis (=TRUE
		Knock control synchronization error at phase error	=FALSE
		State of EPM operation mode should not have valid crankshaft signal present	=FALSE
) Engine load dynamic for knock detection active	=FALSE
		(Intake manifold pressure	≥200 to 400(hPa)
		(see Look-Up-Table #49)	
		Delay for dynamic detection	
		Engine in idle condition)	=FALSE
		maintained active for time (Knock control: time for load- dynamic action on knock detection) (see Look-Up-Table #51)	≥0.29 to 0.44(sec)
		Engine speed dynamic for knock detection active (=FALSE

				Engine speed gradient averaged during one working cycle (see Look-Up-Table #50)	≥400 to 3000(1/min/s)		
				for time)	>0,25(sec)		
				Éngine Speed No pending or confirmed DTCs	>1400(rpm) =see sheet inhibit tables		
				Basic enable conditions met	=see sheet enable tables		
P0333	Knock sensor 2 short circuit to battery	Filtered knock sensor output	>4,7(V)	Engine speed	>500(rpm)	3(events)	2 Trip
	Runs every 15-120 sec (as a function of Engine Speed)	Where Low pass filter gain – Integration result for short circuit to battery diagnosis	=0,5				
P0332	Knock sensor 2 short circuit to ground	Filtered knock sensor output	<0,2(V)	Engine speed	>500(rpm)	3(events)	2 Trip
	Runs every 15-120 sec (as a function of Engine Speed)	Where Low pass filter gain – Integration result for short circuit to ground diagnosis	=0,5				
P0330	Knock sensor 2 open circuit	Integration result for open load detection	>2147483647	Knock sensor PWM duty cycle applied	>50(%)	30(events)	2 Trip
	Runs every 15-120 sec (as a function of Engine Speed)	Where Low pass filter gain – Integration result for open load diagnosis	=0,5	Engine speed	>800(rpm)		
				Engine speed	<5000(rpm)		
				Engine load	>13(%)		
				Engine load SCG & SCB diagnostic enabled	<160(%) =TRUE		
P0331	Knock sensor 2 reference signal rationality check	Normalized reference level of knock control	>0.67109 to 2,5(V*msec)	Engine coolant temperature at engine start	>34,96(°C)	0,1(s)	2 Trip
		(see Look-Up-Table #48)					

		25OBDG07A	A Part 2 ECM Summar	y Tables			
		Debounce counter for knock sensor diagnosis	>30(Counts)	Knock control active (((Relative charge of air in the cylinder (see Look-Up-Table #53)	=TRUE ≥50 to 55(%)		
P1983	Knock sensor 2 reference signal rationality check	Normalized reference level of knock control	<0.00156 to 0.00586(V*msec)	OR (Engine load dynamic for knock	=FALSE	0,1(s)	2 Trip
		(see Look-Up-Table #47) Debounce counter for knock sensor diagnosis	>30(Counts)	detection active (*) maintained active for time (Knock control: time for dynamic adaptation)	≥0.29 to 0.5(sec)		
) Engine Speed Engine start is finished for number of combustions to	>800(rpm) =TRUE >20(Counts)		
				deactivate knock control after start end Fuel Cut off) GDI mode stratified is active	=FALSE =FALSE		
) for time)	>0(sec)		
) Enable knock sensor diagnosis (=TRUE		
				Knock control synchronization error at phase error OR	=FALSE		
				State of EPM operation mode should not have valid crankshaft signal present	=FALSE		
				, Engine load dynamic for knock detection active (=FALSE		

					Intake manifold pressure	≥200 to 400(hPa)		
					(see Look-Up-Table #49)			
					Delay for dynamic detection			
					Engine in idle condition	=FALSE		
					Maintained active for time (Knock control: time for load- dynamic action on knock detection) (see Look-Up-Table #51)	≥0.29 to 0.44(sec)		
					Engine speed dynamic for knock detection active (=FALSE		
					Engine speed gradient averaged during one working cycle (see Look-Up-Table #50)	≥400 to 3000(1/min/s)		
					for time	>0,25(sec)		
					, Engine Speed No pending or confirmed DTCs	>1400(rpm) =see sheet inhibit		
					Basic enable conditions met	tables =see sheet enable tables		
ľ	P033D	Knock sensor 3 short circuit to battery	Filtered knock sensor output	>4,7(V)	Engine speed	>500(rpm)	3(events)	2 Trip
		Runs every 15-120 sec (as a function of Engine Speed)	Where Low pass filter gain – Integration result for short circuit to battery diagnosis	=0,5				
	P033C	Knock sensor 3 short circuit to ground	Filtered knock sensor output	<0,2(V)	Engine speed	>500(rpm)	3(events)	2 Trip
		Runs every 15-120 sec (as a function of Engine Speed)	Where Low pass filter gain – Integration result for short circuit to ground diagnosis	=0,5				
	P033A	Knock sensor 3 open circuit	Integration result for open load	>2147483647	Knock sensor PWM duty cycle	>50(%)	30(events)	2 Trip
			detection		applied			
		Runs every 15-120 sec (as a function of Engine Speed)	Where Low pass filter gain – Integration result for open load diagnosis	=0,5	Engine speed	>800(rpm)		

				Engine speed	<5000(rpm)		
				Engine load	>13(%)		
				Engine load SCG & SCB diagnostic enabled	<160(%) =TRUE		
P033B	Knock sensor 4 reference signal rationality check	Normalized reference level of knock control (see Look-Up-Table #48)	>0.67109 to 2,5(V*msec)	Engine coolant temperature at engine start	>34,96(°C)	0,1(s)	2 Trip
		Debounce counter for knock sensor diagnosis	>30(Counts)	Knock control active ((=TRUE		
				(Relative charge of air in the cylinder (see Look-Up-Table #53) OR	≥50 to 55(%)		
P1985	Knock sensor 4 reference signal rationality check	Normalized reference level of knock control (see Look-Up-Table #47)	>0.00156 to 0.00586(V*msec)	(Engine load dynamic for knock detection active (*)	=FALSE	0,1(s)	2 Trip
		Debounce counter for knock sensor diagnosis	>30(Counts)	maintained active for time (Knock control: time for dynamic adaptation) (see Look-Up-Table #52)	≥0.29 to 0.5(sec)		
) Engine Speed Engine start is finished for	>800(rpm) =TRUE		
				deactivate knock control after start end Fuel Cut off	=FALSE		
) GDI mode stratified is active	=FALSE		
				, for time	>0(sec)		
)	=TRUE		
				Enable knock sensor diagnosis (

					Knock control synchronization error at phase error OR State of EPM operation mode should not have valid crankshaft signal present) Engine load dynamic for knock	=FALSE =FALSE =FALSE		
					detection active (
					Intake manifold pressure	≥200 to 400(hPa)		
					(see Look-Up-Table #49)			
					Delay for dynamic detection	=0		
					Engine in idle condition)	=FALSE		
					maintained active for time (Knock control: time for load- dynamic action on knock detection) (see Look-Up-Table #51)	≥0.29 to 0.44(sec)		
					Engine speed dynamic for knock detection active (=FALSE		
					Engine speed gradient averaged during one working cycle (see Look-Up-Table #50)	≥400 to 3000(1/min/s)		
					for time	>0,25(sec)		
					Éngine Speed No pending or confirmed DTCs	>1400(rpm) =see sheet inhibit tables		
					Basic enable conditions met	=see sheet enable tables		
50. CCM –	P02EE	Plausibility check of injector	(Ignition is ON	=TRUE	20(events)	2 Trip
INJECTION VALVE FLYBACK VOLTAGE -		ADC signal buffer	ADC buffer signal from beginning of Controlled Valve Operation signal evaluation	≤15000(counts)	No pending or confirmed DTCs	=see sheet inhibit tables		
CYLINDER 1 TO 8			OR		Basic enable conditions met	=see sheet enable tables		
			ADC buffer signal from end of Controlled Valve Operation signal evaluation)	≥5000(counts)				

_							
P02	2EF Plausibility check of injector	(Ignition is ON	=TRUE	20(events)	2 Trip
		ADC buffer signal from beginning of Controlled Valve Operation signal evaluation	≤15000(counts)	No pending or confirmed DTCs	=see sheet inhibit tables		
		OR		Basic enable conditions met	=see sheet enable tables		
		ADC buffer signal from end of Controlled Valve Operation signal evaluation)	≥5000(counts)				
PO	2E0 Plausibility check of injector	1		Ignition is ON	_TRUE	20(events)	2 Trin
F U.	ADC signal buffer	(-INOL	20(606113)	zmp
		ADC buffer signal from beginning of Controlled Valve Operation signal evaluation	≤15000(counts)	No pending or confirmed DTCs	=see sheet inhibit tables		
		OR	>E000(counto)	Basic enable conditions met	=see sheet enable tables		
		Controlled Valve Operation signal evaluation	2000(counts)				
P0	2F1 Plausibility check of injector	(lanition is ON	=TRUE	20(events)	2 Trip
1 0.	ADC signal buffer	(20(0101110)	2
		ADC buffer signal from beginning of Controlled Valve Operation signal evaluation	≤15000(counts)	No pending or confirmed DTCs	=see sheet inhibit tables		
		OR		Basic enable conditions met	=see sheet enable tables		
		ADC buffer signal from end of Controlled Valve Operation signal evaluation)	≥5000(counts)				
P0	2F2 Plausibility check of injector	(Ignition is ON	=TRUE	20(events)	2 Trip
	ADC SIGNAI DUTTER	ADC buffer signal from	≤15000(counts)	No pending or confirmed DTCs	=see sheet inhibit		
		Deginning of Controlled Valve Operation signal evaluation ECN	A Section 496 of 772		tables		608 oʻ

			OR ADC buffer signal from end of Controlled Valve Operation signal evaluation)	≥5000(counts)	Basic enable conditions met	=see sheet enable tables		
P	02F3 F	'lausibility check of injector ADC signal buffer	(ADC buffer signal from beginning of Controlled Valve Operation signal evaluation OR ADC buffer signal from end of Controlled Valve Operation signal evaluation)	≤15000(counts) ≥5000(counts)	Ignition is ON No pending or confirmed DTCs Basic enable conditions met	=TRUE =see sheet inhibit tables =see sheet enable tables	20(events)	2 Trip
P	02F4 F	'lausibility check of injector ADC signal buffer	(ADC buffer signal from beginning of Controlled Valve Operation signal evaluation OR ADC buffer signal from end of Controlled Valve Operation signal evaluation)	≤15000(counts) ≥5000(counts)	Ignition is ON No pending or confirmed DTCs Basic enable conditions met	=TRUE =see sheet inhibit tables =see sheet enable tables	20(events)	2 Trip
P	02F5 F	'lausibility check of injector ADC signal buffer	(ADC buffer signal from beginning of Controlled Valve Operation signal evaluation OR ADC buffer signal from end of Controlled Valve Operation signal evaluation)	≤15000(counts) ≥5000(counts)	Ignition is ON No pending or confirmed DTCs Basic enable conditions met	=TRUE =see sheet inhibit tables =see sheet enable tables	20(events)	2 Trip

51. CCM – ENGINE OIL TEMPERATU RE SENSORS CIRCUIT	P01BC	Monitoring Maxmum error Signal Range Check for oil temperature sensor 2 in sump	ADC-voltage of the oel temperature sensor 2 in sump	>4950(mV)	Battery Voltage	≥9000(mV)	1(s)	2 Trip
sump					Basic enable conditions met	=see sheet enable tables		
	P01BB	Monitoring Minimum error Signal Range Check for oil temperature sensor 2 in sump	ADC-voltage of the oel temperature sensor 2 in sump	<200(mV)	Battery Voltage	≥9000(mV)	1(s)	2 Trip
					Basic enable conditions met	=see sheet enable tables		
	P0198	Monitoring Maxmum error Signal Range Check for oil temperature sensor 2 in sump	ADC-voltage of the oil temperature sensor	>4950(mV)	Battery Voltage	≥9000(mV)	1(s)	2 Trip
					Basic enable conditions met	=see sheet enable tables		
	P0197	Monitoring Minimum error Signal Range Check for oil temperature sensor 2 in sump	ADC-voltage of the oil temperature sensor	<200(mV)	Battery Voltage	≥9000(mV)	1(s)	2 Trip
					Basic enable conditions met	=see sheet enable tables		

		25OBDG07A F	Part 2 ECM Summa	ary Tables			
P2C21	Check the deviation between oil temperature sensor 1 and thesensor 2	The absoulte value of the difference between the oil temperature sensors in the sump	>15(°C)	Battery Voltage	≥9000(mV)	0,1(s)	2 Trip
				Basic enable conditions met	=see sheet enable tables		
P0196	Coldstart CrossCheck Max Error for engine oil temperature sensor	Average temperature of other e sensors - Sensor temperature	>14,96(°C)	Battery Voltage	≥9000(mV)	1(s)	2 Trip
				Basic enable conditions met	=see sheet enable tables		
P0196	Coldstart CrossCheck Max Error for engine oil temperature sensor	Sensor temperature - Average e temperature of other sensors	<14,96(°C)	Sensor signal is valid	=TRUE	1(s)	2 Trip
				Engine off time	>28800(sec)		
				Mean value calculation out of reference temperature sensors is finished.	=TRUE		
P0199	Engine Oil Temperature Sensor (EOT) Circuit Intermittent	Absolute value (Sensed value of sump Temperature - Filtered sensor value of the I-temperature -sensor 2 in sump)	≥9,96(°C)	Battery Voltage	≥9000(mV)	1(s)	2 Trip
		for time	≥A+B(sec)	Basic enable conditions met	=see sheet enable tables		
		where					
		A: debounce time error detection Jitter–Check Oil temperature sensor2	=5(sec)				
		B: debounce time error Jitter-Check Oil temperature sensor2	=20(sec)				
P01BD	Engine Oil Temperature Sensor (EOT) Circuit Intermittent (Sensor B)	Absolute value (Sensed value of sump Temperature - Filtered sensor value of the I-temperature -sensor 2 in sump)	≥9,96(°C)			1(s)	2 Trip
		for time	≥A+B(sec)				
		where					

			25OBDG07	A Part 2 ECM Summar	y Tables			
			A: debounce time error detection Jitter–Check Oil temperature sensor2	=5(sec)				
			B: debounce time error Jitter-Check Oil temperature sensor2	=20(sec)				
52. CCM – DIAGNOSIS OF ENGINE OIL PRESSURE SENSOR	P0523	Monitoring of Engine Oil Pressure Sensor for Signal range check - High	Engine oil pressure sensor voltage	>4500(mV)	Ignition is ON	=TRUE	1(s)	2 Trip
			Same as:		No pending or confirmed DTCs	=see sheet inhibit		
			Engine Oil Pressure (see Look-Up-Table #85)	>0 to 1049.8(kPa)	Basic enable conditions met	tables =see sheet enable tables		
	P0522	Monitoring of Engine Oil Pressure Sensor for Signal range check - Low/Open	Engine oil pressure sensor voltage	<250(mV)	Ignition is ON	=TRUE	1(s)	2 Trip
			Same as:		No pending or confirmed DTCs	=see sheet inhibit		
			Engine Oil Pressure (see Look-Up-Table #85)	<0 to 10498(hPa)	Basic enable conditions met	tables =see sheet enable tables		
	P0521	Error: oil pressure sensor is not plausible	Fail Case #1 Engine Running:		Fail Case #1 Engine Running Enable Conditions:		3(s)	2 Trip
			Relative Oil Pressure	>500(kPa)	Engine speed Oil temperature in the oil sump The high-side switch must be the Closed oil pressure control	=TRUE		
					Status CrCtl request exceeds driver's request Status of forward drive request by driver request	≤0 ≤0		
					No active faults associated with the	P0523=FALSE		
			OR Relative Oil Pressure	<50(kPa)	Engine speed Time after engine start	P0522=FALSE >1520(rpm) >4,96(sec)		
					Basic enable conditions met	=see sheet enable tables		
			Fail Case #2 After Run: Absolute value of the Relative Oil Pressure	>100(kPa)	Fail Case #2 Engine Off Enable Conditions: (Current system / ECU substate is in POSTDRIVE Time since the status SYC_POSTDRIVE was reached) Oil temperature in the oil sump No active faults associated with the oil pressure sensor Basic enable conditions met	=TRUE >10(sec) >59,96(°C) P0523=FALSE P0522=FALSE =see sheet enable tables	3(s)	
--	-------	-----------------------------------	--	-----------	--	--	--------	--------
			Fail Case #3 Before Engine Start: Absolute value of the Relative Oil Pressure	>80(kPa)	Fail Case #3 Engine Off Enable Conditions: Engine off time	>100(sec)	3(s)	
					Engine speed Oil temperature in the oil sump Motor status is cranking	=0(rpm) >59,96(°C) =TRUE		
					No active faults associated with the oil pressure sensor	P0523=FALSE P0522=FALSE		
					Basic enable conditions met	=see sheet enable tables		
53. CCM – ACCELERAT DR PEDAL - BIGNAL 1 / 2	P2123	Circuit continuity - circuit high	Accelerator pedal position sensor 1 voltage	≥4775(mV)	Ignition is ON	=TRUE	0,2(s)	1 Trip
					No pending or confirmed DTCs	=see sheet inhibit		
					Basic enable conditions met	esee sheet enable tables		
	P2122	Circuit continuity - circuit low	Accelerator pedal position sensor 1 voltage	≤280(mV)	Ignition is ON	=TRUE	0,2(s)	1 Trip
					No pending or confirmed DTCs Basic enable conditions met	=see sheet inhibit tables =see sheet enable tables		

			25OBDG07	A Part 2 ECM Summary	y Tables			
	P2138	Synchronization check	Absolute difference between accelerator pedal position sensor 1 voltage (a) and sensor 2 voltage (b)	>120 to 180(mV)	Ignition is ON	=TRUE	0,25(s)	1 Trip
			(see Look-Up-Table #1) where		No pending or confirmed DTCs	=see sheet inhibit		
			(a) Maximum Value between accelerator pedal position sensor 1 voltage divided by (d)	=Max(sensor 1 raw voltage/d,c)(V)	Basic enable conditions met	=see sheet enable tables		
			(b) Maximum value between accelerator pedal position	=Max(sensor 2 raw voltage,c)(V)				
			(c) Minimum voltage and (c) synchronization check	=424(mV)				
			(d) Factor between sensor values	=2				
	P2128	Circuit continuity - circuit high	Accelerator pedal position sensor 2 voltage	≥4775(mV)	Ignition is ON	=TRUE	0,2(s)	1 Trip
					No pending or confirmed DTCs	=see sheet inhibit tables		
					Basic enable conditions met	=see sheet enable tables		
	P2127	Circuit continuity - circuit low	Accelerator pedal position sensor 2 voltage	≤280(mV)	Ignition is ON	=TRUE	0,2(s)	1 Trip
					No pending or confirmed DTCs	=see sheet inhibit		
					Basic enable conditions met	=see sheet enable tables		
54. CCM – THROTTLE POSITION	P0123	Diagnosis of Throttle Position Sensor1 Bank1 for Signal Range Check-High	Raw voltage value of Throttle Position Sensor1 Bank1	>4,805(V)	ECU is in DRIVE state	=TRUE	0,14(s)	1 Trip
SENSOR - SENSOR 1 B1					OR			
DIAGNOSIS					ECU is in POSTDRIVE state Request safety fuel cut off SKA bank 1, following condition:	=TRUE =FALSE		
			EG	CM Section 502 of 772	(Request reversible safety fuel cut off SKA bank 1, which has following	=FALSE		614 of 1,098

				(
				(Battery voltage for throttle valve OR Engine speed	=TRUE >2000(rpm)		
) Limp home position not reached bank	=FALSE		
				Irreversible safety fuel cut off SKA	=FALSE		
) No pending or confirmed DTCs	=see sheet inhibit tables		
				Basic enable conditions met	=see sheet enable tables		
P0122	Diagnosis of Throttle Position Sensor1 Bank1 for Signal Range Check-Low	Raw voltage value of Throttle Position Sensor1 Bank1	<0,195(V)	ECU is in DRIVE state	=TRUE	0,14(s)	1 Trip
				OR ECU is in POSTDRIVE state Request safety fuel cut off SKA bank 1, following condition:	=TRUE =FALSE		
				(Request reversible safety fuel cut off SKA bank 1, which has following condition: (=FALSE		
				(Battery voltage for throttle valve operation sufficient bank 1 OR	=TRUE		
				Engine speed	>2000(rpm)		
) Limp home position not reached bank 1	=FALSE		
) Irreversible safety fuel cut off SKA bank 1	=FALSE		
) No pending or confirmed DTCs	=see sheet inhibit tables		
				Basic enable conditions met	=see sheet enable tables		

P0121	Synchronization check for Throttle Position Sensor1 Bank1 - rationality check against modelled air charge value	((ECU is in DRIVE state	=TRUE	0,14(s)	1 Trip
	Deviation of relative actual angle from Throttle Position Sensors	(Absolute difference between relative actual angle calculated based on voltages from sensor 1 and sensor 2 (see Look-Up-Table #93)	>5 to 6.25(%)	OR			
)	≥0,14(sec)	ECU is in POSTDRIVE state	=TRUE		
		for time (Absolute difference between relative actual angle calculated based on voltage from sensor 1 and relative air charge signal)	>9,02(%)) Request safety fuel cut off SKA bank 1, following condition: (=FALSE		
		for time	≥0,28(sec)	(
) OR		Request reversible safety fuel cut off SKA bank 1, which has following condition:	=FALSE		
	Deviation of relative actual angle from Throttle Position Sensors wrt relative air charge signal	(Absolute difference between relative actual angle calculated based on voltage from sensor 1 and sensor 2 and relative air charge signal	>0(%)	Battery voltage for throttle valve operation sufficient bank 1 OR	=TRUE		
) for time	≥0,36(sec)	Engine speed	>2000(rpm)		
	Error in the main charge) OR Main charge sensor error	=TRUF) Limp home position not reached bank 1)	=FALSE		
	sensor	following conditions:		/ Irreversible safety fuel cut off SKA bank 1	=FALSE		
		Condition for error of main filling sensor (=TRUE) Flag for throttle angle calculated from main charge sensor is unthrottled, following condition:	=FALSE		

	Validity of the pressure sensor of the intake manifold bank 1	=FALSE	(
	Condition for HFM error (without debounce)	=TRUE	Difference between throttle angle calculated from unthrottled mass flow of main charging sensor and throttle valve angle at which the 95 charge is through minimum tolerance for bank1	<0(%)		
	()			
	Flag Variant Diagnosis Error bank 1	=IRUE	No pending or confirmed DTCs	=see sheet inhibit tables		
	OR		Basic enable conditions met	=see sheet enable tables		
	Error flag of the signal variation check of the HFM sensor (Bank 2)	=TRUE				
	Flag plausible diagnosis error OR	=TRUE				
	Flag to display a physical HFM range error bank 1 OR	=TRUE				
	Flag to display a physical HFM range error bank 2 OR (=TRUE				
	Validity flag of the measured air mass flow sensor signal for bank 1	=TRUE				
	Validity flag of the measured air mass flow sensor signal for bank 2	=TRUE				
) Release of the HFM diagnosis of the electrical signal	=TRUE				
)					
	for time	≥0,14(sec)				
)					
Diagnosis of Throttle Position Sensor 1 Bank 1 for SENT data - Communication Check	Communication error from the SENT Channel of Throttle Position Sensor 1 Bank 1, following conditions:	=TRUE	(ECU is in DRIVE state	=TRUE	0,13(s)	1 Trip
	(OR			

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and

		25OBD0	G07A Part 2 ECM Summary	Tables			
P2ABE	Diagnosis of Throttle Position Sensor 2 Bank 1 for SENT data - Communication Check	No signal on the line	=TRUE	ECU is in POSTDRIVE state)	=TRUE		2 Trip
		OR		Request safety fuel cut off SKA bank 1, following condition:	=FALSE		
		Pulse length of SENT message is out of range	=TRUE	(
		OR		(Request reversible safety fuel cut off SKA bank 1, which has following condition:	=FALSE		
		Calibration pulse of SENT message is out of range	=TRUE	(
)		Battery voltage for throttle valve operation sufficient bank 1 OR	=TRUE		
				Engine speed	>2000(rpm)		
) Limp home position not reached bank 1	=FALSE		
) Irreversible safety fuel cut off SKA bank 1	=FALSE		
) No pending or confirmed DTCs	=see sheet inhibit		
				Basic enable conditions met	=see sheet enable tables		
U136C	Invalid data from SENT device (Sensor 1)	No valid data from the SEN Channel of Throttle Position Sensor 1 Bank 1, following conditions:	T =TRUE	(ECU is in DRIVE state	=TRUE	0,12(s)	1 Trip
and	Involid data from SENT davias	(Free in the monitoring statu		OR			1 Trip
01300	(Sensor 2)	of SENT driver Bank 1	S =IROE)	=TROE		ттр
)		Request safety fuel cut off SKA bank 1, following condition: (=FALSE		
				(Request reversible safety fuel cut off SKA bank 1, which has following condition:	=FALSE		
				(Battery voltage for throttle valve operation sufficient bank 1 OR	=TRUE		
				Engine speed	>2000(rpm)		
			FOM Contine FOC of 770)			610

					Limp home position not reached bank 1) Irreversible safety fuel cut off SKA bank 1) No pending or confirmed DTCs Basic enable conditions met	=FALSE =FALSE =see sheet inhibit tables =see sheet enable tables		
	P0658	Too low battery voltage bank 1	Battery voltage	<7(V)	Current system/ECU sub-state is in DRIVE state	=TRUE(-)	2000(ms)	2 Trip
			For time	>=0,03(sec)	No pending or confirmed DTCs	=see sheet inhibit tables		
	P2670	Too low battery voltage bank 2	Battery voltage	<7(V)	Current system/ECU sub-state is in DRIVE state	=TRUE(-)	2000(ms)	2 Trip
			For time	>=0,03(sec)	No pending or confirmed DTCs	=see sheet inhibit tables		
55. CCM – THROTTLE POSITION SENSOR - SENSOR 2 B1 DIAGNOSIS	P0223	Diagnosis of Throttle Position Sensor2 Bank1 for Signal Range Check-High	Raw voltage value of Throttle Position Sensor2 Bank1	>4,805(V)	ECU is in DRIVE state OR ECU is in POSTDRIVE state Request safety fuel cut off SKA bank 1, following condition: (Request reversible safety fuel cut off SKA bank 1, which has following condition: ((Battery voltage for throttle valve operation sufficient bank 1 OR Engine speed) Limp home position not reached bank 1) Irreversible safety fuel cut off SKA bank 1) No pending or confirmed DTCs	=TRUE =TRUE =FALSE =FALSE =TRUE >2000(rpm) =FALSE =FALSE =see sheet inhibit tables	0,14(s)	1 Trip

		250BDG07A	Part 2 ECM Summa	iry Tables			
				Basic enable conditions met	=see sheet enable tables		
P0222	Diagnosis of Throttle Position Sensor2 Bank1 for Signal Range Check-Low	Raw voltage value of Throttle Position Sensor2 Bank1	<0,195(V)	ECU is in DRIVE state	=TRUE	0,14(s)	1 Trip
				OR ECU is in POSTDRIVE state Request safety fuel cut off SKA bank 1, following condition:	=TRUE =FALSE		
				Request reversible safety fuel cut off SKA bank 1, which has following condition: (=FALSE		
				(Battery voltage for throttle valve operation sufficient bank 1 OR	=TRUE		
				Engine speed	>2000(rpm)		
) Limp home position not reached bank 1)	=FALSE		
				/ Irreversible safety fuel cut off SKA bank 1	=FALSE		
) No pending or confirmed DTCs	=see sheet inhibit tables		
				Basic enable conditions met	=see sheet enable tables		
P0221	Synchronization check for Throttle Position Sensor2 Bank1 - rationality check against modelled air charge value	((ECU is in DRIVE state	=TRUE	0,14(s)	1 Trip
	Deviation of relative actual angle from Throttle Position Sensors	(Absolute difference between relative actual angle calculated based on voltage from sensor 1 and relative actual angle calculated based on voltage from sensor 2 (see Look-Up-Table #93)	>5 to 6.25(%)	OR			

	Absolute difference between relative actual throttle angle calculated based on voltage from sensor 2 and throttle angle calculated from the main charge sensor (intake manifold pressure sensor	>9,0234(%)	ECU is in POSTDRIVE state)	=TRUE
	for time	≥0,28(sec)	Request safety fuel cut off SKA bank 1, following condition: (=FALSE
) OR		(Request reversible safety fuel cut off SKA bank 1, which has following condition:	=FALSE
Deviation of relative actual angle from Throttle Position Sensors wrt relative air charge signal	Absolute difference between relative actual angle calculated based on voltage from sensor 1 and sensor 2 and relative air charge signal	<0(%)	(
	for time	≥0,36(sec)	Battery voltage for throttle valve operation sufficient bank 1	=TRUE
Error in the main charge sensor	Main charge sensor error, following conditions:	=TRUE	Engine speed	>2000(rpm)
	Condition for error of main filling sensor (=TRUE	Limp home position not reached bank 1)	=FALSE
	Validity of the pressure sensor of the intake manifold bank 1	=FALSE	, Irreversible safety fuel cut off SKA bank 1	=FALSE
	Condition for HFM error (without debounce)	=TRUE)	
	(Flag for throttle angle calculated from main charge sensor is unthrottled, following condition:	=FALSE
	Flag Variant Diagnosis Error bank 1	=TRUE	(
	OR		Difference between throttle angle calculated from unthrottled mass flow of main charging sensor and throttle valve angle at which the 95 charge is through minimum tolerance for bank1	<0(%)
	Error flag of the signal variation check of the HFM sensor (Bank 2)	=TRUE)	
	OR		No pending or confirmed DTCs	=see sheet inhibit tables
	Flag plausible diagnosis	=TRUE M Section 509 of 772	Basic enable conditions met	=see sheet enable

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		OR Flag to display a physical HF range error bank 1 OR	FM =TRUE				
		Flag to display a physical HF range error bank 2 OR (FM =TRUE				
		Validity flag of the measured air mass flow sensor signal f bank 1 OR	I =TRUE for				
		Validity flag of the measured air mass flow sensor signal f bank 2)	I =TRUE for				
		Release of the HFM diagnos of the electrical signal	sis =TRUE				
)) for time	≥0,14(sec)				
)					
U0606	Diagnosis of Throttle Position Sensor 1 Bank 1 for SENT data - Communication Check	Communication error from t SENT Channel of Throttle Position Sensor 2 Bank 1, following conditions:	he =TRUE	(ECU is in DRIVE state	=TRUE	0,13(s)	1 Trip
and		(OR			
U0607	Diagnosis of Throttle Position Sensor 2 Bank 1 for SENT data - Communication Check	No signal on the line	=TRUE	ECU is in POSTDRIVE state)	=TRUE		1 Trip
		OR		Request safety fuel cut off SKA bank 1, following condition:	=FALSE		
		Pulse length of SENT message is out of range	=TRUE	(
		OR		(Request reversible safety fuel cut off SKA bank 1, which has following condition:	=FALSE		
		Calibration pulse of SENT message is out of range	=TRUE	(
)		Battery voltage for throttle valve operation sufficient bank 1 OR	=TRUE		
				Engine speed	>2000(rpm)		
			FCM Section E10 of 772)			622.0

					Limp home position not reached bank 1) Irreversible safety fuel cut off SKA bank 1) No pending or confirmed DTCs Basic enable conditions met	=FALSE =FALSE =see sheet inhibit tables =see sheet enable		
	U136C	Invalid data from SENT device	No valid data from the SENT Channel of Throttle Position Sensor 2 Bank 1, following conditions:	T =TRUE	(ECU is in DRIVE state	=TRUE	0,12(s)	1 Trip
	and U136D		(Error in the monitoring status of SENT driver Bank 1	s =TRUE	OR ECU is in POSTDRIVE state)	=TRUE		1 Trip
)		Request safety fuel cut off SKA bank 1, following condition:	=FALSE		
					(Request reversible safety fuel cut off SKA bank 1, which has following condition:	=FALSE		
					(Battery voltage for throttle valve operation sufficient bank 1 OR	=TRUE		
					Engine speed	>2000(rpm)		
) Limp home position not reached bank 1	=FALSE		
) Irreversible safety fuel cut off SKA bank 1)	=FALSE		
					No pending or confirmed DTCs	=see sheet inhibit		
					Basic enable conditions met	=see sheet enable tables		
. CCM – ROTTLE DSITION	P0228	Diagnosis of Throttle Position Sensor1 Bank2 for Signal Range Check-High	Raw voltage value of Throttle Position Sensor1 Bank2	e >4,805(V)	ECU is in DRIVE state	=TRUE	0,14(s)	1 Trip
SOR 1 B2 GNOSIS					OR ECU is in POSTDRIVE state Request safety fuel cut off SKA bank 2, following condition:	=TRUE =FALSE		
				ECM Section 511 of 772	(623 o

				Irreversible safety fuel cut off SKA bank 2 Request reversible safety fuel cut off SKA bank 2, following conditions:	=FALSE =FALSE		
				((Battery voltage for throttle valve operation sufficient bank 2 OR	=TRUE		
				Engine speed	>2000(rpm)		
) Limp home position not reached bank 2)	=FALSE		
) No pending or confirmed DTCs	=see sheet inhibit tables		
				Basic enable conditions met	=see sheet enable tables		
P0227	Diagnosis of Throttle Position Sensor1 Bank2 for Signal Range Check-Low	Raw voltage value of Throttle Position Sensor1 Bank2	<0,195(V)	ECU is in DRIVE state	=TRUE	0,14(s)	1 Trip
				OR ECU is in POSTDRIVE state Request safety fuel cut off SKA bank 2, following condition:	=TRUE =FALSE		
				Irreversible safety fuel cut off SKA bank 2	=FALSE		
				Request reversible safety fuel cut off SKA bank 2, following conditions:	=FALSE		
				((Battery voltage for throttle valve operation sufficient bank 2	=TRUE		
				Engine speed	>2000(rpm)		
) Limp home position not reached bank 2)	=FALSE		
				, No pending or confirmed DTCs	=see sheet inhibit tables		

				Basic enable conditions met	=see sheet enable tables		
P0226	Synchronization check for Throttle Position Sensor1 Bank2 - rationality check against modelled air charge value	((ECU is in DRIVE state	=TRUE	0,14(s)	1 Trip
	Deviation of relative actual angle from Throttle Position Sensors	Absolute difference between relative actual angle calculated based on voltages from sensor 1 and sensor 2 (see Look-Up-Table #94)	>5 to 6.25(%)	OR			
		for time	≥0,14(sec)	ECU is in POSTDRIVE state	=TRUE		
		Absolute difference between relative actual angle calculated based on voltage from sensor 1 and relative air charge signal	>9,02(%)) Request safety fuel cut off SKA bank 2, following condition:	=FALSE		
		for time	≥0,28(sec)	(
)		Irreversible safety fuel cut off SKA bank 2	=FALSE		
		(and Request reversible safety fuel cut off SKA bank 2, following conditions:	=FALSE		
	Deviation of relative actual angle from Throttle Position Sensors wrt relative air charge signal	Absolute difference between relative actual angle calculated based on voltage from sensor 1 and sensor 2 and relative air charge signal	>0(%)	(
		for time	≥0,36(sec)	(
) OR		Battery voltage for throttle valve operation sufficient bank 2	=TRUE		
	Error in the main charge sensor	Error main charge sensor, following conditions:	=TRUE) Limp home position not reached bank 2	=FALSE		
		(Flag for throttle angle calculated from main charge sensor is unthrottled, following condition:	=FALSE		
		Condition for error of main	=TRUE	(

filling sensor

		(Difference between throttle angle calculated from unthrottled mass flow of main charging sensor and throttle valve angle at which the 95 charge is through minimum tolerance for bank1	<0(%)		
		Validity of the pressure sensor of the intake manifold bank 1	=FALSE)			
		Condition for HFM error (without debounce) (=TRUE)			
		Flag Variant Diagnosis Error bank 1	=TRUE	No pending or confirmed DTCs	=see sheet inhibit tables		
		OR		Basic enable conditions met	=see sheet enable tables		
		check of the HFM sensor (Bank 2) OR	=IKUE				
		Flag plausible diagnosis error OR	=TRUE				
		Flag to display a physical HFM range error bank 1 OR	=TRUE				
		Flag to display a physical HFM range error bank 2 OR (=TRUE				
		Validity flag of the measured air mass flow sensor signal for bank 1	=TRUE				
		Validity flag of the measured air mass flow sensor signal for bank 2	=TRUE				
		, Release of the HFM diagnosis of the electrical signal	=TRUE				
)) for time	≥0,14(sec)				
)					
U0608	Diagnosis of Throttle Position Sensor 1 Bank 2 for SENT data - Communication Check	Communication error from the SENT Channel of Throttle Position Sensor 1 Bank 2, following conditions:	=TRUE	(ECU is in DRIVE state	=TRUE	0,13(s)	1 Trip

OR Request safety fuel cut off SKA bank 2, following condition: Pulse length of SENT message is out of range =TRUE OR Request reversible safety fuel cut off SKA bank 2, following conditions: OR Request reversible safety fuel cut off SKA bank 2, following conditions: Calibration pulse of SENT message is out of range) =TRUE (Request reversible safety fuel cut off SKA bank 2, following conditions: Calibration pulse of SENT message is out of range) =TRUE (Battery voltage for throttle valve operation sufficient bank 2)	and U0688	Diagnosis of Throttle Position Sensor 2 Bank 2 for SENT data - Communication Check	(No signal on the line	=TRUE	OR ECU is in POSTDRIVE state)	=TRUE		1 Trip
Invalid data from SENT device No valid data from the SENT device (Sensor 1) Invalid data from SENT device (Sensor 2) No valid data from the SENT device or device of SENT device or device of SENT device or device of SENT device (Sensor 2) Invalid data from SENT device (For in the monitoring status of SENT diver Bank 2, following conditions: Invalid data from SENT device (For in the monitoring status of SENT diver Bank 2, following conditions: Invalid data from SENT device (For in the monitoring status of SENT diver Bank 2, following conditions: Invalid data from SENT device (For in the monitoring status of SENT diver Bank 2, following conditions: Invalid data from SENT device (For in the monitoring status of SENT diver Bank 2, following conditions: Invalid data from SENT device (For in the monitoring status of SENT diver Bank 2, following conditions: Invalid data from SENT device (For in the monitoring status of SENT diver Bank 2, following conditions: Invalid data from SENT device (For in the monitoring status of SENT diver Bank 2, following conditions: Invalid data from SENT device (For in the monitoring status of SENT diver Bank 2, following conditions: Invalid data from SENT device (For in the monitoring status of SENT diver Bank 2, following condition: Invalid data from SENT device (For in the monitoring status of SENT diver Bank 2, following condition: Interversible safety fuel cut off SKA bank 2, following conditions: (() (() (() (() (() (() (() (() (() (() (() (() () (() (() </td <td></td> <td></td> <td>OR Pulse length of SENT message is out of range</td> <td>=TRUE</td> <td>Request safety fuel cut off SKA bank 2, following condition: (</td> <td>=FALSE</td> <td></td> <td></td>			OR Pulse length of SENT message is out of range	=TRUE	Request safety fuel cut off SKA bank 2, following condition: (=FALSE		
OR Request reversible safety fuel cut off SKA bank 2, following conditions: Calibration pulse of SENT message is out of range) =TRUE ((((Battery voltage for throttle valve operation sufficient bank 2)) U136E Invalid data from SENT device No valid data from the SENT =TRUE (U136F Invalid data from SENT device (Sensor 1) No valid data from the SENT =TRUE ECU is in DRIVE state and U136F Invalid data from SENT device (Sensor 2) No valid data from the monitoring status of SENT driver Bank 2 =TRUE CR grad (Error in the monitoring status of SENT driver Bank 2 =TRUE OR grad (Error in the monitoring status of SENT driver Bank 2, following conditions: =TRUE OR grad (Error in the monitoring status of SENT driver Bank 2 =TRUE OR () Request reversible safety fuel cut off SKA bank 2, following conditions: ((and Request reversible safety fuel cut off SKA bank 2, and Request reversible safety fuel cut off SKA bank 2, following conditions: (Irreversible safety fuel cut off SKA bank 2	=FALSE		
Calibration pulse of SENT message is out of range) =TRUE (Battery voltage for throttle valve operation sufficient bank 2)) Limp home position not reached bank 2)) Limp home position not reached bank 2)) No pending or confirmed DTCs = see Basic enable conditions met = see U136E Invalid data from SENT device (Sensor 1) No valid data from the SENT Channel of Throttle Position Sensor 1 Bank 2, following conditions: and U136F Invalid data from SENT device (Sensor 2) No real data from SENT device for in the monitoring status of SENT diver Bank 2 =TRUE of Sensor 1 Bank 2, following conditions: =TRUE OR ECU is in DRIVE state OR ECU is in POSTDRIVE state of SENT driver Bank 2 =TRUE OR ECU is in POSTDRIVE state)) Request safety fuel cut off SKA bank 2, following condition: (((((OR		Request reversible safety fuel cut off SKA bank 2, following conditions:	=FALSE		
y Implementation y Implementation <td></td> <td></td> <td>Calibration pulse of SENT message is out of range</td> <td>=TRUE</td> <td>(</td> <td></td> <td></td> <td></td>			Calibration pulse of SENT message is out of range	=TRUE	(
U136E Invalid data from SENT device No valid data from the SENT =TRUE { U136E Invalid data from SENT device No valid data from the SENT =TRUE ((Sensor 1) Channel of Throttle Position Sensor 1 Bank 2, following conditions: =TRUE (ECU is in DRIVE state and (U136F Invalid data from SENT device Error in the monitoring status of SENT driver Bank 2 =TRUE OR ECU is in POSTDRIVE state)) Request safety fuel cut off SKA bank 2, following condition: ((Irreversible safety fuel cut off SKA bank 2 and Request reversible safety fuel cut off SKA bank 2, following conditions: ()		(Battery voltage for throttle valve operation sufficient bank 2	=TRUE		
) No pending or confirmed DTCs =see Basic enable conditions met =see U136E Invalid data from SENT device No valid data from the SENT =TRUE (Channel of Throttle Position Sensor 1 Bank 2, following conditions: =TRUE (ECU is in DRIVE state and (Error in the monitoring status of SENT driver Bank 2 =TRUE OR ECU is in POSTDRIVE state)) Request safety fuel cut off SKA bank 2, following condition: (Invalid data from SENT device (Error in the monitoring status of SENT driver Bank 2 =TRUE OR ECU is in POSTDRIVE state)) Request safety fuel cut off SKA bank 2, following condition: ((Irreversible safety fuel cut off SKA bank 2, following conditions: (and Request reversible safety fuel cut off SKA bank 2, following conditions:) Limp home position not reached bank 2)	=FALSE		
U136E Invalid data from SENT device (Sensor 1) No valid data from the SENT Channel of Throttle Position Sensor 1 Bank 2, following conditions: =TRUE (ECU is in DRIVE state and U136F Invalid data from SENT device (Sensor 2) (Fror in the monitoring status of SENT driver Bank 2 =TRUE OR ECU is in POSTDRIVE state)) (Fror in the monitoring status of SENT driver Bank 2 =TRUE OR ECU is in POSTDRIVE state)) (Fror in the monitoring status of SENT driver Bank 2 =TRUE OR ECU is in POSTDRIVE state)) (Fror in the monitoring status of SENT driver Bank 2 =TRUE OR ECU is in POSTDRIVE state)) (Fror in the monitoring status of SENT driver Bank 2 =TRUE OR ECU is in POSTDRIVE state)) (Fror in the monitoring status of SENT driver Bank 2 =TRUE OR ECU is in POSTDRIVE state)) (Fror in the monitoring status of SENT driver Bank 2 =TRUE OR ECU is in POSTDRIVE state)) (Fror in the monitoring status of SENT driver Bank 2 =TRUE (Fror in the monitoring status of SENT driver Bank 2 ((Fror in the monitoring status of SENT driver Bank 2, following conditions: (Fror in the monitoring status of SENT driver Bank 2, following condit) No pending or confirmed DTCs	=see sheet inhibit		
U136E Invalid data from SENT device (Sensor 1) No valid data from the SENT Channel of Throttle Position Sensor 1 Bank 2, following conditions: =TRUE (ECU is in DRIVE state and U136F Invalid data from SENT device (Sensor 2) (Error in the monitoring status of SENT driver Bank 2 =TRUE OR ECU is in POSTDRIVE state))) Request safety fuel cut off SKA bank 2, following condition: (Irreversible safety fuel cut off SKA bank 2 and Request reversible safety fuel cut off SKA bank 2, following conditions:					Basic enable conditions met	tables =see sheet enable tables		
and U136F Invalid data from SENT device (Sensor 2))) Request safety fuel cut off SKA bank 2, following condition: (Irreversible safety fuel cut off SKA bank 2 and Request reversible safety fuel cut off SKA bank 2 ((U136E	Invalid data from SENT device (Sensor 1)	No valid data from the SENT Channel of Throttle Position Sensor 1 Bank 2, following conditions:	=TRUE	(ECU is in DRIVE state	=TRUE	0,12(s)	1 Trip
) Request safety fuel cut off SKA bank 2, following condition: (Irreversible safety fuel cut off SKA bank 2 and Request reversible safety fuel cut off SKA bank 2, following conditions: (and U136F	Invalid data from SENT device (Sensor 2)	(Error in the monitoring status of SENT driver Bank 2	=TRUE	OR ECU is in POSTDRIVE state)	=TRUE		1 Trip
(Irreversible safety fuel cut off SKA bank 2 and Request reversible safety fuel cut off SKA bank 2, following conditions: ()		Request safety fuel cut off SKA bank 2, following condition:	=FALSE		
and Request reversible safety fuel cut off SKA bank 2, following conditions: ((Irreversible safety fuel cut off SKA bank 2	=FALSE		
(and Request reversible safety fuel cut off	=FALSE		
(Battery voltage for throttle valve operation sufficient bank 2					SKA bank 2, following conditions:			

			250BDG07	7A Part 2 ECM Summary	/ Tables			
					Limp home position not reached bank 2))	=FALSE		
					No pending or confirmed DTCs	=see sheet inhibit tables		
					Basic enable conditions met	=see sheet enable tables		
57. CCM – THROTTLE POSITION	P212D	Diagnosis of Throttle Position Sensor2 Bank2 for Signal Range Check-High	Raw voltage value of Throttle Position Sensor2 Bank2	>4,805(V)	ECU is in DRIVE state	=TRUE	0,14(s)	1 Trip
SENSOR - ENSOR 2 B2					OR			
DIAGNOSIS					ECU is in POSTDRIVE state	=TRUE		
					Request safety fuel cut off SKA bank 2, following condition:	=FALSE		
					lrreversible safety fuel cut off SKA bank 2	=FALSE		
					Request reversible safety fuel cut off SKA bank 2, following conditions:	=FALSE		
					(
					Battery voltage for throttle valve OR	=TRUE		
					Engine speed	>2000(rpm)		
) Limp home position not reached bank 2)	=FALSE		
) No pending or confirmed DTCs	=see sheet inhibit tables		
					Basic enable conditions met	=see sheet enable tables		
	P212C	Diagnosis of Throttle Position Sensor2 Bank2 for Signal Bange Check-Low	Raw voltage value of Throttle Position Sensor2 Bank2	<0,195(V)	ECU is in DRIVE state	=TRUE	0,14(s)	1 Trip
		Range Onook Low			OR ECU is in POSTDRIVE state Request safety fuel cut off SKA bank 2, following condition:	=TRUE =FALSE		
					(Irreversible safety fuel cut off SKA bank 2	=FALSE		
					Request reversible safety fuel cut off SKA bank 2, following conditions:	=FALSE		
			–	CM Contine E16 of 770				600 -

				((Battery voltage for throttle valve operation sufficient bank 2 OR Engine speed	=TRUE >2000(rpm)		
) Limp home position not reached bank 2)	=FALSE		
) No pending or confirmed DTCs	=see sheet inhibit tables		
				Basic enable conditions met	=see sheet enable tables		
P212B	Synchronization check for Throttle Position Sensor2 Bank2 - rationality check against modelled air charge	((ECU is in DRIVE state	=TRUE	0,14(s)	1 Trip
	Deviation of relative actual angle from Throttle Position Sensors	(Absolute difference between relative actual angle calculated based on voltage from sensor 1 and relative actual angle calculated based on voltage from sensor 2 (see Look-Up-Table #94)	>5 to 6.25(%)	OR			
		Absolute difference between relative actual throttle angle calculated based on voltage from sensor 2 and throttle angle calculated from the main charge sensor (intake manifold pressure sensor	>9,0234(%)	ECU is in POSTDRIVE state)	=TRUE		
) for time	≥0,28(sec)	Request safety fuel cut off SKA bank 2, following condition:	=FALSE		
) OR		(Irreversible safety fuel cut off SKA bank 2	=FALSE		
	Deviation of relative actual angle from Throttle Position Sensors wrt relative air charge signal	Absolute difference between relative actual angle calculated based on voltage from sensor 1 and sensor 2 and relative air charge signal	<0(%)	Request reversible safety fuel cut off SKA bank 2, following conditions:	=FALSE		

	for time	≥0,36(sec)	(
Error in the main charge sensor	OR Error main charge sensor, following conditions:	=TRUE	(Battery voltage for throttle valve operation sufficient bank 2	=TRUE
	Condition for error of main	=TRUE) Limp home position not reached bank	=FALSE
	(Flag for throttle angle calculated from main charge sensor is unthrottled, following condition:	=FALSE
	Validity of the pressure sensor of the intake manifold bank 1	=FALSE	(
	Condition for HFM error (without debounce)	=TRUE	Difference between throttle angle calculated from unthrottled mass flow of main charging sensor and throttle valve angle at which the 95 charge is through minimum tolerance for bank1	<0(%)
	()	
	Flag Variant Diagnosis Error bank 1 OR	=TRUE))	
	Error flag of the signal variation check of the HFM sensor (Bank 2)	=TRUE	No pending or confirmed DTCs	=see sheet inhibit tables
	OR OR		Basic enable conditions met	=see sheet enable tables
	Flag plausible diagnosis error OR	=TRUE		
	Flag to display a physical HFM range error bank 1 OR	=TRUE		
	Flag to display a physical HFM range error bank 2 OR (=TRUE		
	Validity flag of the measured air mass flow sensor signal for bank 1 OR	=TRUE		
	Validity flag of the measured air mass flow sensor signal for bank 2	=TRUE		
	, Release of the HFM diagnosis of the electrical signal	=TRUE		
)) for time	>0.14(222)		
		<0,14(SeC)		

)					
U0608	Diagnosis of Throttle Position Sensor 1 Bank 2 for SENT data - Communication Check	Communication error from the SENT Channel of Throttle Position Sensor 2 Bank 2, following conditions:	=TRUE	(ECU is in DRIVE state	=TRUE	0,13(s)	1 Trip
and U0688	Diagnosis of Throttle Position Sensor 2 Bank 2 for SENT data - Communication Check	(No signal on the line	=TRUE	OR ECU is in POSTDRIVE state)	=TRUE		1 Trip
		OR Pulse length of SENT	=TRUE	Request safety fuel cut off SKA bank 2, following condition: (=FALSE		
		message is out of range		Irreversible safety fuel cut off SKA bank 2	=FALSE		
		OR		Request reversible safety fuel cut off SKA bank 2, following conditions:	=FALSE		
		Calibration pulse of SENT message is out of range	=TRUE	(
)		Battery voltage for throttle valve operation sufficient bank 2	=TRUE		
				Limp home position not reached bank 2)	=FALSE		
) No pending or confirmed DTCs	=see sheet inhibit tables		
				Basic enable conditions met	=see sheet enable tables		
U136E	Invalid data from SENT device (Sensor 1)	No valid data from the SENT Channel of Throttle Position Sensor 2 Bank 2, following conditions:	=TRUE	(ECU is in DRIVE state	=TRUE	0,12(s)	1 Trip
and U136F	Invalid data from SENT device (Sensor 2)	(Error in the monitoring status of SENT driver Bank 2	=TRUE	OR ECU is in POSTDRIVE state)	=TRUE		1 Trip
)		Request safety fuel cut off SKA bank 2, following condition:	=FALSE		
				V Irreversible safety fuel cut off SKA bank 2	=FALSE		

					Request reversible safety fuel cut off SKA bank 2, following conditions:	=FALSE		
					((Battery voltage for throttle valve operation sufficient bank 2)	=TRUE		
					Limp home position not reached bank 2)	=FALSE		
					/ No pending or confirmed DTCs	=see sheet inhibit tables		
					Basic enable conditions met	=see sheet enable tables		
58. CCM – MANIFOLD ABSOLUTE PRESSURE	P0108	Monitoring of Intake manifold pressure sensor bank1 for Signal range check-High	Raw voltage from Intake manifold pressure sensor bank1	>4,499966(V)	No pending or confirmed DTCs	=see sheet inhibit tables	1,5(s)	1 Trip
SENSOR - DI					Basic enable conditions met	=see sheet enable tables		
	P0107	Monitoring of Intake manifold pressure sensor bank1 for Signal range check-Low	Raw voltage from Intake manifold pressure sensor bank1	<0,500005(V)	No pending or confirmed DTCs	=see sheet inhibit tables	1,5(s)	1 Trip
					Basic enable conditions met	=see sheet enable tables		
	P0106	Sensor cross check high for pressure sensor of the intake manifold - Bank 1	Sensor cross check high fault detected for pressure sensor of the intake manifold	=TRUE	No pending or confirmed DTCs	=see sheet inhibit tables		1 Trip
					Basic enable conditions met	=see sheet enable tables		
	P0106	Sensor cross check low for pressure sensor of the intake manifold - Bank 1	Sensor cross check low fault detected for pressure sensor of the intake manifold	=TRUE	No pending or confirmed DTCs	=see sheet inhibit tables		1 Trip
					Basic enable conditions met	=see sheet enable tables		
	P0106	Signal variation check for pressure sensor of the intake manifold - Bank 1	Signal variation check fault detected for pressure sensor of the intake manifold	=TRUE	No pending or confirmed DTCs	=see sheet inhibit tables		1 Trip
					Basic enable conditions met	=see sheet enable tables		

59. CCM – MANIFOLD ABSOLUTE PRESSURE	P2A0D	Monitoring of Intake manifold pressure sensor bank2 for Signal range check-High	Raw voltage from Intake manifold pressure sensor bank2	>4,5(V)	No pending or confirmed DTCs	=see sheet inhibit tables	1,5(s)	1 Trip
SENSOR – B2					Basic enable conditions met	=see sheet enable tables		
	P2A0C	Monitoring of Intake manifold pressure sensor bank2 for Signal range check-l ow	Raw voltage from Intake manifold pressure sensor	<0,5(V)	No pending or confirmed DTCs	=see sheet inhibit tables	1,5(s)	1 Trip
		Signal range check Low	bankz		Basic enable conditions met	=see sheet enable tables		
	P2A0B	Sensor cross check high for pressure sensor of the intake manifold - Bank 2	Sensor cross check high fault detected for pressure sensor of the intake manifold	=TRUE	No pending or confirmed DTCs	=see sheet inhibit tables		1 Trip
					Basic enable conditions met	=see sheet enable tables		
	P2A0B	Sensor cross check low for pressure sensor of the intake	Sensor cross check low fault detected for pressure sensor	=TRUE	No pending or confirmed DTCs	=see sheet inhibit tables		1 Trip
					Basic enable conditions met	=see sheet enable tables		
ľ	P2A0B	Signal variation check for pressure sensor of the intake	Signal variation check fault detected for pressure sensor	=TRUE	No pending or confirmed DTCs	=see sheet inhibit tables		1 Trip
					Basic enable conditions met	=see sheet enable tables		
60. CCM – ENGINE OFF TIMER	P262B	Rationality check of control module power off timer	At least one bit of the counter value in the counter device RAM	=TRUE	Ignition is ON	=TRUE	1(event)	2 Trip
			doesn't change it's value OR		Basic enable conditions are met	=see sheet enable tables		
			Communication error is reported by counter device OR	=TRUE				
			Difference between counter steps compared to ECU system time is out of tolerance	=TRUE				
61. CCM – ECM INTERNAL FAILURES	P062B	Path 1: Electrical failure with high pressure injection valve	Electrical fault is detected for the control bank 1 (=TRUE	Diagnosis inhibited by statistical function	=FALSE	5(s)	2 Trip
TALORES		POWERSLAGE TO DALIK T	Number of misfire counter for cylinder 0 ECN	>100 VI Section 521 of 772	Engine speed	<6000(rpm)		633 o

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			Number of misfire counter for cylinder 4	>100	Engine speed	>1520(rpm)		
) and		relative air charge No pending or confirmed DTCs	<100(%) =see sheet inhibit tables		
			Rail pressure control minimum error is set	=TRUE	Basic enable conditions met	=see sheet enable tables		
	P062B	Path 2: Electrical failure with high pressure injection valve powerstage for bank 2	Electrical fault is detected for the control bank 2 (=TRUE	Diagnosis inhibited by statistical function	=FALSE	5(s)	2 Trip
			Number of misfire counter for cylinder 1	>100	Engine speed	<6000(rpm)		
			Number of misfire counter for cylinder 5	>100	Engine speed	>1520(rpm)		
) and		relative air charge No pending or confirmed DTCs	<100(%) =see sheet inhibit tables		
			Rail pressure control minimum error is set	=TRUE	Basic enable conditions met	=see sheet enable tables		
	P062B	Path 3: Electrical failure with high pressure injection valve powerstage for bank 3	Electrical fault is detected for the control bank 3 (=TRUE	Diagnosis inhibited by statistical function	=FALSE	5(s)	2 Trip
			Number of misfire counter for cylinder 2	>100	Engine speed	<6000(rpm)		
			Number of misfire counter for cylinder 6	>100	Engine speed	>1520(rpm)		
) and		relative air charge No pending or confirmed DTCs	<100(%) =see sheet inhibit tables		
			Rail pressure control minimum error is set		Basic enable conditions met	=see sheet enable tables		
ſ	P062B	Path 4: Electrical failure with high pressure injection valve powerstage for bank 4	Electrical fault is detected for the control bank 3 (=TRUE	Diagnosis inhibited by statistical function	=FALSE	5(s)	2 Trip
			Number of misfire counter for cylinder 3	>100	Engine speed	<6000(rpm)		
			Number of misfire counter for cylinder 7	>100	Engine speed	>1520(rpm)		
) and		relative air charge No pending or confirmed DTCs	<100(%) =see sheet inhibit tables		
			Rail pressure control minimum error is set	=TRUE	Basic enable conditions met	=see sheet enable tables		

P062B	Path 5: Detects if the booster voltage of Dc-Dc convertor is too low	Output voltage of DcDc converter	≤20(V)	Battery voltage	≥10,9(V)	2(events)	2 Trip
				Battery voltage Basic enable conditions met	≤6553,5(V) =see sheet enable tables		
				No pending or confirmed DTCs	=see sheet inhibit tables		
P08FF	Path 6: Error check in CVO diagnosis for all cylinders	Number of tested cylinders against min or max error for Controlled Valve Operation diagnosis	≥8	Ignition is ON	=TRUE	0,1(s)	2 Trip
		and		No pending or confirmed DTCs	=see sheet inhibit tables		
		Number of cylinders in error state due to minimum or maximum error in Controlled Valve Operation diagnose	≥8	Basic enable conditions met	=see sheet enable tables		
P0606	Detects error of ignition power stage diagnosis ASIC Bank 1	Device information error from the powerstage ASIC	=TRUE	Battery voltage	>9000(mV)	20(events)	1 Trip
				Battery voltage Engine synchronization Engine speed Difference between new and old ignition counter ensuring that all cylinder were fired at least once	<655340(mV) =TRUE >1400(rpm) >9(counts)		
				Basic enable conditions met	=see sheet enable tables		
P0606	Detects error of ignition power stage diagnosis ASIC Bank 2	Device information error from the powerstage ASIC	=TRUE	Battery voltage	>9000(mV)	20(events)	1 Trip
				Battery voltage Engine synchronization Engine speed Difference between new and old ignition counter ensuring that all cylinder were fired at least once	<655340(mV) =TRUE >1400(rpm) >9(counts)		
				Basic enable conditions met	=see sheet enable tables		
P0606	Detects when the last activity detected for the CAN Communication Hardware has been greater than the limit for a calibrated period of time	Time since last activity detected for the CAN Communication Hardware is a greater than limit	=TRUE	Ignition is ON	=TRUE	0.02(s)	1 Trip
				Basic enable conditions are met	=see sheet enable tables		

P0606	Detects when the last activity detected for the LIN Communication Hardware has been greater than the limit for a calibrated period of time	Time since last activity detected for the LIN Communication Hardware is a greater than limit	=TRUE			0.02(s)	1 Trip
P0606	Internal monitoring of main processor controller: Monitoring of hardware error	Error management module (EMM) / Safety management unit (SMU) reports alarm	=TRUE	Ignition is on	=TRUE	0,01(s)	1 Trip
	management			Basic enable conditions are met	=TRUE		
P06D1	Detects commmunication error with ignition power stage	SPI information error from the powerstage ASIC	=TRUE	Battery voltage	>9000(mV)	20(events)	1 Trip
	diagnosis ASIC Bank 1			Battery voltage Engine synchronization Engine speed Difference between new and old ignition counter ensuring that all	<655340(mV) =TRUE >1400(rpm) >9(counts)		
				cylinder were fired at least once Basic enable conditions met	=see sheet enable tables		
P06D1	Detects commmunication error with ignition power stage diagnosis ASIC Bank 2	SPI information error from the powerstage ASIC	=TRUE	Battery voltage	>9000(mV)	20(events)	1 Trip
	-			Battery voltage Engine synchronization Engine speed Difference between new and old ignition counter ensuring that all	<655340(mV) =TRUE >1400(rpm) >9(counts)		
		EC	M Section 524 of 772	cylinder were fired at least once			636

				Basic enable conditions met	=see sheet enable tables		
P060B	Function monitoring - Pedal potentiometer signal 2 voltage check - The measured ADC voltage pulled to low level is compared with a threshold.	Measured voltage at the ADC for the acceleration pedal signal 2	≥0,215(V)	Ignition is on	=TRUE	0,1(s)	1 Trip
				AD-input to low-level (Short Circuit to Ground)	=TRUE		
				Basic enable conditions are met	=TRUE		
P060B	Function monitoring - Test voltage range check - The measured ADC test voltage channel voltage is compared	Measured voltage at the ADC test voltage input	>4829,1(mV)	Ignition is on	=TRUE	0,15(s)	1 Trip
	with thresholds.	OR Measured voltage at the ADC test voltage input	<4726,5(mV)	Basic enable conditions are met	=TRUE		
P060A	Path 1: CAN and Flexray shut-off path test	Detects if CAN and Flexray transmission is diabled in case of an error	=TRUE	Shut-Off path test is completed	=TRUE	0,01(s)	1 Trip
				Ignition ON Basic enable conditions are met	=TRUE =see sheet enable tables		
	Path 2: Power stage shut-off path test	Detects if power stages is disabled in case of an errror	=TRUE	Shut-Off path test is completed	=TRUE		
		OR The entire power stage shut-off path test has not been completed for time where A - Maximum number of	=TRUE >A * 2.2ms() =450	Ignition ON Basic enable conditions are met	=TRUE =see sheet enable tables		
		repetitions of shut-off path test					
P060D	Path 1: Detects if the absolute difference between the accelerator pedal signal 1 voltage and the accelerator pedal signal 2 voltage exceeds with a threshold (part pedal).	(Ignition ON	=TRUE	0,026(s)	1 Trip

	Absolute difference of accelerator pedal position sensor voltages, calculated by the following formula: max[(a);(b)] - max[(b);(c)] I	>360,6(mV)	(maximum value between the accelerator pedal position sensor 1 raw voltage (from ADC) and the voltage threshold for start of plausibility check of the accelerator signal	≤4061,4(mV)	0,026(s)	
	where:(a) Accelerator pedal positionsensor 1 current voltage (from ADC)	=measured parameter	maximum value between the voltage threshold for start of plausibility check of the accelerator signal and the accelerator pedal position sensor 2 raw voltage (from ADC)	≤4061,4(mV)		
	(b) Voltage threshold for start of plausibility check of the accelerator signal	=848(mV))			
	(c) Accelerator pedal position sensor 2 current voltage (from ADC)	=measured parameter	Null load test impulse check in ADC monitoring is not active	=TRUE		
)		Basic enable conditions are met No accelerator pedal fault	=TRUE =TRUE		
Path 2: Detects if the absolute difference between the accelerator pedal signal 1 voltage and the accelerator pedal signal 2 voltage exceeds with a threshold (full pedal).	(Ignition ON	=TRUE	0,026(s)	1 Trip
	Absolute difference of accelerator pedal position sensor voltages, calculated by	>360,6(mV)	(
	max[(a);(b)] - max[(b);(c)]		maximum value between the accelerator pedal position sensor 1 raw voltage (from ADC) and the voltage threshold for start of plausibility check of the accelerator signal	>4061,4(mV)		

	where:		maximum value between the voltage threshold for start of plausibility check of the accelerator signal and the accelerator pedal position sensor 2 raw voltage (from ADC)	>4061,4(mV)	
	(a) Accelerator pedal position sensor 1 current voltage (from	=measured parameter)		
	(b) Voltage threshold for start of plausibility check of the accelerator signal	=848(mV)	Null load test impulse check in ADC monitoring is not active	=TRUE	
	(c) Accelerator pedal position sensor 2 current voltage (from	=measured parameter	Basic enable conditions are met	=TRUE	
)		No accelerator pedal fault	=TRUE	
For accelerator pedal sensor 1 and 2 separately, detects if the learned normalized accelerator pedal voltage of Level 2 is greater than the learned normalized accelerator pedal voltage of Level 1.	minimum learned normalized accelerator pedal voltage L2 and the minimum learned normalized pedal voltage L1 - accelerator pedal sensor 1, calculated by the following formula:				
	(d) > (e) where (d) Minimum learned normalized pedal voltage L2 -	=measured parameter	Basic enable conditions are met	=TRUE	
	accelerator pedal sensor 1 (e) Minimum learned normalized pedal voltage L1 - accelerator pedal sensor 1	=measured parameter			
	Difference between the minimum learned normalized accelerator pedal voltage L2 and the minimum learned normalized pedal voltage L1 - accelerator pedal sensor 2, calculated by the following formula: (f) > (g) where	>0			
	(f) Minimum learned normalized pedal voltage L2 - accelerator pedal sensor 2	=measured parameter			
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		(g) Minimum learned normalized pedal voltage L1 - accelerator pedal sensor 2	=measured parameter				
P061C	Engine speed plausibility check - The difference between calculated (function monitoring) and measured engine speed is greater than a calibrated threshold for a calibrated period of time	C Difference between calculated engine speed from function monitoring and measured engine speed	≥320(rpm)	Engine synchronization is active	=TRUE	0,08(s)	1 Trip
			E	Engine speed signal is valid (angle counter difference ≥0)	=TRUE		
				Synchronization is not lost	=TRUE >520(rpm)		
				speed in function monitoring Basic enable conditions are met	=TRUE		
	Detects if minimum engine speed is reached and debounced for a calibrated period of time	Engine speed gradient	≥520(rpm)	Engine synchronization is active	=TRUE		
		Debounce time for engine speed gradient in function monitoring	≥0,52(sec)	Engine speed signal is not valid (angle counter difference < 0)	=TRUE		
		lionenig		Synchronization is not lost Basic enable conditions are met	=TRUE =TRUE		
P0607	Path 1:	ABE line active	=TRUE	Shut-off path test active	=FALSE	0,05(s)	1 Trip
	Monitoring ABE activation			ECU is in DRIVE state			
				Battery voltage	>8(V)		
) For time Basic enable conditions are met	≥0,1(sec) =see sheet enable tables		
P0607	Path 2: Monitoring shut-off by query-	WDA line active	=TRUE	Shut-off path test active	=FALSE	0,05(s)	1 Trip
	response communication			ECU is in DRIVE state Basic enable conditions are met	=see sheet enable tables		
P0607	Path 3: Monitoring shut-off by error pin	Error pin line active	=TRUE	Shut-off path test active	=FALSE	0,05(s)	1 Trip
	activation	_	OM Os stien 500 st 770	ECU is in DRIVE state			040

				Basic enable conditions are met	=see sheet enable tables		
P0607	Path 4: Monitoring ABE activation at	ABE line active	=TRUE	Shut-off path test active	=FALSE	0,05(s)	1 Trip
	overvollage delection	Latching of overvoltage	=TRUE	ECU is in DRIVE state			
		detection is activated		Basic enable conditions are met	=see sheet enable tables		
P0603	Detects KeepAlive error during runtime at an external device	Any of the peripheral monitoring function reports a keep alive error such as memory errors, incorrect init state, unexpected resets of the external device during runtime	=TRUE he le	Ignition is ON	=TRUE	0,1(s)	1 Trip
				Basic enable conditions met	=see sheet enable tables		
P0603	Detects KeepAlive error during initialization phase at an external device	Any of the peripheral monitoring function reports a keep alive error such as memory errors, incorrect init state, unexpected resets of the external device during initialization phase	=TRUE he	Ignition is ON	=TRUE	0,1(s)	1 Trip
				Basic enable conditions met	=see sheet enable tables		
P0604	Read diagnosis for non volatile memory	A memory block could not be read successfully	e =TRUE	Ignition is ON	=TRUE	0,1(s)	1 Trip
				Basic enabling conditions are met	=see sheet enable tables		
P0604	Write diagnosis for non volatile	A memory block could not be	e =TRUE	Ignition is ON	=TRUE	0,1(s)	1 Trip
	memory	Stored Successionly		Basic enabling conditions are met	=see sheet enable tables		
P30D6	Digital output communication loss/errors. Irregular operation of the SPI for Throttle actuator motor control circuit Bank 1	SPI error read out from power stage diagnoctics of Throttle actuator motor control circuit Bank 1	er =TRUE	(ECU is in DRIVE state	=TRUE	0,1(s)	1 Trip
			FCM Section 520 of 772	OR ECU is in POSTDRIVE state	=TRUE		644 0

			The powerstage of the actuator is switched on, following conditions:	=TRUE		
			(
			State of the thottle valve powerstage bank 1	>0		
) Release of adaptation Actual position is valid	=FALSE =TRUE		
			Request safety fuel cut off SKA bank 1, following condition: (=FALSE		
			Request reversible safety fuel cut off SKA bank 1, which has following condition:	=FALSE		
			Battery voltage for throttle valve operation sufficient bank 1	>7,5(V)		
			Engine speed	>2000(rpm)		
) Limp home position not reached bank 1	=FALSE		
) No pending or confirmed DTCs	=see sheet inhibit tables		
			Basic enable conditions met	=see sheet enable tables		
P30D7	Digital output communication loss/errors. Irregular operation of the SPI for Throttle actuator motor control circuit Bank 2SPI error read out from power stage diagnoctics of Throttle actuator motor control circuit Bank 2	=TRUE	(ECU is in DRIVE state	=TRUE	0,1(s)	1 Trip
			OR ECU is in POSTDRIVE state	=TRUE		
) The powerstage of the actuator is switched on, following conditions:	=TRUE		
			(State of the thottle valve powerstage bank 2	>0		
) Release of adaptation	=FALSE		
			Actual position is valid	=TRUE		
			Request safety fuel cut off SKA bank 2, following condition: (=FALSE		
			Request reversible safety fuel cut off SKA bank 2, which has following	=FALSE		
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				(Battery voltage for throttle valve operation sufficient bank 2 OR Engine speed	>7,5(V) >2000(rpm)		
) Limp home position not reached bank 2	=FALSE		
) No pending or confirmed DTCs Basic enable conditions met	=see sheet inhibit tables =see sheet enable tables		
P060C	Path 2: Cylinder individual fuel correction rationality check in function monitoring.	(Ignition is ON	=TRUE	4,16(s)	1 Trip
		Cylinder individual fuel correction	>(a*b) + c(%)	Engine Speed	≥1200(rpm)		
		where		Injection cut off (ICO) is not requested	=TRUE		
		a : Relative fuel mass for		Injection cut off (ICO) is not	=TRUE		
		b : Factor maximum tolerance in check of cylinder-individual fuel in function monitoring	1,1	System voltage exceeds 8V	=TRUE		
		c : Offset tolerance in check of cylinder-individual fuel in function monitoring	10,5(%)	Limp home mode is not requested from function monitoring	=TRUE		
)		No loss of Synchronisation during function monitoring	=TRUE		
		OR (Cylinder individual fuel correction	<(a*b) - c(%)	(ECU is not in pre-drive state OR	=TRUE		
		where a : Relative fuel mass for individual cylinder		ECU is not in post-drive state)	=TRUE		
		b : Factor maximum tolerance in check of cylinder-individual fuel in function monitoring	0,9	Air-Fuel check is disabled for function monitoring	=FALSE		
		c : Offset tolerance in check of cylinder-individual fuel in function monitoring)	10,5(%)	Basic enable conditions are met	=see sheet enable tables		

Path 3: The complement check of cylinder counter for homogeneous injection, stratified injection and calculation of post injection at dynamic load	The complement of cylinder counter is not equal to the redundant counter for homogenous injection in function monitoring	=TRUE	Ignition is ON	=TRUE	4,16(s)	1 Trip
	OR		Engine Speed	≥1200(rpm)		
	The complement of cylinder counter is not equal to the redundant counter for stratified injection in function monitoring	=TRUE	Injection cut off (ICO) is not requested	=TRUE		
	OR		Injection cut off (ICO) is not	=TRUE		
	The complement of cylinder counter is not equal to the redundant counter for calculation of post-injection at dynamic load in function monitoring	=TRUE	System voltage exceeds 8V	=TRUE		
	OR		Limp home mode is not requested from function monitoring	=TRUE		
	Cylinder counter for homogeneous injection OR	≥8	No loss of Synchronisation during function monitoring	=TRUE		
	Cylinder counter for stratified injection OR	≥8	ECU is not in pre-drive state	=TRUE		
	Cylinder counter for calculation of post-injection at dynamic load	n ≥8	ECU is not in post-drive state	=TRUE		
)			
			Air-Fuel check is disabled for function monitoring	=FALSE		
			Basic enable conditions are met	=see sheet enable tables		
Path 4: Plausibility check : Average value for cylinder individual fue correction in function nonitoring is greater than a calibrated threshold for a	Average value for cylinder individual fuel correction in al function monitoring	>1,03	Ignition is ON	=TRUE	4,16(s)	1 Trip
anerated period of time			Engine Speed	≥1200(rpm)		
			Injection cut off (ICO) is not requested	=TRUE		
			Injection cut off (ICO) is not requested from function monitoring	=TRUE		
	E	CM Section 532 of 772	System voltage exceeds 8V	=TRUE		644 o

				Limp home mode is not requested from function monitoring No loss of Synchronisation during function monitoring (=TRUE =TRUE		
				ECU is not in pre-drive state OR	=TRUE		
				ECU is not in post-drive state) Air-Fuel check is disabled for	=TRUE =FALSE		
				function monitoring Basic enable conditions are met	=see sheet enable tables		
P060C	Path 5: Detects plausibility check of air/fuel ratio in function	(Engine Speed	≥1200(rpm)	0,52(s)	1 Trip
		Complement of mode of operation in gasoline direct injection (GDI) for monitoring	!=A	Injection cut off (ICO) is not requested	=TRUE		
		where:		Injection cut off (ICO) is not requested from function monitoring	=TRUE		
		A: Mode of operation in gasoline direct injection (GDI) for monitoring		System voltage exceeds 8V	=TRUE		
)		Limp home mode is not requested from function monitoring	=TRUE		
				No loss of Synchronisation during function monitoring (=TRUE		
				CLU is not in pre-drive state	=TRUF		
				ECU is not in post-drive state	=TRUE		
				Air-Fuel check is disabled for function monitoring	=FALSE		
				No pending or confirmed DTCs	=see sheet enable tables		
				Basic enable conditions are met	=see sheet inhibit tables		
	Path 6: Checks the operation mode of ECU in function monitoring	(Engine Speed	≥1200(rpm)	0,52(s)	1 Trip
		Gasoline direct injection for monitoring is not in homogeneous operation mode	=TRUE	Injection cut off (ICO) is not requested	=TRUE		
		Gasoline direct injection (GDI) for monitoring is not in homogeneous split mode	=TRUE	Injection cut off (ICO) is not requested from function monitoring	=TRUE		

		Gasoline direct injection (GDI) for monitoring is not in homogeneous knock	=TRUE	System voltage exceeds 8V	=TRUE		
)		Limp home mode is not requested	=TRUE		
				No loss of Synchronisation during function monitoring	=TRUE		
				CU is not in pre-drive state ECU is not in post-drive state	=TRUE =TRUE		
				/ Air-Fuel check is disabled for function monitoring	=FALSE		
				No pending or confirmed DTCs	=see sheet enable tables		
				Basic enable conditions are met	=see sheet inhibit tables		
	Path 7: The Lambda setpoint is checked against the range of permissable values for bank 1 and bank 2 systems	Desired lambda limitation for Bank 1 for monitoring	<0,65	Engine Speed	≥1200(rpm)	0,52(s)	1 Trip
	and bank 2 systems	OR		Injection cut off (ICO) is not requested	=TRUE		
		Desired lambda limitation for Bank 2 for monitoring	<0,65	Injection cut off (ICO) is not requested from function monitoring	=TRUE		
		OR Desired lambda limitation for	>1,2	System voltage exceeds 8V Limp home mode is not requested	=TRUE =TRUE		
		Bank 1 for monitoring OR		from function monitoring No loss of Synchronisation during function monitoring	=TRUE		
		Desired lambda limitation for Bank 2 for monitoring	>1,2	(
				ECU is not in pre-drive state ECU is not in post-drive state	=TRUE =TRUE		
) Air-Fuel check is disabled for function monitoring	=FALSE		
				No pending or confirmed DTCs	=see sheet enable tables		
				Basic enable conditions are met	=see sheet inhibit tables		
P060C	Path 8: Ignition angle plausibility check in function monitoring	Ignition angle value	!=A(degrees)	Ignition is ON	=TRUE	0,16(s)	1 Trip
		where: A: complement of "the complement of the ignition		Engine Speed Injection cut off (ICO) is not requested	≥1200(rpm) =TRUE		
		ande value"	M Caption E24 of 772				646 6

				Injection cut off (ICO) is not requested from function monitoring System voltage exceeds 8V Limp home mode is not requested from function monitoring No loss of Synchronisation during function monitoring (ECU is not in pre-drive state OR ECU is not in post-drive state) Air-Fuel check is disabled for function monitoring Basic enable conditions are met	=TRUE =TRUE =TRUE =TRUE =TRUE =FALSE =see sheet inhibit tables	
P060C	Relative air charge range check in function monitoring	Absolute deviation of predicted relative air charge from calculated relative air charge	>30,75(%)	Ignition is on	=TRUE	1 Trip
		For time	>=360(msec)	Engine Speed	>=1200(rpm)	
				Injection cut off (ICO) is not	=TRUE	
				Injection cut off (ICO) is not requested	=TRUE	
				System voltage exceeds 8V	=TRUE	
				from function monitoring	=IRUE	
				No loss of synchronisation during function monitoring	=TRUE	
				(ECU is not in pre-drive OR	=TRUE	
				ECU is not in post-drive	=TRUE	
				Air-Fuel check is disabled for	=FALSE	
				Basic enable conditions are met	=see sheet inhibit tables	
P060C	Monitoring of fuel cut-off pattern for PFI	Fuel cut-off error debounce counter	>=13()	Engine speed during function monitoring	>=1200(rpm)	1 Trip
				Injection cut-off demand from level 1	=FALSE	
				Injection cut-off demand from level 2	=FALSE	
				Undervoltage shutoff active	=FALSE	
				Limp-nome mode active	=FALSE	

				Loss of engine speed synchronization in the function monitoring Pre- drive in function Monitoring active Post- drive in function Monitoring active Basic enable conditions are met	=FALSE =FALSE =see sheet inhibit	
					tables	
P060C	Monitoring of cylinder individual fuel correction for PFI	(Engine speed during function monitoring	>=1200(rpm)	1 Trip
		Fuel mass correction factor tolerance-compensation, average over all cylinders	>1,03	Injection cut-off demand from level 1	=FALSE	
		OR		Injection cut-off demand from level 2	=FALSE	
		Fuel mass correction factor tolerance-compensation, cylinder individual	>1,5156	Undervoltage shutoff active	=FALSE	
		OR Fuel mass correction factor tolerance-compensation, cylinder individual during AFIM diagnosis	>1,5156	Limp-home mode active Loss of engine speed synchronization in the function monitoring	=FALSE =FALSE	
		OR		Pre- drive in function Monitoring active	=FALSE	
		Counter for AFIM activation time in function monitoring (PFI)	>1	Post- drive in function Monitoring active	=FALSE	
		OR Redundant fuel mass correction factor tolerance- compensation (cylinder individual) is unequal the fuel mass correction factor tolerance-compensation (cylinder individual)	=TRUE	PFI active Basic enable conditions are met	=TRUE =see sheet inhibit tables	
		Frror debounce counter	>=13			
P060C	Monitoring the mixture control of bank 1 and 2 of the PFI path	((Engine speed during function monitoring	>=1200(rpm)	1 Trip
		Expected value for relative fuel mass	>(A*B)+C	Injection cut-off demand from level 1	=FALSE	
		where:		Injection cut-off demand from level 2	=FALSE	
		A: Relative fuel mass		Undervoltage shutoff active	=FALSE	
				······································		
-------	--	---	-----------	--	------------------------------	--------
		B: Factor maximum tolerance in check of bank selective fuel	=1,101563	Limp-home mode active	=FALSE	
		C: Offset tolerance in check of fuel	=9,75	Loss of engine speed synchronization in the function	=FALSE	
)		Pre- drive in function Monitoring active	=FALSE	
		OR		Post- drive in function Monitoring active	=FALSE	
		(State air-fuel-check disabled in function monitoring	=FALSE	
		Expected value for relative fuel	<(A*B)-C	PFI active	=TRUE	
		where:		Basic enable conditions are met	=see sheet inhibit tables	
		A: Relative fuel mass B: Factor maximum tolerance in check of bank selective fuel				
		C: Offset tolerance in check of fuel				
)) Error debounce counter	>=13			
P060C	Monitoring the mixture control of bank 1 and 2 of the PFI path	One of the critical factors in the calculation of the bank-specific fuel mass is exceeding its threshold	=TRUE	Engine speed during function monitoring	>=1200(rpm)	1 Trip
		Error debounce counter	>=13	Injection cut-off demand from level 1	=FALSE	
				Injection cut-off demand from level 2	=FALSE	
				Undervoltage shutoff active	=FALSE	
				Limp-home mode active Loss of engine speed synchronization in the function monitoring	=FALSE =FALSE	
				Pre- drive in function Monitoring active	=FALSE	
				Post- drive in function Monitoring active	=FALSE	
				State air-fuel-check disabled in function monitoring	=FALSE	
				PFI active	=TRUE	
				Dasic enable conditions are met	tables	

P060C Monitoring GDI and PFI mode (activations and mixture mangement of both modes

1 Trip

		20022001111		146100			
		Error in the redundant check of PFI and GDI mode activation	=TRUE	Injection cut-off demand from level 1	=FALSE		
		OR		Injection cut-off demand from level 2	=FALSE		
		Error in the redundant check of PFI and GDI mixture management	=TRUE	Undervoltage shutoff active	=FALSE		
		OR Error in the redundant check for fuel cut off	=TRUE	Limp-home mode active Loss of engine speed synchronization in the function	=FALSE =FALSE		
)		Pre- drive in function Monitoring active	=FALSE		
		Error debounce counter	>=13	Post- drive in function Monitoring active	=FALSE		
				State air-fuel-check disabled in function monitoring	=FALSE		
				Basic enable conditions are met	=see sheet inhibit tables		
'060C	Path 9: Torque comparison - The difference between current torque in the function monitoring and the filtered relative permissible torque is compared with threshold.	(Difference between current torque and filtered relative permissible torque in function monitoring	>0(%)	Ignition is ON	=TRUE	0,52(s)	1 Trip
	compared with threshold.	for time	≥0.04 x A(sec)	Injection cut off (ICO) is not requested from function monitoring	=TRUE		
		A: error tolerance time for torque comparison in the function monitoring	=13	Injection cut off (ICO) is not requested	=TRUE		
		OR Error sum of the relative deviation from the permissable torque in function monitoring	>8(%*sec)	System voltage exceeds 8V Limp home mode is not requested from function monitoring	=TRUE =TRUE		
)		No loss of Synchronisation during function monitoring (=TRUE		
				ECU is not in pre-drive state	=TRUE		
				ECU is not in post-drive state	=TRUE		
				Basic enable conditions are met	=see sheet inhibit tables		
2060C	Path 10: The injection cut-off pattern total is evaluated by compared with the expected and actual injection cut-off pattern.	The complement of injection cut-off pattern total is not equal to the injection cut-off pattern	=TRUE	Ignition is ON	=TRUE	0.52(s)	1 Trip
		ECM	Section 538 of 772				650

			Engine Speed	≥1200(rpm)		
			Injection cut off (ICO) is not	=TRUE		
			Injection cut off (ICO) is not requested from function monitoring	=TRUE		
			System voltage exceeds 8V Limp home mode is not requested	=TRUE =TRUE		
			from function monitoring No loss of Synchronisation during function monitoring (=TRUE		
			CU is not in pre-drive state	=TRUE		
			ECU is not in post-drive state	=TRUE		
			Air-Fuel check is disabled for function monitoring	=FALSE		
			Basic enable conditions are met	=see sheet inhibit tables		
Path 11: The complement check of driver injection demand for homogeneous injection, stratified injection and calculation of post injection at	The complement of driver injection demand is not equal to the redundant driver injection demand for homogenous injection in function monitoring	=TRUE	Ignition is ON	=TRUE	0.52(s)	1 Trip
stratified injection and calculation of post injection at dynamic load.	OR The complement of driver injection demand is not equal to the redundant driver injection demand for stratified injection in function monitoring	=TRUE	and Engine Speed	≥1200(rpm)		
	OR		Injection cut off (ICO) is not	=TRUE		
	The complement of driver injection demand is not equal to the redundant driver injection demand for calculation of post injection at dynamic in function monitoring	=TRUE	Injection cut off (ICO) is not requested from function monitoring	=TRUE		
			System voltage exceeds 8V	=TRUE		
			Limp home mode is not requested from function monitoring No loss of Synchronisation during	=TRUE		
			function monitoring (
			ECU is not in pre-drive state OR	=TRUE		
	ECM S	Section 539 of 772	ECU is not in post-drive state	=TRUE		651

) Air-Fuel check is disabled for function monitoring Basic enable conditions are met	=FALSE =see sheet inhibit tables		
Path 12: The complement of injection mode timing check in function monitoring.	The complement of injection timing is not equal to the redundant injection timing in function monitoring	=TRUE	Ignition is ON	=TRUE	0.52(s)	1 Trip
U	, i i i i i i i i i i i i i i i i i i i		Engine Speed	≥1200(rpm)		
			Injection cut off (ICO) is not requested	=TRUE		
			Injection cut off (ICO) is not requested from function monitoring	=TRUE		
			System voltage exceeds 8V Limp home mode is not requested	=TRUE =TRUE		
			from function monitoring No loss of Synchronisation during function monitoring	=TRUE		
			(ECU is not in pre-drive state	=TRUE		
			ECU is not in post-drive state	=TRUE		
			/ Air-Fuel check is disabled for function monitoring	=FALSE		
			Basic enable conditions are met	=see sheet inhibit tables		
Path 13: Complement check to ensure the stored injection cut off information for all cylinders for homogeneous injection, stratified injection and calculation of post injection at dynamic load.	Injection cut off mask is not equal to the injection cut off pattern total in the cylinder individual cut off array at the cylinder for homogeneous injection	=TRUE	Ignition is ON	=TRUE	0.52(s)	1 Trip
	OR		Engine Speed	≥1200(rpm)		
	Injection cut off pattern total is not equal to the complement of injection cut off pattern total in the cylinder individual cut off array at position of stratified injection	=TRUE	Injection cut off (ICO) is not requested	=TRUE		
	OR		Injection cut off (ICO) is not requested from function monitoring	=TRUE		

	Injection cut off pattern total is not equal to the complement injection cut off pattern total in the cylinder individual cut off array at position of calculation of post injection at dynamic load	s =TRUE of n	System voltage exceeds 8V	=TRUE		
	load		Limp home mode is not requested from function monitoring	=TRUE		
			function monitoring	=IRUE		
			ECU is not in pre-drive state	=TRUE		
			ECU is not in post-drive state)	=TRUE		
			Air-Fuel check is disabled for function monitoring	=FALSE		
			Basic enable conditions are met	=see sheet inhibit tables		
Path 14: Injection cut-off pattern total is checked against the injections currently demanded from the driver for homogeneous and calculation of post injection at dynamic load	(All the partial injections are calculated in S0	=TRUE	0.52(s)	1 Trip
	Driver injection demand for homogeneous injection mode	>0	OR			
	(All the partial injections are calculated in S0 and S1 (mixed timing)	=TRUE		
	Injection is allowed	=FALSE	Engine Speed	≥1200(rpm)		
	OR		Injection cut off (ICO) is not requested	=TRUE		
	Injection cut-off pattern total i performed individually for homogeneous injection mode	s =TRUE	Injection cut off (ICO) is not requested from function monitoring	=TRUE		
)		System voltage exceeds 8V	=TRUE		
)		Limp home mode is not requested from function monitoring	=TRUE		
	OR (No loss of Synchronisation during function monitoring	=TRUE		
	Driver injection demand for calculation of post injection mode	>0	ECU is not in pre-drive state	=TRUE		
	(OR	TOUE		
		=FALSE	LOU IS NOT IN POST-DRIVE STATE	=IKUE		
		ECM Section 541 of 772)			653

		Injection cut-off pattern total is performed individually for calculation of post injection mode	=TRUE	Air-Fuel check is disabled for function monitoring	=FALSE		
)		Basic enable conditions are met	=see sheet inhibit tables		
	Path 15: Injection cut-off pattern total is checked against the injections currently demanded from the driver for stratified injection modes.	(All the partial injections are calculated in S0 and S1	=TRUE	0.52(s)	1 Trip
		Driver injection demand for stratified injection mode	>0	Engine Speed	≥1200(rpm)		
		(Injection cut off (ICO) is not requested	=TRUE		
		Injection is allowed	=FALSE	Injection cut off (ICO) is not requested from function monitoring	=TRUE		
		OR Injection cut-off pattern total is performed individually for stratified injection mode	=TRUE	System voltage exceeds 8V Limp home mode is not requested from function monitoring	=TRUE =TRUE		
)		No loss of Synchronisation during function monitoring	=TRUE		
)		(ECU is not in pre-drive state OR	=TRUE		
				ECU is not in post-drive state	=TRUE		
				Air-Fuel check is disabled for function monitoring	=FALSE		
				Basic enable conditions are met	=see sheet inhibit tables		
P060C	Path 16: Fault check of ECU signal input monitoring Air and fuel	Compliment of synchronous counter S0 is not equal to redundant synchronous counter S0 in function monitoring	=TRUE	Ignition is ON	=TRUE	0.52(s)	1 Trip
		OR		Engine Speed	≥400(rpm)		
		Compliment of synchronous counter S1 is not equal to redundant synchronous counter S1 in function monitoring	=TRUE	Injection cut off (ICO) is not requested	=TRUE		
		OR		Injection cut off (ICO) is not requested from function monitoring	=TRUE		

		Difference between expected values for the number of calls of synchronous counter S0 frames in function monitoring based on the course of engine speed and previous synchronous counter S0	>1(count)	System voltage exceeds 8V	=TRUE		
		OR Difference between expected values for the number of calls of synchronous counter S1 frames in function monitoring based on the course of engine speed and previous synchronous counter S1	> 1(count)	Limp home mode is not requested from function monitoring No loss of Synchronisation during function monitoring	=TRUE =TRUE		
				(ECIL is not in prodrive state			
				OR	TRUE		
				ECU is not in post-drive state	=TRUE		
				, Air-Fuel check is disabled for function monitoring	=FALSE		
				Basic enable conditions are met	=TRUE		
P060C	Path 17: This function performs a plausibility check of the mixture control for GDI systems and safeguards the fuel mass.	Expected value for relative fuel mass in function monitoring (GDI)	>(A*B) + C(%)	Ignition is ON	=TRUE	0,26(s)	1 Trip
		where		Engine Speed	≥1200(rpm)		
		A: Relative fuel mass		Injection cut off (ICO) is not requested	=TRUE		
		B: Factor maximum tolerance in check of bank selective fuel in function monitoring (GDI)	=1,1	Injection cut off (ICO) is not requested from function monitoring	=TRUE		
		C : Offset tolerance in check of fuel in function monitoring (GDI)	=10,5(%)	System voltage exceeds 8V	=TRUE		
		OR		Limp home mode is not requested	=TRUE		
		Expected value for relative fuel mass in function monitoring (GDI)	<(A*B) - C(%)	from function monitoring No loss of Synchronisation during function monitoring	=TRUE		
		where A: Relative fuel mass B : Factor minimum tolerance in check of bank selective fuel in function monitoring (CDI)	0,9	(ECU is not in pre-drive state OR	=TRUE		

		25OBDG0	7A Part 2 ECM Summary	/ Tables			
		C : Offset tolerance in check of fuel in function monitoring (GDI)	of 10,5(%)	ECU is not in post-drive state	=TRUE		
) Air-Fuel check is disabled for function monitoring	=FALSE		
				Basic enable conditions are met	=see sheet enable tables		
P060C	Path 18: Control fault check of mixture management for GDI.	After start adaption factor in function monitoring	>1,01(°C)	Ignition is ON	=TRUE	0,26(s)	1 Trip
		OR		Engine Speed	≥1200(rpm)		
		(Injection cut off (ICO) is not	=TRUE		
		Additive adaptive correction o the relative fuel amount on GI path in function monitoring	f >8,1(%) DI	Injection cut off (ICO) is not requested from function monitoring	=TRUE		
		OR Additive adaptive correction o the relative fuel amount on GI path bank 2 in function	f >8,1(%) DI	System voltage exceeds 8V Limp home mode is not requested from function monitoring	=TRUE =TRUE		
)		No loss of Synchronisation during function monitoring	=TRUE		
		OR (lambda collector output in function monitoring	>1,28	(ECU is not in pre-drive state OR	=TRUE		
		OR lambda collector output bank	2 >1,28	ECU is not in post-drive state)	=TRUE		
)		Air-Fuel check is disabled for	=FALSE		
		OR (Basic enable conditions are met	=see sheet enable tables		
		(Fuel mixture adaption for GDI injection path in function monitoring	>1,35(rpm)				
		OR Fuel mixture adaption for GDI injection path bank 2 in function monitoring	>1,35(rpm)				
) OR (
		F					050

<(a*b) - c()
-0,091
6(%)
<(a*b) - c()
-0,091
6(%)
≥1400(rpm)
<-2,11(%)
<1400(rpm)
<-5,11(%)
=IRUE
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		OR Mixture adaption factor for Atkinson gasoline backflow in function monitoring	>1				
P060C	Path 19: Monitoring of the electronic transmission range select (ETRS) system (with irreversible error reaction of Level 2)	Level 1 request to apply EPB invalid	=TRUE	Ignition is ON	=TRUE	0,04(s)	1 Trip
	,	for counts	≥50	(
		means:		ECU is not in pre-drive state	=TRUE		
		(OR			
		Level 1 request to apply EPB	=TRUE	ECU is not in post-drive state	=TRUE		
		Vehicle speed for counts	≥4,97(mph) ≥5) Basic enable conditions are met	=see sheet enable tables		
		/ OR Change of direction request	=TRUE				
		from level 1 invalid	>50				
		for counts	200				
		OR Missed level 1 request to app EPB	ly =TRUE				
		for counts	≥50				
		means: (
		Level 1 request to apply EPB	=FALSE				
		Level 2 request to apply EPB)	=TRUE				
		Park engagement and EPB engagement error set	=TRUE				
		for counts	≥10				
		means: (
		Valid park range request	=TRUE				
		Park engaged by TCU	=FALSE				
			=FALOE				
		for counts	≥150				
			ECM Section 546 of 772				658 c

		25OBDG07A Part 2 ECM Summary Tables										
			'Shift away from park range' request from level 1 invalid for counts	=TRUE ≥50								
	P17DB	Path 20: Monitoring of the electronic transmission range select (ETRS) system (with reversible error reaction of Level 1)	Change of direction request from level 1 invalid	=TRUE	Ignition is ON	=TRUE	0,04(s)	1 Trip				
			OR		(
			'Shift away from park range' request from level 1 invalid	=TRUE	ECU is not in pre-drive state	=TRUE						
					OR ECU is not in post-drive state	=TRUE						
) Basic enable conditions are met	=see sheet enable tables						
	P060C	Fault status of Level1 Level2 comparison for secondary range display CAN Tx signal in function monitoring	Range Display value extracted from Level1 CAN buffer is compared against all the values stored in the Level2 ring buffer. The comparison is valid, if the Range Display value from Level1 CAN buffer is not equal to "Park" or matches at least one of the values in the Level2 ring buffer	=FALSE			0,04(s)	1 Trip				
	P060C	Plausibility check Accelerator	(Position of accelerator pedal	>100(%)	-		50(events)	1 Trip				
		Pedal signals from ASW (L1) and Monitoring (L2)	in high resolution) - (Standardized accelerator pedal position)									
			or									

			25OBDG07A F	Part 2 ECM Summa	ry Tables			
			(Standardized accelerator pedal position) - (Position of accelerator pedal in high resolution)	<21,32(%)				
	P060C	Comparison of the two Virtual Accelerator Pedal signals from ASW (L1) and Monitoring (L2)	(Handshake signal for the virtual accelerator pedal with level 1) - (Accelerated pedal virtual cruise control) or	>100(%)	-		50(events)	1 Trip
			(Accelerated pedal virtual cruise control) - (Handshake signal for the virtual accelerator pedal with level 1)	<100(%)				
	P060C	Path 1:Diagnosis of error during request of post-build index of BSW	The order of return value of the callback function EcuM_RbMoGetActivePostBuil dVariantIndex is accepted For number of counts	=TRUE()	Ignition is on	=TRUE	50(events)	1 Trip
		Path 2: Diagnosis on stability check of the post-build variant over driving cycle	After initialization the written post-build variant changes in comparison to the post-build variant which is continuously received from the basis software	=TRUE()	Ignition is on	=TRUE	-	
			For number of counts		Counter for error debounce due to an error in return of the active post-build configuration	=0		
62. CCM – ECM PROGRAMIN G ERRORS	P0602	Diagnosis of Code Variation of Start Calibration	Dataset is not valid	=TRUE	Ignition is ON	=TRUE	0,2(s)	1Trip- 200ms
					Counter for proc to be executed alternatively Basic enable conditions are met	=FALSE =see sheet enable tables		
	P0630	Monitoring of Vehicle Identification Number	VIN Not programmed : VIN contains 0xFF in all the 17 bytes	=TRUE	Ignition is ON	=TRUE	0,2(s)	1 Trip
					VIN buffer is read successfully from EEP	=TRUE		
					alternatively Basic enable conditions are met	=FALSE =see sheet enable tables		

	P0630		Status of controller transfer detected	=TRUE	Ignition is ON	=TRUE	1(s)	1 Trip
			for time	≥5(sec)	Basic enable conditions met	=see sheet enable tables		
63. CCM – DIAGNOSIS REPORTED VIA CAN COMMUNICA TION	U1960	Monitoring the empty key status	Empty key status reported	=TRUE	Ignition is ON	=TRUE	1(event)	1Trip- 200ms
non					Battery Voltage	≥9000(mV)		
	P2535	Monitoring Ignition Switch Run/Start Position - Circuit High	Ignition Switch Run/Start Position Circuit High	=TRUE	Basic enable conditions are met	=see sheet enable tables	1(event)	1 Trip
	P2534	Monitoring Ignition Switch Run/Start Position - Circuit Low	Ignition Switch Run/Start Position Circuit Low	=TRUE	-		1(event)	1 Trip
	P064F	Unauthorized Software/Calibration Detected	Invalid / Incompatible Configuration detected	=TRUE			1(event)	1 Trip
64. CCM – TARGET WHEEL ADAPTATION FOR MISFIRE DETECTION	P0315	Indicates that the engine has experienced a problem with the crankshaft position sensor and/or the crankshaft sensor wheel by monitoring the adapted crankshaft segment time value against a calibrated threshold	Method 1: Median segment e time adaptation value from test frame	>1,2(deg CrS)	Engine speed	>2050(rpm)		1 Trip
			OR		Engine speed	<3200(rpm)		
			Method 1 : Median segment time adaptation value in the alternative segment position (catalyst heating) from test frame	>1,8(deg CrS)	Engine coolant temperature	>39,96(°C)		
			where		Rough road detection is not active	=TRUE		
			[One test frame defined by: Segment time adaptation sample counts	=11(counts)	(means: Average wheel acceleration rear axle	<55,55(m/(sec^2))		

A 100 M 1		OR	
Current segment time	measured parameter	Average wheel acceleration front	<55,55(m/(sec^2
adaptation value		axle)	
(means:		Traction or electronic stability control torque intervention is not active	=TRUE
Segment time ratio	=[A]/[B]	Calculated EPM segment time is valid	=TRUE
where			
[A] Modelled segment time	=measured parameter(µsec)		
[B] Measured segment time	=measured parameter(µsec)	Overrun/fuel cut-off is active	=TRUE
Filtered for		Segment time adaptation is not complete	=TRUE
N camshaft revolutions		No pending or confirmed DTCs	=see sheet inhib tables
where		Basic enable conditions met	=see sheet enab tables
(N	=(In([A]/[B]))/(In[C])(Ca mshaft revolutions)		
where			
[A] Filter factor lower limit	=0,05		
[B] Filter factor upper limit	=0,2		
[C] Filter factor slope)))] for	=0,9		
Maximum adaptation value threshold exceedance counter	≥1(events)		
Method 2: Difference between	>0,4(deg CrS)		
Method 2: Difference between the maximum and minimum	>0,4(deg CrS)		
Method 2 : Difference between the maximum and minimum filtered ratios of the modelled	>0,4(deg CrS)		
Method 2 : Difference between the maximum and minimum filtered ratios of the modelled to measured segment time during one sample	>0,4(deg CrS)		
Method 2: Difference between the maximum and minimum filtered ratios of the modelled to measured segment time during one sample OR	>0,4(deg CrS)		
Method 2: Difference between the maximum and minimum filtered ratios of the modelled to measured segment time during one sample OR Method 2: Difference between the maximum and minimum filtered ratios of the modelled	>0,4(deg CrS) 1,8(deg CrS)		
Method 2: Difference between the maximum and minimum filtered ratios of the modelled to measured segment time during one sample OR Method 2: Difference between the maximum and minimum filtered ratios of the modelled to measured segment time in	>0,4(deg CrS) 1,8(deg CrS)		
Method 2: Difference between the maximum and minimum filtered ratios of the modelled to measured segment time during one sample OR Method 2: Difference between the maximum and minimum filtered ratios of the modelled to measured segment time in the alternative segment	>0,4(deg CrS) 1,8(deg CrS)		
Method 2: Difference between the maximum and minimum filtered ratios of the modelled to measured segment time during one sample OR Method 2: Difference between the maximum and minimum filtered ratios of the modelled to measured segment time in the alternative segment position (catalyst heating) during one sample	>0,4(deg CrS) 1,8(deg CrS)		
Method 2: Difference between the maximum and minimum filtered ratios of the modelled to measured segment time during one sample OR Method 2: Difference between the maximum and minimum filtered ratios of the modelled to measured segment time in the alternative segment position (catalyst heating) during one sample where	>0,4(deg CrS) 1,8(deg CrS)		
Method 2: Difference between the maximum and minimum filtered ratios of the modelled to measured segment time during one sample OR Method 2: Difference between the maximum and minimum filtered ratios of the modelled to measured segment time in the alternative segment position (catalyst heating) during one sample where (sample means:	>0,4(deg CrS) 1,8(deg CrS)		
Method 2: Difference between the maximum and minimum filtered ratios of the modelled to measured segment time during one sample OR Method 2: Difference between the maximum and minimum filtered ratios of the modelled to measured segment time in the alternative segment position (catalyst heating) during one sample where (sample means: Current segment time adaptation value (means:	>0,4(deg CrS) 1,8(deg CrS) measured parameter		

[A] Modelled segment time[B] Measured segment timeFiltered forN camshaft revolutions	=measured parameter(sec) =measured parameter(sec)
where (N	=(In([A]/[B]))/(In[C])(Ca mshaft revolutions)
where [A] Filter factor lower limit [B] Filter factor upper limit [C] Filter factor slope)))] for	=0,05 =0,2 =0,9
Segment time ratio difference threshold exceedance counter	≥3(events)
Method 3 : Difference between the maximum and minimum segment time adaptation values of the inner five	>0,12(deg CrS)
Method 3: Difference between the maximum and minimum segment time adaptation values of the inner five adaptation samples in the alternative segment position (catalyst heating) where	>[A] x ([B] / [C])
[A] Maximum spread threshold of the inner five adaptation values in the standard segment position	0,12(deg CrS)
[B] Standard segment position	90(deg CrS)
[C] Alternative segment position length and	60(deg CrS)
(sample means: Current segment time adaptation value (means:	measured parameter
Segment time ratio	=[A]/[B]
[A] Modelled segment time	=measured parameter(µsec)
	parameter(µsec)
Filtered for N camshaft revolutions where	

			250BDG07	A Part 2 ECM Summary	Tables			
			(N where [A] Filter factor lower limit [B] Filter factor upper limit [C] Filter factor slope)))] for Inner five segment time adaptation value difference threshold exceedance counter	=(ln([A]/[B]))/(ln[C])(Ca mshaft revolutions) =0,05 =0,2 =0,9 ≥3(events)				
105. TRANSMISSI ON RANGE SELECTOR CONTROL MODULE MESSAGE DIAGNOSIS	U0404	Detects when wrong data length code received by the frame SIB_General_Info_2_S1 from Transmission Range Selector Control Module	Wrong data length code received by the frame SIB_General_Info_2_S1 from Transmission Range Selector Control Module	=TRUE	Ignition is ON Basic enable conditions met	=TRUE =see sheet enable tables	1(s)	2 Trip
	U0404	Detects when wrong data length code received by the frame SIB_General_Info_S1 from Transmission Range Selector Control Module	Wrong data length code received by the frame SIB_General_Info_S1 from Transmission Range Selector Control Module	=TRUE	Ignition is ON Basic enable conditions met	=TRUE =see sheet enable tables	1(s)	2 Trip
	U18D2	Detects when the time since the last message from the Transmission Range Selector Control Module on Powertrain Sensor CAN Bus for the frame SIB_General_Info_2_S1 was received is greater than the Supervision timeout value for a calibrated period of time	Time since last message from the Transmission Range Selector Control Module on Powertrain Sensor CAN Bus was received is greater than a supervision timeout value	=TRUE	Ignition is ON Basic enable conditions met	=TRUE =see sheet enable	1(s)	2 Trip
						tables		
	U18D2	Detects when the time since the last message from the Transmission Range Selector Control Module on Powertrain Sensor CAN Bus for the frame SIB_General_Info_S1 was received is greater than the Supervision timeout value for a calibrated period of time	Time since last message from the Transmission Range Selector Control Module on Powertrain Sensor CAN Bus was received is greater than a supervision timeout value	=TRUE	Ignition is ON	=TRUE	1(s)	2 Trip

				Basic enable conditions met	=see sheet enable tables		
U04	04 Detects when the frame DscrInSnsrPri_MSG_DLC is not received Engine ECU Module	DscrInSnsrPri_MSG_DLC message is not being received from Engine ECU Module	=TRUE			0,69(s)	2 Trip
U04	04 Detects when wrong data length code received by the frame DscrInSnsrPri_MSG	Wrong data length code received by the frame DscrInSnsrPri_MSG	=TRUE			0,69(s)	2 Trip
U04	04 Detects when wrong data length code received by the frame DscrInSnsrPri_MSG	Wrong data length code received by the frame DscrInSnsrPri_MSG	=TRUE			0,69(s)	2 Trip
U18	D2 Detects when the frame DscrInSnsrPri_MSG_TO is no received Engine ECU Module	DscrInSnsrPri_MSG_TO t message is not being received from Engine ECU Module	=TRUE	-		0,69(s)	2 Trip
U04	04 Detects when the frame DscrInSnsrSec_Prtctd_MSG_ DLC is not received Engine ECU Module	DscrInSnsrSec_Prtctd_MSG_ DLC message is not being received from Engine ECU Module	=TRUE			0,63(s)	2 Trip
U18	D3 Detects when the frame DscrInSnsrSec_Prtctd_MSG_ TO is not received Engine ECU Module	DscrInSnsrSec_Prtctd_MSG_ TO message is not being received from Engine ECU Module	=TRUE		I	0,63(s)	2 Trip
an	t						

	U163C	Lost Communication with Transmission Range Selector Control Module on CAN Bus 1							
	U0404	Detects when the frame ExtrnALUChkSec_Prtctd_MSG _DLC is not received Engine ECU Module	ExtrnALUChkSec_Prtctd_MSG _DLC message is not being received from Engine ECU Module	=TRUE	•		0,63(s)	2 Trip	
	U18D3	Detects when the frame ExtrnALUChkSec_Prtctd_MSG _TO is not received Engine ECU Module	ExtrnALUChkSec_Prtctd_MSG _TO message is not being received from Engine ECU Module	=TRUE			0,63(s)	2 Trip	
	and								
	U163C	Lost Communication with Transmission Range Selector Control Module on CAN Bus 1							
66. TIMEOUT DECTECTION OF FRAMES	U0632	Detects when the frame ECM_LIN1_CFM1_RSP_MSG is not received Engine ECU	ECM_LIN1_CFM1_RSP_MSG message is not being received from Engine ECU Module	=TRUE	Ignition is ON	=TRUE	3(events)	2 Trip	
FROM ENGINE ECU					Basic enable conditions met	=see sheet enable tables			
	U02A9	Detects when the frame ECM_LIN1_CWP_Rsp_MSG is not received Engine ECU Module	ECM_LIN1_CWP_Rsp_MSG message is not being received from Engine ECU Module	=TRUE	•		3(events)	2 Trip	
	U0633	Detects when the frame ECM_LIN1_CFM2_RSP_MSG is not received Engine ECU Module	ECM_LIN1_CFM2_RSP_MSG message is not being received from Engine ECU Module	=TRUE			3(events)	2 Trip	1 000

U1600	Detects when the frame ECM_LIN1_TCM_Rsp_MSG is not received Engine ECU Module	ECM_LIN1_TCM_Rsp_MSG message is not being received from Engine ECU Module	=TRUE	3(events)	2 Trip
U112A	Detects when the frame ECM_LIN3_CFM3_RSP_MSG is not received Engine ECU Module	ECM_LIN3_CFM3_RSP_MSG message is not being received from Engine ECU Module	=TRUE	3(events)	2 Trip
U112B	Detects when the frame ECM_LIN3_CFM4_RSP_MSG is not received Engine ECU Module	ECM_LIN3_CFM4_RSP_MSG message is not being received from Engine ECU Module	=TRUE	3(events)	2 Trip
U012D	Detects when the frame ECM_LIN3_LGEN_Rsp2_MS G is not received Engine ECU Module	ECM_LIN3_LGEN_Rsp2_MS G message is not being received from Engine ECU Module	=TRUE		2 Trip
U1347	LGEN TO and LIN3 Busoff error detection	Bus off error occured in LIN3 channel and timeout error occured for ECM_LIN3_LGEN_Rsp2_MS G	=TRUE		2 Trip
U1105	Detects when the frame SrlDat43_Prtctd_MSG_TO is not received Engine ECU Module	SrIDat43_Prtctd_MSG_TO message is not being received from Engine ECU Module	=TRUE	0,33(s)	2 Trip
U1643	Lost Communication with Transmission Control Module on CAN Bus 2				

				_					
U1643	Lost Communication with Transmission Control Module on CAN Bus 2								
U0422	Detects when wrong data length code received by the	Wrong data length code received by the frame	=TRUE	-					0,43
	Trame BdyGenInfo3_Prtctd_MSG_DL C" from Body Control Module	C from Body Control Module							
U0140	Detects when the frame "BdyGenInfo3_Prtctd_MSG_T O" is not received from Body Control Module	Wrong data length code received by the frame BdyGenInfo3_Prtctd_MSG_TO from Body Control Module	=TRUE						0,43
U0422	Detects when wrong data length code received by the frame BkupSysPwrMode_Prtctd_MS G_DLC" from Body Control Module	Wrong data length code received by the frame BkupSysPwrMode_Prtctd_MS G_DLC from Body Control Module	=TRUE						0,33
U0140	Detects when the frame "BkupSysPwrMode_Prtctd_MS G_TO" is not received from Body Control Module	Wrong data length code received by the frame BkupSysPwrMode_Prtctd_MS G_TO from Body Control Module	=TRUE					-	0,33
U0422	Detects when the frame "DrvDoorOpenSwtVirtDevErr" is not received from Body Control Module	Wrong data length code received by the frame DrvDoorOpenSwtVirtDevErr from Body Control Module	=TRUE						1(s
U0422	Detects when wrong data length code received by the frame DrvDoorOpenVld" from Body Control Module	Wrong data length code received by the frame DrvDoorOpenVld from Body Control Module	=TRUE						1(
U0422	Detects when the frame "DrvrDoorAjarSwtActvMask" is not received from Body Control Module	Wrong data length code received by the frame DrvrDoorAjarSwtActvMask from Body Control Module	=TRUE						1(s

U0422	Detects when wrong data length code received by the frame SysPwrMode_Prtctd_MSG_DL C" from Body Control Module	Wrong data length code received by the frame SysPwrMode_Prtctd_MSG_DL C from Body Control Module	=TRUE	0,33(s)	2 Trip
U0140	Detects when the frame "SysPwrMode_Prtctd_MSG_T O" is not received from Body Control Module	Wrong data length code received by the frame SysPwrMode_Prtctd_MSG_TO from Body Control Module	=TRUE	0,33(s)	2 Trip
U0418	Detects when wrong data length code received by the frame "BrkSysInfoReqs3_Prtctd_MS G_DLC" from Brake System Control Module	Wrong data length code received by the frame BrkSysInfoReqs3_Prtctd_MSG _DLC from Brake System Control Module	=TRUE	0,33(s)	1 Trip
U1639	Detects when the frame "BrkSysInfoReqs3_Prtctd_MS G_TO" is not received from Brake System Control Module	Wrong data length code received by the frame BrkSysInfoReqs3_Prtctd_MSG _TO from Brake System Control Module	=TRUE	0,33(s)	2 Trip
U0418	Detects when wrong data length code received by the frame "BrkSysInfoSts2_Prtctd_MSG_ DLC" from Brake System Control Module	Wrong data length code received by the frame BrkSysInfoSts2_Prtctd_MSG_ DLC from Brake System Control Module	=TRUE	0,48(s)	1 Trip
U1610	Detects when the frame "BrkSysInfoSts2_Prtctd_MSG_ TO" is not received from Brake System Control Module	Wrong data length code received by the frame BrkSysInfoSts2_Prtctd_MSG_ TO from Brake System Control Module	=TRUE	0,48(s)	2 Trip
U0447	Detects when wrong data length code received by the frame "NodeStatus_CAN2_MSG02_ DLC" from Gateway Module	Wrong data length code received by the frame NodeStatus_CAN2_MSG02_D LC from Gateway Module	=TRUE	10(s)	2 Trip

U1608	Detects when the frame "NodeStatus_CAN2_MSG02_ TO" is not received from Gateway Module	Wrong data length code received by the frame NodeStatus_CAN2_MSG02_T O from Gateway Module	=TRUE			10(s)	2 Trip
U131D	Detects when wrong data length code received by the frame "FTZM_Information_1_S1_AR C" from Fuel Tank Zone Module	Wrong data length code received by the frame FTZM_Information_1_S1_ARC from Fuel Tank Zone Module	=TRUE	Ignition is ON	=TRUE	3(events)	1 Trip
				Basic enable conditions met	=see sheet enable		
U131D	Detects when wrong data length code received by the frame "FTZM_Information_1_S1_Chk s" from Fuel Tank Zone Module	Wrong data length code received by the frame FTZM_Information_1_S1_Chk s from Fuel Tank Zone Module	=TRUE			3(events)	1 Trip
U131D	Detects when wrong data length code received by the frame "FTZM_Information_1_S1_DL C" from Fuel Tank Zone Module	Wrong data length code received by the frame FTZM_Information_1_S1_DLC from Fuel Tank Zone Module	=TRUE			10(s)	1 Trip
U18A2	Detects when the frame "FTZM_Information_1_S1_TO" is not received from Fuel Tank Zone Module	Wrong data length code received by the frame FTZM_Information_1_S1_TO from Fuel Tank Zone Module	=TRUE			10(s)	2 Trip
U131D	Detects when wrong data length code received by the frame "FTZM_Information_11_S1_A RC" from Fuel Tank Zone Module	Wrong data length code received by the frame FTZM_Information_11_S1_AR C from Fuel Tank Zone Module	=TRUE			3(events)	1 Trip
U131D	Detects when wrong data length code received by the frame "FTZM_Information_11_S1_Ch ks" from Fuel Tank Zone Module	Wrong data length code received by the frame FTZM_Information_11_S1_Ch ks from Fuel Tank Zone Module	=TRUE			3(events)	1 Trip

U131D	Detects when wrong data length code received by the frame "FTZM_Information_11_S1_DL C" from Fuel Tank Zone Module	Wrong data length code received by the frame FTZM_Information_11_S1_DL C from Fuel Tank Zone Module	=TRUE	10(s)	1 Trip
U18A2	Detects when the frame "FTZM_Information_11_S1_T O" is not received from Fuel Tank Zone Module	Wrong data length code received by the frame FTZM_Information_11_S1_TO from Fuel Tank Zone Module	=TRUE	10(s)	2 Trip
U131D	Detects when wrong data length code received by the frame "FTZM_Information_12_S1_A RC" from ECM/PCM	Wrong data length code received by the frame FTZM_Information_12_S1_AR C from ECM/PCM	=TRUE	3(events)	1 Trip
U131D	Detects when wrong data length code received by the frame "FTZM_Information_12_S1_Ch ks" from ECM/PCM	Wrong data length code received by the frame FTZM_Information_12_S1_Ch ks from ECM/PCM	=TRUE	3(events)	1 Trip
U131D	Detects when wrong data length code received by the frame "FTZM_Information_12_MSG_ DLC" from ECM/PCM	Wrong data length code received by the frame FTZM_Information_12_MSG_ DLC from ECM/PCM	=TRUE	10(s)	1 Trip
U18A2	Detects when the frame "FTZM_Information_12_MSG_ TO" is not received from Fuel Tank Zone Module	Wrong data length code received by the frame FTZM_Information_12_MSG_ TO from Fuel Tank Zone Module	=TRUE	10(s)	2 Trip
U131D	Detects when wrong data length code received by the frame "FTZM_Information_13_S1_A RC" from Fuel Tank Zone Module	Wrong data length code received by the frame FTZM_Information_13_S1_AR C from Fuel Tank Zone Module	=TRUE	3(events)	1 Trip

	U131D	Detects when wrong data length code received by the frame "FTZM_Information_13_S1_Ch ks" from Fuel Tank Zone Module	Wrong data length code received by the frame FTZM_Information_13_S1_C ks from Fuel Tank Zone Module	=TRUE h	3(events)	1 Trip
1	U131D	Detects when wrong data length code received by the frame "FTZM_Information_13_S1_M SG_DLC" from Fuel Tank Zone Module	Wrong data length code received by the frame FTZM_Information_13_S1_M G_DLC from Fuel Tank Zone Module	=TRUE		10(s)	1 Trip
	U18A2	Detects when the frame "FTZM_Information_13_S1_M SG_TO" is not received from Fuel Tank Zone Module	Wrong data length code received by the frame FTZM_Information_13_S1_M G_TO from Fuel Tank Zone Module	=TRUE		10(s)	2 Trip
	U131D	Detects when wrong data length code received by the frame "FTZM_Information_16_MSG_ ARC" from ECM/PCM	Wrong data length code received by the frame FTZM_Information_16_MSG_ ARC from ECM/PCM	=TRUE	3(events)	1 Trip
	U131D	Detects when wrong data length code received by the frame "FTZM_Information_16_MSG_ Chks" from ECM/PCM	Wrong data length code received by the frame FTZM_Information_16_MSG_ Chks from ECM/PCM	=TRUE	3(events)	1 Trip
1	U131D	Detects when wrong data length code received by the frame "FTZM_Information_16_MSG_ DLC" from ECM/PCM	Wrong data length code received by the frame FTZM_Information_16_MSG_ DLC from ECM/PCM	=TRUE		10(s)	1 Trip
	U18A2	Detects when the frame "FTZM_Information_16_MSG_ TO" is not received from Fuel Tank Zone Module	Wrong data length code received by the frame FTZM_Information_16_MSG_ TO from Fuel Tank Zone Module	=TRUE		10(s)	2 Trip
	U131D	Detects when wrong data length code received by the frame "FTZM_Information_2_S1_AR C" from ECM/PCM	Wrong data length code received by the frame FTZM_Information_2_S1_AR from ECM/PCM	=TRUE C ECM Section 560 of 772	3(events)	1 Trip 672

31D	Detects when wrong data length code received by the frame "FTZM_Information_2_S1_Chk s" from ECM/PCM	Wrong data length code received by the frame FTZM_Information_2_S1_Chk s from ECM/PCM	=TRUE				
D	Detects when wrong data length code received by the frame "FTZM_Information_2_S1_DL C" from ECM/PCM	Wrong data length code received by the frame FTZM_Information_2_S1_DLC from ECM/PCM	=TRUE	_			
	Detects when the frame "FTZM_Information_2_S1_TO" is not received from Fuel Tank Zone Module	Wrong data length code received by the frame FTZM_Information_2_S1_TO from Fuel Tank Zone Module	=TRUE	-			
	Detects when wrong data length code received by the frame "FTZM_Information_5_S1_AR C" from Fuel Tank Zone Module	Wrong data length code received by the frame FTZM_Information_5_S1_ARC from Fuel Tank Zone Module	=TRUE				3(
D	Detects when wrong data length code received by the frame "FTZM_Information_5_S1_Chk s" from Fuel Tank Zone Module	Wrong data length code received by the frame FTZM_Information_5_S1_Chk s from Fuel Tank Zone Module	=TRUE	-			3
1D	Detects when wrong data length code received by the frame "FTZM_Information_5_S1_DL C" from Fuel Tank Zone Module	Wrong data length code received by the frame FTZM_Information_5_S1_DLC from Fuel Tank Zone Module	=TRUE	-			

U18A2	Detects when the frame "FTZM_Information_5_S1_TO" is not received from Fuel Tank Zone Module	Wrong data length code received by the frame FTZM_Information_5_S1_TO from Fuel Tank Zone Module	=TRUE		10(s)	2 Trip
U131D	Detects when wrong data length code received by the frame "FTZM_Information_6_S1_AR C" from Fuel Tank Zone Module	Wrong data length code received by the frame FTZM_Information_6_S1_ARC from Fuel Tank Zone Module	=TRUE		3(events)	1 Trip
U131D	Detects when wrong data length code received by the frame "FTZM_Information_6_S1_Chk s" from Fuel Tank Zone Module	Wrong data length code received by the frame FTZM_Information_6_S1_Chk s from Fuel Tank Zone Module	=TRUE		3(events)	1 Trip
U131D	Detects when wrong data length code received by the frame "FTZM_Information_6_S1_DL C" from Fuel Tank Zone Module	Wrong data length code received by the frame FTZM_Information_6_S1_DLC from Fuel Tank Zone Module	=TRUE		10(s)	1 Trip
U18A2	Detects when the frame "FTZM_Information_6_S1_TO" is not received from Fuel Tank Zone Module	Wrong data length code received by the frame FTZM_Information_6_S1_TO from Fuel Tank Zone Module	=TRUE		10(s)	2 Trip
U131D	Detects when wrong data length code received by the frame "FTZM_Information_7_S1_AR C" from Fuel Tank Zone Module	Wrong data length code received by the frame FTZM_Information_7_S1_ARC from Fuel Tank Zone Module	=TRUE		3(events)	1 Trip
U131D	Detects when wrong data length code received by the frame "FTZM_Information_7_S1_Chk s" from Fuel Tank Zone Module	Wrong data length code received by the frame FTZM_Information_7_S1_Chk s from Fuel Tank Zone Module	=TRUE	1	3(events)	1 Trip

U131D	Detects when wrong data length code received by the frame "FTZM_Information_7_S1_DL C" from Fuel Tank Zone Module	Wrong data length code received by the frame FTZM_Information_7_S1_DLC from Fuel Tank Zone Module	=TRUE	10(s)	1 Trip
U18A2	Detects when the frame "FTZM_Information_7_S1_TO" is not received from Fuel Tank Zone Module	Wrong data length code received by the frame FTZM_Information_7_S1_TO from Fuel Tank Zone Module	=TRUE	10(s)	2 Trip
U131D	Detects when wrong data length code received by the frame "FTZM_Information_8_S1_AR C" from Fuel Tank Zone Module	Wrong data length code received by the frame FTZM_Information_8_S1_ARC from Fuel Tank Zone Module	=TRUE	3(events)	1 Trip
U131D	Detects when wrong data length code received by the frame "FTZM_Information_8_S1_Chk s" from Fuel Tank Zone Module	Wrong data length code received by the frame FTZM_Information_8_S1_Chk s from Fuel Tank Zone Module	=TRUE	3(events)	1 Trip
U131D	Detects when wrong data length code received by the frame "FTZM_Information_8_S1_DL C" from Fuel Tank Zone Module	Wrong data length code received by the frame FTZM_Information_8_S1_DLC from Fuel Tank Zone Module	=TRUE	10(s)	1 Trip
U18A2	Detects when the frame "FTZM_Information_8_S1_TO" is not received from Fuel Tank Zone Module	Wrong data length code received by the frame FTZM_Information_8_S1_TO from Fuel Tank Zone Module	=TRUE	10(s)	2 Trip
U131D	Detects when wrong data length code received by the frame "FTZM_Information_9_S1_AR C" from Fuel Tank Zone Module	Wrong data length code received by the frame FTZM_Information_9_S1_ARC from Fuel Tank Zone Module	=TRUE	3(events)	1 Trip

U131D	Detects when wrong data length code received by the frame "FTZM_Information_9_S1_Chk s" from Fuel Tank Zone Module	Wrong data length code received by the frame FTZM_Information_9_S1_Chk s from Fuel Tank Zone Module	=TRUE			3(events)	1 Trip
U131D	Detects when wrong data length code received by the frame "FTZM_Information_9_S1_DL C" from Fuel Tank Zone Module	Wrong data length code received by the frame FTZM_Information_9_S1_DLC from Fuel Tank Zone Module	=TRUE			10(s)	1 Trip
U18A2	Detects when the frame "FTZM_Information_9_S1_TO" is not received from Fuel Tank Zone Module	Wrong data length code received by the frame FTZM_Information_9_S1_TO from Fuel Tank Zone Module	=TRUE			10(s)	2 Trip
U13CE	Detects when wrong data length code received by the frame "FTZMCmdFrmX" from Fuel Tank Zone Module	Wrong data length code received by the frame FTZMCmdFrmX from Fuel Tank Zone Module	=TRUE			40(events)	2 Trip
U0607	Detects when the frame "SemiAtvDmpgSysVhTpSpdLi m_Prtctd_MSG_TO" is not received from Suspension Control Module B	Wrong data length code received by the frame SemiAtvDmpgSysVhTpSpdLim _Prtctd_MSG_TO from Suspension Control Module B	=TRUE	Ignition is ON	=TRUE	0,33(s)	1 Trip
				Basic enable conditions met	=see sheet enable tables		
U1611	Timeout monitoring	Message MSG_2088 is not being received	=TRUE	Ignition is ON	=TRUE	10000(msec)	2 Trip
				Basic enable conditions met	=see sheet enable tables		
U1611	Timeout monitoring	Message MSG_2089 is not being received	=TRUE	Ignition is ON	=TRUE	10000(msec)	2 Trip
				Basic enable conditions met	=see sheet enable tables		
U1611	Timeout monitoring	Message MSG_2091 is not being received	=TRUE	Ignition is ON	=TRUE	10000(msec)	2 Trip
			A Spotion 564 of 772	Basic enable conditions met	=see sheet enable tables		676 -
		ECIN					0/0/0

	U1611	Timeout monitoring	Message MSG_2092 is not being received	=TRUE	Ignition is ON	=TRUE	10000(msec)	2 Trip
l					Basic enable conditions met	=see sheet enable tables		
	U0146	Timeout monitoring	Message MSG_2242 is not being received	=TRUE	Ignition is ON	=TRUE	10000(msec)	1 Trip
I.					Basic enable conditions met	=see sheet enable tables		
	U0447	Data length code monitoring	Wrong data length code received by the frame MSG_3017	=TRUE	Ignition is ON	=TRUE	10000(msec)	2 Trip
I.					Basic enable conditions met	=see sheet enable tables		
	U1609	Timeout monitoring	Message MSG_3017 is not being received	=TRUE	Ignition is ON	=TRUE	10000(msec)	2 Trip
I.					Basic enable conditions met	=see sheet enable tables		
	U0146	Timeout monitoring	Message MSG_9092 is not being received	=TRUE	Ignition is ON	=TRUE	10000(msec)	2 Trip
l					Basic enable conditions met	=see sheet enable tables		
	U0401	Data length code monitoring	Wrong data length code received by the frame SrlDat48 Prtctd MSG	=TRUE	Ignition is ON	=TRUE	10000(msec)	2 Trip
L					Basic enable conditions met	=see sheet enable tables		
	U1611	Timeout monitoring	Message SrlDat48_Prtctd_MSG is not being received	=TRUE	Ignition is ON	=TRUE	10000(msec)	2 Trip
L			,		Basic enable conditions met	=see sheet enable tables		
	U0140	Timeout monitoring	Message SrlDat6_Prtctd_MSG is not being received	=TRUE	Ignition is ON	=TRUE	10000(msec)	2 Trip
I.					Basic enable conditions met	=see sheet enable tables		
	U0140	Timeout monitoring	Message SrlDat9_MSG is not being received	=TRUE	Ignition is ON	=TRUE	10000(msec)	2 Trip
					Basic enable conditions met	=see sheet enable tables		

		25OBDG07	A Part 2 ECM Summary	7 Tables			
U01	40 Detects when the frame SrIDat9_MSG is not received Engine ECU Module	SrlDat9_MSG message is not being received from Engine ECU Module	=TRUE	Ignition is ON	=TRUE	1(s)	1 Trip
				Basic enable conditions met	=see sheet enable tables		
U04	22 Detects an alive rolling counte error of the frame IBSBatVltInfo_MSG	r Alive rolling counter error detected	=TRUE	Ignition is ON	=TRUE		1 Trip
_				Basic enable conditions met	=see sheet enable tables		
U04	22 Detects when the checksum o the frame IBSBatVItInfo_MSG is not correct	f Checksum of the message BIBSBatVItInfo_MSG is not correct	=TRUE	Ignition is ON	=TRUE		1 Trip
				Basic enable conditions met	=see sheet enable tables		
U04	22 Detects data length error of the frame IBSBatVItInfo_MSG	e Data length of the message IBSBatVltInfo_MSG is not correct	=TRUE	Ignition is ON	=TRUE	10(s)	1 Trip
				Basic enable conditions met	=see sheet enable tables		
U04	22 Detects when the frame IBSBatVItInfo_MSG is not received Engine ECU Module	IBSBatVltInfo_MSG message is not being received from Engine ECU Module	=TRUE	Ignition is ON	=TRUE	10(s)	1 Trip
_				Basic enable conditions met	=see sheet enable tables		
U04	47 Data length code monitoring	Wrong data length code received by the frame MSG_2018	=TRUE	Ignition is ON	=TRUE	10000(msec)	2 Trip
				Basic enable conditions met	=see sheet enable tables		
U16	08 Timeout monitoring	Message MSG_2018 is not being received	=TRUE	Ignition is ON	=TRUE	10000(msec)	2 Trip
				Basic enable conditions met	=see sheet enable tables		

	U0447	Data length code monitoring	Wrong data length code received by the frame MSG 2020	=TRUE	Ignition is ON	=TRUE	10000(msec)	2 Trip
					Basic enable conditions met	=see sheet enable tables		
ſ	U1608	Timeout monitoring	Message MSG_2020 is not being received	=TRUE	Ignition is ON	=TRUE	10000(msec)	2 Trip
					Basic enable conditions met	=see sheet enable tables		
I	U0447	Data length code monitoring	Wrong data length code received by the frame MSG_2022	=TRUE	Ignition is ON	=TRUE	10000(msec)	2 Trip
					Basic enable conditions met	=see sheet enable tables		
ĺ	U1608	Timeout monitoring	Message MSG_2022 is not being received	=TRUE	Ignition is ON	=TRUE	10000(msec)	2 Trip
I.					Basic enable conditions met	=see sheet enable tables		
ľ	U0447	Data length code monitoring	Wrong data length code received by the frame MSG 2024	=TRUE	Ignition is ON	=TRUE	10000(msec)	2 Trip
			_		Basic enable conditions met	=see sheet enable tables		
ľ	U1608	Timeout monitoring	Message MSG_2024 is not being received	=TRUE	Ignition is ON	=TRUE	10000(msec)	2 Trip
					Basic enable conditions met	=see sheet enable tables		
ſ	U0447	Data length code monitoring	Wrong data length code received by the frame MSG 2025	=TRUE	Ignition is ON	=TRUE	10000(msec)	2 Trip
					Basic enable conditions met	=see sheet enable tables		
	U1608	Timeout monitoring	Message MSG_2025 is not being received	=TRUE	Ignition is ON	=TRUE	10000(msec)	2 Trip
					Basic enable conditions met	=see sheet enable tables		
	U0447	Data length code monitoring	Wrong data length code received by the frame MSG_2232	=TRUE	Ignition is ON	=TRUE	10000(msec)	2 Trip
					Basic enable conditions met	=see sheet enable tables		
	U1608	Timeout monitoring	Message MSG_2232 is not being received	=TRUE	Ignition is ON	=TRUE	10000(msec)	2 Trip

L					Basic enable conditions met	=see sheet enable tables		
ſ	U0447	Data length code monitoring	Wrong data length code received by the frame MSG 2242	=TRUE	Ignition is ON	=TRUE	10000(msec)	2 Trip
L					Basic enable conditions met	=see sheet enable tables		
ſ	U0418	Data length code monitoring	Wrong data length code received by the frame MSG_2031	=TRUE	Ignition is ON	=TRUE	10000(msec)	2 Trip
L			-		Basic enable conditions met	=see sheet enable tables		
	U1610	Timeout monitoring	Message MSG_2031 is not being received	=TRUE	Ignition is ON	=TRUE	10000(msec)	2 Trip
					Basic enable conditions met	=see sheet enable tables		
	U0418	Data length code monitoring	Wrong data length code received by the frame MSG_2036	=TRUE	Ignition is ON	=TRUE	10000(msec)	2 Trip
L			_		Basic enable conditions met	=see sheet enable tables		
ſ	U1610	Timeout monitoring	Message MSG_2036 is not being received	=TRUE	Ignition is ON	=TRUE	10000(msec)	2 Trip
L					Basic enable conditions met	=see sheet enable tables		
	U0418	Data length code monitoring	Wrong data length code received by the frame MSG_2037	=TRUE	Ignition is ON	=TRUE	10000(msec)	2 Trip
L			_		Basic enable conditions met	=see sheet enable tables		
ſ	U1610	Timeout monitoring	Message MSG_2037 is not being received	=TRUE	Ignition is ON	=TRUE	10000(msec)	2 Trip
L					Basic enable conditions met	=see sheet enable tables		
ľ	U0402	Data length code monitoring	Wrong data length code received by the frame MSG_2050	=TRUE	Ignition is ON	=TRUE	10000(msec)	2 Trip
I.					Basic enable conditions met	=see sheet enable tables		
	U1643	Timeout monitoring	Message MSG_2050 is not being received	=TRUE	Ignition is ON	=TRUE	10000(msec)	2 Trip
					Basic enable conditions met	=see sheet enable tables		

	U0402	Data length code monitoring	Wrong data length code received by the frame MSG 2051	=TRUE	Ignition is ON	=TRUE	10000(msec)	2 Trip
			_		Basic enable conditions met	=see sheet enable tables		
ľ	U1643	Timeout monitoring	Message MSG_2051 is not being received	=TRUE	Ignition is ON	=TRUE	10000(msec)	2 Trip
					Basic enable conditions met	=see sheet enable tables		
	U0402	Data length code monitoring	Wrong data length code received by the frame MSG_2088	=TRUE	Ignition is ON	=TRUE	10000(msec)	2 Trip
I.					Basic enable conditions met	=see sheet enable tables		
	U0402	Data length code monitoring	Wrong data length code received by the frame MSG 2089	=TRUE	Ignition is ON	=TRUE	10000(msec)	2 Trip
L			-		Basic enable conditions met	=see sheet enable tables		
ľ	U0402	Data length code monitoring	Wrong data length code received by the frame MSG 2090	=TRUE	Ignition is ON	=TRUE	10000(msec)	2 Trip
L			-		Basic enable conditions met	=see sheet enable tables		
ľ	U1643	Timeout monitoring	Message MSG_2090 is not being received	=TRUE	Ignition is ON	=TRUE	10000(msec)	2 Trip
L					Basic enable conditions met	=see sheet enable tables		
ľ	U0402	Data length code monitoring	Wrong data length code received by the frame MSG 2091	=TRUE	Ignition is ON	=TRUE	10000(msec)	2 Trip
					Basic enable conditions met	=see sheet enable tables		
ľ	U0402	Data length code monitoring	Wrong data length code received by the frame	=TRUE	Ignition is ON	=TRUE	10000(msec)	2 Trip
			WOO_2002		Basic enable conditions met	=see sheet enable tables		
	U0402	Data length code monitoring	Wrong data length code received by the frame MSG 2093	=TRUE	Ignition is ON	=TRUE	10000(msec)	2 Trip
			m00_2000		Basic enable conditions met	=see sheet enable tables		
	U1643	Timeout monitoring	Message MSG_2093 is not being received	=TRUE	Ignition is ON	=TRUE	10000(msec)	2 Trip

					Basic enable conditions met	=see sheet enable tables		
Г	U0418	Data length code monitoring	Wrong data length code received by the frame MSG 2098	=TRUE	Ignition is ON	=TRUE	10000(msec)	2 Trip
					Basic enable conditions met	=see sheet enable tables		
Г	U1610	Timeout monitoring	Message MSG_2098 is not being received	=TRUE	Ignition is ON	=TRUE	10000(msec)	2 Trip
L					Basic enable conditions met	=see sheet enable tables		
Г	U0418	Data length code monitoring	Wrong data length code received by the frame MSG_2102	=TRUE	Ignition is ON	=TRUE	10000(msec)	2 Trip
L					Basic enable conditions met	=see sheet enable tables		
	U1610	Timeout monitoring	Message MSG_2102 is not being received	=TRUE	Ignition is ON	=TRUE	10000(msec)	2 Trip
L					Basic enable conditions met	=see sheet enable tables		
Г	U0422	Data length code monitoring	Wrong data length code received by the frame MSG 9034	=TRUE	Ignition is ON	=TRUE	10000(msec)	2 Trip
					Basic enable conditions met	=see sheet enable tables		
Г	U0140	Timeout monitoring	Message MSG_9034 is not being received	=TRUE	Ignition is ON	=TRUE	10000(msec)	2 Trip
					Basic enable conditions met	=see sheet enable tables		
Г	U0422	Data length code monitoring	Wrong data length code received by the frame MSG_9035	=TRUE	Ignition is ON	=TRUE	10000(msec)	2 Trip
L					Basic enable conditions met	=see sheet enable tables		
1	U0140	Timeout monitoring	Message MSG_9035 is not being received	=TRUE	Ignition is ON	=TRUE	10000(msec)	2 Trip
					Basic enable conditions met	=see sheet enable tables		
	U0422	Data length code monitoring	Wrong data length code received by the frame MSG 9089	=TRUE	Ignition is ON	=TRUE	10000(msec)	2 Trip
					Basic enable conditions met	=see sheet enable tables		

			250BDG07A	Part 2 ECM Summa	ry Tables			
	U0140	Timeout monitoring	Message MSG_9089 is not being received	=TRUE	Ignition is ON	=TRUE	10000(msec)	2 Trip
					Basic enable conditions met	=see sheet enable tables		
ľ	U0422	Data length code monitoring	Wrong data length code received by the frame MSG_9091	=TRUE	Ignition is ON	=TRUE	10000(msec)	2 Trip
					Basic enable conditions met	=see sheet enable tables		
	U0140	Timeout monitoring	Message MSG_9091 is not being received	=TRUE	Ignition is ON	=TRUE	10000(msec)	2 Trip
					Basic enable conditions met	=see sheet enable tables		
	U0447	Data length code monitoring	Wrong data length code received by the frame MSG 9092	=TRUE	Ignition is ON	=TRUE	10000(msec)	2 Trip
			-		Basic enable conditions met	=see sheet enable tables		
	U0422	Data length code monitoring	Wrong data length code received by the frame MSG 9094	=TRUE	Ignition is ON	=TRUE	10000(msec)	2 Trip
					Basic enable conditions met	=see sheet enable tables		
	U0140	Timeout monitoring	Message MSG_9094 is not being received	=TRUE	Ignition is ON	=TRUE	10000(msec)	2 Trip
					Basic enable conditions met	=see sheet enable tables		
	U0418	Data length code monitoring	Wrong data length code received by the frame SrlDat14 Prtctd MSG	=TRUE	Ignition is ON	=TRUE	330(msec)	2 Trip
					Basic enable conditions met	=see sheet enable tables		
ľ	U1610	Timeout monitoring	Message SrlDat14_Prtctd_MSG is not being received	=TRUE	Ignition is ON	=TRUE	330(msec)	2 Trip
			.		Basic enable conditions met	=see sheet enable tables		
ľ	U0418	Data length code monitoring	Wrong data length code received by the frame SrlDat15_Prtctd_MSG	=TRUE	Ignition is ON	=TRUE	10000(msec)	2 Trip
					Basic enable conditions met	=see sheet enable tables		
	U1610	Timeout monitoring	Message SrlDat15_Prtctd_MSG is not being received	=TRUE	Ignition is ON	=TRUE	10000(msec)	2 Trip

					Basic enable conditions met	=see sheet enable tables		
ľ	U0418	Data length code monitoring	Wrong data length code received by the frame SrIDat16 Prtctd MSG	=TRUE	Ignition is ON	=TRUE	430(msec)	2 Trip
I.					Basic enable conditions met	=see sheet enable tables		
	U1610	Timeout monitoring	Message SrlDat16_Prtctd_MSG is not being received	=TRUE	Ignition is ON	=TRUE	10000(msec)	2 Trip
I.			5		Basic enable conditions met	=see sheet enable tables		
	U0418	Data length code monitoring	Wrong data length code received by the frame SrIDat17_Prtctd_MSG	=TRUE	Ignition is ON	=TRUE	10000(msec)	2 Trip
I.					Basic enable conditions met	=see sheet enable tables		
	U1610	Timeout monitoring	Message SrIDat17_Prtctd_MSG is not being received	=TRUE	Ignition is ON	=TRUE	10000(msec)	2 Trip
I.					Basic enable conditions met	=see sheet enable tables		
	U0422	Data length code monitoring	Wrong data length code received by the frame SrIDat2 Prtctd MSG	=TRUE	Ignition is ON	=TRUE	10000(msec)	2 Trip
I.					Basic enable conditions met	=see sheet enable tables		
	U0140	Timeout monitoring	Message SrlDat2_Prtctd_MSG is not being received	=TRUE	Ignition is ON	=TRUE	10000(msec)	2 Trip
I.					Basic enable conditions met	=see sheet enable tables		
	U0422	Data length code monitoring	Wrong data length code received by the frame SrIDat3 Prtctd MSG	=TRUE	Ignition is ON	=TRUE	330(msec)	2 Trip
					Basic enable conditions met	=see sheet enable tables		
ľ	U0140	Timeout monitoring	Message SrlDat3_Prtctd_MSG is not being received	=TRUE	Ignition is ON	=TRUE	330(msec)	2 Trip
					Basic enable conditions met	=see sheet enable tables		
	U0402	Data length code monitoring	Wrong data length code received by the frame SrIDat30 Prtctd MSG	=TRUE	Ignition is ON	=TRUE	420(msec)	2 Trip
					Basic enable conditions met	=see sheet enable tables		
U1643	Timeout monitoring	Message SrlDat30_Prtctd_MSG is not being received	=TRUE	Ignition is ON	=TRUE	420(msec)	2 Trip	
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				Basic enable conditions met	=see sheet enable tables			
U0447	Data length code monitoring	Wrong data length code received by the frame SrIDat90_Prtctd_MSG	=TRUE	Ignition is ON	=TRUE	100(msec)	2 Trip	
				Basic enable conditions met	=see sheet enable tables			
U1608	Timeout monitoring	Message SrIDat90_Prtctd_MSG is not being received	=TRUE	Ignition is ON	=TRUE	100(msec)	2 Trip	
				Basic enable conditions met	=see sheet enable tables			
U0402	Data length code monitoring	Wrong data length code received by the frame TrnsEstGr_Prtctd_MSG	=TRUE	Ignition is ON	=TRUE	420(msec)	2 Trip	
				Basic enable conditions met	=see sheet enable tables			
U1643	Timeout monitoring	Message TrnsEstGr_Prtctd_MSG is not being received	=TRUE	Ignition is ON	=TRUE	420(msec)	2 Trip	
				Basic enable conditions met	=see sheet enable tables			
U0402	Data length code monitoring	Wrong data length code received by the frame TrnsGnrInfo2_Prtctd_MSG	=TRUE	Ignition is ON	=TRUE	420(msec)	2 Trip	
				Basic enable conditions met	=see sheet enable tables			
U1643	Timeout monitoring	Message TrnsGnrInfo2_Prtctd_MSG is not being received	=TRUE	Ignition is ON	=TRUE	420(msec)	2 Trip	
				Basic enable conditions met	=see sheet enable tables			
U0422	Data length code monitoring	Wrong data length code received by the frame VehldNmDig10 17 MSG	=TRUE	Ignition is ON	=TRUE	10000(msec)	2 Trip	
				Basic enable conditions met	=see sheet enable tables			
U0140	Timeout monitoring	Message SrlDat3_Prtctd_MSG is not being received	=TRUE	Ignition is ON	=TRUE	330(msec)	2 Trip	
				Basic enable conditions met	=see sheet enable tables			
U0422	Data length code monitoring	Wrong data length code received by the frame VehOdoDispVal_Prtctd_MSG	=TRUE	Ignition is ON	=TRUE	330(msec)	2 Trip	

					Basic enable conditions met	=see sheet enable tables		
	U0140	Timeout monitoring	Message VehOdoDispVal_Prtctd_MSG is not being received	=TRUE	Ignition is ON	=TRUE	330(msec)	2 Trip
			Ĵ		Basic enable conditions met	=see sheet enable tables		
	U1345	Complete timeout of the frames in LIN1 communication	Complete timeout of the frames in LIN1 communication detected	=TRUE	Ignition is ON	=TRUE	130(msec)	2 Trip
					Basic enable conditions met	=see sheet enable tables		
	U1347	Complete timeout of the frames in LIN3 communication	Complete timeout of the frames in LIN3 communication detected	=TRUE	Ignition is ON	=TRUE	130(msec)	2 Trip
					Basic enable conditions met	=see sheet enable tables		
67. CCM – ENGINE CONTROL MODULE LIN BUS OFF MONITORING	P1911	Validity of the Transmission Control Data Received Via LIN	Mismatch between the transmitted range command received from the Gearshift Co- ordinator module and Echo Range Command from Transmission Control Module through LIN	=TRUE	Current Range Command value is equal to Previous Range Command Value	=TRUE	400()	2 Trip
					System is not in PARK mode and system power is used by accessories or system wakeup	=TRUE		
					Ignition ON (=TRUE		
					Current range of gear lever is in PARK position	=FALSE		
					Initialization of gear selection in progress is active) OR (=FALSE		
					Current range command is in parking range	=FALSE		
					Current range command is in power mode OFF range	=FALSE		
					, Engine Transmission Range Selection brake command is in deny driver override command	=FALSE		
					Engine Transmission Range Selection brake command is in allow driver override command	=FALSE		
					Manufacturer Enable Counter used to automatically arm Seed & Key	=0		
					LIN diagnostics enabled	=TRUE		

					No pending or confirmed DTCs Basic enabling conditions are met	=see sheet inhibit tables =see sheet enable tables		
	U1345	Diagnosis of LIN Bus 1 off error	Bus off error is detected at LIN 1 Bus controller	=TRUE	Ignition is ON	=TRUE	10(events)	2 Trip
					Battery Voltage	≥9000(mV)		
					Basic enable conditions are met	=see sheet enable tables		
	U1347	Diagnosis of LIN Bus 3 off error	Bus off error is detected at LIN 3 Bus controller	=TRUE	Ignition is ON	=TRUE	10(events)	2 Trip
					Battery Voltage Basic enable conditions are met	≥9000(mV) =see sheet enable tables		
68. ELECTRONIC TRANSMISSI ON PLAUSIBILITY DIAGNOSTIC S	P16F4	Range Selection Monitoring Ring shall set the Transmission Range Control Performance upon failure of any of the following daignostic failures: Park Exit Monitor, Park Acknowledgement Monitor, Neutral Acknowledgement Monitor, Transition to Drive Monitor, Transition to Reverse Monitor	Transmission Range Control fault reported	=TRUE	Park Exit Monitor	=TRUE	0(s)	2 Trip
					Park Acknowledgement Monitor	=TRUE		
					Neutral Acknowledgement Monitor	=TRUE		
					Transition to Reverse Monitor	=TRUE		
					Battery Voltage Basic enable conditions met	≥9000(mV) =see sheet enable tables		
	P18E9	In Drive Button Diagnosis, if atleast one of the switch is stuck ON for the enough time then the Transmission Range Selector Switchs A-B-C Stuck On is set to Faulty.	Switch 1 stuck on error	=TRUE	Battery Voltage	≥9000(mV)	0,04(s)	2 Trip

25OBDG07A Part 2 ECM Summary Tables										
			Switch 2 stuck on error	=TRUE	Basic enable conditions met	=see sheet enable tables				
			Switch 3 stuck on error	=TRUE						
ĺ	P18CD	For drive button diagnosis, If position of switch 1 is in different status than other two for longer time. Then switch correlation A is set to Fault	Switch A status is different from B & C	=TRUE	Battery Voltage	≥9000(mV)	0(s)	2 Trip		
					Basic enable conditions met	=see sheet enable tables				
	P18CF	For drive button diagnosis, If position of switch 2 is in different status than other two for longer time. Then switch correlation B is set to Fault	Switch B status is different from A & C	=TRUE			0(s)	2 Trip		
	P18D1	For drive button diagnosis, If position of switch 3 is in different status than other two for longer time. Then switch correlation C is set to Fault	Switch C status is different from A & B	=TRUE			0(s)	2 Trip		
	P18EA	In Neutral Button Diagnosis, if atleast one of the switch is stuck ON for the enough time then the Transmission Range Selector Switchs D-E-F Stuck On is set to Faulty.	Switch 1 stuck on error	=TRUE	Battery Voltage	≥9000(mV)	0,04(s)	2 Trip		
			Switch 2 stuck on error	=TRUE	Basic enable conditions met	=see sheet enable tables				
			Switch 3 stuck on error	=TRUE						
	P18D3	For neutral button diagnosis, If position of switch 1 is in different status than other two for longer time. Then switch correlation D is set to Fault	Switch D status is different from E & F	=TRUE	Battery Voltage	≥9000(mV)	0(s)	2 Trip		
					Basic enable conditions met	=see sheet enable tables				

P18D5	For neutral button diagnosis, If position of switch 2 is in different status than other two for longer time. Then switch correlation E is set to Fault	Switch E status is different from D & F	=TRUE			0(s)	2 Trip
P18D7	For neutral button diagnosis, If position of switch 3 is in different status than other two for longer time. Then switch correlation F is set to Fault	Switch F status is different from D & E	=TRUE			0(s)	2 Trip
P18EB	In Neutral Button Diagnosis, if atleast one of the switch is stuck ON for the enough time then the Transmission Range Selector Switchs G-H-J Stuck On is set to Faulty.	Switch 1 stuck on error	=TRUE	Battery Voltage	≥9000(mV)	0,04(s)	2 Trip
		Switch 2 stuck on error	=TRUE	Basic enable conditions met	=see sheet enable tables		
		Switch 3 stuck on error	=TRUE				
P18D9	For reverse button diagnosis, If position of switch 1 is in different status than other two for longer time. Then switch correlation G is set to Fault	Switch set G stuckopen failure detection calculation	=TRUE	Battery Voltage	≥9000(mV)	0(s)	2 Trip
				Basic enable conditions met	=see sheet enable tables		
P18DB	For reverse button diagnosis, If position of switch 2 is in different status than other two for longer time. Then switch correlation H is set to Fault	Switch set H stuckopen failure detection calculation	=TRUE			0(s)	2 Trip
P18DD	For reverse button diagnosis, If position of switch 3 is in different status than other two for longer time. Then switch correlation J is set to Fault	Switch set J stuckopen failure detection calculation	=TRUE			0(s)	2 Trip

	P18E1	For manual button diagnosis, I manual switch position is activated then Transmission Range Selector Switch L Correlation is set to fault	f Transmission range selector switch L circuit correlation fault is reported	=TRUE	Manual button diagnostics enable	=TRUE	60(s)	2 Trip
					flag manual switch 2 position error active	=FALSE		
					Battery Voltage	≥9000(mV)		
					Basic enable conditions met	=see sheet enable tables		
	P07BE	Transmission Park Position Sensor Switch A/B Correlation	Both positions are set at the same time	=TRUE	Ignition is ON	=TRUE	60(s)	2 Trip
	P189D	Park Position switch stuck at open fault path	Transmission park stuck at open evaluation	=TRUE	Basic enable conditions are met	=see sheet enable tables	0(s)	2 Trip
	P17F3	Park position switch Stuck Open Check	Park button stuck in open position.	=TRUE	Ignition is ON	=TRUE	60(s)	2 Trip
			for time	≥1(sec)	Battery Voltage	≥9000(mV)		
					Basic enable conditions met	=see sheet enable tables		
					(ESDR Park 1 Position	=TRUE		
					ESDR Park 2 Position	=TRUE		
					for time)	≥1.0(sec)		
69. SIGNAL PROCESSIN G OF AUTOSAR	U0402	Frame \$31 - Transmission Estimated Gear Protected : Transmission Estimated Gear or Frame \$1E - Transmission General Information 2 Protected : Transmission Output Shaft Angular Velocity	Invalid data message reported	=TRUE	Battery Voltage	≥9000(mV)	2(events)	1 Trip

U0404	Frame \$C1 - Discrete Input Sensor Secondary Protected : Input 1-14 Circuit Fault Active	Invalid Data Received From Gear Shift Control Module "A"	=TRUE	Battery Voltage	≥9000(mV)	2(events)	2 Trip
	or			Basic enable conditions met	=see sheet enable tables		
	Frame \$CF - External ALU Check Secondary Protected : External ALU Check Secondary Seed Index Array and test valid Authenticated						
U0418	Frame \$287 - Braking System Secondary Vehicle Top Speed Limit Value	Invalid Data Received From Brake System Control Module "A"	=TRUE	Battery Voltage	≥9000(mV)	2(events)	1 Trip
	or			Basic enable conditions met	=see sheet enable		
	Frame \$12 - Brake System Information Status 2 Protected : Antilock Brake System Active, Brake Pedal Driver Applied Pressure, Brake System Torque Overlay Delta Torque Command	,			tables		
110.400	From \$10 Prote Dadat	Invelid Data Descined From		Detter Valtere	>0000/m//)	0(4 T.i.
00422	Prame \$10 - Brake Pedal Position, Cruise Secondary Switch, Cruise and Speed Limiter Switch Status	Body Control Module	=IRUE	Battery voltage	≥9000(mv)	2(events)	1 Trip
	or			Basic enable conditions met	=see sheet enable		
	Frame \$20D - Backup System Power Mode Protected : Secondary Run Crank Command				Tadies		
	or						

	Frame \$284 - System Power Mode Protected : Primary Run Crank Command Active or Frame \$40C - Vehicle Odometer Display Value						
U0404	Monitoring of Frame	Invalid Data Received From Body Control Module	=TRUE	Battery Voltage	≥9000(mV)	2(events)	2 Trip
U1961	Frame \$41C - Electronic Shift Range Secondary Display Protected : Electronic Shift Range Secondary Display	Security Peripheral Performance Failure reported	=TRUE	Battery Voltage	≥9000(mV)	2(events)	1 Trip
	or			Basic enable conditions met	=see sheet enable		
	Security Peripheral Performance – Performance or Incorrect Operation				tables		
	or						
	Frame \$229 - Vehicle Speed Average Driven Protected : Fuel Mode Status, Reduced Power Indication On						
	or						
	Frame \$22A - Vehicle Speed Average Non Driven Protected : Vehicle Speed Average NonDriven						
	or						
	Frame \$41F - Wheel Distance Protected : Wheel Distance Per Revolution Front, rear						

	P1986	Remote start request evaluation	Engine Rotation Detected without Starter Activation	=TRUE	Battery Voltage	≥9000(mV)	0(s)	1 Trip
					Basic enable conditions met	=see sheet enable tables		
70. CAN BUS OFF DIAGNOSIS	U0073	Diagnosis of Bus A off error for High Speed CAN controller	Bus off error is detected at High Speed CAN controller "A"	=TRUE	Ignition is ON	=TRUE	2(s)	1 Trip
	U0074	Diagnosis of Bus B off error for High Speed CAN controller	r Bus off error is detected at High Speed CAN controller "B"	=TRUE	Battery Voltage	≥9000(mV)		2 Trip
	U0076	Diagnosis of Bus D off error for High Speed CAN controller	r Bus off error is detected at High Speed CAN controller "D"	=TRUE	Basic enable conditions are met	=see sheet enable tables		1 Trip
71. DIAGNOSIS OF ECM PROGRAMMI NG AND VIN	U2A90	Vehicle VIN Programming Status	VIN is programmed	=FALSE	Ignition is ON	=TRUE	1(s)	1 Trip
					Battery Voltage Basic enable conditions met	≥9000(mV) =see sheet enable tables		

			25OBDG07A	Part 2 ECM Summa	ry Tables			
	U2A91	Normal VIN and ECM ODO Vehicle VIN Comparison	Normal VIN and ECM ODO Vehicle mismatch	=TRUE	Ignition is ON	=TRUE	1(s)	1 Trip
					Battery Voltage Basic enable conditions met	≥9000(mV) =see sheet enable tables		
	U1978	VIN Of The Very First Vehicle Programming Status	VIN of the very first vehicle programmed	=FALSE	Ignition is ON	=TRUE	1(s)	1 Trip
					Battery Voltage Basic enable conditions met	≥9000(mV) =see sheet enable tables		
72. CCM – EVAP SYSTEM VENTILATION	P0449	Diagnosis of EVAP System Vent Valve Control Circuit- Open Load fault	EVAP powerstage reports open load fault through CAN communication message	=TRUE	Ignition is ON	=TRUE	2(s)	2 Trip
					No pending or confirmed DTCs	=see sheet inhibit tables		
DIAGNOSIS					Basic enable conditions met			
	P0498	Diagnosis of EVAP System Vent Valve Control Circuit- Circuit Low	EVAP powerstage reports short circuit to groud fault through CAN communication message	=TRUE	Ignition is ON	=TRUE	2(s)	2 Trip
					No pending or confirmed FIDs	=see sheet inhibit tables		
					Basic enable conditions met	=see sheet enable tables		
	P0499	Diagnosis of EVAP System Vent Valve Control Circuit- Circuit High	EVAP powerstage reports short circuit to battery fault through CAN communication message	=TRUE	Ignition is ON	=TRUE	2(s)	2 Trip
					No pending or confirmed FIDs	=see sheet inhibit tables		
					Basic enable conditions met	=see sheet enable tables		

			250BDG07A	Part 2 ECM Summary	/ Tables			
73. CCM – SENSOR SUPPLY RELAY (FTZM	P16D9	Circuit Check - Short circuit to Battery	Power stage feedback voltage	>4500(mV)	Ignition is ON	=TRUE	20(event)	2 Trip
VOLTAGE SUPPLY)					(Battery Voltage Battery Voltage Power stage off-diagnosis enable	≥8000(mV) ≤655340(mV) <2(sec)		
					Power stage output signal Timeout after which the state No pending or confirmed DTCs	=FALSE ≤1(sec) =see sheet inhibit tables		
					Basic enable conditions met	=see sheet enable tables		
	P16D8	Circuit Check - Short circuit to Ground	Power stage feedback voltage (see Look-Up-Table #83)	<1950 to 4500(mV)	Ignition is ON	=TRUE	5(event)	2 Trip
					(Battery Voltage Battery Voltage Power stage off-diagnosis enable)	≥8000(mV) ≤655340(mV) <2(sec)		
					Power stage output signal No pending or confirmed DTCs	=TRUE =see sheet inhibit tables		
					Basic enable conditions met	=see sheet enable tables		
	P16D7	Circuit Check - Open Load	Power stage feedback voltage	≥1500(mV)	Ignition is ON	=TRUE	20(event)	2 Trip
			Power stage feedback voltage	≤2000(mV)	(
					Battery Voltage Battery Voltage Power stage off-diagnosis enable timer)	≥8000(mV) ≤655340(mV) <2(sec)		
					Power stage output signal Timeout after which the state machine leaves the off-diagnosis state	=FALSE ≤1(sec)		
					No pending or confirmed DTCs	=see sheet inhibit tables		
					Basic enable conditions met	=see sheet enable tables		

			200BD	GUTA Part 2 EGW Summary	Tables			
74. CCM – FUEL CONTROL ENABLE WIRE (FTZM) DIAGNOSIS	P0629	Digital output stage - Circuit H	lig Pre Supply Pump output voltage	>4700(mV)	(ECU is in POSTDRIVE state OR Airbag is activated) OR (Fuel pressure actual value OR Fuel System Priming Timer is active) Battery voltage No pending or confirmed DTCs	=TRUE =TRUE >600(kPa) =TRUE >10900(mV) =see sheet inhibit	0,2(s)	2 Trip
					Basic enable conditions met	tables =see sheet enable tables		
	P0628	Digital output stage - Circuit Lo	ov Pre Supply Pump output voltage (see Look-Up-Table #90)	<1950 to 4500(mV)	(Engine is in running state OR Validity bit of fuel low pressure value Fuel pressure actual value) Fuel pressure actual value Fuel System Priming Timer is not active Battery voltage No pending or confirmed DTCs	=TRUE =TRUE <100(hPa) <100(hPa) =FALSE >10900(mV) =see sheet inhibit tables	0,05(s)	2 Trip
						tables		
	P0627	Digital output stage - Open	Pre Supply Pump output voltage		(1(s)	2 Trip
			Pre Supply Pump output voltage		ECU is in POSTDRIVE state	=TRUE		
				ECM Section 584 of 772	AIRDAD IS ACTIVATED	=IKUE		696 d

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) OR (Fuel pressure actual value OR Fuel System Priming Timer is active) Battery voltage No pending or confirmed DTCs Basic enable conditions met	>600(hPa) =TRUE >10900(mV) =see sheet inhibit tables =see sheet enable tables		
75. CCM – IGNITION COIL OWERSTAG	P2301	Diagnoses the Ignition Coil "A" Primary low side driver circuit for circuit high faults.	Voltage high during driver on state (indicates short-to-power)	Short to power: ≤ 0.5 Ω impedance between signal and controller power	Battery voltage	>9000(mV)	0,4(s)	2 Trip
E ELECTRICAL DIAGNOSIS					Battery voltage Ignition synchronized Engine speed Difference between new and old ignition counter ensuring that all cylinder were fired at least once Basic enable conditions met	<655340(mV) >1400(rpm) >9(counts) =see sheet enable tables		
	P2300	Diagnoses the Ignition Coil "A" Primary low side driver circuit for circuit low faults.	Voltage low during driver off state (indicates short-to- ground)	Short to ground: ≤ 0.5 Ω impedance between signal and controller ground	Battery voltage Ignition synchronized Engine speed Difference between new and old ignition counter ensuring that all cylinder were fired at least once Basic enable conditions met	>9000(mV) <655340(mV) >1400(rpm) >9(counts) =see sheet enable tables	0,4(s)	2 Trip
	P0351	Diagnoses the Ignition Coil "A" Primary low side driver circuit for open circuit faults.	Voltage low during driver off state (indicates open circuit)	Open Circuit : ≥ 200 KΩ impedance between ECU pin and load	Battery voltage	>9000(mV) <655340(mV)	0,4(s)	2 Trip
					Ignition synchronized Engine speed	>1400(rpm)		

			Difference between new and old ignition counter ensuring that all cylinder were fired at least once Basic enable conditions met	>9(counts) =see sheet enable tables		
P2304	Diagnoses the Ignition Coil "H" Voltage high during driver on low side driver circuit for circuit state (indicates short-to-power high faults.	Short to power:) ≤ 0.5 Ω impedance between signal and controller power	Battery voltage	>9000(mV)	0,4(s)	2 Trip
			Battery voltage Ignition synchronized	<655340(mV)		
			Engine speed Difference between new and old ignition counter ensuring that all cylinder were fired at least once	>1400(rpm) >9(counts)		
			Basic enable conditions met	=see sheet enable tables		
P2303	Diagnoses the Ignition Coil "H" Voltage low during driver off Primary low side driver circuit for circuit low faults. ground)	Short to ground: ≤ 0.5 Ω impedance between signal and controller ground	Battery voltage	>9000(mV)	0,4(s)	2 Trip
		Ū.	Battery voltage Ignition synchronized	<655340(mV)		
			Engine speed Difference between new and old ignition counter ensuring that all cylinder were fired at least once	>1400(rpm) >9(counts)		
			Basic enable conditions met	=see sheet enable tables		
P0352	Diagnoses the Ignition Coil "H" Voltage low during driver off Primary low side driver circuit state (indicates open circuit) for open circuit faults.	Open Circuit : ≥ 200 KΩ impedance between ECU pin and load	Battery voltage	>9000(mV)	0,4(s)	2 Trip
			Battery voltage Ignition synchronized	<655340(mV)		
			Engine speed Difference between new and old ignition counter ensuring that all cylinder were fired at least once	>1400(rpm) >9(counts)		
			Basic enable conditions met	=see sheet enable tables		

		250BDG07A	Part 2 ECM Summary	Tables			
P2307	Diagnoses the Ignition Coil "D" low side driver circuit for circuit high faults.	Voltage high during driver on state (indicates short-to-power)	Short to power: ≤ 0.5 Ω impedance between signal and controller power	Battery voltage	>9000(mV)	0,4(s)	2 Trip
				Battery voltage Ignition synchronized Engine speed Difference between new and old ignition counter ensuring that all cylinder were fired at least once	<655340(mV) >1400(rpm) >9(counts)		
				Basic enable conditions met	=see sheet enable tables		
P2306	Diagnoses the Ignition Coil "D" low side driver circuit for circuit low faults.	Voltage low during driver off state (indicates short-to- ground)	Short to ground: ≤ 0.5 Ω impedance between signal and controller around	Battery voltage	>9000(mV)	0,4(s)	2 Trip
			ground	Battery voltage Ignition synchronized Engine speed Difference between new and old ignition counter ensuring that all cylinder were fired at least once	<655340(mV) >1400(rpm) >9(counts)		
				Basic enable conditions met	=see sheet enable tables		
P0353	Diagnoses the Ignition Coil "D" Primary low side driver circuit for open circuit faults.	Voltage low during driver off state (indicates open circuit)	Open Circuit : ≥ 200 KΩ impedance between ECU pin and load	Battery voltage	>9000(mV)	0,4(s)	2 Trip
			louu	Battery voltage Ignition synchronized Engine speed Difference between new and old ignition counter ensuring that all cylinder were fired at least once	<655340(mV) >1400(rpm) >9(counts)		
				Basic enable conditions met	=see sheet enable tables		
P2310	Diagnoses the Ignition Coil "C" low side driver circuit for circuit high faults.	Voltage high during driver on state (indicates short-to-power)	Short to power: ≤ 0.5 Ω impedance between signal and controller power	Battery voltage	>9000(mV)	0,4(s)	2 Trip
				Battery voltage Ignition synchronized Engine speed	<655340(mV) >1400(rpm)		

				Difference between new and old ignition counter ensuring that all cylinder were fired at least once	>9(counts)		
				Basic enable conditions met	=see sheet enable tables		
P2309	Diagnoses the Ignition Coil "C" low side driver circuit for circuit low faults.	Voltage low during driver off state (indicates short-to- ground)	Short to ground: ≤ 0.5 Ω impedance between signal and controller ground	Battery voltage	>9000(mV)	0,4(s)	2 Trip
			9.00.00	Battery voltage	<655340(mV)		
				Ignition synchronized Engine speed	>1400(rpm)		
				Difference between new and old	>9(counts)		
				ignition counter ensuring that all cylinder were fired at least once			
				Basic enable conditions met	=see sheet enable tables		
P0354	Diagnoses the Ignition Coil "C" Primary low side driver circuit for open circuit faults.	Voltage low during driver off state (indicates open circuit)	Open Circuit : ≥ 200 KΩ impedance between ECU pin and load	Battery voltage	>9000(mV)	0,4(s)	2 Trip
				Battery voltage Ignition synchronized	<655340(mV)		
				Engine speed	>1400(rpm)		
				ignition counter ensuring that all cylinder were fired at least once	>3(00um3)		
				Basic enable conditions met	=see sheet enable tables		
D2212	Diagnoses the Ignition Coil "P"	Voltago high during driver on	Short to power:	Pattonuvoltago	> 0000/m\/)	0.4(c)	2 Trip
F2313	Primary low side driver circuit for circuit high faults.	state (indicates short-to-power)	≤ 0.5 Ω impedance between signal and controller power	Dattery voltage	>9000(117)	0,4(3)	2 110
				Battery voltage	<655340(mV)		
				Engine speed	>1400(rpm)		
				Difference between new and old ignition counter ensuring that all cylinder were fired at least once	>9(counts)		
				Basic enable conditions met	=see sheet enable tables		

	P2312	Diagnoses the Ignition Coil "B" Primary low side driver circuit for circuit low faults.	Voltage low during driver off state (indicates short-to- ground)	Short to ground: ≤ 0.5 Ω impedance between signal and controller ground	Battery voltage	>9000(mV)	0,4(s)	2 Trip
				ground	Battery voltage	<655340(mV)		
					Engine speed Difference between new and old	>1400(rpm) >9(counts)		
					ignition counter ensuring that all cylinder were fired at least once			
					Basic enable conditions met	=see sheet enable tables		
ľ	P0355	Diagnoses the Ignition Coil "B" Primary low side driver circuit for open circuit faults.	Voltage low during driver off state (indicates open circuit)	Open Circuit : ≥ 200 KΩ impedance between ECU pin and	Battery voltage	>9000(mV)	0,4(s)	2 Trip
				loud	Battery voltage	<655340(mV)		
					Engine speed	>1400(rpm)		
					Difference between new and old ignition counter ensuring that all cylinder were fired at least once	>9(counts)		
					Basic enable conditions met	=see sheet enable tables		
	P2316	Diagnoses the Ignition Coil "E" low side driver circuit for circuit high faults.	Voltage high during driver on state (indicates short-to-power)	Short to power: ≤ 0.5 Ω impedance between signal and controller power	Battery voltage	>9000(mV)	0,4(s)	2 Trip
					Battery voltage	<655340(mV)		
					Engine speed	>1400(rpm)		
					ignition counter ensuring that all cylinder were fired at least once	>9(counts)		
					Basic enable conditions met	=see sheet enable tables		
	P2315	Diagnoses the Ignition Coil "E" low side driver circuit for circuit low faults.	Voltage low during driver off state (indicates short-to- ground)	Short to ground: ≤ 0.5 Ω impedance between signal and controller ground	Battery voltage	>9000(mV)	0,4(s)	2 Trip
				0	Battery voltage	<655340(mV)		
					Engine speed	>1400(rpm)		

			250BDG07	A Part 2 ECM Summary	Tables			
					Difference between new and old ignition counter ensuring that all cylinder were fired at least once	>9(counts)		
					Basic enable conditions met	=see sheet enable tables		
ĺ	P0356	Diagnoses the Ignition Coil "E" Primary low side driver circuit for open circuit faults.	Voltage low during driver off state (indicates open circuit)	Open Circuit : ≥ 200 KΩ impedance between ECU pin and load	Battery voltage	>9000(mV)	0,4(s)	2 Trip
					Battery voltage	<655340(mV)		
					Engine speed	>1400(rpm)		
					ignition counter ensuring that all	>9(counts)		
					cylinder were fired at least once Basic enable conditions met	=see sheet enable tables		
	P2319	Diagnoses the Ignition Coil "G" low side driver circuit for circuit high faults.	Voltage high during driver on state (indicates short-to-power)	Short to power: ≤ 0.5 Ω impedance between signal and controller power	Battery voltage	>9000(mV)	0,4(s)	2 Trip
					Battery voltage	<655340(mV)		
					Ignition synchronized Engine speed	>1400(rpm)		
					Difference between new and old ignition counter ensuring that all cylinder were fired at least once	>9(counts)		
					Basic enable conditions met	=see sheet enable tables		
	P2318	Diagnoses the Ignition Coil "G" Primary low side driver circuit for circuit low faults.	Voltage low during driver off state (indicates short-to- ground)	Short to ground: ≤ 0.5 Ω impedance between signal and controller ground	Battery voltage	>9000(mV)	0,4(s)	2 Trip
				9.00.00	Battery voltage	<655340(mV)		
					Engine speed	>1400(rpm)		
					Difference between new and old ignition counter ensuring that all	>9(counts)		
					cylinder were fired at least once Basic enable conditions met	=see sheet enable tables		
	P0357	Diagnoses the Ignition Coil "G" Primary low side driver circuit for open circuit faults.	Voltage low during driver off state (indicates open circuit)	Open Circuit : ≥ 200 KΩ impedance between ECU pin and	Battery voltage	>9000(mV)	0,4(s)	2 Trip
			E/	IUdu CM Section 500 of 772	Battery voltage	<655340(mV)		702

			25OBDG07	7A Part 2 ECM Summary	Tables			
					Ignition synchronized Engine speed Difference between new and old ignition counter ensuring that all cylinder were fired at least once	>1400(rpm) >9(counts)		
					Basic enable conditions met	=see sheet enable tables		
	P2322	Diagnoses the Ignition Coil "F" low side driver circuit for circuit high faults.	Voltage high during driver on state (indicates short-to-power)	Short to power: ≤ 0.5 Ω impedance between signal and controller power	Battery voltage	>9000(mV)	0,4(s)	2 Trip
					Battery voltage Ignition synchronized Engine speed Difference between new and old ignition counter ensuring that all	<655340(mV) >1400(rpm) >9(counts)		
					cylinder were fired at least once Basic enable conditions met	=see sheet enable tables		
	P2321	Diagnoses the Ignition Coil "F" low side driver circuit for circuit low faults.	Voltage low during driver off state (indicates short-to- ground)	Short to ground: ≤ 0.5 Ω impedance between signal and controller	Battery voltage	>9000(mV)	0,4(s)	2 Trip
				giouna	Battery voltage Ignition synchronized	<655340(mV)		
					Engine speed Difference between new and old ignition counter ensuring that all	>1400(rpm) >9(counts)		
					Basic enable conditions met	=see sheet enable tables		
	P0358	Diagnoses the Ignition Coil "F" Primary low side driver circuit for open circuit faults.	Voltage low during driver off state (indicates open circuit)	Open Circuit : ≥ 200 KΩ impedance between ECU pin and load	Battery voltage	>9000(mV)	0,4(s)	2 Trip
					Battery voltage Ignition synchronized	<655340(mV)		
					Engine speed Difference between new and old ignition counter ensuring that all cylinder were fired at least once	>1400(rpm) >9(counts)		
					Basic enable conditions met	=see sheet enable tables		
CCM – JEL CTION	P1248	Diagnoses the Cylinder 1 Injector "A" for short circuit fault between high side and	Voltage high during driver ON state (indicates short circuit to battery)	Short to power: ≤ 0.5 Ω impedance between ECU pin and	Battery Voltage	≥10,9(V)	2(events)	1 Trip
I OW		low side of driver circuit	E	CMPS6tflbh 591vdr77210				703 (

SIDE DIAGNOSIS					Battery Voltage Basic enable conditions met No pending or confirmed DTCs	≤6553,5(V) =see sheet enable tables =see sheet inhibit tables		
	P029D	Detects mechanical failure open high pressure injection value 1	Number of misfire counter for cylinder 1	>100	Diagnosis inhibited by statistical function	=FALSE	5(s)	2 Trip
			Rail pressure control minimum error is set	=TRUE	Engine speed	<6000(rpm)		
					Engine speed relative air charge Electrical failure with high pressure injectors	>1520(rpm) <100(%) =FALSE		
					No pending or confirmed DTCs Basic enable conditions met	=see sheet inhibit tables =see sheet enable tables		
	P0201	Diagnoses the Cylinder 1 Injector "A" low side of driver circuit for open circuit faults	Voltage low during driver OFF state (indicates open circuit)	Open Circuit: ≥ 200 K Ω impedance between ECU pin and load	Battery Voltage	≥10,9(V)	2(events)	1 Trip
					Battery Voltage Basic enable conditions met	≤6553,5(V) =see sheet enable tables		
					No pending or confirmed DTCs	=see sheet inhibit tables		
	P0201	Diagnoses the Cylinder 1 Injector "A" low side of driver circuit for short circuit faults (short circuit to battery or short	Voltage low during driver OFF state (indicates short circuit to ground)	Short to ground: ≤ 0.5 Ω impedance between ECU pin and ground	Battery Voltage	≥10,9(V)	2(events)	1 Trip
			OR Voltage high during driver ON state (indicates short circuit to battery)	Short to power: ≤ 0.5 Ω impedance between ECU pin and injector supply voltage	Battery Voltage Basic enable conditions met	≤6553,5(V) =see sheet enable tables		
				njoolor oupply vollago	No pending or confirmed DTCs	=see sheet inhibit tables		
	P1249	Diagnoses the Cylinder 2 Injector "A" for short circuit fault between high side and low side of driver circuit	Voltage high during driver ON state (indicates short circuit to battery)	Short to power: ≤ 0.5 Ω impedance between ECU pin and injector supply voltage	Battery Voltage	≥10,9(V)	2(events)	1 Trip
					Battery Voltage Basic enable conditions met No pending or confirmed DTCs	≤6553,5(V) =see sheet enable tables =see sheet inhibit		
						tables		

P02A1	Detects mechanical failure open high pressure injection value 2	Number of misfire counter for cylinder 2	>100	Diagnosis inhibited by statistical function	=FALSE	5(s)	2 Trip
		Rail pressure control minimum error is set	=TRUE	Engine speed	<6000(rpm)		
				Engine speed	>1520(rpm)		
				relative air charge	<100(%)		
				Electrical failure with high pressure	=FALSE		
				Injectors	-see sheet inhihit		
				No pending of committee D103	tables		
				Basic enable conditions met	=see sheet enable tables		
P0202	Diagnoses the Cylinder 2	Voltage low during driver OFF	Open Circuit: ≥ 200 K	Battery Voltage	≥10,9(V)	2(events)	1 Trip
	Injector "A" low side of driver circuit for open circuit faults	state (indicates open circuit)	Ω impedance between ECU pin and load				·
				Pottony Voltago			
				Basic enable conditions met	=see sheet enable		
					tables		
				No pending or confirmed DTCs	=see sheet inhibit tables		
P0202	Diagnoses the Cylinder 2	Voltage low during driver OFF	Short to ground: ≤ 0.5	Battery Voltage	≥10,9(V)	2(events)	1 Trip
	Injector "A" low side of driver circuit for short circuit faults	state (indicates short circuit to ground)	Ω impedance between ECU pin and ground			, , ,	·
	(short circuit to battery or short	OR		Battery Voltage	≤6553.5(V)		
		Voltage high during driver ON	Short to power:	Basic enable conditions met	=see sheet enable		
		state (indicates short circuit to battery)	$\leq 0.5 \Omega$ impedance between ECU pin and		tables		
			injector supply voltage	No pending or confirmed DTCs	=see sheet inhibit		
				1 0	tables		
P124A	Diagnoses the Cylinder 3	Voltage high during driver ON	Short to power:	Battery Voltage	≥10,9(V)	2(events)	1 Trip
	Injector "A" for short circuit	state (indicates short circuit to	$\leq 0.5 \Omega$ impedance				
	fault between high side and	battery)	between ECU pin and				
			injector supply voltage	Battery Voltage	≤6553.5(V)		
				Basic enable conditions met	=see sheet enable		
					tables		
				No pending or confirmed DTCs	=see sheet inhibit tables		
P02A5	Detects mechanical failure	Number of misfire counter for	>100	Diagnosis inhibited by statistical	=FALSE	5(s)	2 Trip
	open high pressure injection valve 3	cylinder 3		function			
		Rail pressure control minimum error is set	=TRUE	Engine speed	<6000(rpm)		

					Engine speed relative air charge Electrical failure with high pressure injectors No pending or confirmed DTCs Basic enable conditions met	>1520(rpm) <100(%) =FALSE =see sheet inhibit tables =see sheet enable tables		
	P0208	Diagnoses the Cylinder 3 Injector "A" low side of driver circuit for open circuit faults	Voltage low during driver OFF state (indicates open circuit)	Open Circuit: ≥ 200 K Ω impedance between ECU pin and load	Battery Voltage	≥10,9(V)	2(events)	1 Trip
					Battery Voltage Basic enable conditions met	≤6553,5(V) =see sheet enable tables		
					No pending or confirmed DTCs	=see sheet inhibit tables		
ĺ	P0208	Diagnoses the Cylinder 3 Injector "A" low side of driver circuit for short circuit faults (short circuit to battery or short	Voltage low during driver OFF state (indicates short circuit to ground)	Short to ground: ≤ 0.5 Ω impedance between ECU pin and ground	Battery Voltage	≥10,9(V)	2(events)	1 Trip
			OR Voltage high during driver ON state (indicates short circuit to battery)	Short to power: ≤ 0.5 Ω impedance between ECU pin and injector supply voltage	Battery Voltage Basic enable conditions met	≤6553,5(V) =see sheet enable tables		
					No pending or confirmed DTCs	=see sheet inhibit tables		
	P124B	Diagnoses the Cylinder 4 Injector "A" for short circuit fault between high side and low side of driver circuit	Voltage high during driver ON state (indicates short circuit to battery)	Short to power: ≤ 0.5 Ω impedance between ECU pin and injector supply voltage	Battery Voltage	≥10,9(V)	2(events)	1 Trip
				,	Battery Voltage Basic enable conditions met	≤6553,5(V) =see sheet enable		
					No pending or confirmed DTCs	=see sheet inhibit tables		
	P02A9	Detects mechanical failure open high pressure injection valve 4	Number of misfire counter for cylinder 4	>100	Diagnosis inhibited by statistical function	=FALSE	5(s)	2 Trip
			Rail pressure control minimum error is set	=TRUE	Engine speed	<6000(rpm)		
					Engine speed	>1520(rpm)		
					relative air charge Electrical failure with high pressure	<100(%) =FALSE		
					Injectors No pending or confirmed DTCs	=see sheet inhibit		
				M Contine EOA of 770		tables		706 -

					Basic enable conditions met	=see sheet enable tables		
	P0203	Diagnoses the Cylinder 4 Injector "A" low side of driver circuit for open circuit faults	Voltage low during driver OFF state (indicates open circuit)	Open Circuit: ≥ 200 K Ω impedance between ECU pin and load	Battery Voltage	≥10,9(V)	2(events)	1 Trip
					Battery Voltage Basic enable conditions met	≤6553,5(V) =see sheet enable tables		
					No pending or confirmed DTCs	=see sheet inhibit tables		
ĺ	P0203	Diagnoses the Cylinder 4 Injector "A" low side of driver circuit for short circuit faults (short circuit to battery or short	Voltage low during driver OFF state (indicates short circuit to ground)	Short to ground: ≤ 0.5 Ω impedance between ECU pin and ground	Battery Voltage	≥10,9(V)	2(events)	1 Trip
		(,	OR Voltage high during driver ON state (indicates short circuit to battery)	Short to power: ≤ 0.5 Ω impedance between ECU pin and	Battery Voltage Basic enable conditions met	≤6553,5(V) =see sheet enable tables		
				injector supply voltage	No pending or confirmed DTCs	=see sheet inhibit tables		
ĺ	P124C	Diagnoses the Cylinder 5 Injector "A" for short circuit fault between high side and low side of driver circuit	Voltage high during driver ON state (indicates short circuit to battery)	Short to power: ≤ 0.5 Ω impedance between ECU pin and injector supply voltage	Battery Voltage	≥10,9(V)	2(events)	1 Trip
					and Battery Voltage and	≤6553,5(V)		
					Basic enable conditions met	=see sheet enable tables		
					and No pending or confirmed DTCs	=see sheet inhibit tables		
ľ	P02AD	Detects mechanical failure open high pressure injection value 5	Number of misfire counter for cylinder 5	>100	Diagnosis inhibited by statistical function	=FALSE	5(s)	2 Trip
			Rail pressure control minimum error is set	=TRUE	Engine speed	<6000(rpm)		
					Engine speed	>1520(rpm)		
					relative air charge Electrical failure with high pressure	<100(%) =FALSE		
					No pending or confirmed DTCs	=see sheet inhibit tables		
					Basic enable conditions met	=see sheet enable tables		

P0204	Diagnoses the Cylinder 5 Injector "A" low side of driver circuit for open circuit faults.	Voltage low during driver OFF state (indicates open circuit)	Open Circuit: ≥ 200 K Ω impedance between ECU pin and load	Battery Voltage	≥10,9(V)	2(events)	1 Trip
				Battery Voltage Basic enable conditions met	≤6553,5(V) =see sheet enable tables		
				No pending or confirmed DTCs	=see sheet inhibit tables		
P0204	Diagnoses the Cylinder 5 Injector "A" low side of driver circuit for short circuit faults (short circuit to battery or short	Voltage low during driver OFF state (indicates short circuit to ground)	Short to ground: ≤ 0.5 Ω impedance between ECU pin and ground	Battery Voltage	≥10,9(V)	2(events)	1 Trip
	(,	OR Voltage high during driver ON state (indicates short circuit to battery)	Short to power: ≤ 0.5 Ω impedance between ECU pin and	Battery Voltage Basic enable conditions met	≤6553,5(V) =see sheet enable tables		
			injector supply voltage	No pending or confirmed DTCs	=see sheet inhibit tables		
P124D	Diagnoses the Cylinder 6 Injector "A" for short circuit fault between high side and low side of driver circuit	Voltage high during driver ON state (indicates short circuit to battery)	Short to power: ≤ 0.5 Ω impedance between ECU pin and injector supply voltage	Battery Voltage	≥10,9(V)	2(events)	1 Trip
			, ,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,	Battery Voltage Basic enable conditions met	≤6553,5(V) =see sheet enable tables		
				No pending or confirmed DTCs	=see sheet inhibit tables		
P02B1	Detects mechanical failure open high pressure injection	Number of misfire counter for cylinder 6	>100	Diagnosis inhibited by statistical function	=FALSE	5(s)	2 Trip
	valve o	Rail pressure control minimum	=TRUE	Engine speed	<6000(rpm)		
				Engine speed	>1520(rpm)		
				Electrical failure with high pressure	=FALSE		
				No pending or confirmed DTCs	=see sheet inhibit		
				Basic enable conditions met	=see sheet enable tables		
P0207	Diagnoses the Cylinder 6 Injector "A" low side of driver circuit for open circuit faults	Voltage low during driver OFF state (indicates open circuit)	Open Circuit: ≥ 200 K Ω impedance between ECU pin and load	Battery Voltage	≥10,9(V)	2(events)	1 Trip
		EC	CM Section 596 of 772	Battery Voltage	≤6553,5(V)		708 (

	25OBDG07A Part 2 ECM Summary Tables												
					Basic enable conditions met	=see sheet enable tables							
					No pending or confirmed DTCs	=see sheet inhibit tables							
ĺ	P0207	Diagnoses the Cylinder 6 Injector "A" low side of driver circuit for short circuit faults (short circuit to battery or short	Voltage low during driver OFF state (indicates short circuit to ground)	Short to ground: ≤ 0.5 Ω impedance between ECU pin and ground	Battery Voltage	≥10,9(V)	2(events)	1 Trip					
			OR Voltage high during driver ON state (indicates short circuit to battery)	Short to power: ≤ 0.5 Ω impedance between ECU pin and injector supply voltage	Battery Voltage Basic enable conditions met	≤6553,5(V) =see sheet enable tables							
					No pending or confirmed DTCs	=see sheet inhibit tables							
	P124E	Diagnoses the Cylinder 7 Injector "A" for short circuit fault between high side and low side of driver circuit	Voltage high during driver ON state (indicates short circuit to battery)	Short to power: ≤ 0.5 Ω impedance between ECU pin and injector supply voltage	Battery Voltage	≥10,9(V)	2(events)	1 Trip					
					Battery Voltage Basic enable conditions met	≤6553,5(V) =see sheet enable tables							
					No pending or confirmed DTCs	=see sheet inhibit tables							
ľ	P02B5	Detects mechanical failure open high pressure injection valve 7	Number of misfire counter for cylinder 7	>100	Diagnosis inhibited by statistical function	=FALSE	5(s)	2 Trip					
			Rail pressure control minimum error is set	=TRUE	Engine speed	<6000(rpm)							
					Engine speed	>1520(rpm)							
					relative air charge Electrical failure with high pressure	<100(%) =FALSE							
					injectors No pending or confirmed DTCs	=see sheet inhibit							
					Basic enable conditions met	=see sheet enable tables							
ľ	P0205	Diagnoses the Cylinder 7 Injector "A" low side of driver circuit for open circuit faults	Voltage low during driver OFF state (indicates open circuit)	Open Circuit: ≥ 200 K Ω impedance between ECU pin and load	Battery Voltage	≥10,9(V)	2(events)	1 Trip					
					Battery Voltage Basic enable conditions met	≤6553,5(V) =see sheet enable tables							
					No pending or confirmed DTCs	=see sheet inhibit tables							

			25OBDG07	A Part 2 ECM Summary	Tables			
	P0205	Diagnoses the Cylinder 7 Injector "A" low side of driver circuit for short circuit faults (short circuit to battery or short	Voltage low during driver OFF state (indicates short circuit to ground)	Short to ground: ≤ 0.5 Ω impedance between ECU pin and ground	Battery Voltage	≥10,9(V)	2(events)	1 Trip
		(,	OR Voltage high during driver ON state (indicates short circuit to battery)	Short to power: ≤ 0.5 Ω impedance between ECU pin and	Battery Voltage Basic enable conditions met	≤6553,5(V) =see sheet enable tables		
				injector supply voltage	No pending or confirmed DTCs	=see sheet inhibit tables		
ĺ	P124F	Diagnoses the Cylinder 8 Injector "A" for short circuit fault between high side and low side of driver circuit	Voltage high during driver ON state (indicates short circuit to battery)	Short to power: ≤ 0.5 Ω impedance between ECU pin and injector supply voltage	Battery Voltage	≥10,9(V)	2(events)	1 Trip
					Battery Voltage Basic enable conditions met	≤6553,5(V) =see sheet enable tables		
					No pending or confirmed DTCs	=see sheet inhibit tables		
	P02B9	Detects mechanical failure open high pressure injection	Number of misfire counter for cylinder 8	>100	Diagnosis inhibited by statistical function	=FALSE	5(s)	2 Trip
		valve o	Rail pressure control minimum error is set	=TRUE	Engine speed	<6000(rpm)		
					Engine speed relative air charge Electrical failure with high pressure injectors	>1520(rpm) <100(%) =FALSE		
					No pending or confirmed DTCs	=see sheet inhibit tables		
					Basic enable conditions met	=see sheet enable tables		
	P0206	Diagnoses the Cylinder 8 Injector "A" low side of driver circuit for open circuit faults	Voltage low during driver OFF state (indicates open circuit)	Open Circuit: ≥ 200 K Ω impedance between ECU pin and load	Battery Voltage	≥10,9(V)	2(events)	1 Trip
					Battery Voltage Basic enable conditions met	≤6553,5(V) =see sheet enable		
					No pending or confirmed DTCs	=see sheet inhibit tables		
	P0206	Diagnoses the Cylinder 8 Injector "A" low side of driver circuit for short circuit faults	Voltage low during driver OFF state (indicates short circuit to ground)	Short to ground: ≤ 0.5 Ω impedance between ECU pin and ground	Battery Voltage	≥10,9(V)	2(events)	1 Trip
		(Short circuit to battery or short	OR		Battery Voltage	≤6553,5(V)		
			EC	CM Section 598 of 772				vents) 1 Trip i(s) 2 Trip vents) 1 Trip vents) 1 Trip 710 of

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		250BDG07	A Part 2 ECM Summary	Tables			
		Voltage high during driver ON state (indicates short circuit to battery)	Short to power: ≤ 0.5 Ω impedance between ECU pin and injector supply voltage	Basic enable conditions met No pending or confirmed DTCs	=see sheet enable tables =see sheet inhibit		
					tables		
P2146	Diagnoses the Cylinder 1 Injector "A" for short circuit (short circuit to battery or short circuit to ground) at high side	Voltage low during driver OFF state (indicates short circuit to ground)	Short to ground: ≤ 0.5 Ω impedance between ECU pin and ground	Battery Voltage	≥10,9(V)	2(events)	1 Trip
	of the driver circuit	OR Voltage high during driver ON state (indicates short circuit to battery)	Short to power: ≤ 0.5 Ω impedance between ECU pin and injector supply voltage	Battery Voltage Basic enable conditions met	≤6553,5(V) =see sheet enable tables		
			injector supply voltage	No pending or confirmed DTCs	=see sheet inhibit tables		
P2149	Diagnoses the Cylinder 2 Injector "B" for short circuit (short circuit to battery or short circuit to ground) at high side	Voltage low during driver OFF state (indicates short circuit to ground)	Short to ground: ≤ 0.5 Ω impedance between ECU pin and ground	Battery Voltage	≥10,9(V)	2(events)	1 Trip
		OR Voltage high during driver ON state (indicates short circuit to battery)	Short to power: ≤ 0.5 Ω impedance between ECU pin and	Battery Voltage Basic enable conditions met	≤6553,5(V) =see sheet enable tables		
			injector supply voltage	No pending or confirmed DTCs	=see sheet inhibit tables		
P2152	Diagnoses the Cylinder 3 Injector "C" for short circuit (short circuit to battery or short circuit to ground) at high side of the driver circuit	Voltage low during driver OFF state (indicates short circuit to ground)	Short to ground: ≤ 0.5 Ω impedance between ECU pin and ground	Battery Voltage	≥10,9(V)	2(events)	1 Trip
		OR Voltage high during driver ON state (indicates short circuit to battery)	Short to power: ≤ 0.5 Ω impedance between ECU pin and injector supply voltage	Battery Voltage Basic enable conditions met	≤6553,5(V) =see sheet enable tables		
			,	No pending or confirmed DTCs	=see sheet inhibit tables		
P2155	Diagnoses the Cylinder 4 Injector "D" for short circuit (short circuit to battery or short circuit to ground) at high side of the driver circuit	Voltage low during driver OFF state (indicates short circuit to ground)	Short to ground: ≤ 0.5 Ω impedance between ECU pin and ground	Battery Voltage	≥10,9(V)	2(events)	1 Trip
		OR EC	CM Section 599 of 772	Rattery Voltage	<6553 5(\/)		711 oʻ

		25OBDG07/	A Part 2 ECM Summary	Tables			
		Voltage high during driver ON state (indicates short circuit to battery)	Short to power: ≤ 0.5 Ω impedance between ECU pin and injector supply voltage	Basic enable conditions met	=see sheet enable tables		
			, ,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,	No pending or confirmed DTCs	=see sheet inhibit tables		
P216A	Diagnoses the Cylinder 5 Injector "E" for short circuit (short circuit to battery or short circuit to ground) at high side of the driver circuit	Voltage low during driver OFF state (indicates short circuit to ground)	Short to ground: ≤ 0.5 Ω impedance between ECU pin and ground	Battery Voltage	≥10,9(V)	2(events)	1 Trip
		OR Voltage high during driver ON state (indicates short circuit to battery)	Short to power: $\leq 0.5 \Omega$ impedance between ECU pin and injector supply voltage	Battery Voltage Basic enable conditions met	≤6553,5(V) =see sheet enable tables		
				No pending or confirmed DTCs	=see sheet inhibit tables		
P216D	Diagnoses the Cylinder 6 Injector "F" for short circuit (short circuit to battery or short circuit to ground) at high side of the driver circuit	Voltage low during driver OFF state (indicates short circuit to ground)	Short to ground: ≤ 0.5 Ω impedance between ECU pin and ground	Battery Voltage	≥10,9(V)	2(events)	1 Trip
		OR Voltage high during driver ON state (indicates short circuit to battery)	Short to power: ≤ 0.5 Ω impedance between ECU pin and injector supply voltage	Battery Voltage Basic enable conditions met	≤6553,5(V) =see sheet enable tables		
			njeder expp.j renage	No pending or confirmed DTCs	=see sheet inhibit tables		
P217A	Diagnoses the Cylinder 7 Injector "G" for short circuit (short circuit to battery or short circuit to ground) at high side of the driver circuit	Voltage low during driver OFF state (indicates short circuit to ground)	Short to ground: ≤ 0.5 Ω impedance between ECU pin and ground	Battery Voltage	≥10,9(V)	2(events)	1 Trip
		OR Voltage high during driver ON state (indicates short circuit to battery)	Short to power: ≤ 0.5 Ω impedance between ECU pin and	Battery Voltage Basic enable conditions met	≤6553,5(V) =see sheet enable tables		
			injector supply voltage	No pending or confirmed DTCs	=see sheet inhibit tables		

			250BDG07.	A Part 2 ECM Summary	Tables			
	P217D	Diagnoses the Cylinder 8 Injector "H" for short circuit (short circuit to battery or short circuit to ground) at high side of the driver circuit	Voltage low during driver OFF state (indicates short circuit to ground)	Short to ground: ≤ 0.5 Ω impedance between ECU pin and ground	Battery Voltage	≥10,9(V)	2(events)	1 Trip
			OR Voltage high during driver ON state (indicates short circuit to battery)	Short to power: ≤ 0.5 Ω impedance between ECU pin and injector supply voltage	Battery Voltage Basic enable conditions met	≤6553,5(V) =see sheet enable tables		
				injector supply voltage	No pending or confirmed DTCs	=see sheet inhibit tables		
77. CCM – FUEL PRESSURE REGULATOR CONTROL	P0089	Path 1a: Plausibility check of High Pressure fuel system where controller output is compared with maximum threshold for	Filtered value of the High pressure controller output	>7,5(MPa)	Common Conditions		10(s)	2 Trip
HIGH/LOW SIDE - B1/B2		calibrated period of time			Conditions for Plausibility check of Fuel supply system			
					Airbag is activated Rail pressure sensor voltage is not plausible	=FALSE =FALSE		
					Battery voltage Mean value of effective relative volumetric injected fuel mass	≤655340(mV) ≥7,5(%)		
					Mean value of effective relative volumetric injected fuel mass Initial fueling mode is active	≤3072(%) =FALSE		
) Time counter at end of start	≥2(sec)		
					Conditions for reset of high-pressure regulation	=FÀLSÉ		
					(((
					Actual number of cylinders with injection cut-off	<8(counts)		
					Desired number of cylinders with injection cut-off) OR	<8(counts)		
					End of start is reached) OR Difference between the actual rail pressure and filtered rail pressure setpoint (A+B) where in:	=FALSE		

	=1(MPa)
 (A) rail pressure offset during fuel cutoff for activation demand control (B) maximum difference between actual rail pressure and set rail pressure for deactivation of MSV if fuel cutt off is active 	=1(MPa)
)	
(
High pressure pump is active	=TRUE
Engine is in running state	=TRUE
Crankshaft signal is detected	=TRUE
) for time	=0,04(sec)
) OR	
High pressure pump is not active End of start is reached	=FALSE =TRUE
)	-1102
(Start of injection enabled	=TRUE
(
Engine start is in pre-injection mode	=TRUE
Injection counter	≥(A+B)
(A+B) where in:	=2(counts)
(A) Number of injections for	
enabling high-pressure controller (B) Number of cylinders OR	=8
Engine start is not in pre-injection	=FALSE
Injection counter	≥2(counts)
)	
) (
Engine state of synchronisation for	≥30
(
Engine is in running state OR	=TRUE
Crankshaft signal is detected	=TRUE
) for time)	=0,04(sec)
)	
for time No pending or confirmed DTCs	=2(sec) =see sheet inhibit table

				Basic enable conditions met	=see sheet enable table		
	Path 1b: Plausibility check of High Pressure fuel system where controller output is compared with maximum threshold for	Filtered value of the High pressure controller output pressure	>7,5(MPa)	Common Conditions		6(s)	2 Trip
	calibrated period of time			Fuel tank is empty or reserve	=TRUE		
P0089	Path 2: Plausibility check of High Pressure fuel system where controller output is compared with minimum threshold for calibrated period of time	Filtered value of the High pressure controller output pressure	<-7,5(MPa)	Conditions for Plausibility check of Fuel supply system (10(s)	2 Trip
				Airbag is activated Rail pressure sensor voltage is not	=FALSE =FALSE		
				Battery voltage Mean value of effective relative volumetric injected fuel mass	≤655340(mV) ≥7,5(%)		
				Mean value of effective relative volumetric injected fuel mass	≤3072(%)		
				Initial fueling mode is active	=FALSE		
				Time counter at end of start Conditions for reset of high-pressure regulation (((≥2(sec) =FALSE		
				(Actual number of cylinders with injection cut-off	<8(counts)		
				Desired number of cylinders with injection cut-off) OR	<8(counts)		
				End of start is reached) OR Difference between the actual rail pressure and filtered rail pressure setpoint (A+B) where in:	=FALSE		
				(A) rail pressure offset during fuel cutoff for activation demand control	=1(MPa)		

-	(B) maximum difference between actual rail pressure and set rail pressure for deactivation of MSV if fuel cutt off is active	=1(MPa)
	(
	High pressure pump is active	=TRUE
	Engine is in running state	=TRUE
	Crankshaft signal detected	=TRUE
) for time	=0,04(sec)
) OR	
	High pressure pump not active End of start is reached	=FALSE =TRUE
)	
	Start of injection is enabled	=TRUE
	Engine start is in pre-injection	=TRUE
	Injection counter	≥(A+B)
	(A+B) where in:	-2(counts)
	(A) Number of injections for	-2(counts)
	enabling high-pressure controller	0
	OR	=0
	Engine start is not in pre-injection	=FALSE
	Injection counter	≥2(counts)
))	
	(Engine state of synchronisation for	≥30
	rail pressure control activation	
	Engine is in running state	=TRUE
	Crankshaft signal is detected	=TRUE
) for time	=0,04(sec)
)	
	for time	=2(sec)
	No pending or confirmed DTCs	=see sheet inhibit table
	Desis angles and liting and	and about analysis

P2C01	Path 1a: Plausibility check of High Pressure fuel system where controller output is compared with maximum threshold for calibrated period of time	Filtered value of the High pressure controller output	>7,5(MPa)	Common Conditions		10(s)	2 Trip
				Conditions for Plausibility check of Fuel supply system (
				Airbag is activated Rail pressure sensor voltage is not	=FALSE =FALSE		
				Battery voltage Mean value of effective relative	≤655340(mV) ≥7,5(%)		
				Mean value of effective relative volumetric injected fuel mass	≤3072(%)		
				Initial fueling mode is active)	=FALSE		
				Time counter at end of start Conditions for reset of high-pressure regulation	≥2(sec) =FALSE		
				(Actual number of cylinders with	<8(counts)		
				Desired number of cylinders with injection cut-off	<8(counts)		
) OR			
				End of start is reached) OR	=FALSE		
				Difference between the actual rail pressure and filtered rail pressure			
				(A+B) where in:			
				(A) rail pressure offset during fuel cutoff for activation demand control	=1(MFa)		
				(B) maximum difference between actual rail pressure and set rail pressure for deactivation of MSV if	=1(MPa)		
				fuel cutt off is active			
				(Engine is in running state			
		ECM	A Section 605 of 772	OR	-INUE		717 o

			Crankshaft signal is detected	=TRUE		
) for time	=0,04(sec)		
) OR			
			High pressure pump is not active	=FALSE		
			End of start is reached	=TRUE		
)			
			Start of injection enabled	=TRUE		
			(
			Engine start is in pre-injection mode	=IRUE		
			Injection counter	≥(A+B)		
			(A+B) where in:			
			(A) Number of injections for	=2(counts)		
			enabling high-pressure controller			
			(B) Number of cylinders	=8		
			OR	EAL OF		
			Engine start is not in pre-injection	=FALSE		
			Injection counter	≥2(counts)		
)			
)			
			Engine state of synchronisation for	≥30		
			rail pressure control activation			
			(
			Engine is in running state	=IRUE		
			Crankshaft signal is detected	=TRUE		
)			
			for time	=0,04(sec)		
)			
			for time	=2(sec)		
			No pending or confirmed DTCs	=see sheet inhibit table		
			Basic enable conditions met	=see sheet enable		
				table		
Dath thi	Filtorod volue of the Llich		Common Conditions		6(2)	2 Trip
Plausibility check of High	pressure controller output	>1,3(IVIPa)	Common Conditions		0(S)	∠ i rip
Pressure fuel system where	pressure					
controller output is compared						
calibrated period of time						
			Fuel tank is empty or reserve	=TRUE		

P2C01	Path 2: Plausibility check of High Pressure fuel system where controller output is compared with minimum threshold for	Filtered value of the High pressure controller output pressure	<-7,5(MPa)	Conditions for Plausibility check of Fuel supply system (10(s)	2 Trip
	calibrated period of time			Airbag is activated Rail pressure sensor voltage is not	=FALSE =FALSE		
				plausible			
				Battery voltage	≤655340(mV)		
				Mean value of effective relative	≥7,5(%)		
				Mean value of effective relative	<3071 953(%)		
				volumetric injected fuel mass	<u> </u>		
				Initial fueling mode is active	=FALSE		
				/ Time counter at end of start	≥2(sec)		
				Conditions for reset of high-pressure	=FALSE		
				regulation			
				(
				(
				(
				(Actual number of cylinders with	<8(counte)		
				injection cut-off			
				Desired number of cylinders	<8(counts)		
				with injection cut-off			
) OR			
				End of start is reached	=FALSE		
)			
				OR			
				Difference between the actual rail			
				pressure and filtered rail pressure			
				Setpoint (A+B) where in:			
					=1(MPa)		
				(A) rail pressure offset during fuel			
				cutoff for activation demand control			
				(B) maximum difference between	=1(MPa)		
				actual rail pressure and set rail			
				pressure for deactivation of MSV if			
)			
				(
				High pressure pump is active	=TRUE		
				(
				Engine is in running state	=TRUE		
				OR Orankak oft size al. http://www.com			
				Cranksnatt signal detected	=IKUE		
				, for time	=0.04(sec)		
		FC	CM Section 607 of 772	\	-0,04(000)		719

			OR High pressure pump not active End of start is reached) (=FALSE =TRUE			
			Start of injection is enabled	=TRUE			
			Engine start is in pre-injection	=TRUE			
			mode Injection counter (A+B) where in:	≥(A+B)			
			(A) Number of injections for	=2(counts)			
			(B) Number of cylinders OR	=8			
			Engine start is not in pre-injection	=FALSE			
			Injection counter	≥2(counts)			
) (Engine state of synchronisation for rail pressure control activation	≥30			
			(Engine is in running state	=TRUE			
			Crankshaft signal is detected	=TRUE			
) for time)	=0,04(sec)			
			, for time No pending or confirmed DTCs	=2(sec) =see sheet inhibit table			
			Basic enable conditions met	=see sheet enable table			
Detects if High Pressure fuel system control deviation of rail pressure is lesser than maximum threshold for	Filtered value of rail pressur control deviation	re <-3(MPa)	Conditions for Plausibility check of Fuel supply system (=TRUE	7(s)	1 Trip	
			Airbag is activated Rail pressure sensor voltage is not	=FALSE =FALSE			
			plausible Battery voltage Mean value of effective relative volumetric injected fuel mass	≤655340(mV) ≥7,5(%)			
			Mean value of effective relative	≤3071,953(%)			
			Initial fueling mode is active	=FALSE		700 -	4 004

P228D
) Time counter at end of start Conditions for reset of high-pressure regulation	≥2(sec) =FALSE
(
`(
Actual number of cylinders with	<8(counts)
Desired number of cylinders	<8(counts)
with injection cut-off	(, , , , , , , , , , , , , , , , , , ,
)	
End of start is reached	=FALSE
)	
OR Difference between the actual rail	
pressure and filtered rail pressure	
setpoint	
(A+B) where in:	-1(MPa)
(A) rail pressure offset during fuel	= ((wii u)
cutoff for activation demand control	
(B) maximum difference between actual rail pressure and set rail	=1(MPa)
pressure for deactivation of MSV if	
fuel cutt off is active	
) (
`(
High pressure pump is active	=TRUE
Engine is in running state	=TRUE
OR	
Crankshaft signal is detected	=TRUE
, for time	=0,04(sec)
)	
OR High pressure pump is not active	=FALSE
End of start is reached	=TRUE
)	
(Start of injection enabled	=TRUE
(
(Engine start is in proviniention	
mode	-INUE
Injection counter	≥(A+B)
(A+B) where in:	=2(counts)

(A) Number of injections for

(B) Number of cylinders	=8
) OR	
(Engine start is not in pro-	
injection mode	=FALSE
Injection counter	≥2(counts)
)	
)′	
(Engine state of synchronisation for	>30
rail pressure control activation	230
(
Engine is in running state	=IRUE
Crankshaft signal is detected	=TRUE
) for time	=0,04(sec)
)	, , ,
) for time	-2(sec)
High pressure diagnosis disabled	=FALSE
due to CSERS diagnosis	
(Catalyst heating activated	=FALSE
OR	-
Catalyst heating request by cold	=FALSE
OR	
Time counter at end of start	<2(sec)
OR Plausibility check fuel supply system	=FALSE
active	
OR (
Rail pressure setpoint	≥36(MPa)
OR	
Rail pressure setpoint OR	≤b(MPa)
Absolute of difference between rail	≥15(MPa)
pressure set point and its filtered	
OR	
Engine speed	≤500(rpm)
Coolant temperature at engine	≤-25,04(°C)
)	
OR High pressure regulation is reset	
)	-INOL

				No pending or confirmed DTCs	=see sheet inhibit table		
				Basic enable conditions met	=see sheet enable table		
P228C	Path 1: Detects if High Pressure fuel system control deviation of rail pressure is greater than minimum threshold for	Filtered value of rail pressure control deviation	>3(MPa)	Common conditions		5(s)	1 Trip
	calibrated period of time			Conditions for Plausibility check of Fuel supply system	=TRUE		
				Airbag is activated Rail pressure sensor voltage is not	=FALSE =FALSE		
				plausible Battery voltage Mean value of effective relative volumetric injected fuel mass	≤655340(mV) ≥7,5(%)		
				Mean value of effective relative volumetric injected fuel mass	≤3072(%)		
				Initial fueling mode is active) Time counter at end of start	=FALSE		
				Conditions for reset of high-pressure regulation ((=FALSE		
				Actual number of cylinders with injection cut-off	<8(counts)		
				Desired number of cylinders with injection cut-off) OR	<8(counts)		
				End of start is reached) OR Difference between the actual rail pressure and filtered rail pressure setpoint (A+B) where in:	=FALSE		
				(A) rail pressure offset during fuel cutoff for activation demand control	=1(MPa)		
				(B) maximum difference between actual rail pressure and set rail pressure for deactivation of MSV if fuel cutt off is active	=1(MPa)		

) (
(High pressure pump is active	=TRUE
Engine is in running state	=TRUE
Crankshaft signal is detected	=TRUE
, for time	=0,04(sec)
OR High pressure pump is not active End of start is reached	=FALSE =TRUE
Start of injection enabled	=TRUE
(Engine start is in pre-injection	=TRUE
Injection counter (A+B) where in:	≥(A+B)
(A) Number of injections for	=2(counts)
enabling high-pressure controller (B) Number of cylinders)	=8
OR (Engine start is not in pre-	=FALSE
injection mode Injection counter	≥2(counts)
)) (
Engine state of synchronisation for rail pressure control activation	≥30
(Engine is in running state	=TRUE
Crankshaft signal is detected	=TRUE
for time	=0,04(sec)
) ' for time High pressure diagnosis disabled due to CSERS diagnosis	=2(sec) =FALSE
Catalyst heating activated OR	=FALSE

				Catalyst heating request by cold engine	=FALSE		
				OR Time counter at end of start OR	<2(sec)		
				Plausibility check fuel supply system active OR	=FALSE		
				Rail pressure setpoint	≥36(MPa)		
				Rail pressure setpoint OR	≤6(MPa)		
				Absolute of difference between rail pressure set point and its filtered value OR	≥15(MPa)		
				Engine speed Coolant temperature at engine output)	≤500(rpm) ≤-25,04(°C)		
				OR High pressure regulation is reset	=TRUE		
) Fuel tank is empty or reserve No pending or confirmed DTCs	=FALSE =see sheet inhibit table		
				Basic enable conditions met	=see sheet enable table		
	Path 2: Detects if High Pressure fuel system control deviation of rail pressure is greater than minimum threshold for calibrated period of time during fuel tank is empty or reserve	Filtered value of rail pressure control deviation	>3(MPa)	Common conditions		5(s)	
	state			Fuel tank is empty or reserve	=TRUE		
P2C9F	Detects if High Pressure fuel system control deviation of rail pressure is lesser than maximum threshold for calibrated period of time	Filtered value of rail pressure control deviation	<-3(MPa)	Conditions for Plausibility check of Fuel supply system (=TRUE	7(s)	1 Trip
				Airbag is activated Rail pressure sensor voltage is not plausible	=FALSE =FALSE		
		EC	CM Section 613 of 772	Battery voltage Mean value of effective relative volumetric injected fuel mass	≤655340(mV) ≥7,5(%)		725 of

Mean value of effective relative	≤3071,953(%)
volumetric injected fuel mass	
Initial fueling mode is active	=FALSE
Time counter at end of start	≥2(sec)
Conditions for reset of high-pressure regulation	=FALSE
(
(
(
(Actual number of outlinders with	(0)
Actual humber of cylinders with	<o(counts)< td=""></o(counts)<>
Desired number of cylinders	<8(counts)
with injection cut-off	(0001110)
) OB	
End of start is reached	=FALSE
) OB	
Difference between the actual rail	
pressure and filtered rail pressure	
setpoint	
(A+B) where in:	
	=1(MPa)
(A) rail pressure offset during fuel	
Cutoff for activation demand control	
(B) maximum difference between	
pressure for deactivation of MSV if	
fuel cutt off is active	
)	
(
(
High pressure pump is active	=TRUE
(
Engine is in running state	=IRUE
Crankshaft signal is detected	=TRUE
for time	=0.04(sec)
)	
OR	
High pressure pump is not active	=FALSE
End of start is reached	=TRUE
)	
Start of injection enabled	=TRUE
(
(
Engine start is in pre-injection	=TRUE
mode	
Injection counter	≥(A+B)

١

	=2(counts)
(A) Number of injections for	
enabling high-pressure controller	
(B) Number of cylinders	=8
)	
OR	
(
Engine start is not in pre-	=FALSE
Injection mode	$\Sigma^{(ac)}$
Injection counter	≥∠(counts)
)	
)	
)	
(Engine state of synchronisation for	>30
rail pressure control activation	200
(
Engine is in running state	=TRUE
OR	
Crankshaft signal is detected	=TRUE
)	
for time	=0,04(sec)
)	
)	
for time	=2(sec)
High pressure diagnosis disabled	=FALSE
due to CSERS diagnosis	
(
Catalyst heating activated	=FALSE
OR	541.05
Catalyst heating request by cold	=FALSE
engine	
UR Time counter at and of start	(2000)
	<2(Sec)
Plausibility check fuel supply system	-FALSE
active	
OR	
(
Rail pressure setpoint	≥36(MPa)
OR	
Rail pressure setpoint	≤6(MPa)
OR	
Absolute of difference between rail	≥15(MPa)
pressure set point and its filtered	
value	
OR	
Engine speed	≤500(rpm)
Coolant temperature at engine	≤-25,04(°C)
output	
) OB	
UR High proceure regulation is react	
right pressure regulation is reset	=IRUE

				No pending or confirmed DTCs	=see sheet inhibit table		
				Basic enable conditions met	=see sheet enable table		
P2CA0	Path 1: Detects if High Pressure fuel system control deviation of rail pressure is greater than minimum threshold for	Filtered value of rail pressure control deviation	>3(MPa)	Common conditions		5(s)	1 Trip
	calibrated period of time			Conditions for Plausibility check of Fuel supply system	=TRUE		
				Airbag is activated	=FALSE		
				Rail pressure sensor voltage is not plausible	=FALSE		
				Battery voltage	≤655340(mV)		
				Mean value of effective relative	≥7,5(%)		
				Volumetric injected fuel mass Mean value of effective relative	≤3071,953(%)		
				Initial fueling mode is active	=FALSE		
				, Time counter at end of start	≥2(sec)		
				Conditions for reset of high-pressure regulation	=FÀLSÉ		
				(
				`(
				Actual number of cylinders with injection cut-off	<8(counts)		
				Desired number of cylinders with injection cut-off	<8(counts)		
)			
				End of start is reached	=FALSE		
) OR Difference between the estual rail			
				pressure and filtered rail pressure			
				setpoint (A+B) where in:			
					=1(MPa)		
				(A) rail pressure offset during fuel			
				(B) maximum difference between	=1(MPa)		
				actual rail pressure and set rail			
				pressure for deactivation of MSV if			
				fuel cutt off is active			

) (
(High pressure pump is active	=TRUE
Engine is in running state	=TRUE
Crankshaft signal is detected	=TRUE
, for time	=0,04(sec)
OR High pressure pump is not active End of start is reached	=FALSE =TRUE
Start of injection enabled	=TRUE
(Engine start is in pre-injection	=TRUE
Injection counter (A+B) where in:	≥(A+B)
(A) Number of injections for	=2(counts)
enabling high-pressure controller (B) Number of cylinders)	=8
OR (Engine start is not in pre-	=FALSE
injection mode Injection counter	≥2(counts)
)) (
Engine state of synchronisation for rail pressure control activation	≥30
(Engine is in running state	=TRUE
Crankshaft signal is detected	=TRUE
for time	=0,04(sec)
) ' for time High pressure diagnosis disabled due to CSERS diagnosis	=2(sec) =FALSE
Catalyst heating activated OR	=FALSE

Catalyst heating request by cold engine OR		Catalyst heating request by cold engine OR	=FALSE				
				Time counter at end of start OR	<2(sec)		
				Plausibility check fuel supply system active OR	=FALSE		
				(Rail pressure setpoint OR	≥36(MPa)		
				Rail pressure setpoint OR	≤6(MPa)		
				Absolute of difference between rail pressure set point and its filtered value OR	≥15(MPa)		
				Engine speed Coolant temperature at engine output	≤500(rpm) ≤-25,04(°C)		
				OR High pressure regulation is reset	=TRUE		
				, Fuel tank is empty or reserve No pending or confirmed DTCs	=FALSE =see sheet inhibit table		
				Basic enable conditions met	=see sheet enable table		
	Path 2: Detects if High Pressure fuel system control deviation of rail pressure is greater than minimum threshold for calibrated period of time during fuel tank is empty or reserve	Filtered value of rail pressure control deviation	>3(MPa)	Common conditions		5(s)	
	state			Fuel tank is empty or reserve	=TRUE		
P00C6	Fuel Rail Pressure Too Low - Engine Cranking Bank 1	High pressure start	=FALSE	Engine is in standby state	=TRUE	0.1(s)	2 Trip
		(Condition calucation of diagnosis	=FALSE		
		Fuel rail pressure (see Look-Up-Table #28)	<7 to 20(MPa)	nign pressure start is stopped Engine temperature for diagnosis start with high fuel pressure	≤142,96(°C)		

for number of synchronous counts (see Look-Up-Table #26)	=150(counts)	Engine temperature for diagnosis start with high fuel pressure	>-42,54(°C)
OR (Release condition for all high pressure starts (=TRUE
(Fuel rail pressure (see Look-Up-Table #28)	<7 to 20(MPa)	(Engine is in ready state	=TRUE
OR		OR	
Filtered rail pressure)	<1,5(MPa)		
Engine is running)	=TRUE	Injection is not released	=TRUE
for time (Max. waiting time for high fuel pressure) (see Look-Up-Table #29)	=5 to 10(sec))	
OR		Temperature for upper threshold high	<142,96(°C)
(Temperature for lowe threshold high	≥-60,04(°C)
Fuel rail pressure (see Look-Up-Table #28)	≥7 to 20(MPa)	Condition disable flow of high pressure pump	=FALSE
and		(
Filtered rail pressure	<1,5(MPa)	Voltage rail pressure sensor not	=FALSE
)		Airbag activated	=FALSE
,		Battery voltage	≤655340(mV)
)	
		Condition hot start (=FALSE
		Engine temperature	<89,96(°C)
		Integrated air mass flow from engine start to maximum value) (>0,55(kg)
		Condition end of start for activation of	=TRUE
		Condition enable start injection	=TRUE
) OR Engine is in ready state	
			= I KUE
			=TRUE

			(Start type from the start coordinator indicates no start OR (Start type from the start coordinator indicates low pressure start	=TRUE =FALSE
			Start type from the start coordinator indicates preijections with low pressure start)	=FALSE
) Filtered fuel rail pressure real value (absolute pressure) No pending or confirmed DTCs	≤1.5(Mpa) =see sheet inhibit tables
			Basic enable conditions met	=see sheet enable tables
Monitoring of preinjection with	Preinjection with low pressure	=FALSE	Engine is in standby state	=TRUE
low pressure	(Condition calucation of diagnosis	=FALSE
	Start temperature for the start co-ordinator OR	≥-10,54(°C)	Engine temperature for diagnosis start with high fuel pressure Engine temperature for diagnosis	≤142,96(°C) >-42,54(°C)
	Injection counter	≥A * B(counts)	start with high fuel pressure Release condition for all high pressure starts	=TRUE
	where A: Number of working cycle during preinjection (see Look-Up-Table #27)	=0 to 1(cycle)	(
	B: Number of cylinder		(
	OR State of EPM operation mode is in Backup camshaft mode OR	=TRUE	Engine is in ready state OR	=TRUE
	Repeated cold start	=TRUE	Injection is not released	=TRUE
	/) Temperature for upper threshold high	-142 Q6(°C)
			pressure start	
			I emperature for lowe threshold high	≥-60,04(°C)

				Condition disable flow of high pressure pump	=FALSE		
				(Voltage rail pressure sensor not plausible	=FALSE		
				Airbag activated	=FALSE		
				Battery voltage	≤655340(mV)		
)			
				Condition hot start	=FALSE		
				(Engine temperature OR	<89,96(°C)		
				Integrated air mass flow from engine start to maximum value	>0,55(kg)		
) ((
				Condition end of start for activation of md structure	=TRUE		
				Condition enable start injection)	=TRUE		
				OR Engine is in ready state	=TRUE		
) (High prossure start request	=TRUE		
				(
				Start type from the start coordinator indicates low pressure start	=TRUE		
)			
				, No pending or confirmed DTCs	=see sheet inhibit tables		
				Basic enable conditions met	=see sheet enable tables		
P01CA	Fuel Rail Pressure Too Low -	High pressure start	=FALSE	Engine is in standby state	=TRUE	0.1(s)	2 Trip
	Engine Granking Bank 2						
		(Condition calucation of diagnosis	=FALSE		
		Fuel rail pressure (see Look-Up-Table #28)	<7 to 20(MPa)	Engine temperature for diagnosis start with high fuel pressure	≤142,96(°C)		

250BDG07A P	ant 2 ECIVI Summary	Tables	
for number of synchronous counts (see Look-Up-Table #26)	=150(counts)	Engine temperature for diagnosis start with high fuel pressure	>-42,54(°C)
OR ((Release condition for all high pressure starts ((=TRUE
Fuel rail pressure (see Look-Up-Table #28)	<7 to 20(MPa)	Engine is in ready state	=TRUE
OR		OR	
Filtered rail pressure	<1,5(MPa)		
) Engine is running	=TRUE	Injection is not released	=TRUE
) for time (Max. waiting time for high fuel pressure) (see Look-Up-Table #29)	=5 to 6(sec))	
OR		Temperature for upper threshold high	<142,96(°C)
(pressure start Temperature for lowe threshold high	≥-60,04(°C)
Fuel rail pressure (see Look-Up-Table #28)	≥7 to 20(MPa)	pressure start Condition disable flow of high pressure pump	=FALSE
and		(
Filtered rail pressure	<1,5(MPa)	Voltage rail pressure sensor not plausible	=FALSE
)		Airbag activated	=FALSE
)		and Battery voltage)	≤655340(mV)
) Condition hot start	=FALSE
		C Engine temperature	<89,96(°C)
		Integrated air mass flow from engine start to maximum value	>0,55(kg)
		, ((
		 Condition end of start for activation of md structure 	=TRUE
		Condition enable start injection	=TRUE
		Engine is in ready state	=TRUE

			(High pressure start request (=TRUE
			Start type from the start coordinator indicates no start OR	=TRUE
			(Start type from the start coordinator indicates low pressure start	=FALSE
			Start type from the start coordinator indicates preijections with low pressure start))	=FALSE
) Filtered fuel rail pressure real value (absolute pressure) No pending or confirmed DTCs	≤1.5(Mpa) =see sheet inhibit
				Iduics
			Basic enable conditions met	=see sheet enable tables
Monitoring of preinjection with	Preinjection with low pressure	=FALSE	Engine is in standby state	=TRUE
Monitoring of preinjection with low pressure	Preinjection with low pressure is active (=FALSE	Engine is in standby state Condition calucation of diagnosis	=TRUE =FALSE
Monitoring of preinjection with low pressure	Preinjection with low pressure is active (Start temperature for the start co-ordinator	=FALSE ≥-10,54(°C)	Engine is in standby state Condition calucation of diagnosis high pressure start is stopped Engine temperature for diagnosis start with high fuel pressure	=TRUE =FALSE ≤142,96(°C)
Monitoring of preinjection with low pressure	Preinjection with low pressure is active (Start temperature for the start co-ordinator OR	=FALSE ≥-10,54(°C)	Engine is in standby state Condition calucation of diagnosis high pressure start is stopped Engine temperature for diagnosis start with high fuel pressure Engine temperature for diagnosis start with high fuel pressure	=TRUE =FALSE ≤142,96(°C) >-42,54(°C)
Monitoring of preinjection with low pressure	Preinjection with low pressure is active (Start temperature for the start co-ordinator OR Injection counter	=FALSE ≥-10,54(°C) ≥A * B(counts)	Engine is in standby state Condition calucation of diagnosis high pressure start is stopped Engine temperature for diagnosis start with high fuel pressure Engine temperature for diagnosis start with high fuel pressure Release condition for all high pressure starts	=TRUE =FALSE ≤142,96(°C) >-42,54(°C) =TRUE
Monitoring of preinjection with low pressure	Preinjection with low pressure is active (Start temperature for the start co-ordinator OR Injection counter where	=FALSE ≥-10,54(°C) ≥A * B(counts)	Engine is in standby state Condition calucation of diagnosis high pressure start is stopped Engine temperature for diagnosis start with high fuel pressure Engine temperature for diagnosis start with high fuel pressure Release condition for all high pressure starts	=TRUE =FALSE ≤142,96(°C) >-42,54(°C) =TRUE
Monitoring of preinjection with low pressure	Preinjection with low pressure is active (Start temperature for the start co-ordinator OR Injection counter where A: Number of working cycle during preinjection (see Look-Up-Table #27)	=FALSE ≥-10,54(°C) ≥A * B(counts) =0 to 1(cycle)	Engine is in standby state Condition calucation of diagnosis high pressure start is stopped Engine temperature for diagnosis start with high fuel pressure Engine temperature for diagnosis start with high fuel pressure Release condition for all high pressure starts	=TRUE =FALSE ≤142,96(°C) >-42,54(°C) =TRUE
Monitoring of preinjection with low pressure	Preinjection with low pressure is active (Start temperature for the start co-ordinator OR Injection counter where A: Number of working cycle during preinjection (see Look-Up-Table #27) B: Number of cylinder	=FALSE ≥-10,54(°C) ≥A * B(counts) =0 to 1(cycle)	Engine is in standby state Condition calucation of diagnosis high pressure start is stopped Engine temperature for diagnosis start with high fuel pressure Engine temperature for diagnosis start with high fuel pressure Release condition for all high pressure starts (=TRUE =FALSE ≤142,96(°C) >-42,54(°C) =TRUE
Monitoring of preinjection with low pressure	Preinjection with low pressure is active (Start temperature for the start co-ordinator OR Injection counter where A: Number of working cycle during preinjection (see Look-Up-Table #27) B: Number of cylinder OR State of EPM operation mode is in Backup camshaft mode OR	=FALSE ≥-10,54(°C) ≥A * B(counts) =0 to 1(cycle) =TRUE	Engine is in standby state Condition calucation of diagnosis high pressure start is stopped Engine temperature for diagnosis start with high fuel pressure Engine temperature for diagnosis start with high fuel pressure Release condition for all high pressure starts ((Engine is in ready state OR	=TRUE =FALSE ≤142,96(°C) >-42,54(°C) =TRUE =TRUE
Monitoring of preinjection with low pressure	Preinjection with low pressure is active (Start temperature for the start co-ordinator OR Injection counter where A: Number of working cycle during preinjection (see Look-Up-Table #27) B: Number of cylinder OR State of EPM operation mode is in Backup camshaft mode OR Repeated cold start	=FALSE ≥-10,54(°C) ≥A * B(counts) =0 to 1(cycle) =TRUE =TRUE	Engine is in standby state Condition calucation of diagnosis high pressure start is stopped Engine temperature for diagnosis start with high fuel pressure Engine temperature for diagnosis start with high fuel pressure Release condition for all high pressure starts (=TRUE =FALSE ≤142,96(°C) >-42,54(°C) =TRUE =TRUE
Monitoring of preinjection with low pressure	Preinjection with low pressure is active (Start temperature for the start co-ordinator OR Injection counter where A: Number of working cycle during preinjection (see Look-Up-Table #27) B: Number of cylinder OR State of EPM operation mode is in Backup camshaft mode OR Repeated cold start)	=FALSE ≥-10,54(°C) ≥A * B(counts) =0 to 1(cycle) =TRUE =TRUE	Engine is in standby state Condition calucation of diagnosis high pressure start is stopped Engine temperature for diagnosis start with high fuel pressure Engine temperature for diagnosis start with high fuel pressure Release condition for all high pressure starts ((Engine is in ready state OR Injection is not released	=TRUE =FALSE ≤142,96(°C) >-42,54(°C) =TRUE =TRUE

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					Temperature for lowe threshold high pressure start Condition disable flow of high pressure pump (Voltage rail pressure sensor not plausible Airbag activated Battery voltage)) Condition hot start (Engine temperature OR	≥-60,04(°C) =FALSE =FALSE ≤655340(mV) =FALSE <89,96(°C)		
					Integrated air mass flow from engine start to maximum value) ((>0,55(kg)		
					Condition end of start for activation of md structure Condition enable start injection	=TRUE =TRUE		
					OR Engine is in ready state	=TRUE		
) (High pressure start request	=TRUE		
					(Start type from the start coordinator indicates low pressure start	=TRUE		
)			
					No pending or confirmed DTCs	=see sheet inhibit tables		
					Basic enable conditions met	=see sheet enable tables		
78. FUEL PRESSURE REGULATOR ELECTRICAL	P10E8	Diagnoses the fuel quantity control valve for short circuit fault between the high side and low side of the driver circuit	Voltage low during driver OFF state (indicates short circuit to ground)	Short to ground: ≤ 0.5 Ω impedance between ECU pin and ground	Battery voltage	≥10900(mV)	20(s)	1 Trip
CHECKS			OR		Battery voltage	<655340(mV)		

			250BDG07	A Part 2 ECM Summary	Tables			
			Voltage high during driver ON state (indicates short circuit to battery)	Short to power: ≤ 0.5 Ω impedance between ECU pin and injector supply voltage	Engine speed	≥80(rpm)		
					Basic enable conditions met	=see sheet enable tables		
					No pending or confirmed DTCs	=see sheet inhibit tables		
ĺ	P00CA	Diagnoses the fuel quantity control valve for short circuit to battery fault at the high side of the driver circuit	Short Circuit on the High Side will be registered if the MSV is actuated and a short circuit to ground or battery of the High Side of the electrical circuit to control the mass flow valve is detected	TRUE	Battery voltage	≥10,9(V)	20(event)	1 Trip
					Battery voltage WDA inactive Basic enable conditions met	<655,34(V) =TRUE =see sheet enable tables		
					No pending or confirmed DTCs	=see sheet inhibit tables		
	P00C9	Diagnoses the fuel quantity control valve for short circuit to ground fault at the high side of the driver circuit	Voltage low during driver OFF state (indicates short circuit to ground)	Short to ground: ≤ 0.5 Ω impedance between ECU pin and ground	Battery voltage	≥10900(mV)	20(event)	1 Trip
					Battery voltage Engine speed Basic enable conditions met	<655340(mV) ≥80(rpm) =see sheet enable		
					No pending or confirmed DTCs	=see sheet inhibit tables		
	P0090	Detects open circuit error of fuel quantity control valve when there is high current flowing through the driver circuit	Voltage low during driver OFF state (indicates open circuit)	Open Circuit: ≥ 200 K Ω impedance between ECU pin and load	Battery voltage	≥10900(mV)	20(s)	1 Trip
					Battery voltage Engine speed Basic enable conditions met	<655340(mV) ≥80(rpm) =see sheet enable tables		
					No pending or confirmed DTCs	=see sheet inhibit tables		

		250BDG07	A Part 2 ECM Summary	Tables			
P0092	Diagnoses the fuel quantity control valve for short circuit to battery fault at the low side of the driver circuit	Voltage high during driver ON state (indicates short circuit to battery)	Short to power: ≤ 0.5 Ω impedance between ECU pin and injector supply voltage	Battery voltage	≥10900(mV)	20(event)	1 Trip
				Battery voltage Engine speed Basic enable conditions met	<655340(mV) ≥80(rpm) =see sheet enable tables		
				No pending or confirmed DTCs	=see sheet inhibit tables		
P0091	Diagnoses the fuel quantity control valve for short circuit to ground fault at the low side of the driver circuit	Voltage low during driver OFF state (indicates short circuit to ground)	Short to ground: ≤ 0.5 Ω impedance between ECU pin and ground	Battery voltage	≥10900(mV)	20(event)	1 Trip
				Battery voltage	<655340(mV)		
				Engine speed	≥80(rpm)		
				Basic enable conditions met	=see sheet enable		
				No pending or confirmed DTCs	=see sheet inhibit		
				1 0	tables		
P313A	Diagnoses the fuel quantity	Voltage low during driver OFF	Short to ground: ≤ 0.5	Battery voltage	≥10900(mV)	20(s)	1 Trip
	control valve for short circuit fault between the high side and low side of the driver circuit	state (indicates short circuit to ground)	Ω impedance between ECU pin and ground				
		OR Voltage high during driver ON state (indicates short circuit to battery)	Short to power: ≤ 0.5 Ω impedance between ECU pin and	Battery voltage Engine speed	<655340(mV) ≥80(rpm)		
			injector supply voltage	Basic enable conditions met	=see sheet enable		
				No pending or confirmed DTCs	=see sheet inhibit tables		
P3139	Diagnoses the fuel quantity control valve for short circuit to battery fault at the high side of the driver circuit	Short Circuit on the High Side will be registered if the MSV is actuated and a short circuit to ground or battery of the High Side of the electrical circuit to control the mass flow valve is detected	TRUE	Battery voltage	≥10,9(V)	20(event)	1 Trip
				Battery voltage WDA inactive Basic enable conditions met	<655,34(V) =TRUE =see sheet enable		
				No pending or confirmed DTCs	tables =see sheet inhibit		
					tables		

P3138	Diagnoses the fuel quantity control valve for short circuit to ground fault at the high side of the driver circuit	Voltage low during driver OFF state (indicates short circuit to ground)	Short to ground: ≤ 0.5 Ω impedance between ECU pin and ground	Battery voltage Battery voltage Engine speed Basic enable conditions met No pending or confirmed DTCs	≥10900(mV) <655340(mV) ≥80(rpm) =see sheet enable tables =see sheet inhibit tables	20(event)	1 Trip
P2C02	Detects open circuit error of fuel quantity control valve when there is high current flowing through the driver circuit	Voltage low during driver OFF state (indicates open circuit)	Open Circuit: ≥ 200 K Ω impedance between ECU pin and load	Battery voltage Battery voltage Engine speed Basic enable conditions met No pending or confirmed DTCs	≥10900(mV) <655340(mV) ≥80(rpm) =see sheet enable tables =see sheet inhibit tables	20(s)	1 Trip
P2C04	Diagnoses the fuel quantity control valve for short circuit to battery fault at the low side of the driver circuit	Voltage high during driver ON state (indicates short circuit to battery)	Short to power: ≤ 0.5 Ω impedance between ECU pin and injector supply voltage	Battery voltage Battery voltage Engine speed Basic enable conditions met No pending or confirmed DTCs	≥10900(mV) <655340(mV) ≥80(rpm) =see sheet enable tables =see sheet inhibit tables	20(event)	1 Trip
P2C03	Diagnoses the fuel quantity control valve for short circuit to ground fault at the low side of the driver circuit	Voltage low during driver OFF state (indicates short circuit to ground)	Short to ground: ≤ 0.5 Ω impedance between ECU pin and ground	Battery voltage Battery voltage Engine speed Basic enable conditions met No pending or confirmed DTCs	≥10900(mV) <655340(mV) ≥80(rpm) =see sheet enable tables =see sheet inhibit tables	20(event)	1 Trip

79. CCM – FUEL PUMP – FTZM	P12A6	ECM command state for pump does not match feedback value from FTZM_Information_2_S1 signal FTZMSnsdFuelCtIEnblAtv "Fuel Tank Zone Module Sensed Fuel Control Enable Active"	Status of Pre supply pump is not plausible with the status received from the Communication module	=TRUE	Rationality check for Pre-Supply pump diagnosis is active	=TRUE	2(s)	1 Trip
					No pending or confirmed DTCs	=see sheet inhibit		
					Basic enable conditions met	=see sheet enable tables		
	P129F	Commanded pump speed in ECM does not match feedback value from FTZM_Information_8_S1 signal FTZMBrshFPmpSnsdSpd "Fuel Tank Zone Module Brushless Fuel Pump Sensed Speed" - feedback speed too high	Difference between actual Pre Supply Pump speed and Pre Supply Pump speed converted from PWM value	>300(rpm)	Rationality check for Pre-Supply pump diagnosis is active	=TRUE	3(s)	2 Trip
		g.i			No pending or confirmed DTCs	=see sheet inhibit tables		
					Basic enable conditions met	=see sheet enable tables		
	P129F	Commanded pump speed in ECM does not match feedback value from FTZM_Information_8_S1 signal FTZMBrshFPmpSnsdSpd "Fuel Tank Zone Module Brushless Fuel Pump Sensed Speed" - feedback speed too low	Difference between Pre Supply Pump speed converted from PWM value and actual Pre Supply Pump speed	>300(rpm)	Rationality check for Pre-Supply pump diagnosis is active	=TRUE	3(s)	2 Trip
					No pending or confirmed DTCs	=see sheet inhibit tables		
					Basic enable conditions met	=see sheet enable tables		
	P3188	Filtered fuel pressure deviation in the low pressure fuel system is lesser than calibrated threshold for calibrated period of time	Filtered fuel pressure deviation in the low pressure system	<-50(kPa)	Electrical fuel pump operational mode is in closed loop control	=TRUE	10(s)	2 Trip
					Fuel flow demand of electrical fuel	≥0,1(l/h)		
			ECM	Section 628 of 772	pump			740 of 1

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				Engine is running state Pre-Supply pump is ON)	=TRUE =TRUE		
				No pending or confirmed DTCs	=see sheet inhibit tables		
				Basic enable conditions met	=see sheet enable tables		
P3187	Filtered fuel pressure deviation in the low pressure fuel system is greater than calibrated threshold for calibrated period of time	Filtered fuel pressure deviation in the low pressure system	>50(kPa)	Electrical fuel pump operational mode is in closed loop control	=TRUE	10(s)	2 Trip
				(Fuel flow demand of electrical fuel	≥0,1(l/h)		
				Engine is running state Pre-Supply pump is ON	=TRUE =TRUE		
				/ No pending or confirmed DTCs	=see sheet inhibit tables		
				Basic enable conditions met	=see sheet enable tables		
P3187	Error check for diagnosis of a governor output value that is too high	Filtered governor output value for the low pressure fuel system	>250(kPa)	Operation mode of the electrical fuel pump control	=5(-)	10000(msec)	2 Trip
				Dynamic Diagnosis of fuel low pressure sensor active (Intrusive flag	=FALSE(-)		
				Ignition is on No pending or confirmed DTCs	=TRUE(-) =see sheet inhibit tables		
P3188	Error check for diagnosis of a governor output value that is too little	Filtered governor output value for the low pressure fuel system	<-250(kPa)	Operation mode of the electrical fuel pump control	=5(-)	10000(msec)	2 Trip
				Dynamic Diagnosis of fuel low pressure sensor active (Intrusive flag	=FALSE(-)		
				Ignition is on No pending or confirmed DTCs	=TRUE(-) =see sheet inhibit tables		
P102B	Monitoring of FTZM fuel pump output for circuits high fault	Fuel Tank Zone Module(FTZM) fuel pump	=TRUE	Ignition ON	=TRUE	0,5(s)	1 Trip
		output is shorted to battery		No pending or confirmed DTCs	=see sheet inhibit		

					Basic enabling conditions are met	=see sheet enable tables		
	P102A	Monitoring of FTZM fuel pump output for circuits low fault	Fuel Tank Zone Module(FTZM) fuel pump	=TRUE	Ignition ON	=TRUE	0,5(s)	1 Trip
			output is shorted to ground		No pending or confirmed DTCs	=see sheet inhibit tables		
					Basic enabling conditions are met	=see sheet enable tables		
	P1029	Monitoring of FTZM fuel pump output for circuits open fault	Fuel Tank Zone Module(FTZM) fuel pump	=TRUE	Ignition ON	=TRUE	0,5(s)	1 Trip
			output onoun to opened		No pending or confirmed DTCs	=see sheet inhibit		
					Basic enabling conditions are met	=see sheet enable tables		
80. CCM – FTZM INTERNAL PERFORMAN	P1005	Monitoring of FTZM fuel pump driver contol module for too many unexpected resets	Fuel Pump driver contol module too many resets is detected	=TRUE	Ignition ON	=TRUE	0,5(s)	1 Trip
CE					No pending or confirmed DTCs	=see sheet inhibit tables		
					Basic enabling conditions are met	=see sheet enable tables		
	P1255	Monitoring of FTZM fuel pump output for over temperature fault	Fuel Tank Zone Module(FTZM) over temperature is detected	=TRUE	Ignition ON	=TRUE	0,5(s)	2 Trip
					No pending or confirmed DTCs	=see sheet inhibit tables		
					Basic enabling conditions are met	=see sheet enable tables		
	U101A	FTZM communication fault check	FTZM configuration error	=TRUE	Ignition is ON	=TRUE	0,1(s)	2 Trip
					Battery Voltage	≥9000(mV)		
				ECM Section 630 of 772	Basic enable conditions are met	=see sheet enable tables		742 o

81. CCM – CAMSHAFT POSITION ACTUATOR - INTAKE B1	P2089	Diagnoses the "A" Camshaft Position Actuator Bank 1 low side driver circuit for short circuit to battery faults.	Voltage high during driver on state (indicates short-to-power)	Short to power: ≤ 0.5 Ω impedance between signal and controller power	Ignition is ON	=TRUE	1(s)	2 Trip
DIAGNOSIS					ECU is in drive state Engine Speed Battery Voltage Battery Voltage No pending or confirmed DTCs Basic enable conditions met	=TRUE ≥80(rpm) >10900(mV) <25500(mV) =see sheet inhibit tables =see sheet enable		
						tables		
	P2088	Diagnoses the "A" Camshaft Position Actuator Bank 1 low side driver circuit for short circuit to ground faults.	Voltage low during driver off state (indicates short-to- ground)	Short to ground: ≤ 0.5 Ω impedance between signal and controller ground	Ignition is ON	=TRUE	0,2(s)	2 Trip
					ECU is in drive state Engine Speed Battery Voltage Battery Voltage No pending or confirmed DTCs	=TRUE ≥80(rpm) >10900(mV) <25500(mV) =see sheet inhibit tables		
					Basic enable conditions met	=see sheet enable tables		
	P0010	Diagnoses the "A" Camshaft Position Actuator Bank 1 low side driver circuit for open circuit faults	Voltage low during driver off state (indicates open circuit)	Open Circuit : ≥ 200 KΩ impedance between ECU pin and load	Ignition is ON	=TRUE	1(s)	2 Trip
					ECU is in drive state Engine Speed Battery Voltage Battery Voltage No pending or confirmed DTCs	=TRUE ≥80(rpm) >10900(mV) <25500(mV) =see sheet inhibit		
					Basic enable conditions met	=see sheet enable tables		
82. CCM – CAMSHAFT POSITION ACTUATOR - INTAKE B2	P2093	Diagnoses the "A" Camshaft Position Actuator Bank 2 low side driver circuit for short circuit to battery faults.	Voltage high during driver on state (indicates short-to-power)	Short to power: ≤ 0.5 Ω impedance between signal and controller power	Ignition is ON	=TRUE	1(s)	2 Trip
ELECTRICAL			EC	CM Section 631 of 772	ECU is in drive state	=TRUE >80(rnm)		743 of 1,09

			250BDG07/	A Part 2 ECM Summary	Tables			
					Battery Voltage Battery Voltage No pending or confirmed DTCs Basic enable conditions met	>10900(mV) <25500(mV) =see sheet inhibit tables =see sheet enable tables		
	P2092	Diagnoses the "A" Camshaft Position Actuator Bank 2 low side driver circuit for short circuit to ground faults.	Voltage low during driver off state (indicates short-to- ground)	Short to ground: ≤ 0.5 Ω impedance between signal and controller ground	Ignition is ON ECU is in drive state Engine Speed Battery Voltage Battery Voltage No pending or confirmed DTCs Basic enable conditions met	=TRUE =TRUE ≥80(rpm) >10900(mV) <25500(mV) =see sheet inhibit tables =see sheet enable tables	0,2(s)	2 Trip
	P0020	Diagnoses the "A" Camshaft Position Actuator Bank 2 low side driver circuit for open circuit faults	Voltage low during driver off state (indicates open circuit)	Open Circuit : ≥ 200 KΩ impedance between ECU pin and load	Ignition is ON ECU is in drive state Engine Speed Battery Voltage Battery Voltage No pending or confirmed DTCs Basic enable conditions met	=TRUE =TRUE ≥80(rpm) >10900(mV) <25500(mV) =see sheet inhibit tables =see sheet enable tables	1(s)	2 Trip
83. CCM – CAMSHAFT POSITION ACTUATOR - EXHAUST B1 ELECTRICAL DIAGNOSIS	P2091	Diagnoses the "B" Camshaft Position Actuator Bank 1 low side driver circuit for short circuit to battery faults.	Voltage high during driver on state (indicates short-to-power)	Short to power: ≤ 0.5 Ω impedance between signal and controller power	Ignition is ON ECU is in drive state Engine Speed Battery Voltage Battery Voltage No pending or confirmed DTCs Basic enable conditions met	=TRUE =TRUE ≥80(rpm) >10900(mV) <25500(mV) =see sheet inhibit tables =see sheet enable tables	1(s)	2 Trip

			250BDG07	A Part 2 ECM Summary	Tables			
	P2090	Diagnoses the "B" Camshaft Position Actuator Bank 1 low side driver circuit for short circuit to ground faults.	Voltage low during driver off state (indicates short-to- ground)	Short to ground: ≤ 0.5 Ω impedance between signal and controller ground	Ignition is ON	=TRUE	0,2(s)	2 Trip
					ECU is in drive state Engine Speed Battery Voltage Battery Voltage No pending or confirmed DTCs Basic enable conditions met	=TRUE ≥80(rpm) >10900(mV) <25500(mV) =see sheet inhibit tables =see sheet enable tables		
	P0013	Diagnoses the "B" Camshaft Position Actuator Bank 1 low side driver circuit for open circuit faults	Voltage low during driver off state (indicates open circuit)	Open Circuit : ≥ 200 KΩ impedance between ECU pin and load	Ignition is ON	=TRUE	1(s)	2 Trip
					ECU is in drive state Engine Speed Battery Voltage Battery Voltage No pending or confirmed DTCs Basic enable conditions met	=TRUE ≥80(rpm) >10900(mV) <25500(mV) =see sheet inhibit tables =see sheet enable tables		
84. CCM – CAMSHAFT POSITION CTUATOR - XHAUST B2 LECTRICAL DIAGNOSIS	P2095	Diagnoses the "B" Camshaft Position Actuator Bank 2 low side driver circuit for short circuit to battery faults.	Voltage high during driver on state (indicates short-to-power)	Short to power: ≤ 0.5 Ω impedance between signal and controller power	Ignition is ON ECU is in drive state Engine Speed	=TRUE =TRUE ≥80(rpm)	1(s)	2 Trip
					Battery Voltage Battery Voltage No pending or confirmed DTCs Basic enable conditions met	>10900(mV) <25500(mV) =see sheet inhibit tables =see sheet enable tables		
	P2094	Diagnoses the "B" Camshaft Position Actuator Bank 2 low side driver circuit for short circuit to ground faults.	Voltage low during driver off state (indicates short-to- ground)	Short to ground: ≤ 0.5 Ω impedance between signal and controller ground	Ignition is ON	=TRUE	0,2(s)	2 Trip
			FC	M Section 633 of 772	ECU is in drive state Engine Speed Battery Voltage Battery Voltage	=TRUE ≥80(rpm) >10900(mV) <25500(mV)		745 of 1 (

			250BDG07	7A Part 2 ECM Summary	Tables			
					No pending or confirmed DTCs	=see sheet inhibit tables		
					Basic enable conditions met	=see sheet enable tables		
I	P0023	Diagnoses the "B" Camshaft Position Actuator Bank 2 low side driver circuit for open circuit faults	Voltage low during driver off state (indicates open circuit)	Open Circuit : ≥ 200 KΩ impedance between ECU pin and load	Ignition is ON	=TRUE	1(s)	2 Trip
					ECU is in drive state Engine Speed Battery Voltage Battery Voltage No pending or confirmed DTCs	=TRUE ≥80(rpm) >10900(mV) <25500(mV) =see sheet inhibit		
					Basic enable conditions met	=see sheet enable tables		
85. CCM – ENGINE OIL PRESSURE CONTROL	P0524	Oil pressure - Low	Relative engine oil pressure (see Look-Up-Table #86)	<0 to 342(hPa)	(Absolute value of transversal acceleration	≤5(g)	0(s)	1 Trip
ACTUATOR			for time	1.2 to 5(sec)	for time	≥0(sec)		
			(debounce time for low oil pressure warning) (see Look-Up-Table #87)					
					for hold time after condition becomes	≤0(sec)		
					No pending or confirmed DTCs	=see sheet inhibit		
					Basic enable conditions met	=see sheet enable tables		
I	P06DD	Measured oil pressure compared to setpoint - High	Difference between measured engine oil pressure and oil pressure surface set point (see Look-Up-Table #88)	>300 to 800(hPa)	Short trip test active	=FALSE	1(s)	2 Trip
			for time constant filter	>2(sec)	(Absolute value of transversal	≥5(g)		
					for time for hold time after condition becomes false)	≥0(sec) ≤0(sec)		
					Oil temperature Oil pump high side switch commanded on	>-50,04(°C) =TRUE		
					Backup duty cycle for oil pressure is in use	=FALSE		
			E	CM Section 634 of 772	In alastria driva mada			746 of 1

				No pending or confirmed DTCs	=see sheet inhibit tables		
				Basic enable conditions met	=see sheet enable tables		
P06DD	Measured oil pressure compared to setpoint - Low	Engine oil pressure minus oil pressure set point (see Look-Up-Table #89)	<-800 to -200(hPa)	Short trip test active	=FALSE	1(s)	2 Trip
				(Absolute value of transversal acceleration	≥5(g)		
				for time for hold time after condition becomes	≥0(sec) ≤0(sec)		
				Oil temperature Oil pump high side switch	>-50,04(°C) =TRUE		
				Backup duty cycle for oil pressure is in use	=FALSE		
				In electric drive mode No pending or confirmed DTCs	=FALSE =see sheet inhibit tables		
				Basic enable conditions met	=see sheet enable tables		
P06DC	Diagnoses oil pump low side driver circuit for circuit high	Oil pump actuator driver has posted a high circuit failure	=TRUE	Actuator power stage is enabled	=TRUE	0,05(s)	2 Trip
	fault						
	fault		Short-to-power: ≤ 0.5 Ω impedance between signal and controller power	2 Battery voltage	>10900(mV)		
	fault		Short-to-power: ≤ 0.5 Ω impedance between signal and controller power	Battery voltage	>10900(mV) ≥0(sec)		
	fault		Short-to-power: ≤ 0.5 Ω impedance between signal and controller power	 Battery voltage for time No pending or confirmed DTCs 	>10900(mV) ≥0(sec) =see sheet inhibit		
	fault		Short-to-power: ≤ 0.5 Ω impedance between signal and controller power	 Battery voltage for time No pending or confirmed DTCs Basic enable conditions met 	>10900(mV) ≥0(sec) =see sheet inhibit tables =see sheet enable tables		
P06DB	fault Diagnoses oil pump low side driver circuit for circuit low fault	Oil pump actuator driver has posted a low circuit failure	Short-to-power: ≤ 0.5 Ω impedance between signal and controller power =TRUE	 Battery voltage for time No pending or confirmed DTCs Basic enable conditions met Actuator power stage is enabled 	>10900(mV) ≥0(sec) =see sheet inhibit tables =see sheet enable tables =FALSE	0,05(s)	1 Trip
P06DB	fault Diagnoses oil pump low side driver circuit for circuit low fault	Oil pump actuator driver has posted a low circuit failure	Short-to-power: ≤ 0.5 Ω impedance between signal and controller power =TRUE Short-to-ground: ≤ 0.5 Ω impedance between signal and controller around	 Battery voltage for time No pending or confirmed DTCs Basic enable conditions met Actuator power stage is enabled Battery voltage 	>10900(mV) ≥0(sec) =see sheet inhibit tables =see sheet enable tables =FALSE >10900(mV)	0,05(s)	1 Trip
P06DB	fault Diagnoses oil pump low side driver circuit for circuit low fault	Oil pump actuator driver has posted a low circuit failure	Short-to-power: ≤ 0.5 Ω impedance between signal and controller power =TRUE Short-to-ground: ≤ 0.5 Ω impedance between signal and controller ground	 Battery voltage for time No pending or confirmed DTCs Basic enable conditions met Actuator power stage is enabled Battery voltage for time 	>10900(mV) ≥0(sec) =see sheet inhibit tables =see sheet enable tables =FALSE >10900(mV) ≥0(sec)	0,05(s)	1 Trip

					Basic enable conditions met	=see sheet enable tables		
	P06DA	Diagnoses oil pump low side driver circuit for open circuit	Oil pump actuator driver has posted an open circuit failure	=TRUE	Actuator power stage is enabled	=TRUE	1(s)	2 Trip
		lault		Open Circuit: ≥ 200 K Ω impedance between ECU pin and load	Battery voltage	>10900(mV)		
					for time	≥0(sec)		
					No pending or confirmed DTCs	=see sheet inhibit tables		
					Basic enable conditions met	=see sheet enable tables		
	P06DA	Diagnoses oil pump low side driver circuit for over temperature circuit fault	Oil pump actuator driver has posted an over temperature circuit failure	=TRUE	Actuator power stage is enabled	=TRUE	1(s)	2 Trip
					Battery voltage for time	>10900(mV) ≥0(sec)		
					No pending or confirmed DTCs	=see sheet inhibit tables		
					Basic enable conditions met	=see sheet enable tables		
86. CCM – EVAP PURGE VALVE - B1 DIAGNOSTIC	P0459	Diagnoses the EVAP System Purge Control Valve low side driver circuit for circuit high faults	Output (driver) current	≥5,6(A)	Battery voltage	≥10000(mV)	1(s)	2 Trip
S					Battery voltage Power stage (driver) is switched on	≤17000(mV) =TRUE		
					Basic enable conditions met	=see sheet enable tables		
					No pending or confirmed DTCs	=see sheet inhibit tables		
	P0458	Diagnoses the EVAP System Purge Control Valve low side driver circuit for circuit low faults	Output (driver) voltage	≤2,74(V)	Battery voltage	≥10000(mV)	1(s)	2 Trip
					Battery voltage Power stage (driver) is switched off Basic enable conditions met	≤17000(mV) =TRUE =see sheet enable tables		
					No pending or confirmed DTCs	=see sheet inhibit tables		

			250BD	G07A Part 2 ECM Summary	7 Tables			
	P0443	Diagnoses the EVAP System Purge Control Valve low side driver circuit for open circuit faults.	Output (driver) voltage	>3,26(V)	Battery voltage	≥10000(mV)	1(s)	2 Trip
			Output (driver) voltage	≤4,7(V)	Battery voltage Power stage (driver) is switched off Basic enable conditions met	≤17000(mV) =TRUE =see sheet enable tables		
					No pending or confirmed DTCs	=see sheet inhibit tables		
87. CCM – EVAP PURGE VALVE – B2 DIAGNOSTIC	P04AD	Diagnoses the EVAP System Purge Control Valve low side driver circuit for circuit high faults	Output (driver) current	≥5,6(A)	Battery voltage	≥10000(mV)	1(s)	2 Trip
S					Battery voltage Power stage (driver) is switched on Basic enable conditions met	≤17000(mV) =TRUE =see sheet enable		
					No pending or confirmed DTCs	=see sheet inhibit tables		
	P04AC	Diagnoses the EVAP System Purge Control Valve low side driver circuit for circuit low faults.	Output (driver) voltage	≤2,74(V)	Battery voltage	≥10000(mV)	1(s)	2 Trip
					Battery voltage Power stage (driver) is switched off Basic enable conditions met	≤17000(mV) =TRUE =see sheet enable tables		
					No pending or confirmed DTCs	=see sheet inhibit tables		
I	P04AB	Diagnoses the EVAP System Purge Control Valve low side driver circuit for open circuit faults.	Output (driver) voltage	>3,26(V)	Battery voltage	≥10000(mV)	1(s)	2 Trip
			Output (driver) voltage	≤4,7(V)	Battery voltage Power stage (driver) is switched off Basic enable conditions met	≤17000(mV) =TRUE =see sheet enable tables		
					No pending or confirmed DTCs	=see sheet inhibit tables		
88. CCM – THROTTLE ACTUATOR – B1	P2176	Throttle actuator Bank1 first initialization - lower mechanical stop learning fail	((Offset learning aborted	=FALSE	0.01(s)	1 Trip
DIAGNOSIS			Initial learning of the closed throttle valve position has	=TRUE	OR			
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	Aborted due to one of the enable conditions no longer being fulfilled (see secondary parameters)	=TRUE	Offset learning successful)	=FALSE
) OR (Offset check at cold temperature conditions active (=FALSE
First learning of closed mechanical stop: Throttle position at lower mechanical stop	Step 1 (Learning of the closed throttle valve position):		((Return spring check aborted	=TRUE
·	Lower mechanical stop offset learning aborted at step 1 (moving throttle valve to the closed position) due to the following reason (closed position has not reached):		OR	
	(Return spring check successful	=TRUE
	(Difference between actual throttle position sensor1 at lower mechanical stop and desired value for adaptation (based on max. allowed for lower mechanical stop voltage)	>1,5(%)	, Return spring check fault is set OR	=FALSE
)		Device type)	>0
	for time	≥1(sec)	(
)		Offset learning will be enabled during ECU is in drive state when below conditions are satisfied for time ((>29(sec)
	OR ((Offset learning active	=TRUE
First learning of closed mechanical stop: Duty cycle at lower mechanical stop and resulting change in sensor voltage	Step 2 (If no fault in step 1 then ramp to closed position with duty cylce in a defined range and check sensor voltages):		(
	Lower mechanical stop offset learning aborted at step 2 (pressing throttle valve to the		Offset learning active	=FALSE
	((

	Calculated duty cycle ratio	≤60(%)	The powerstage of the throttle actuator is	=TRUE
	`		commanded on	、7 5 (八)
	for time	≥1(sec))	≥1,3(V)
)	
)		OR	
	OR		Power save is active)	=TRUE
	(Limp home driving mode requested	=FALSE
Range check of learned sensor voltage at low mechanical stop	Step 3 (If no fault in step 2 then check range of learned sensor voltages at lower mechanical stop):		Safety fuel cut off requested	=FALSE
	Lower mechanical stop offset learning aborted at step 3 (sensor offset learning at low mechanical stop) due to one of the the following conditions:		Torque limitation requested)	=FALSE
	((Long term and short term	=FALSE
	Lower mechanical stop voltage	>0,732(V)	OR	
	Sensor 1 OR		(Long term and short term	=TRUE
			adaptation chosen	
	Lower mechanical stop voltage sensor 1	<0,291(V)	Long term and short term is released	=TRUE
	OR)	
	Lower mechanical stop voltage sensor 2	>4,708(V))	
	OR		OR	
	Lower mechanical stop voltage sensor 2	<4,267(V)	(
)		(
)		First learning performed OR	=FALSE
			Limp air position is not plausible OR	=TRUE
			External trigger to start offset learning	=TRUE
) (ECILis in drive state	=TRUE
			OR	
			ECU is in post drive state for time	>5(sec)
))	
			UK FCILis in post drive state for time	5(000)
				~0(000)
	FCM	Section 639 of 772	/	

Offset learning will be enabled when below conditions are satisfied ((=TRUE		
(Offset learning active OR	=TRUE		
Offset learning active	=FALSE		
(The powerstage of the throttle	=TRUE		
actuator is commanded on Battery voltage))	>7,5(V)		
) OR Power save is active	=TRUE		
) Limp home driving mode requested Safety fuel cut off requested Torque limitation requested	=FALSE =FALSE =FALSE		
) Vehicle speed	≤0.62(mph)		
Engine speed	≤300(rpm)		
Battery voltage	≤16000(mV)		
Battery voltage	≥10000(mV)		
Intake air temperature before throttle	≤143,26(°C)		
Intake air temperature before throttle	≥5,26(°C)		
Engine coolant temperature	≤100,46(°C)		
Engine coolant temperature	≥5,26(°C)		
No pending or confirmed DTCs	=see sheet inhibit tables		
Basic enable conditions met	=see sheet enable tables		
(Offset learning aborted	=FALSE	1(s)	1 Trip

(pressing throttle valve to the low mechanical stop with certain force) due to the following reason (duty cycle ratio has not reached threshold):

learning aborted at step 2

Throttle actuator Bank1 - lower Lower mechanical stop offset

mechanical stop learning fail

P2176

(Calculated duty cycle ratio	≤60(%)	OR Offset learning successful	=FALSE
for time	≥1(sec)) Offset check at cold temperature conditions active	=FALSE
)		(
OR		`(Return spring check aborted	=TRUE
Lower mechanical stop offset learning aborted at step 3 (sensor offset learning at low mechanical stop) due to one of the the following conditions:		OR	
(Return spring check successful	=TRUE
Lower mechanical stop voltage sensor 1	>0,732(V)	/ Return spring check fault is set) OR	=FALSE
Lower mechanical stop voltage sensor 1	<0,291(V)	Device type)	>0
Lower mechanical stop voltage sensor 2	>4.67(V)	Offset learning will be enabled during ECU is in drive state when below conditions are satisfied for time (>29(sec)
OR			
Lower mechanical stop voltage sensor 2	<4.267(V)	Offset learning active	=TRUE
)		OR (
		Offset learning active (=FALSE
		The powerstage of the throttle actuator is	=TRUE
		commanded on Battery voltage))	>7,5(V)
) OR	
		Power save is active	=IRUE
		Limp home driving mode requested Safety fuel cut off requested Torque limitation requested	=FALSE =FALSE =FALSE
) (Long term and short term adaptation chosen	=FALSE

0R

(Long term and short term	=TRUE
adaptation chosen	
released	TRUE
)	
) OR	
(
OR	=FALSE
Limp air position is not plausible	=TRUE
OR External trigger to start effect	
learning	TRUE
)	
(ECILis in drive state	=TRUE
OR	
ECU is in post drive state for time	>5(sec)
)	
))	
OR	
ECU is in post drive state for time	>5(SeC)
) Offset learning will be enabled when	=TRUE
below conditions are satisfied	
(
(
Offset learning active	=TRUE
OR	
Offset learning active	=FALSE
(
I he powerstage of the throttle	=IRUE
commanded on	
Battery voltage	>7,5(V)
)	
)	
ÓR	
Power save is active	=TRUE
) Limp home driving mode requested	=FALSE
Safety fuel cut off requested	=FALSE
Torque limitation requested	=FALSE
) Vehicle speed	< 0.62(mnh)
	-0.02(())

				Engine speed	≤300(rpm)		
				Battery voltage	≤16000(mV)		
				Battery voltage	≥10000(mV)		
				Intake air temperature before throttle	≤143,26(°C)		
				valve Intake air temperature before throttle	≥5,26(°C)		
				valve Engine coolant temperature	≤100,46(°C)		
				Engine coolant temperature	≥5,26(°C)		
				No pending or confirmed DTCs	=see sheet inhibit		
				Basic enable conditions met	tables =see sheet enable tables		
P30E3	Path 1: Throttle position at	Step 1 (Learning of the closed		(=FALSE	1(s)	1 Trip
	lower mechanical stop exceeded maximum limit for	throttle valve position):		Offset learning aborted			
	Throttla Docition Concor Donk	Actuator throttle position	>(Vmax - V) * Tgrad +	OR			
		Where:	Offset(%)	Offset learning successful	=FALSE		
		Vmax (Maximum voltage value allowed at mechanical stop,	=0,732(V)) Offset check at cold temperature conditions active	=FALSE		
		V (Actual learned sensor	=sensed voltage(V)	(
		voltage of sensor 1 at the lower mechanical stop)		(
		Tgrad (Gradient of the throttle valve angle versus sensor 1	=calculated value(% / V)	(Return spring check aborted	=TRUE		
		Offset (Offset to Desired position value to start ramping into mechanical stop)	=1,5(%)	OR			
				Return spring check successful	=TRUE		
	Path 2: Range check of learned sensor voltage at lowe mechanical stop for Throttle Position Sensor Bank 1 : Maximum learning limit	Low mechanical stop first er learning has been performed	=TRUE	Return spring check fault is set	=FALSE		
	exceeded	and		OR			
		Step 3 (If no fault in step 1 then check range of learned sensor voltages at lower		Device type)	>0		
		machanical stan). E(CM Section 643 of 772				755 (

25OBDG07A Part 2 ECM Summary Tables Actual learned sensor voltage >0.732(V) (

of sensor 1 at the mechanical	>0,732(V)	(
OR		Offset learning will be enabled during ECU is in drive state when below conditions are satisfied for time (>29(sec
Actual learned sensor voltage of sensor 2 at the mechanical stop	>4,708(V)	(
•		Offset learning active OR	=TRUE
		Offset learning active (=FALSI
		The powerstage of the throttle actuator is commanded on	=TRUE
		Battery voltage))) OR	>7,5(V
		Power save is active	=TRUE
		Limp home driving mode requested	=FALSI
		Safety fuel cut off requested	=FALSI
		Torque limitation requested)	=FALSI
		(Long term and short term adaptation chosen OR	=FALSI
		(Long term and short term adaptation chosen	=TRUE
		Long term and short term is released	=TRUE
) OR (
		(First learning performed	=FALSI
		Limp air position is not plausible OR	=TRUE
		External trigger to start offset	=TRUE
ECM	Section 644 of 772	learning	
) (ECU is in drive state OR	=TRUE		
---	------------------------------		
ECU is in post drive state for time	>5(sec)		
)) OR			
ECU is in post drive state for time	>5(sec)		
) Offset learning will be enabled when below conditions are satisfied (=TRUE		
(Offset learning active OR	=TRUE		
Offset learning active	=FALSE		
The powerstage of the throttle	=TRUE		
commanded on Battery voltage))	>7,5(V)		
) OR Power save is active	=TRUE		
) Limp home driving mode requested Safety fuel cut off requested Torque limitation requested	=FALSE =FALSE =FALSE		
) Vehicle speed	≤0.62(mph)		
Engine speed	≤300(rpm)		
Battery voltage	≤16000(mV)		
Battery voltage	≥10000(mV)		
Intake air temperature before throttle	≤143,26(°C)		
Intake air temperature before throttle	≥5,26(°C)		
Engine coolant temperature	≤100,46(°C)		
Engine coolant temperature	≥5,26(°C)		
No pending or confirmed DTCs	=see sheet inhibit tables		

				Basic enable conditions met	=see sheet enable tables		
P30E4	Range check of learned sensor voltage at lower mechanical stop for Throttle Position Sensor Bank 1: Minimum learning limit exceeded	r Low mechanical stop first learning has been performed	=TRUE	(Offset learning aborted	=FALSE	1(s)	1 Trip
		and Step 3 (If no fault in step 2 then check range of learned		OR Offset learning successful)	=FALSE		
		sensor voltages at lower Actual learned sensor voltage of sensor 1 at the mechanical	≤0,732(V)	Offset check at cold temperature conditions active	=FALSE		
		Actual learned sensor voltage of sensor 2 at the mechanical stop	≤4,708(V)	(
		(Actual learned sensor voltage	<0,291(V)	(Return spring check aborted OR	=TRUE		
		stop OR		Return spring check successful	=TRUE		
		Actual learned sensor voltage of sensor 2 at the mechanical stop	<4,267(V)	Return spring check fault is set	=FALSE		
)		OR Device type) (>0		
				Offset learning will be enabled during ECU is in drive state when below conditions are satisfied for time ((>29(sec)		
				Offset learning active OR	=TRUE		
				Offset learning active	=FALSE		
				The powerstage of the throttle actuator is	=TRUE		
				Battery voltage)))	>7,5(V)		

Power save is active	=TRUE
) Limp home driving mode requested Safety fuel cut off requested Torque limitation requested	=FALSE =FALSE =FALSE
) (Long term and short term adaptation chosen	=FALSE
OR (Long term and short term	=TRUE
adaptation chosen Long term and short term is	=TRUE
released	
) OR	
(
First learning performed	=FALSE
Limp air position is not plausible	=TRUE
External trigger to start offset learning	=TRUE
) (ECU is in drive state	=TRUE
OR ECU is in post drive state for time	>5(sec)
)	
) OR	
ECU is in post drive state for time	>5(sec)
Offset learning will be enabled when below conditions are satisfied	=TRUE
(
(Offset learning active OR	=TRUE
(Offset learning active	=FALSE
(The powerstage of the throttle	=TRUE
commanded on	7 50.0
)	>1,5(V)
)	
OR	

				Power save is active	=TRUE		
				Limp home driving mode requested	=FALSE		
				Safety fuel cut off requested Torque limitation requested	=FALSE =FALSE		
) Vehicle speed	≤0.62(mph)		
				Engine speed	≤300(rpm)		
				Battery voltage	≤16000(mV)		
				Battery voltage	≥10000(mV)		
				Intake air temperature before throttle	≤143,26(°C)		
				Intake air temperature before throttle	≥5,26(°C)		
				Engine coolant temperature	≤100,46(°C)		
				Engine coolant temperature	≥5,26(°C)		
				No pending or confirmed DTCs	=see sheet inhibit		
				Basic enable conditions met	=see sheet enable tables		
P2101	Rationality check of throttle	((ECU is in DRIVE state	=TRUE	0,5(s)	1 Trip
P2101	Rationality check of throttle actuator control Bank 1 deviation - Actual actuator position is continuously monitored against commanded	((ECU is in DRIVE state	=TRUE	0,5(s)	1 Trip
P2101	Rationality check of throttle actuator control Bank 1 deviation - Actual actuator position is continuously monitored against commanded value	(Difference between actual actuator position and its commanded value	>A * B + C(%)	(ECU is in DRIVE state	=TRUE	0,5(s)	1 Trip
P2101	Rationality check of throttle actuator control Bank 1 deviation - Actual actuator position is continuously monitored against commanded value	(Difference between actual actuator position and its commanded value OR	>A * B + C(%)	(ECU is in DRIVE state OR ECU is in POSTDRIVE state	=TRUE	0,5(s)	1 Trip
P2101	Rationality check of throttle actuator control Bank 1 deviation - Actual actuator position is continuously monitored against commanded value	(Difference between actual actuator position and its commanded value OR Difference between commanded value and actual actuator position	>A * B + C(%) >(A * B + C)(%)	(ECU is in DRIVE state OR ECU is in POSTDRIVE state) (Powerstage switched off by diagnosis	=TRUE =TRUE =TRUE	0,5(s)	1 Trip
P2101	Rationality check of throttle actuator control Bank 1 deviation - Actual actuator position is continuously monitored against commanded value	(Difference between actual actuator position and its commanded value OR Difference between commanded value and actual actuator position	>A * B + C(%) >(A * B + C)(%)	(ECU is in DRIVE state OR ECU is in POSTDRIVE state) (Powerstage switched off by diagnosis	=TRUE =TRUE	0,5(s)	1 Trip

		(B) Factor for allowed control deviation	=0,02	(
		(C) Allowed control deviation in steady state	=5(%)	State of the thottle valve powerstage bank 1	>0		
) Release of adaptation Actual position is valid Request safety fuel cut off SKA bank 1, following condition:	=FALSE =TRUE =FALSE		
				Request reversible safety fuel cut off SKA bank 1, which has following condition:	=FALSE		
				(Battery voltage for throttle valve operation sufficient bank 1 OR	>7,5(V)		
				Engine speed	>2000(rpm)		
) Limp home position not reached bank 1)	=FALSE		
				/ No pending or confirmed DTCs	=see sheet inhibit		
				Basic enable conditions met	tables =see sheet enable tables		
P0638	Range check of Throttle	Absolute value of Throttle	>Minimum(A, (B*C))(%)) (ECI Lis in DBIVE state	TOUE	0.0004(+)	1 Trip
	Actuator Control duty cycle Bank 1	valve duty cycle ratio bank 1			=IRUE	0,6001(S)	·
	Actuator Control duty cycle Bank 1	Where: A - Upper threshold for Throttle Actuator Control duty cycle Bank 1 diagnosis in case of low battery voltage	95(%)	OR ECU is in POSTDRIVE state)	=TRUE	0,6001(s)	
	Actuator Control duty cycle Bank 1	 valve duty cycle ratio bank 1 Where: A - Upper threshold for Throttle Actuator Control duty cycle Bank 1 diagnosis in case of low battery voltage B - Upper threshold for Throttle Actuator Control duty cycle bank1 diagnosis 	95(%) 80(%)	OR ECU is in POSTDRIVE state) Absolute value of position controller of the throttle valve bank 1 of motor bench one / gradient of the filtered desired value	=TRUE =TRUE <78,125(%/sec)	0,6001(s)	
	Actuator Control duty cycle Bank 1	 valve duty cycle ratio bank 1 Where: A - Upper threshold for Throttle Actuator Control duty cycle Bank 1 diagnosis in case of low battery voltage B - Upper threshold for Throttle Actuator Control duty cycle bank1 diagnosis C - Factor for battery voltage compensation bank 1 	95(%) 80(%) =13.5V / measured battery voltage [V]	OR ECU is in POSTDRIVE state) Absolute value of position controller of the throttle valve bank 1 of motor bench one / gradient of the filtered desired value The powerstage of the actuator is switched on, following conditions:	=TRUE =TRUE <78,125(%/sec) =TRUE	0,6001(s)	
	Actuator Control duty cycle Bank 1	 valve duty cycle ratio bank 1 Where: A - Upper threshold for Throttle Actuator Control duty cycle Bank 1 diagnosis in case of low battery voltage B - Upper threshold for Throttle Actuator Control duty cycle bank1 diagnosis C - Factor for battery voltage compensation bank 1 	95(%) 80(%) =13.5V / measured battery voltage [V]	OR ECU is in POSTDRIVE state) Absolute value of position controller of the throttle valve bank 1 of motor bench one / gradient of the filtered desired value The powerstage of the actuator is switched on, following conditions: (State of the thottle valve powerstage bank 1	=TRUE =TRUE <78,125(%/sec) =TRUE >0	0,6001(s)	
	Actuator Control duty cycle Bank 1	 valve duty cycle ratio bank 1 Where: A - Upper threshold for Throttle Actuator Control duty cycle Bank 1 diagnosis in case of low battery voltage B - Upper threshold for Throttle Actuator Control duty cycle bank1 diagnosis C - Factor for battery voltage compensation bank 1 	95(%) 80(%) =13.5V / measured battery voltage [V]	OR ECU is in POSTDRIVE state) Absolute value of position controller of the throttle valve bank 1 of motor bench one / gradient of the filtered desired value The powerstage of the actuator is switched on, following conditions: (State of the thottle valve powerstage bank 1) Release of adaptation	=TRUE =TRUE <78,125(%/sec) =TRUE >0 =FALSE	0,6001(s)	
	Actuator Control duty cycle Bank 1	 valve duty cycle ratio bank 1 Where: A - Upper threshold for Throttle Actuator Control duty cycle Bank 1 diagnosis in case of low battery voltage B - Upper threshold for Throttle Actuator Control duty cycle bank1 diagnosis C - Factor for battery voltage compensation bank 1 	95(%) 80(%) =13.5V / measured battery voltage [V]	OR ECU is in POSTDRIVE state) Absolute value of position controller of the throttle valve bank 1 of motor bench one / gradient of the filtered desired value The powerstage of the actuator is switched on, following conditions: (State of the thottle valve powerstage bank 1) Release of adaptation Actual position is valid Request safety fuel cut off SKA bank	=TRUE =TRUE <78,125(%/sec) =TRUE >0 =FALSE =TRUE =FALSE =TRUE =FALSE	0,6001(s)	
	Actuator Control duty cycle Bank 1	 Nubsolute value of Finiotite value duty cycle ratio bank 1 Where: A - Upper threshold for Throttle Actuator Control duty cycle Bank 1 diagnosis in case of low battery voltage B - Upper threshold for Throttle Actuator Control duty cycle bank1 diagnosis C - Factor for battery voltage compensation bank 1 	95(%) 80(%) =13.5V / measured battery voltage [V]	OR ECU is in POSTDRIVE state) Absolute value of position controller of the throttle valve bank 1 of motor bench one / gradient of the filtered desired value The powerstage of the actuator is switched on, following conditions: (State of the thottle valve powerstage bank 1) Release of adaptation Actual position is valid Request safety fuel cut off SKA bank 1, following condition:	=TRUE =TRUE <78,125(%/sec) =TRUE >0 =FALSE =TRUE =FALSE =FALSE	0,6001(s)	761

				(Request reversible safety fuel cut off SKA bank 1, which has following condition:	=FALSE		
				(Battery voltage for throttle valve operation sufficient bank 1	=TRUE		
				Engine speed	>2000(rpm)		
) Limp home position not reached bank 1)	=FALSE		
) Battery voltage for throttle valve	=TRUE		
				No pending or confirmed DTCs	=see sheet inhibit		
				Basic enable conditions met	=see sheet enable tables		
P1551	Path 2: Range check of limp air position for Bank 1 - high	Difference between actual learned sensor voltage of sensor 1 at limp air position after mean value calculation and actual learned sensor voltage of sensor 1 at the lower mechanical stop OR	>1,37(V)	(Offset learning aborted	=FALSE	0.01(s)	1 Trip
		Difference between actual learned sensor voltage of sensor 2 at the lower mechanical stop and actual learned sensor voltage of sensor 2 at limp air position after mean value calculation	>1,37(V)	Offset learning successful)	=FALSE		
				Offset check at cold temperature conditions active (=FALSE		
				((Return spring check aborted	=TRUE		
				OR Return spring check successful	=TRUE		
) Return spring check fault is set	=FALSE		
) OR Device type) (>0		

Offset learning will be enabled	>29(sec)
during ECU is in drive state when	
below conditions are satisfied for	
ume (
Offset learning active	=TRUE
OR	
(
Offset learning active	=FALSE
(
The powerstage of the throttle	=TRUE
actuator is	
commanded on	
Battery voltage	>7,5(V)
)	
)	
)	
OR	TOUE
Power save is active	=IRUE
) Limp homo driving mode requested	
Safety fuel cut off requested	=FALSE -FALSE
Torque limitation requested	-FALSE
/ (Long term and short term	=FALSE
adaptation chosen	
OR	
(Long term and short term	=TRUE
adaptation chosen	
Long term and short term is	=TRUE
released	
)	
)	
OR	
(
(First loarning parformed	
	=FALSE
Limp air position is not plausible	=TRUE
OR	-11(0)
External trigger to start offset	=TRUE
learning	_
)	
(=TRUE
ECU is in drive state	
OR	
ECU is in post drive state for time	>5(sec)
、 、	

ECU is in post drive state for time	>5(sec)
) Offset learning will be enabled when below conditions are satisfied	=TRUE
(
(Offset learning active OR	=TRUE
(Offset learning active	=FALSE
The powerstage of the throttle actuator is	=TRUE
commanded on Battery voltage	>7,5(V)
)')	
OR Power save is active)	=TRUE
Limp home driving mode requested Safety fuel cut off requested Torque limitation requested	=FALSE =FALSE =FALSE
) Vehicle speed	≤0.62(mph)
Engine speed	≤300(rpm)
Battery voltage	≤16000(mV)
Battery voltage	≥10000(mV)
Intake air temperature before throttle	≤143,26(°C)
Intake air temperature before throttle	≥5,26(°C)
Engine coolant temperature	≤100,46(°C)
Engine coolant temperature	≥5,26(°C)
No pending or confirmed DTCs Basic enable conditions met	=see sheet inhibit tables =see sheet enable tables

P1551	Path 3: Range check of limp air position for Bank 1 - low	Difference between actual learned sensor voltage of sensor 1 at limp air position after mean value calculation and actual learned sensor voltage of sensor 1 at the lower mechanical stop	<0,74(V)	(Offset learning aborted	=FALSE	0.01(s)	1 Trip
		OR Difference between actual learned sensor voltage of	<0,74(V)	OR Offset learning successful)	=FALSE		
		sensor 2 at the lower mechanical stop and actual learned sensor voltage of sensor 2 at limp air position after mean value calculation		,			
				Offset check at cold temperature conditions active (=FALSE		
				((Return spring check aborted	=TRUE		
				Return spring check successful	=TRUE		
) Return spring check fault is set) OP	=FALSE		
				Device type	>0		
				Offset learning will be enabled during ECU is in drive state when below conditions are satisfied for time ((>29(sec)		
				(Offset learning active OR	=TRUE		
				Offset learning active	=FALSE		
				The powerstage of the throttle actuator is	=TRUE		
				Battery voltage))	>7,5(V)		
				OR Power save is active	=TRUE		
		F	ECM Section 653 of 772) Limp home driving mode requested	=FALSE		765 (
		-					

Torque limitation requested	=FALSE
) (Long term and short term	
adaptation chosen	=FALSE
OR	
(Long term and short term	=TRUE
adaptation chosen	
Long term and short term is	=TRUE
released	
) OR	
(
(
First learning performed	=FALSE
UR Limp air position is not plausible	
OR	-INOL
External trigger to start offset	=TRUE
learning	
)	
(ECILia in driva atata	=IRUE
OR	
ECU is in post drive state for time	>5(sec)
·	(),
)	
)	
OR ECIL is in post drive state for time	~5(sec)
	>3(360)
, Offset learning will be enabled when	=TRUE
below conditions are satisfied	
(
(
(Offset learning active	-TRUF
OR	-1102
(
Offset learning active	=FALSE
(
I he powerstage of the throttle	=IRUE
commanded on	
Battery voltage	>7,5(V)
)	
)	
)	
UK Power save is active	
)	-INUE
, Limp home driving mode requested	=FALSE
Safety fuel cut off requested	=FALSE

			Torque limitation requested	=FALSE		
) Vehicle speed	≤0.62(mph)		
			Engine speed	≤300(rpm)		
			Battery voltage	≤16000(mV)		
			Battery voltage	≥10000(mV)		
			Intake air temperature before throttle	≤143,26(°C)		
			Intake air temperature before throttle	≥5,26(°C)		
			valve Engine coolant temperature	≤100,46(°C)		
			Engine coolant temperature	≥5,26(°C)		
			No pending or confirmed DTCs	=see sheet inhibit		
			Basic enable conditions met	tables =see sheet enable tables		
P1551 Path 4: Limp ai Bank 1 - compa mechanical stop	r position drift (rison with lower o sensor		(Offset learning aborted	=FALSE	0.01(s)	1 Trip
voltage	Actual offset learning step and	=4	OR Offset learning successful	=FALSE		
	(A - B) Absolute value of the actual learned value minus last stored value	>0.155(V)) Offset check at cold temperature conditions active	=FALSE		
	Where:		(
	A	=(A1 + A2) / 2(V)	(Return spring check aborted	=TRUE		
	В А1	=(B1 + B2) / 2(V) =A11 - A12(V)	OR Return spring check successful	=TRUE		
	A2	=A22 - A21(V)) Return spring check fault is set	=FALSE		
	B1 B2	=B11 - B12(V) =B22 - B21(V)) OR Device type	20		
	(A11) Learned sensor voltage	(,))			
	of sensor 1 at limp air position					
	(A12) Learned reference sensor voltage of sensor 1 at the lower mechanical stop		Offset learning will be enabled during ECU is in drive state when below conditions are satisfied for time	>29(sec)		
	_		(

25OBDG07A Part 2 ECM Summary Tables (A22) Learned reference sensor voltage of sensor 2 at the lower mechanical stop (A21) Learned sensor voltage Offset learning active of sensor 2 at limp air position OR (B11) Actual learned sensor voltage of sensor 1 at limp air position after mean value calculation (B12) Learned reference sensor voltage of sensor 1 at the lower mechanical stop (B22) Learned reference Offset learning active sensor voltage of sensor 2 at the lower mechanical stop (B21) Actual learned sensor voltage of sensor 2 at limp air position after mean value calculation The powerstage of the throttle actuator is commanded on and Battery voltage OR Power save is active Limp home driving mode requested Safety fuel cut off requested Torque limitation requested Long term and short term adaptation chosen OR Long term and short term adaptation chosen Long term and short term is released) OR First learning performed OR

Limp air position is not plausible

=TRUE

=FALSE

=TRUE

>7,5(V)

=TRUE

=FALSE

=FALSE =FALSE

=FALSE

=TRUE

=TRUE

=FALSE

=TRUE

External trigger to start offset learning	=TRUE
) (ECU is in drive state	=TRUE
OR ECU is in post drive state for time	>5(sec)
))	
ECU is in post drive state for time	>5(sec)
) Offset learning will be enabled when below conditions are satisfied (=TRUE
(Offset learning active OR	=TRUE
Offset learning active	=FALSE
(The powerstage of the throttle	=TRUE
actuator is commanded on Battery voltage)	>7,5(V)
)) 0P	
Power save is active	=TRUE
) Limp home driving mode requested Safety fuel cut off requested Torque limitation requested	=FALSE =FALSE =FALSE
) Vehicle speed	≤0.62(mph)
Engine speed	≤300(rpm)
Battery voltage	≤16000(mV)
Battery voltage	≥10000(mV)
Intake air temperature before throttle	≤143,26(°C)
Intake air temperature before throttle	≥5,26(°C)
Engine coolant temperature	≤100,46(°C)
Engine coolant temperature	≥5,26(°C)

				No pending or confirmed DTCs	=see sheet inhibit tables		
				Basic enable conditions met	=see sheet enable tables		
P2119	Path 1: Throttle valve opening spring check - opening failure for Bank 1	Here it is checked whether opening spring can be returned by mechanical force only to the defined limp home position in the defined time ((Offset learning aborted	=FALSE	0,26(s)	1 Trip
		Actual offset learning step ((=4	OR Offset learning successful	=FALSE		
		Limp air position is implausible OR	=TRUE	Offset check at cold temperature conditions active	=FALSE		
		First learning performed	=FALSE	((Return spring check aborted OR	=TRUE		
		Position of the throttle valve	≤A * C1(%)	Return spring check successful	=TRUE		
				, Return spring check fault is set)	=FALSE		
		for time	≥0,26(sec)	OR			
)		Device type)	>0		
		((Offset learning will be enabled during ECU is in drive state when below conditions are satisfied for time	>29(sec)		
		Limp air position is implausible	=FALSE				
		First learning performed Position of the throttle valve	=TRUE ≤Limp home position of throttle valve - 3%(%)	Offset learning active OR	=TRUE		
		Limp air position is implausible when:		(

Absolute difference of the deviation of limp air position sensor voltage at ECU start from lower mechanical stop position sensor voltage and the deviation of actual learned limp air position sensor voltage from lower mechanical stop position sensor voltage	>0.155(V)	Offset learning active	=FALSE
for time	≥0,26(sec)	(
)		The powerstage of the throttle actuator is commanded on	=TRUE
Where: (A) Gradient of the throttle valve angle	=100% / ((V12 - V11) + (V21 - V22)) * 0.5(%/V)	Battery voltage))	>7,5(V)
(C1) Threshold for minimum absolute limp air position allowed	=0,74(V)	OR	
(V12) Actual learned sensor voltage of sensor 1 at the		Power save is active)	=TRUE
(V11) Actual learned sensor voltage of sensor 1 at the lower mechanical stop		Limp home driving mode requested	=FALSE
(V21) Actual learned sensor voltage of sensor 2 at the lower mechanical stop		Safety fuel cut off requested	=FALSE
(V22) Actual learned sensor voltage of sensor 2 at the upper mechanical stop		Torque limitation requested)	=FALSE
		(Long term and short term adaptation chosen OR	=FALSE
		(Long term and short term	=TRUE
		Long term and short term is released)	=TRUE
		OR (
		First learning performed	=FALSE
		Limp air position is not plausible OR	=TRUE
		External trigger to start offset learning)	=TRUE

(E	CU is in drive state	=TRUE
E	CU is in post drive state for time	>5(sec)
)		
)		
EC	U is in post drive state for time	>5(sec)
) Off bel	set learning will be enabled when ow conditions are satisfied	=TRUE
(
(Of C	ffset learning active DR	=TRUE
(Offset learning active	=FALSE
act	The powerstage of the throttle uator is	=TRUE
	commanded on Battery voltage	>7,5(V)
)	
)		
Po	wer save is active	=TRUE
Lim	no home driving mode requested	=FALSE
Saf	fety fuel cut off requested	=FALSE
Tor	rque limitation requested	=FALSE
) Vel	hicle speed	≤0.62(mph)
Enę	gine speed	≤300(rpm)
Bat	ttery voltage	≤16000(mV)
Bat	ttery voltage	≥10000(mV)
Inta valv	ake air temperature before throttle	≤143,26(°C)
Inta valv	ake air temperature before throttle	≥5,26(°C)
Enę	gine coolant temperature	≤100,46(°C)
Enę	gine coolant temperature	≥5,26(°C)
No	pending or confirmed DTCs	=see sheet inhibit tables
Bas	sic enable conditions met	=see sheet enable

P2119	Path 2: Throttle valve opening spring failure while spreading the opening spring for Bank 1	Position of the throttle valve	>1 + B1 + B2(%)	(Offset learning aborted	=FALSE	0,3(s)	1 Trip
	the opening spring for bank i	Where:		OR			
		(B1) Offset for the lower mechanical stop because of dirt	=Calculated parameter(%)	Offset learning successful)	=FALSE		
		(B2) Range for actual position (offset to desired value) to check whether open spring spread position is reached	=1(%)	Offset check at cold temperature conditions active	=FALSE		
				(
				(=TRUE		
				Return spring check aborted	-		
				Return spring check successful	=TRUE		
				Return spring check fault is set	=FALSE		
				OR Device type	. 0		
) (>0		
				Offset learning will be enabled during ECU is in drive state when below conditions are satisfied for time (>29(sec)		
				(Offset learning active OR	=TRUE		
				Offset learning active	=FALSE		
				The powerstage of the throttle actuator is	=TRUE		
				commanded on Battery voltage)	>7,5(V)		
)) OR			
				Power save is active	=TRUE		
				Limp home driving mode requested	=FALSE		
				Safety fuel cut off requested	=FALSE		
				Torque limitation requested)	=FALSE		
				(Long term and short term	=FALSE		
		ECN	A Saction 661 of 772	adaptation chosen			772 (

OR

UR	
(Long term and short term	=TRUE
Long term and short term is	
released	-11(02
)	
)	
OR (
First learning performed	=FALSE
Limp air position is not plausible	=TRUE
OR External trigger to start offset	
learning	-INOL
)	
(=TRUE
CU is in drive state	
ECU is in post drive state for time	>5(sec)
)	
)	
ÓR	
ECU is in post drive state for time	>5(sec)
) Offset learning will be enabled when	
below conditions are satisfied	-INOL
(
(
(Offset learning active	
OR	=INOL
(
Offset learning active	=FALSE
(The powerstage of the throttle	
actuator is	-INOL
commanded on	
Battery voltage	>7,5(V)
)	
)	
OR .	
Power save is active	=TRUE
) Linn hanna driving made some stad	
Safety fuel cut off requested	=FALSE =FALSE
Torque limitation requested	=FALSE
)	
Vehicle speed	≤0.62(mph)

				Engine speed	≤300(rpm)		
				Battery voltage	≤16000(mV)		
				Battery voltage	≥10000(mV)		
				Intake air temperature before throttle	≤143,26(°C)		
				Intake air temperature before throttle	≥5,26(°C)		
				Engine coolant temperature	≤100,46(°C)		
				Engine coolant temperature	≥5,26(°C)		
				No pending or confirmed DTCs	=see sheet inhibit		
				Basic enable conditions met	=see sheet enable tables		
P2119	Path 3: Throttle valve return spring failure check for Bank 1	((Offset learning aborted	=FALSE	0,36(s)	1 Trip
		Limp air position is implausible	=TRUE	OR			
		OR		Offset learning successful	=FALSE		
		First learning performed	=FALSE) Offset check at cold temperature conditions active	=FALSE		
)		(
		Position of the throttle valve for time	>A * C1(V) ≥0,36(sec)	(Return spring check aborted OR	=TRUE		
)		Return spring check successful	=TRUE		
		OR) Return spring check fault is set)	=FALSE		
		(OR	_		
		Limp air position is implausible	=FALSE	Device type	>0		
		First learning performed Position of the throttle valve	=TRUE >Limp home position of throttle valve + 3%(%)	(Offset learning will be enabled during ECU is in drive state when below conditions are satisfied for time	>29(sec)		
		Limp air position is implausible when:		(((

Absolute difference of the deviation of limp air position sensor voltage at ECU start from lower mechanical stop position sensor voltage and the deviation of actual learned limp air position sensor voltage from lower mechanical stop position sensor voltage	>0.155(V)	Offset learning active	=TRUE
for time	≥0,36(sec)	OR	
) Where: (A) Gradient of the throttle valve angle	=100% / ((V12 - V11) + (V21 - V22)) * 0.5(%/V)	(Offset learning active (=FALSE
(C1) Threshold for maximum absolute limp air position allowed	=1,37(V)	The powerstage of the throttle actuator is	=TRUE
(V12) Actual learned sensor voltage of sensor 1 at the upper mechanical stop (V11) Actual learned sensor voltage of sensor 1 at the lower mechanical stop (V21) Actual learned sensor voltage of sensor 2 at the lower mechanical stop)) OR	>7,5(V)
(V22) Actual learned sensor voltage of sensor 2 at the upper mechanical stop		Power save is active)	=TRUE
		Limp home driving mode requested Safety fuel cut off requested Torque limitation requested	=FALSE =FALSE =FALSE
		(Long term and short term adaptation chosen OR	=FALSE
		(Long term and short term adaptation chosen	=TRUE
		Long term and short term is released	=TRUE
)) OR (
		First learning performed	=FALSE
		Limp air position is not plausible	=TRUE
		External trigger to start offset	=TRUE

) (ECU is in drive state	=TRUE
OR ECU is in post drive state for time	>5(sec)
))	
OR ECU is in post drive state for time	>5(sec)
) Offset learning will be enabled when below conditions are satisfied	=TRUE
((
(Offset learning active OR	=TRUE
(Offset learning active	=FALSE
The powerstage of the throttle actuator is	=TRUE
commanded on Battery voltage	>7,5(V)
)	
OR Power save is active	=TRUE
) Limp home driving mode requested	=FALSE
Safety fuel cut off requested	=FALSE
)	
Vehicle speed	≤0.62(mph)
Engine speed	≤300(rpm)
Battery voltage	≤16000(mV)
Battery voltage	≥10000(mV)
Intake air temperature before throttle valve	≤143,26(°C)
Intake air temperature before throttle	≥5,26(°C)
Engine coolant temperature	≤100,46(°C)
Engine coolant temperature	≥5,26(°C)
No pending or confirmed DTCs	=see sheet inhibit tables
Basic enable conditions met	=see sheet enable

P2119	Path 4: Throttle valve return spring failure while spreading the return spring for Bank 1	Position of the throttle valve	≤(D1 + D2) - D3(%)	(Offset learning aborted	=FALSE	0.2(s)	1 Trip
		Where: (D1) Limp home position of the	=Calculated	OR Offset learning successful	=FALSE		
		throttle valve (D2) Value by which return spring is spread starting from	parameter(%) =15(%)) Offset check at cold temperature conditions active	=FALSE		
		(D3) Range for actual position (offset to desired value) to check whether return spring	=2(%)	((
		spread position to redoried		(Return spring check aborted OR	=TRUE		
				Return spring check successful)	=TRUE		
				Return spring check fault is set) OR	=FALSE		
				Device type) (>0		
				Offset learning will be enabled during ECU is in drive state when below conditions are satisfied for time (>29(sec)		
				Offset learning active OR	=TRUE		
				Offset learning active	=FALSE		
				The powerstage of the throttle actuator is	=TRUE		
				Battery voltage)))	>7,5(V)		
				Power save is active	=TRUE		
				, Limp home driving mode requested Safety fuel cut off requested Torque limitation requested	=FALSE =FALSE =FALSE		
) (Long term and short term adaptation chosen	=FALSE		
		FO	M Contine CCC of 770	OR			770 0

(Long term and short term	=TRUE
adaptation chosen	
Long term and short term is	=IRUE
)	
)	
OR .	
(
(
First learning performed OR	=FALSE
Limp air position is not plausible OR	=TRUE
External trigger to start offset	=TRUE
learning	
)	
(FOLLie in drive state	=IRUE
OR	
ECU is in post drive state for time	>5(sec)
	- ()
)	
)	
OR	- ()
ECU is in post drive state for time	>5(SeC)
) Offset learning will be enabled when	=TRUF
below conditions are satisfied	THOL
(
(
(
Offset learning active	=TRUE
OR (
Offset learning active	=FALSE
(
The powerstage of the throttle	=TRUE
actuator is	
commanded on	. 7 5 / / /
battery voltage	>7,5(V)
)	
)	
OR	
Power save is active	=TRUE
) Lizza hanna dei ina erada annuatad	
Safety fuel cut off requested	=FALSE -FALSE
Torque limitation requested	=FALSE
)	
Vehicle speed	≤0.62(mph)
Engine speed	≤300(rpm)

				Battery voltage	≤16000(mV)		
				Battery voltage	≥10000(mV)		
				Intake air temperature before throttle	≤143,26(°C)		
				Intake air temperature before throttle	≥5,26(°C)		
				Engine coolant temperature	≤100,46(°C)		
				Engine coolant temperature	≥5,26(°C)		
				No pending or confirmed DTCs	=see sheet inhibit		
				Basic enable conditions met	=see sheet enable tables		
P2100	Path 1 :	Voltage low during driver OFF	Open Circuit: ≥ 200 K	(ECU is in DRIVE state	=TRUE	0.0(s)	1 Trip
	Diagnosis of the Throttle Actuator Control Bank 1 H	state (indicates open circuit)	Ω impedance between ECU pin and load				
	bridge circuit for open circuit			OR			
				ECU is in POSTDRIVE state	=TRUE		
) The powerstage of the actuator is switched on, following conditions:	=TRUE		
				(State of the thottle valve powerstage bank 1	>0		
) Release of adaptation	-FALSE		
				Actual position is valid	=TRUE		
				Request safety fuel cut off SKA bank 1, following condition:	=FALSE		
				(Request reversible safety fuel cut off SKA bank 1, which has following condition:	=FALSE		
				(Battery voltage for throttle valve operation sufficient bank 1	>7,5(V)		
				OR Engine speed	>2000(rpm)		
) Limp home position not reached bank	=FALSE		
) No pending or confirmed DTCs	=see sheet inhibit		
				Basic enable conditions met	tables =see sheet enable tables		

P2100	Path 2: Check throttle valve power stage IC for over temperature	Over temperature error from the power stage is detected	=TRUE	(ECU is in DRIVE state	=TRUE	0.01(s)	1 Trip
) The powerstage of the actuator is switched on, following conditions:	=TRUE		
				(State of the thottle valve powerstage bank 1	>0		
) Release of adaptation	=FALSE		
				Actual position is valid	=TRUE		
				Request safety fuel cut off SKA bank 1, following condition:	=FALSE		
				Request reversible safety fuel cut off SKA bank 1, which has following condition:	=FALSE		
				Battery voltage for throttle valve operation sufficient bank 1	>7,5(V)		
				Engine speed	>2000(rpm)		
) Limp home position not reached bank 1	=FALSE		
) No pending or confirmed DTCs	=see sheet inhibit tables		
				Basic enable conditions met	=see sheet enable tables		
Bataa							. — .
P2100	Path 3 : Diagnoses the Turbine bypass valve H bridge high side driver circuit at out 1 for circuit low fault	Voltage low during driver ON state (indicates short circuit to ground)	Short to ground: ≤ 0.5 Ω impedance between signal and controller ground	(ECU is in DRIVE state	=TRUE	0.01(s)	1 Trip
	laan	OR		OR			
	Diagnoses the Turbine bypass valve H bridge low side driver circuit at out 2 for circuit high fault	Voltage high during driver ON state (indicates short circuit to battery)	Short to power: ≤ 0.5 Ω impedance between signal and controller power	ECU is in POSTDRIVE state)	=TRUE		
				The powerstage of the actuator is switched on, following conditions:	=TRUE		
				State of the thottle valve powerstage bank 1	>0		
) Poloopo of adaptation			
				Actual position is valid	-TRUF		
		EC	CM Section 669 of 772	notual publicit is valiu	-INUE		781 of

				Request safety fuel cut off SKA bank 1, following condition:	=FALSE		
				Request reversible safety fuel cut off SKA bank 1, which has following condition:	=FALSE		
				(Battery voltage for throttle valve operation sufficient bank 1 OR	>7,5(V)		
				Engine speed	>2000(rpm)		
) Limp home position not reached bank 1	=FALSE		
) No pending or confirmed DTCs	=see sheet inhibit		
				Basic enable conditions met	=see sheet enable tables		
89. CCM – THROTTLE ACTUATOR – B2	P218A Throttle actuator Bank2 first initialization - lower mechanic stop learning fail	(al		(Offset learning aborted	=FALSE	0.01(s)	1 Trip
DIAGNOSIS		Initial learning of the closed throttle valve position has started	=TRUE	OR			
		Aborted due to one of the enable conditions no longer being fulfilled (see secondary parameters)	=TRUE	Offset learning successful)	=FALSE		
) OR		Offset check at cold temperature conditions active	=FALSE		
	First learning of closed mechanical stop: Throttle position at lower mechanical stop	Lower mechanical stop offset learning aborted at step 1 (moving throttle valve to the closed position) due to the following reason (closed position has not reached):		(
		(((Return spring check aborted	=TRUE		
		Difference between actual	>1,5(%)	Return spring check successful	=TRUE		
)		, Return spring check fault for bank 2 is set)	=FALSE		
		for time	≥1(sec)	OR			
)		Device type)	>0		
		ECM	Section 670 of 772	,			782

	OR Lower mechanical stop offset learning aborted at step 2 (pressing throttle valve to the low mechanical stop with certain force) due to the following reason (duty cycle ratio has not reached threabald):		(Offset learning will be enabled during ECU is in drive state when below conditions are satisfied for time (>29(sec)
	((
First learning of closed mechanical stop: Duty cycle at lower mechanical stop and resulting change in sensor voltage	Calculated duty cycle ratio	≤60(%)	Offset learning active	=TRUE
)		OR	
	for time	≥1(sec)	(
Range check of learned sensor voltage at low mechanical stop	OR Lower mechanical stop offset learning aborted at step 3 (sensor offset learning at low mechanical stop) due to one of the the following conditions:		Offset learning active (=FALSE
	(The powerstage of the throttle actuator for bank 2 is	=TRUE
	Lower mechanical stop voltage sensor 1 OR	>0,732(V)))	>7,5(V)
	Lower mechanical stop voltage sensor 1	<0,291(V)	ÓR	
	OR		Power save is active for bank 2	=TRUE
	Lower mechanical stop voltage sensor 2	>4,708(V)	Limp home driving mode requested for bank 2	=FALSE
	OR		Safety fuel cut off requested for bank 2	=FALSE
	Lower mechanical stop voltage sensor 2	<4,267(V)	Torque limitation requested for bank 2)	=FALSE
)		, (Long term and short term adaptation chosen OR	=FALSE
			(Long term and short term adaptation chosen	=TRUE
			Long term and short term is released	=TRUE

) OR (
First learning performed	=FALSE
Limp air position is not plausible	=TRUE
External trigger to start offset learning	=TRUE
) (ECU is in drive state	=TRUE
OR ECU is in post drive state for time	>5(sec)
)	
OR ECU is in post drive state for time	>5(sec)
) Offset learning will be enabled when	=TRUE
below conditions are satisfied ((
Offset learning active OR	=TRUE
Offset learning active	=FALSE
The powerstage of the throttle actuator for bank 2 is	=TRUE
commanded on Battery voltage)	>7,5(V)
)	
OR Power save is active for bank 2	=TRUE
) Limp home driving mode requested	=FALSE
Safety fuel cut off requested for bank	=FALSE
2 Torque limitation requested for bank 2	=FALSE
) Vehicle speed	≤0.62(mph)
Engine speed	≤300(rpm)
Battery voltage	≤16000(mV)

				Battery voltage	≥10000(mV)		
				Intake air temperature before throttle	≤143,26(°C)		
				Intake air temperature before throttle valve	≥5,26(°C)		
				Engine coolant temperature	≤100,46(°C)		
				Engine coolant temperature	≥5,26(°C)		
				No pending or confirmed DTCs	=see sheet inhibit tables		
				Basic enable conditions met	=see sheet enable tables		
P218A	Throttle actuator Bank2 - lower mechanical stop learning fail	Lower mechanical stop offset learning aborted at step 2 (pressing throttle valve to the low mechanical stop with certain force) due to the following reason (duty cycle ratio has not reached threshold):		(Offset learning aborted	=FALSE	1(s)	1 Trip
		(Calculated duty cycle ratio	≤60(%)	OR Offset learning successful	=FALSE		
		for time	≥1(sec)) Offset check at cold temperature conditions active (=FALSE		
		OR		((Return spring check aborted	=TRUE		
		Lower mechanical stop offset learning aborted at step 3 (sensor offset learning at low mechanical stop) due to one of the the following conditions:		OR			
		(Return spring check successful	=TRUE		
		Lower mechanical stop voltage sensor 1	>0,732(V)	Return spring check fault for bank 2 is set)	=FALSE		
		Lower mechanical stop voltage sensor 1 OR	<0,291(V)	Device type) (>0		
		Lower mechanical stop voltage sensor 2	>4,708(V)	Offset learning will be enabled during ECU is in drive state when below conditions are satisfied for time (>29(sec)		

OR

)

OR			
Lower mechanical stop voltage sensor 2	<4,267(V)	Offset learning active	=TRUE
)		OR	
		(
		Offset learning active	=FALSE
		The powerstage of the throttle	=TRUF
		actuator for bank 2 is	-11102
		commanded on	
		Battery voltage	>7,5(V)
)	
)	
		OR .	
		Power save is active for bank 2	=TRUE
		Limp home driving mode requested for bank 2	=FALSE
		Safety fuel cut off requested for bank	=FALSE
		2 Torgue limitation requested for bonk	
		2	=FALSE
)	
		adaptation chosen	=FALSE
		OK (Long term and short term	-TRUE
		adaptation chosen	-11102
		Long term and short term is	=TRUE
		released	
) OR	
		(
		(
		First learning performed OR	=FALSE
		Limp air position is not plausible	=TRUE
		External trigger to start offset	=TRUE
		learning	
)	
		ECU is in drive state	
		OR	
		ECU is in post drive state for time	>5(sec)
)	
		, OR	
		ECU is in post drive state for time	>5(sec)

	Offset learning will be enabled when below conditions are satisfied	=TRUE		
	(
	(Offerst la service a setting			
	Offset learning active OR	=IRUE		
	(Offset learning active	=FALSE		
	(The powerstage of the throttle	-TRUF		
	actuator for bank 2 is			
	commanded on Battery voltage	>7,5(V)		
)			
) OR			
	Power save is active for bank 2	=TRUE		
) Limp home driving mode requested	=FALSE		
	for bank 2 Safety fuel cut off requested for bank	=FALSE		
	2 Torque limitation requested for bank	=FALSE		
	2			
	Vehicle speed	≤0.62(mph)		
	Engine speed	≤300(rpm)		
	Battery voltage	≤16000(mV)		
	Battery voltage	≥10000(mV)		
	Intake air temperature before throttle	≤143,26(°C)		
	Intake air temperature before throttle	≥5,26(°C)		
	valve Engine coolant temperature	≤100,46(°C)		
	Engine coolant temperature	≥5,26(°C)		
	No pending or confirmed DTCs	=see sheet inhibit		
	Basic enable conditions met	tables =see sheet enable tables		
	(Offset learning aborted	=FALSE	1(s)	1 Trip
ax - V) * Torad +	OR			

exceeded maximum limit for Thankin Danisian Oranan Danis Actuator throttle position

Step 1 (Learning of the closed

throttle valve position):

Path 1: Throttle position at

lower mechanical stop

P30E5

>(Vmax - V) * Tgrad + OR ECM Sectfoff 875 % 772

	Where:		Offset learning successful	=FALSE
	Vmax (Maximum voltage value allowed at mechanical stop,	=0,732(V)) Offset check at cold temperature conditions active	=FALSE
	V (Actual learned sensor voltage of sensor bank 2 at the lower mechanical stop)	=sensed voltage(V)	((
	Tgrad (Gradient of the throttle valve angle versus sensor bank 2 voltage)	=calculated value(% / V)	(Return spring check aborted	=TRUE
	position value to start ramping into mechanical stop)	-1,0(70)		
			Return spring check successful)	=TRUE
Path 2: Range check of learned sensor voltage at lower mechanical stop for Throttle Position Sensor Bank 2 : Maximum learning limit	Low mechanical stop first learning has been performed	=TRUE	Return spring check fault for bank 2 is set)	=FALSE
exceeded	and Step 3 (If no fault in step 2 then check range of learned sensor voltages at lower mechanical stop):		OR Device type)	>0
	Actual learned sensor voltage of sensor 1 at the mechanical stop	>0,732(V)	(
	OR		Offset learning will be enabled during ECU is in drive state when below conditions are satisfied for time	>29(sec)
	Actual learned sensor voltage of sensor 2 at the mechanical stop	>4,708(V)	(
	Stop		Offset learning active OR (=TRUE
			Offset learning active	=FALSE
			The powerstage of the throttle actuator for bank 2 is	=TRUE
			Battery voltage	>7,5(V)
	50	M Section 676 of 770) OR	

Power save is active for bank 2	=TRUE
)	
Limp home driving mode requested	=FALSE
for bank 2	E 41.0E
Safety fuel cut off requested for bank	=FALSE
2	

Torque limitation requested for bank 2	=FALSE
) (Long term and short term adaptation chosen OR	=FALSE
(Long term and short term	=TRUE
adaptation chosen Long term and short term is	=TRUE
)	
)	
OR (
(
First learning performed	=FALSE
Limp air position is not plausible	=TRUE
External trigger to start offset	=TRUE
learning	
)	=TRUF
ECU is in drive state	THE
OR	- ()
ECU is in post drive state for time	>5(sec)
)	
) OR	
ECU is in post drive state for time	>5(sec)
) Offset learning will be enabled when	
below conditions are satisfied	-INOL
(
(
Offset learning active	=TRUE
OR	
(Offset learning active	=FALSE
(

				The powerstage of the throttle actuator for bank 2 is commanded on	=TRUE		
				Battery voltage))) OR	>7,5(V)		
				Power save is active for bank 2	=TRUE		
				Limp home driving mode requested	=FALSE		
				Safety fuel cut off requested for bank	=FALSE		
				Torque limitation requested for bank 2	=FALSE		
) Vehicle speed	≤0.62(mph)		
				Engine speed	≤300(rpm)		
				Battery voltage	≤16000(mV)		
				Battery voltage	≥10000(mV)		
				Intake air temperature before throttle	≤143,26(°C)		
				Intake air temperature before throttle	≥5,26(°C)		
				Engine coolant temperature	≤100,46(°C)		
				Engine coolant temperature	≥5,26(°C)		
				No pending or confirmed DTCs	=see sheet inhibit		
				Basic enable conditions met	=see sheet enable tables		
P30E6	Range check of learned sensor voltage at lower mechanical stop for Throttle Position Sensor Bank 2: Minimum	Low mechanical stop first learning has been performed	=TRUE	(Offset learning aborted	=FALSE	1(s)	1 Trip
	learning limit exceeded	and Step 3 (If no fault in step 2 then check range of learned sensor voltages at lower mechanical stop):		OR Offset learning successful)	=FALSE		
		Actual learned sensor voltage of sensor 1 at the mechanical stop	≤0,732(V)	Offset check at cold temperature conditions active	=FALSE		

Actual learned sensor voltage of sensor 2 at the mechanical stop	≤4,708(V)	(
((Return spring check aborted	=TRUE
Actual learned sensor voltage of sensor 1 at the mechanical stop	<0,291(V)	OR	
OR		Return spring check successful	=TRUE
Actual learned sensor voltage of sensor 2 at the mechanical stop	<4,267(V)	Return spring check fault for bank 2 is set) OR	=FALSE
,		Device type) (>0
		Offset learning will be enabled during ECU is in drive state when below conditions are satisfied for time (>29(sec)
		Offset learning active OR	=TRUE
		Offset learning active	=FALSE
		The powerstage of the throttle actuator for bank 2 is	=TRUE
		Battery voltage))	>7,5(V)
		OR Power save is active for bank 2	=TRUF
) Limp home driving mode requested	
		for bank 2	
		Safety fuel cut off requested for bank 2	=FALSE
		Torque limitation requested for bank 2)	=FALSE
		, (Long term and short term adaptation chosen	=FALSE
		(Long term and short term	=TRUE
_		Long term and short term is released	=TRUE

) OR (
First learning performed	=FALSE						
Limp air position is not plausible	=TRUE						
External trigger to start offset learning	=TRUE						
) (ECU is in drive state	=TRUE						
OR ECU is in post drive state for time	>5(sec)						
)							
OR ECU is in post drive state for time	>5(sec)						
) Offset learning will be enabled when	=TRUE						
below conditions are satisfied ((
Offset learning active OR	=TRUE						
Offset learning active	=FALSE						
The powerstage of the throttle actuator for bank 2 is	=TRUE						
Battery voltage	>7,5(V)						
)							
OR Power save is active for bank 2	=TRUE						
) Limp home driving mode requested	=FALSE						
Safety fuel cut off requested for bank	=FALSE						
 Torque limitation requested for bank 2 	=FALSE						
) Vehicle speed	≤0.62(mph)						
Engine speed	≤300(rpm)						
Battery voltage	≤16000(mV)						
				Battery voltage	≥10000(mV)		
-------	---	---	----------------------------	---	------------------------------	--------	--------
				Intake air temperature before throttle valve	≤143,26(°C)		
				Intake air temperature before throttle valve	≥5,26(°C)		
				Engine coolant temperature	≤100,46(°C)		
				Engine coolant temperature	≥5,26(°C)		
				No pending or confirmed DTCs	=see sheet inhibit tables		
				Basic enable conditions met	=see sheet enable tables		
P210B	Rationality check of throttle actuator control Bank 2 deviation - Actual actuator position is continuously monitored against commanded value	((ECU is in DRIVE state	=TRUE	0,5(s)	1 Trip
		Difference between actual actuator position and its commanded value	>A * B + C(%)	OR			
		OR		ECU is in POSTDRIVE state	=TRUE		
		Difference between commanded value and actual actuator position	>(A * B + C)(%)	(Powerstage switched off by diagnosis	=TRUE		
))			
		Where: (A) Rate of change of the commanded value	=calculated value(% / sec)	for time The powerstage of the actuator is switched on, following conditions:	≥0.8(sec) =TRUE		
		(B) Factor for allowed control deviation	=0,02	(

	(C) Allowed control deviation in steady state	=5(%)	State of the thottle valve powerstage bank 2	>0		
) Release of adaptation Actual position is valid Request safety fuel cut off SKA bank 2, following condition:	=FALSE =TRUE =FALSE		
			(Request reversible safety fuel cut off SKA bank 2, which has following condition:	=FALSE		
			(Battery voltage for throttle valve operation sufficient bank 2 OR	>7,5(V)		
			Engine speed	>2000(rpm)		
) Limp home position not reached bank 2	=FALSE		
) No pending or confirmed DTCs	=see sheet inhibit		
			Basic enable conditions met	tables =see sheet enable tables		
Range check of Throttle Actuator Control duty cycle Bank 2	Absolute value of Throttle valve duty cycle ratio bank 2	>Minimum(A, (B*C))(%)(ECU is in DRIVE state	=TRUE	0,6001(s)	1 Trip
	where A - Upper threshold for Throttle Actuator Control duty cycle Bank 2 diagnosis in case of low battery voltage	95(%)	OR ECU is in POSTDRIVE state)	=TRUE		
	B - Upper threshold for Throttle Actuator Control duty cycle bank 2 diagnosis	80(%)	Absolute value of position controller of the throttle valve bank 2 of motor bench one / gradient of the filtered	<78,125(%/sec)		
	C - Factor for battery voltage compensation bank 2	=13.5V / measured battery voltage [V]	The powerstage of the actuator is switched on, following conditions:	=TRUE		
			(State of the thottle valve powerstage bank 2)	>0		
			, Release of adaptation	=FALSE		
			Actual position is valid Request safety fuel cut off SKA bank 2, following condition: (=TRUE =FALSE		

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				Request reversible safety fuel cut off SKA bank 2, which has following condition: (Battery voltage for throttle valve operation sufficient bank 2	=FALSE =TRUE		
				OR Engine speed	>2000(rpm)		
) Limp home position not reached bank 2	=FALSE		
) Battery voltage for throttle valve operation sufficient for bank 2	=TRUE		
				No pending or confirmed DTCs	=see sheet inhibit tables		
				Basic enable conditions met	=see sheet enable tables		
P30E7	Path 2: Range check of limp air position for Bank 2 - high	Difference between actual learned sensor voltage of sensor 1 at limp air position after mean value calculation and actual learned sensor voltage of sensor 1 at the lower mechanical stop	>1,4(V)	(Offset learning aborted	=FALSE	0.01(s)	1 Trip
		Difference between actual learned sensor voltage of sensor 2 at the lower mechanical stop and actual learned sensor voltage of sensor 2 at limp air position after mean value calculation	>1,4(V)	Offset learning successful)	=FALSE		
				Offset check at cold temperature conditions active	=FALSE		
				(Return spring check aborted OR	=TRUE		
				Return spring check successful	=TRUE		
				/ Return spring check fault for bank 2 is set)	=FALSE		
				Device type) (>0		

Offset learning will be enabled	>29(sec)
below conditions are satisfied for	
time	
(
(
(
Offset learning active	=TRUE
OR	
(
Offset learning active	=FALSE
(
The powerstage of the throttle	=TRUE
actuator for bank 2 is	
commanded on	
Battery voltage	>7,5(V)
)	, ()
) ´	
) ´	
ÓR	
Power save is active for bank 2	=TRUE
/ Limp home driving mode requested	=FALSE
for bank 2	
Safety fuel cut off requested for bank	=FALSE
2	
Z Torque limitation requested for bank	-FALSE
2	
/ (Long term and short term	
adaptation chosen	
(Long term and short term	
adaptation choson	-INOL
Long term and short term is	
rological	TRUE
)	
)	
(First loorning performed	
First learning performed	=FALSE
UR	
Limp air position is not plausible	=IRUE
UR	
External trigger to start offset	=IRUE
learning	
)	TOUE
	=IRUE
ECU is in drive state	
UK	_ ⁄ 、
ECU is in post drive state for time	>5(sec)

、

)	
ÓR	
ECU is in post drive state for time	>5(sec)
) Offset learning will be enabled when below conditions are satisfied (=TRUE
(Offset learning active OR	=TRUE
Offset learning active	=FALSE
(The powerstage of the throttle actuator for bank 2 is	=TRUE
commanded on Battery voltage)	>7,5(V)
))	
Power save is active for bank 2	=TRUE
) Limp home driving mode requested	=FALSE
Safety fuel cut off requested for bank	=FALSE
2 Torque limitation requested for bank 2	=FALSE
) Vehicle speed	≤0.62(mph)
Engine speed	≤300(rpm)
Battery voltage	≤16000(mV)
Battery voltage	≥10000(mV)
Intake air temperature before throttle valve	≤143,26(°C)
Intake air temperature before throttle	≥5,26(°C)
Engine coolant temperature	≤100,46(°C)
Engine coolant temperature	≥5,26(°C)
No pending or confirmed DTCs	=see sheet inhibit
Basic enable conditions met	=see sheet enable tables

P30E7	Path 3: Range check of limp air position for Bank 2 - low	Difference between actual learned sensor voltage of sensor 1 at limp air position after mean value calculation and actual learned sensor voltage of sensor 1 at the lower mechanical stop	<0,74(V)	(Offset learning aborted	=FALSE	0.01(s)	1 Trip
		OR Difference between actual learned sensor voltage of sensor 2 at the lower mechanical stop and actual learned sensor voltage of sensor 2 at limp air position after mean value calculation	<0,74(V)	OR Offset learning successful)	=FALSE		
				Offset check at cold temperature conditions active (=FALSE		
				(Return spring check aborted OR	=TRUE		
				Return spring check successful	=TRUE		
				Return spring check fault for bank 2 is set)	=FALSE		
				OR Device type)	>0		
				(Offset learning will be enabled during ECU is in drive state when below conditions are satisfied for time (>29(sec)		
				(Offset learning active OR	=TRUE		
				Offset learning active	=FALSE		
				The powerstage of the throttle actuator for bank 2 is	=TRUE		
				Battery voltage))	>7,5(V)		
				OR Power save is active for bank 2	=TRUE		
				, Limp home driving mode requested	=FALSE		

Safety fuel cut off requested for bank	=FALSE
2 Teams limitation around the bank	
2	=FALSE
)	
, (Long term and short term	=FALSE
adaptation chosen	
OR	
(Long term and short term	=TRUE
adaptation chosen	
Long term and short term is	=IRUE
released	
)	
, OR	
(
(
First learning performed	=FALSE
OR	
Limp air position is not plausible	=IRUE
External trigger to start offset	-TRUF
learning	-1102
)	
(=TRUE
ECU is in drive state	
OR	$\Gamma(z,z,z)$
ECO is in post drive state for time	>b(sec)
)	
)	
OR	
ECU is in post drive state for time	>5(sec)
)	
Offset learning will be enabled when below conditions are satisfied	=IRUE
(
(
`(
Offset learning active	=TRUE
OR	
(Offerent les englis en englis en	
	=FALSE
The powerstage of the throttle	=TRUE
actuator for bank 2 is	
commanded on	
Battery voltage	>7,5(V)
)	
, OR	
Power save is active for bank 2	=TRUE

				Limp home driving mode requested for bank 2	=FALSE		
				Safety fuel cut off requested for bank	=FALSE		
				Z Torque limitation requested for bank	=FALSE		
				2	·0.00(
				Vehicle speed	≤0.62(mph)		
				Engine speed	≤300(rpm)		
				Battery voltage	≤16000(mV)		
				Battery voltage	≥10000(mV)		
				Intake air temperature before throttle	≤143,26(°C)		
				Intake air temperature before throttle	≥5,26(°C)		
				Engine coolant temperature	≤100,46(°C)		
				Engine coolant temperature	≥5,26(°C)		
				No pending or confirmed DTCs	=see sheet inhibit		
				Basic enable conditions met	=see sheet enable		
					tables		
P30E7	Path 4: Limp air position drift Bank 2 - comparison with lower	(r		(Offset learning aborted	=FALSE	0.01(s)	1 Trip
	mechanical stop sensor						
	voltage	Actual offset learning step	=4	OR			
		and		Offset learning successful	=FALSE		
		(A - B) Absolute value of the actual learned value minus last	>0.155(V)	Offset check at cold temperature conditions active	=FALSE		
		Where:		(
		A	=(A1 + A2) / 2(V)	(Return spring check aborted	=TRUE		
		Δ1	=(B1 + B2) / 2(V) $= \Delta 11 - \Delta 12(V)$	UK Return spring check successful			
		В А1	=(B1 + B2) / 2(V) =A11 - A12(V)	OR Return spring check successful)	=TRUE		
		В A1 A2	=(B1 + B2) / 2(V) =A11 - A12(V) =A22 - A21(V)	Return spring check successful) Return spring check fault for bank 2 is set	=TRUE =FALSE		
		B A1 A2 B1	=(B1 + B2) / 2(V) =A11 - A12(V) =A22 - A21(V)	Return spring check successful) Return spring check fault for bank 2 is set)	=TRUE =FALSE		
		B A1 A2 B1 B2	=(B1 + B2) / 2(V) =A11 - A12(V) =A22 - A21(V) =B11 - B12(V) =B22 - B21(V)	Return spring check successful) Return spring check fault for bank 2 is set) OR Device type	=TRUE =FALSE >0		
		B A1 A2 B1 B2	=(B1 + B2) / 2(V) =A11 - A12(V) =A22 - A21(V) =B11 - B12(V) =B22 - B21(V)	Return spring check successful) Return spring check fault for bank 2 is set) OR Device type)	=TRUE =FALSE >0		
		A1 A2 B1 B2 (A11) Learned sensor voltage	=(B1 + B2) / 2(V) =A11 - A12(V) =A22 - A21(V) =B11 - B12(V) =B22 - B21(V)	Return spring check successful) Return spring check fault for bank 2 is set) OR Device type) (=TRUE =FALSE >0		
		A1 A2 B1 B2 (A11) Learned sensor voltage of sensor 1 at limp air position,	=(B1 + B2) / 2(V) =A11 - A12(V) =A22 - A21(V) =B11 - B12(V) =B22 - B21(V)	Return spring check successful) Return spring check fault for bank 2 is set) OR Device type) (=TRUE =FALSE >0		

(A12) Learned reference sensor voltage of sensor 1 a the lower mechanical stop, bank 2	at	Offset learning will be enabled during ECU is in drive state when below conditions are satisfied for time (>29(sec)
(A22) Learned reference sensor voltage of sensor 2 a the lower mechanical stop	at	`((
(A21) Learned sensor voltag of sensor 2 at limp air position bank 2	ge on,	Offset learning active	=TRUE
(B11) Actual learned sensor voltage of sensor 1 at limp a position after mean value calculation	Nir	OR	
(B12) Learned reference sensor voltage of sensor 1 a the lower mechanical stop, bank 2	at	(
(B22) Learned reference sensor voltage of sensor 2 a the lower mechanical stop, bank 2	at	Offset learning active	=FALSE
(B21) Actual learned sensor voltage of sensor 2 at limp a position after mean value calculation	ir	(
)		The powerstage of the throttle actuator for bank 2 is	=TRUE
		Battery voltage	>7,5(V)
)	
		OR Power save is active for bank 2)	=TRUE
		Limp home driving mode requested for bank 2	=FALSE
		Safety fuel cut off requested for bank 2	=FALSE
		I orque limitation requested for bank 2)	=FALSE
		(Long term and short term adaptation chosen	=FALSE
		CR (Long term and short term adaptation chosen	=TRUE
		Long term and short term is released	=TRUE
)	
	ECM Section 689 of 772		

(
(First learning performed	=FALSE
Limp air position is not plausible	=TRUE
External trigger to start offset	=TRUE
)	
CECU is in drive state	=TRUE
ECU is in post drive state for time	>5(sec)
)	
) OR	
ECU is in post drive state for time	>5(sec)
Offset learning will be enabled when below conditions are satisfied	=TRUE
(
(
(Offset learning active	=TRUE
(
Offset learning active	=FALSE
The powerstage of the throttle actuator for bank 2 is	=TRUE
commanded on	
Battery voltage	>7,5(V)
)	
)	
ÓR	
Power save is active for bank 2	=TRUE
Limp home driving mode requested for bank 2	=FALSE
Safety fuel cut off requested for bank	=FALSE
Torque limitation requested for bank	=FALSE
)	
Vehicle speed	≤0.62(mph)
Engine speed	≤300(rpm)
Battery voltage	≤16000(mV)
Battery voltage	≥10000(mV)

				Intake air temperature before throttle valve	≤143,26(°C) >5.26(°C)		
				valve			
				Engine coolant temperature	≤100,46(°C)		
				Engine coolant temperature	≥5,26(°C)		
				No pending or confirmed DTCs	=see sheet inhibit tables		
				Basic enable conditions met	=see sheet enable tables		
P211D	Path 1: Throttle valve opening spring check - opening failure for Bank 2	Here it is checked whether opening spring can be returned by mechanical force only to the defined limp home position in the defined time		(Offset learning aborted	=FALSE	0,26(s)	1 Trip
		Actual offset learning step	=4	OR Offset learning successful	=FALSE		
		Limp air position is implausible	=TRUE	Offset check at cold temperature	=FALSE		
		OR					
		First learning performed	=FALSE	(Return spring check aborted	=TRUE		
				OR			
		Position of the throttle valve	≤A [∞] C1(%))	=IRUE		
		for time	≥0,26(sec)	Return spring check fault for bank 2 is set)	=FALSE		
) OR		OR Device type	>0		
		() (
		Limp air position is implausible	=FALSE	Offset learning will be enabled during ECU is in drive state when below conditions are satisfied for time (>29(sec)		
		First learning performed	=TRUE				
		Position of the throttle valve	≤Limp home position of throttle valve - 3%(%)	Offset learning active	=TRUE		
		Limp air position is implausible when:		OR			

Absolute difference of the deviation of limp air position sensor voltage at ECU start from lower mechanical stop position sensor voltage and th deviation of actual learned lim air position sensor voltage from lower mechanical stop position sensor voltage	>0.155(V) e p	(
for time	≥0,26(sec)	Offset learning active	=FALSE
)		(
, Where:		The powerstage of the throttle actuator for bank 2 is commanded on	=TRUE
(A) Gradient of the throttle valve angle	=100% / ((V12 - V11) + (V21 - V22)) * 0.5(%/V)	Battery voltage	>7,5(V)
(C1) Threshold for minimum absolute limp air position allowed	=0,74(V))))	
voltage of sensor 1 at the		OR	
(V11) Actual learned sensor voltage of sensor 1 at the		Power save is active for bank 2)	=TRUE
(V21) Actual learned sensor voltage of sensor 2 at the		Limp home driving mode requested for bank 2	=FALSE
(V22) Actual learned sensor voltage of sensor 2 at the		Safety fuel cut off requested for bank 2	=FALSE
		Torque limitation requested for bank 2	=FALSE
		(Long term and short term adaptation chosen	=FALSE
		(Long term and short term	=TRUE
		Long term and short term is released	=TRUE
) OR (
		(First learning performed	=FALSE
F	CM Section 602 of 772	Limp air position is not plausible	=TRUE

External trigger to start offset learning	=TRUE
) (ECU is in drive state	=TRUE
OR ECU is in post drive state for time	>5(sec)
)	
) OR	
ECU is in post drive state for time	>5(sec)
, Offset learning will be enabled when below conditions are satisfied	=TRUE
Offset learning active OR	=TRUE
(Offset learning active	=FALSE
(
The powerstage of the throttle actuator for bank 2 is	=TRUE
commanded on Battery voltage	>7,5(V)
)	
)	
OR Bower cover in active for bank 2	
)	TRUE
Limp home driving mode requested for bank 2	=FALSE
Safety fuel cut off requested for bank 2	=FALSE
Torque limitation requested for bank 2	=FALSE
)	
Vehicle speed	≤0.62(mph)
Engine speed	≤300(rpm)
Battery voltage	≤16000(mV)
Battery voltage	≥10000(mV)
Intake air temperature before throttle valve	≤143,26(°C)
Intake air temperature before throttle	≥5,26(°C)
Engine coolant temperature	≤100,46(°C)

				Engine coolant temperature	≥5,26(°C)		
				No pending or confirmed DTCs	=see sheet inhibit		
				Basic enable conditions met	tables =see sheet enable tables		
P211D	Path 2: Throttle valve opening spring failure while spreading the opening spring for Bank 2	Position of the throttle valve	>1 + B1 + B2(%)	(Offset learning aborted	=FALSE	0,3(s)	1 Trip
		Where: (B1) Offset for the lower mechanical stop because of dirt	=Calculated Parameter(%)	OR Offset learning successful)	=FALSE		
		(B2) Range for actual position (offset to desired value) to check whether open spring spread position is reached	=1(%)	Offset check at cold temperature conditions active	=FALSE		
				(
				(Return spring check aborted	=TRUE		
				Return spring check successful	=TRUE		
) Return spring check fault for bank 2 is set)	=FALSE		
				OR Device type)	>0		
				(Offset learning will be enabled during ECU is in drive state when below conditions are satisfied for time (>29(sec)		
				(Offset learning active OR	=TRUE		
				Offset learning active	=FALSE		
				(The powerstage of the throttle actuator for bank 2 is	=TRUE		
				Battery voltage))	>7,5(V)		
				OR Power save is active for bank 2	=TRUE		

Limp home driving mode requested	=FALSE
for bank 2	
2	=FALSE
Torque limitation requested for bank	=FALSE
2	
)	
(Long term and short term	=FALSE
adaptation chosen	
OR	
(Long term and short term	=IRUE
Long term and short term is	
released	=INOL
)	
)	
OR	
(
(First la serie a sería rea sel	
	=FALSE
Limp air position is not plausible	-TRUF
OR	THOL
External trigger to start offset	=TRUE
learning	
)	
(ECU is in drive state	=TRUE
UR ECILia in past drive state for time	> E(000)
Leo is in post drive state for time	>5(360)
)	
)	
OR	
ECU is in post drive state for time	>5(sec)
) Offect learning will be enabled when	
below conditions are satisfied	TRUE
(
(
(
Offset learning active	=TRUE
OR	
(Offect learning active	
(=FALSE
The powerstage of the throttle	=TRUE
actuator for bank 2 is	
commanded on	
Battery voltage	>7,5(V)
)	
)	
) OR	

				Power save is active for bank 2) Limp home driving mode requested for bank 2 Safety fuel cut off requested for bank 2 Torque limitation requested for bank 2) Vehicle speed Engine speed Battery voltage Battery voltage Intake air temperature before throttle valve Intake air temperature before throttle	=TRUE =FALSE =FALSE ≤0.62(mph) ≤300(rpm) ≤16000(mV) ≥10000(mV) ≤143,26(°C) ≥5,26(°C)		
				valve Engine coolant temperature	≤100,46(°C)		
				Engine coolant temperature	≥5,26(°C)		
				No pending or confirmed DTCs	=see sheet inhibit tables		
				Basic enable conditions met	=see sheet enable tables		
P211D	Path 3: Throttle valve return spring failure check for Bank 2	((Offset learning aborted	=FALSE	0,36(s)	1 Trip
		Limp air position is implausi	ble =TRUE	OR			
		OR		Offset learning successful	=FALSE		
		First learning performed	=FALSE) Offset check at cold temperature conditions active (=FALSE		
		Position of the throttle valve for time	>A * C1(V) ≥0,36(sec)	((Return spring check aborted OR	=TRUE		
)		Return spring check successful	=TRUE		
		OR) Return spring check fault for bank 2 is set)	=FALSE		
		(Limp air position is implausi	ble =FALSE	OR Device type	>0		
		First learning performed	=TRUE) (

Position of the throttle valve	>Limp home position of throttle valve + 3%(%)	Offset learning will be enabled during ECU is in drive state when below conditions are satisfied for time	>29(sec)
Limp air position is implausible			
Absolute difference of the deviation of limp air position sensor voltage at ECU start from lower mechanical stop position sensor voltage and the deviation of actual learned limp air position sensor voltage from lower mechanical stop position sensor voltage	>0.155(V)	Offset learning active	=TRUE
for time	≥0,36(sec)	OR	
)		(
Where: (A) Gradient of the throttle valve angle	=100% / ((V12 - V11) + (V21 - V22)) * 0.5(%/V)	Offset learning active (=FALSE
(C1) Threshold for minimum absolute limp air position	=1,37(V)	The powerstage of the throttle actuator for bank 2 is	=TRUE
(V12) Actual learned sensor voltage of sensor 1 at the upper mechanical stop (V11) Actual learned sensor voltage of sensor 1 at the lower mechanical stop (V21) Actual learned sensor voltage of sensor 2 at the lower mechanical stop		Commanded on Battery voltage))) OR	>7,5(V)
(V22) Actual learned sensor voltage of sensor 2 at the upper mechanical stop		Power save is active for bank 2)	=TRUE
		Limp home driving mode requested for bank 2	=FALSE
		Safety fuel cut off requested for bank	=FALSE
		Torque limitation requested for bank 2	=FALSE
) (Long term and short term adaptation chosen OR	=FALSE
		(Long term and short term adaptation chosen	=TRUE
		Long term and short term is released	=TRUE

) OR	
(
(First learning performed	=FALSE
Limp air position is not plausible	=TRUE
External trigger to start offset learning	=TRUE
) (ECU is in drive state	=TRUE
ECU is in post drive state for time	>5(sec)
))	
OR ECU is in post drive state for time	>5(sec)
) Offset learning will be enabled when below conditions are satisfied	=TRUE
((
(Offset learning active	=TRUE
OR (
Offset learning active	=FALSE
The powerstage of the throttle actuator for bank 2 is	=TRUE
commanded on Battery voltage	>7,5(V)
)	
ÓR	
Power save is active for bank 2	=TRUE
, Limp home driving mode requested for bank 2	=FALSE
Safety fuel cut off requested for bank	=FALSE
Torque limitation requested for bank	=FALSE
) Vehicle speed	≤0.62(mph)
Engine speed	≤300(rpm)
Battery voltage	≤16000(mV)

				Battery voltage	≥10000(mV)		
				Intake air temperature before throttle	≤143,26(°C)		
				Intake air temperature before throttle valve	≥5,26(°C)		
				Engine coolant temperature	≤100,46(°C)		
				Engine coolant temperature	≥5,26(°C)		
				No pending or confirmed DTCs	=see sheet inhibit tables		
				Basic enable conditions met	=see sheet enable tables		
P211D	Path 4: Throttle valve return spring failure while spreading the return spring for Bank 2	Position of the throttle valve	≤(D1 + D2) - D3(%)	(Offset learning aborted	=FALSE	0.2(s)	1 Trip
		Where: (D1) Limp home position of the	=Calculated	OR Offset learning successful	=FALSE		
		throttle valve	parameter(%))			
		(D2) Value by which return spring is spread starting from	=15(%)	Offset check at cold temperature conditions active	=FALSE		
		(D3) Range for actual position (offset to desired value) to check whether return spring	=2(%)	(
		spread position is reached		(Return spring check aborted OR	=TRUE		
				Return spring check successful	=TRUE		
				Return spring check fault for bank 2 is set	=FALSE		
				OR	. 0		
					20		
				(Offset learning will be enabled during ECU is in drive state when below conditions are satisfied for	>29(sec)		
				time ((
				(Offset learning active OR	=TRUE		
				Offset learning active	=FALSE		

	The powerstage of the throttle	=TRUE
	actuator for bank 2 is	
	commanded on	
	Battery voltage	>7,5(V)
)	
)	
)	
	OR	
	Power save is active for bank 2	=IRUE
	Limp nome anving mode requested	=FALSE
	IOI Dalik Z	
		=FALSE
	Z Torque limitation requested for bank	-FALSE
	2	
)	
	(Long term and short term	=FALSE
	adaptation chosen	
	OR	
	(Long term and short term	=TRUE
	adaptation chosen	
	Long term and short term is	=TRUE
	released	
)	
)	
	OR	
	(
	(
	First learning performed	=FALSE
	UR	TRUE
	Limp air position is not plausible	=IRUE
	UK External trigger to start effect	
		TROE
)	
	/ (ECI Lis in drive state	=TRUE
	OR	
	ECU is in post drive state for time	>5(sec)
	•	
)	
)	
	OR	
	ECU is in post drive state for time	>5(sec)
)	
	Offset learning will be enabled when	=TRUE
	below conditions are satisfied	
	(
	(
	(Offset learning active	
		=IRUE
FCM Section 700 of 772	Offset learning active	

				(The powerstage of the throttle actuator for bank 2 is commanded on Battery voltage))	=TRUE >7,5(V)		
				Power save is active for bank 2	=TRUE		
				Limp home driving mode requested for bank 2	=FALSE		
				Safety fuel cut off requested for bank 2	=FALSE		
				Torque limitation requested for bank 2	=FALSE		
) Vehicle speed	≤0.62(mph)		
				Engine speed	≤300(rpm)		
				Battery voltage	≤16000(mV)		
				Battery voltage	≥10000(mV)		
				Intake air temperature before throttle valve	≤143,26(°C)		
				Intake air temperature before throttle valve	≥5,26(°C)		
				Engine coolant temperature	≤100,46(°C)		
				Engine coolant temperature	≥5,26(°C)		
				No pending or confirmed DTCs	=see sheet inhibit tables		
				Basic enable conditions met	=see sheet enable tables		
P210A	Path 1 : Diagnosis of the Throttle Actuator Control Bank 2 H	Voltage low during driver OFF state (indicates open circuit)	Open Circuit: ≥ 200 K Ω impedance between ECU pin and load	(ECU is in DRIVE state	=TRUE	0.8(s)	1 Trip
	bridge circuit for open circuit			OR ECU is in POSTDRIVE state	=TRUE		
				The powerstage of the actuator is switched on, following conditions:	=TRUE		
				State of the thottle valve powerstage bank 2	>0		
		EC	CM Section 701 of 772) Release of adaptation	=FALSE		813 (

				Actual position is valid Request safety fuel cut off SKA bank 2, following condition: (Request reversible safety fuel cut off SKA bank 2, which has following	=TRUE =FALSE =FALSE		
				condition: (Battery voltage for throttle valve operation sufficient bank 2 OR Engine speed	>7,5(V) >2000(rpm)		
) Limp home position not reached bank 2	=FALSE		
) No pending or confirmed DTCs Basic enable conditions met	=see sheet inhibit tables =see sheet enable tables		
P210A Path 2: Check thro	ottle valve power	Over temperature error from the power stage is detected	=TRUE	(ECU is in DRIVE state	=TRUE	0.01(s)	1 Trip
stage to h				OR			
)	TRUE		
				The powerstage of the actuator is switched on, following conditions:	=TRUE		
				State of the thottle valve powerstage bank 2	>0		
) Release of adaptation	=FALSE		
				Actual position is valid	=TRUE		
				Request safety fuel cut off SKA bank 2, following condition:	=FALSE		
				Request reversible safety fuel cut off SKA bank 2, which has following condition:	=FALSE		
				(Battery voltage for throttle valve operation sufficient bank 2	>7,5(V)		
				Engine speed	>2000(rpm)		
) Limp home position not reached bank 2)	=FALSE		

					No pending or confirmed DTCs	=see sheet inhibit		
					Basic enable conditions met	tables =see sheet enable tables		
	P210A	Path 3 : Diagnoses the Turbine bypass valve H bridge high side driver circuit at out 1 for circuit low fault	Voltage low during driver ON state (indicates short circuit ground)	N Short to ground: ≤ 0.5 to Ω impedance between signal and controller ground	(ECU is in DRIVE state	=TRUE	0.01(s)	1 Trip
		Diagnoses the Turbine bypass valve H bridge low side driver circuit at out 2 for circuit high fault	OR Voltage high during driver O state (indicates short circuit battery)	N Short to power: ≤ 0.5 to Ω impedance between signal and controller power	OR ECU is in POSTDRIVE state)	=TRUE		
				·	The powerstage of the actuator is switched on, following conditions:	=TRUE		
					State of the thottle valve powerstage bank 2	>0		
					Release of adaptation Actual position is valid Request safety fuel cut off SKA bank 2, following condition:	=FALSE =TRUE =FALSE		
					(Request reversible safety fuel cut off SKA bank 2, which has following condition: (=FALSE		
					Battery voltage for throttle valve operation sufficient bank 2	>7,5(V)		
					Engine speed	>2000(rpm)		
) Limp home position not reached bank 2	=FALSE		
) No pending or confirmed DTCs	=see sheet inhibit tables		
					Basic enable conditions met	=see sheet enable tables		
90. COOLING FANS PERFORMAN CE	P0495	Fan1 Speed performance	Actual fan speed - Max estimated fan speed (see Look-Up-Table #34)	>1300 to 4050(rpm)	Battery Voltage	≥9500(mV)	20(s)	2 Trip
MONITORS					Percent cooling fan commanded	<101(%)		
				ECM Section 703 of 772	Basic enable conditions met	see sheet enable= tahlas		815 o

P0494	Fan1 Speed performance	Actual fan speed (see Look-Up-Table #35)	<0 to 3550(rpm)	Battery Voltage	≥9500(mV)	20(s)	2 Trip
				(Time since fan commanded on	≥5(sec)		
				OR (Fan speed Time since fan commanded on))	<1000(rpm) ≥6(sec)		
				Commanded fan speed (Percent cooling fan commanded with hysteresis) Basic enable conditions met	>7.65(%) <7.64(%) =see sheet enable tables		
U1314	Fan1 communication via CAN	Fan1 communication error reported	=TRUE	Ignition is on	=TRUE	10(events)	2 Trip
				Battery Voltage Basic enable conditions met	≥9500(mV) =see sheet enable tables		
P2CBA	Fan2 Speed performance	Actual fan speed - Max estimated fan speed (see Look-Up-Table #36)	>1400 to 4050(rpm)	Battery Voltage	≥9500(mV)	20(s)	2 Trip
				Percent cooling fan commanded	<101(%)		
				Basic enable conditions met	=see sheet enable tables		
P2CB9	Fan2 Speed performance	Actual fan speed (see Look-Up-Table #37)	<0 to 3550(rpm)	Battery Voltage	≥9500(mV)	20(s)	2 Trip
				(Time since fan commanded on	≥5(sec)		
				OR (Fan speed Time since fan commanded on))	<1000(rpm) ≥6(sec)		
				Commanded fan speed (Percent cooling fan commanded with hysteresis) Basic enable conditions met	>7.65(%) <7.64(%) =see sheet enable tables		

U1315	Fan2 communication via CAN	Fan2 communication error reported	=TRUE	Ignition is on	=TRUE	10(events)	2 Trip
				Battery Voltage Basic enable conditions met	≥9500(mV) =see sheet enable tables		
P14D8	Fan3 Speed performance	Actual fan speed - Max estimated fan speed (see Look-Up-Table #38)	>1300 to 4800(rpm)	Battery Voltage	≥9500(mV)	20(s)	2 Trip
				Percent cooling fan commanded	<101(%)		
				Basic enable conditions met	=see sheet enable tables		
P14D7	Fan3 Speed performance	Actual fan speed (see Look-Up-Table #39)	<0 to 4300(rpm)	Battery Voltage	≥9500(mV)	20(s)	2 Trip
				(Time since fan commanded on	≥5(sec)		
				OR (Fan speed Time since fan commanded on))	<1000(rpm) ≥6(sec)		
				Commanded fan speed (Percent cooling fan commanded with hysteresis) Basic enable conditions met	>7.65(%) <7.64(%) =see sheet enable tables		
U1384	Fan3 communication via CAN	Fan3 communication error reported	=TRUE	Ignition is on	=TRUE	10(events)	2 Trip
				Battery Voltage Basic enable conditions met	≥9500(mV) =see sheet enable tables		
P14DC	Fan4 Speed performance	Actual fan speed - Max estimated fan speed (see Look-Up-Table #40)	>1300 to 4800(rpm)	Battery Voltage	≥9500(mV)	20(s)	2 Trip
				Percent cooling fan commanded	<101(%)		
				Basic enable conditions met	=see sheet enable tables		

	25OBDG07A Part 2 ECM Summary Tables											
P14DB	Fan4 Speed performance	Actual fan speed (see Look-Up-Table #41)	<0 to 4300(rpm)	Battery Voltage	≥9500(mV)	20(s)	2 Trip					
				(Time since fan commanded on	≥5(sec)							
				OR (Fan speed Time since fan commanded on))	<1000(rpm) ≥6(sec)							
				Commanded fan speed (Percent cooling fan commanded with hysteresis) Basic enable conditions met	>7.65(%) <7.64(%) =see sheet enable tables							
U05AA	Alive rolling counter monitoring	Alive rolling counter error by the charge air cooler pump communication	=TRUE	Ignition is ON	=TRUE		2 Trip					
		communication		Basic enable conditions met	=see sheet enable tables							
U1385	Fan4 communication via CAN	Fan4 communication error reported	=TRUE	Ignition is on	=TRUE	10(events)	2 Trip					
				Battery Voltage Basic enable conditions met	≥9500(mV) =see sheet enable tables							
P30EF	Monitoring of Fan-1 Actual speed Out of Range - High	Speed value of fan 1	>4999(rpm)	Ignition is on	=TRUE(-)	20000(msec)	2 Trip					
				No pending or confirmed DTCs	=see sheet inhibit tables(-)							
-				Battery voltage	>=9500(mV)							
P30EE	Monitoring of Fan-1 Actual speed Out of Range - Low	Speed value of fan 1	<-109(rpm)	Ignition is on	=TRUE(-)	20000(msec)	2 Trip					
				No pending or confirmed DTCs	=see sheet inhibit tables(-)							
-				Battery voltage	>=9500(mV)							
P30F1	Monitoring of Fan-2 Actual speed Out of Range - High	Speed value of fan 2	>4999(rpm)	Ignition is on	=TRUE(-)	20000(msec)	2 Trip					
				No pending or confirmed DTCs	=see sheet inhibit tables(-)							
-				Battery voltage	>=9500(mV)							
P30F0	Monitoring of Fan-2 Actual speed Out of Range - Low	Speed value of fan 2	<-109(rpm)	Ignition is on	=TRUE(-)	20000(msec)	2 Trip					

					No pending or confirmed DTCs	=see sheet inhibit tables(-)		
					Battery voltage	>=9500(mV)		
	P14E0	Monitoring of Fan-3 Actual speed Out of Range - High	Speed value of fan 3	>4999(rpm)	Ignition is on	=TRUE(-)	20000(msec)	2 Trip
					No pending or confirmed DTCs	=see sheet inhibit tables(-)		
					Battery voltage	>=9500(mV)		
	P14DF	Monitoring of Fan-3 Actual speed Out of Range - Low	Speed value of fan 3	<-109(rpm)	Ignition is on	=TRUE(-)	20000(msec)	2 Trip
					No pending or confirmed DTCs	=see sheet inhibit tables(-)		
					Battery voltage	>=9500(mV)		
	P14DE	Monitoring of Fan-4 Actual speed Out of Range - High	Speed value of fan 4	>4999(rpm)	Ignition is on	=TRUE(-)	20000(msec)	2 Trip
					No pending or confirmed DTCs	=see sheet inhibit tables(-)		
					Ballery Vollage	>=9500(mv)		
	P14DD	Monitoring of Fan-4 Actual speed Out of Range - Low	Speed value of fan 4	<-109(rpm)	Ignition is on	=TRUE(-)	20000(msec)	2 Trip
					No pending or confirmed DTCs	=see sheet inhibit tables(-)		
					Battery voltage	>=9500(mV)		
91. CCM – ECM 5 VOLT SENSOR	P0641	Sensor supply voltage circuit over temperature	Circuit temperature	>170(°C)	Ignition is ON	=TRUE	0.5(s)	1 Trip
– 1 TO 4 DIAGNOSIS					No pending or confirmed DTCs	=see sheet inhibit tables		
					Basic enable conditions met	=see sheet enable tables		
	P0641	Sensor supply voltage circuit overvoltage	Voltage ratio between supply voltage output and reference voltage (+5V)	>1,06	Ignition is ON	=TRUE	0.5(s)	1 Trip
					No pending or confirmed DTCs	=see sheet inhibit tables		
					Basic enable conditions met	=see sheet enable tables		
	P0641	Sensor supply voltage short circuit to ground	Supply voltage	<1(V)	Ignition is ON	=TRUE	0.5(s)	1 Trip
					No pending or confirmed DTCs	=see sheet inhibit tables		

					Basic enable conditions met	=see sheet enable tables		
ľ	P0641	Sensor supply voltage circuit undervoltage	Voltage ratio between supply voltage output and reference voltage (+5V)	<0,94	Ignition is ON	=TRUE	0.5(s)	1 Trip
					No pending or confirmed DTCs	=see sheet inhibit tables		
					Basic enable conditions met	=see sheet enable tables		
	P0651	Sensor supply voltage circuit over temperature	Circuit Temperature	>170(°C)	Ignition is ON	=TRUE	0.5(s)	1 Trip
					No pending or confirmed DTCs	=see sheet inhibit		
					Basic enable conditions met	=see sheet enable tables		
	P0651	Sensor supply voltage circuit overvoltage	Voltage ratio between supply voltage output and reference voltage (+5V)	>1,06	Ignition is ON	=TRUE	0.5(s)	1 Trip
			vollage (10v)		No pending or confirmed DTCs	=see sheet inhibit tables		
					Basic enable conditions met	=see sheet enable tables		
	P0651	Sensor supply voltage short circuit to Ground	Supply voltage	<1(V)	Ignition is ON	=TRUE	0.5(s)	1 Trip
					No pending or confirmed DTCs	=see sheet inhibit tables		
					Basic enable conditions met	=see sheet enable tables		
	P0651	Sensor supply voltage circuit undervoltage	Voltage ratio between supply voltage output and reference voltage (+5V)	<0,94	Ignition is ON	=TRUE	0.5(s)	1 Trip
					No pending or confirmed DTCs	=see sheet inhibit tables		
					Basic enable conditions met	=see sheet enable tables		
	P0697	Sensor supply voltage circuit over temperature	Circuit Temperature	>170(°C)	Ignition is ON	=TRUE	0.5(s)	1 Trip
					No pending or confirmed DTCs	=see sheet inhibit tables		
					Basic enable conditions met	=see sheet enable tables		

P0697	Sensor supply voltage circuit overvoltage	Voltage ratio between supply voltage output and reference voltage (+5V)	>1,06	Ignition is ON	=TRUE	0.5(s)	1 Trip
		volago (101)		No pending or confirmed DTCs	=see sheet inhibit tables		
				Basic enable conditions met	=see sheet enable tables		
P0697	Sensor supply voltage short circuit to Ground	Supply voltage	<1(V)	Ignition is ON	=TRUE	0.5(s)	1 Trip
				No pending or confirmed DTCs	=see sheet inhibit tables		
				Basic enable conditions met	=see sheet enable tables		
P0697	Sensor supply voltage circuit undervoltage	Voltage ratio between supply voltage output and reference voltage (+5V)	<0,94	Ignition is ON	=TRUE	0.5(s)	1 Trip
				No pending or confirmed DTCs	=see sheet inhibit tables		
				Basic enable conditions met	=see sheet enable tables		
P06A3	Sensor supply voltage circuit over temperature	Circuit Temperature	>170(°C)	Ignition is ON	=TRUE	0.5(s)	1 Trip
				No pending or confirmed DTCs	=see sheet inhibit tables		
				Basic enable conditions met	=see sheet enable tables		
P06A3	Sensor supply voltage circuit overvoltage	Voltage ratio between supply voltage output and reference voltage (+5V)	>1,06	Ignition is ON	=TRUE	0.5(s)	1 Trip
				No pending or confirmed DTCs	=see sheet inhibit tables		
				Basic enable conditions met	=see sheet enable tables		
P06A3	Sensor supply voltage short circuit to Ground	Supply voltage	<1(V)	Ignition is ON	=TRUE	0.5(s)	1 Trip
				No pending or confirmed DTCs	=see sheet inhibit tables		
				Basic enable conditions met	=see sheet enable tables		

		25OBDG07/	A Part 2 ECM Summary	Tables			
P06A3	Sensor supply voltage circuit undervoltage	Voltage ratio between supply voltage output and reference voltage (+5\/)	<0,94	Ignition is ON	=TRUE	0.5(s)	1 Trip
				No pending or confirmed DTCs	=see sheet inhibit		
				Basic enable conditions met	=see sheet enable tables		
P1176	The FTZM raw sensor reference voltage is measured and provided via CAN to the ECM. The ECM monitors value provided from the FTZM and is rationalized for Sensor Supply 1.	Following conditions for time	>0(sec)	Ignition ON	=FALSE	40(counts)	2 Trip
		FTZM reference 1 voltage (converted in ECM to percent of reference to rationalize)	<92,24(%)	ECM and CAN bus awake for transmission (meaning CAN awaken by BCM or ECM)	=TRUE		
		FTZM reference 1 voltage (converted in ECM to percent	<87,75(%)	No pending or confirmed DTCs	>0(v) =see sheet inhibit tables		
		OR		Basic enabling conditions are met	=see sheet enable tables		
		(a) - (b) where:	>1,1(%)				
		(a) is the filtered FTZM supply voltage 1	=calculated parameter				
		(b) is FTZM raw supply voltage 1	=measured parameter				
P1177	The FTZM raw sensor reference voltage is measured and provided via CAN to the ECM. The ECM monitors value provided from the FTZM and is rationalized for Sensor Supply 2.	Following conditions for time	>0(sec)	Ignition ON	=FALSE	40(counts)	2 Trip
		FTZM reference 2 voltage (converted in ECM to percent of reference to rationalize)	<92,24(%)	ECM and CAN bus awake for transmission (meaning CAN awaken by BCM or ECM)	=TRUE		
		OR FTZM reference 2 voltage (converted in ECM to percent	<87,75(%)	Battery Voltage No pending or confirmed DTCs	>0(V) =see sheet inhibit tables		
		OR		Basic enabling conditions are met	=see sheet enable tables		
		(a) - (b) where: (a) is the filtered ETZM supply	>1,1(%)				
		voltage 2 (b) is FTZM raw supply voltage	=calculated parameter				
		2					

			25OBDG0	7A Part 2 ECM Summary	/ Tables		
92. CCM – ECM MAIN RELAY	P0690	Detection of sticky main realy for non permanently supplied	ECU is switched on after the Main Relay was not opened	=TRUE	Current control state of the Main Relay is set to open	=TRUE	2 Trip
		System	ECU was still powered during	>500(msec)	Basic enable conditions met	=see sheet enable	
			shutdown for time		No pending or confirmed DTC's	tables =see sheet inhibit tables	
	P0689	Monitoring of ECM/PCM Power Relay Circuit Low fault	ECU is switched off before "End of Shutdown" was reached	=TRUE	Engine is in running state	=TRUE	1 Trip
			for number of counts	>3(counts)	End of shutdown was not reached Basic enable conditions met	=TRUE =see sheet enable tables	
93. BOOST PRESSURE CONTROL	P0234	Overboost condition bank 1	Difference between desired pressure and measured pressure upstream throttle valve, bank 1 (see Look-Up- Table #79)	>(200 to 750)(hPa)	Sensed value valid status bank1	=TRUE	2 Trip
			For time	>=1,5(sec)	Bit enabling detection DLDR	=TRUE	
	P02CA	Overboost condition bank 2	Difference between desired pressure and measured pressure upstream throttle valve, bank 2 (see Look-Up- Table #79)	>(200 to 750)(hPa)	Sensed value valid status bank 2	=TRUE	2 Trip
			For time	>=1,5(sec)	Bit enabling detection DLDR	=TRUE	
	P0299	Underboost condition bank 1	Average delta-boost pressure control deviation, bank 1	<a-b()< td=""><td>[Desired value is valid turbocharger bench 1</td><td>=TRUE</td><td>2 Trip</td></a-b()<>	[Desired value is valid turbocharger bench 1	=TRUE	2 Trip
			A: Upper limit for low pass filtered boost control deviatior bank2	=250(hPa)	Desired value is valid turbocharger bank2	=TRUE	
			B: Difference to upper limit of low pass filtered boost control deviation, which leads to healing of min error	=50(hPa)	Request safety fuel cut off	=FALSE	
			ŭ		Limp home driving requested Request safety fuel cut off SKA Limp home driving requested Sensed value valid status, bank 1 Engine speed with low resolution	=FALSE =FALSE =FALSE =TRUE >(2800 to 3200)(rpm)	
			E	ECM Section 711 of 772	(and Look Lin Table #62)	· /··· /	823 of 1,098

					Desired pressure upstream throttle valve, Bank1 Ambient pressure Condition: WOT area active, bank1	>1600(hPa) >700(hPa) =TRUE		
					Condition boost control active: end of start reached, combustion engine runs on its own power	=TRUE		
					Condition idling active Differnece between desired pressure upstream throttle valve, bank 1 and minimal pressure after air filter]	=TRUE >20(hPa)		
					For time	>=3(sec)		
	P02CB	Underboost condition bank 2	Average delta-boost pressure control deviation, bank 2	<a-b()< td=""><td>[Desired value is valid turbocharger bench 1</td><td>=TRUE</td><td></td><td>2 Trip</td></a-b()<>	[Desired value is valid turbocharger bench 1	=TRUE		2 Trip
			A: Upper limit for low pass filtered boost control deviation bank2	=250(hPa)	Desired value is valid turbocharger bank2	=TRUE		
			B: Difference to upper limit of low pass filtered boost control deviation, which leads to bealing of min error	=50(hPa)	Request safety fuel cut off	=FALSE		
			healing of minerol		Limp home driving requested	=FALSE		
					Request safety fuel cut off SKA	=FALSE		
					Limp home driving requested	=FALSE		
					Sensed value valid status, bank 2 Engine speed with low resolution (see Look-Up-Table #63)	=1RUE >(2800 to 3200)(rpm)		
					Desired pressure upstream throttle valve, bank 2	>1600(hPa)		
					Ambient pressure Condition: WOT area active, bank 2	>700(hPa) =TRUE		
					Condition boost control active: end of start reached, combustion engine runs on its own power	=TRUE		
					Condition idling active	=TRUE		
					Differnece between desired pressure upstream throttle valve, bank 2 and minimal pressure after air filter]	>20(hPa)		
					For time	>=3(sec)		
94. CCM – IDLE SPEED CONTROL DIAGNOSIS	P0507	Detects a negative deviation between commanded and current idle speed - engine operation mode: warm operation	(ECU Sub-State in DRIVE	=TRUE	5(s)	2 Trip
			Deviation of idle speed	<-200(rpm)	Engine start has finished	=TRUE		
			precontrol (set point - current)	Section 712 of 772				824 o

		Integral part of the idle speed control at its lower limit, which is the following conditions:		(No external torque demand (engine is running in idle)	=TRUE		
		A - (B+C)	≤3276,7(Nm)) for time	≥10(sec)		
		Where: A: Maximum torque of idle		Catalyst heating is active	=FALSE		
		B: Precontrol of the drag		Limp-home operation is not active	=TRUE		
		C: Current idle speed governor torque		Safety fuel cut off is not active	=TRUE		
) OR Number of fuel cut-out phases	≥255(counts)	Valid crankshaft signal is present Altitude correction factor Vehicle speed	=TRUE >0,688 =0(mph)		
				Intake air temperature Engine coolant temperature Engine coolant temperature Time after end of start No pending or confirmed DTCs	>-20,3(°C) ≤126(°C) ≥58,5(°C) ≥30(sec) =see sheet inhibit tables		
				Basic enabling conditions are met	=see sheet enable tables		
P0506	Detects a positive deviation between commanded and current idle speed - engine operation mode: warm	Deviation of idle speed precontrol (set point - current) and Engine speed	>100(rpm)	ECU Sub-State in DRIVE	=TRUE	5(s)	2 Trip
	operation	Integral part of the idle speed control at its upper limit, which is the following conditions:		Engine start has finished	=TRUE		
		(A+B)-C	≤3276,7(Nm)	(No external torque demand (engine is running in idle))	=TRUE		
		Where: A: Maximum torque of idle		for time Catalyst heating is active	≥10(sec) =FALSE		
		speed control B: Precontrol of the drag		Limp-home operation is not active	=TRUE		
		C: Current idle speed governor torque		Safety fuel cut off is not active	=TRUE		
		1		Valid crankshaft signal is present Altitude correction factor Vehicle speed Intake air temperature	=TRUE >0,688 =0(mph) >-20,3(°C)		
		ECM	Section 712 of 772	Engine coolant temperature	≤126(°C)		925

			25OBDG07A	Part 2 ECM Summar	y Tables			
					Engine coolant temperature Time after end of start No pending or confirmed DTCs	≥58,5(°C) ≥30(sec) =see sheet inhibit		
					Basic enabling conditions are met	=see sheet enable tables		
95. CHARGE AIR COOLER WATER PUMP	P30AE	Monitoring of WCAC pump current high threshold	Charge air cooler pump motor actual current	>22(A)	Ignition is on	=TRUE(-)	2000(msec)	2 Trip
					No pending or confirmed DTCs	=see sheet inhibit tables(-)		
	P30AF	Monitoring of WCAC pump current low threshold	Charge air cooler pump motor actual current	<0(A)	Ignition is on	=TRUE(-)	2000(msec)	2 Trip
					No pending or confirmed DTCs	=see sheet inhibit tables(-)		
	P2B83	Monitoring of WCAC pump overspeed	Charge air cooler pump actual speed	>7000(rpm)	Ignition is on	=TRUE(-)	2000(msec)	2 Trip
					No pending or confirmed DTCs	=see sheet inhibit tables(-)		
	P10BA	Monitoring of WCAC pump plausibility	I Filtered requested speed of charge air cooler pump - Filtered actual speed of charge air cooler pump I	>7000(rpm)	Ignition is on	=TRUE(-)	5000(msec)	2 Trip
					No pending or confirmed DTCs	=see sheet inhibit tables(-)		
	P026E	Monitoring of WCAC pump out of range check	Charge air cooler pump motor actual current	>A*B(-)	Ignition is on	=TRUE(-)	4000(msec)	2 Trip
			Charge air cooler pump current high limit for a given pump speed (see Look-Up-Table #62)	=(22)(A)	No pending or confirmed DTCs	=see sheet inhibit tables(-)		
			Charge air cooler pump factor high limit for a given coolant temperature (see Look-Up- Table #77)	=(1)(-)				
			Charge air cooler pump motor actual current	<a*b(-)< td=""><td></td><td></td><td></td><td></td></a*b(-)<>				
			Charge air cooler pump current low limit for a given pump speed (see Look-Up-Table #76)	=(0)(A)				

			Charge air cooler pump factor low limit for a given coolant temperature (see Look-Up- Table #75)	=(1)(-)				
	P2B84	Monitoring of WCAC pump underspeed	Charge air cooler pump actual speed	<0(rpm)	Ignition is on	=TRUE(-)	2000(msec)	2 Trip
					No pending or confirmed DTCs	=see sheet inhibit tables(-)		
96. VARIABLE EXHAUST VALVE PERFORMAN CE	P3179	Path 1: Diagnostic Valve actuator when an internal fault is present.	Fuel Tank Zone Module Pulse 1 Input Sensed Raw Value : Sensed Period Raw Value	≥3,33(msec)	Battery Voltage	≥9000(mV)	4(s)	2 Trip
DIAGNOSIS			Fuel Tank Zone Module Pulse 1 Input Sensed Raw Value : Sensed Period Raw Value	<3,33(msec)	Basic enable conditions met	=see sheet enable tables		
		Path 2: Diagnostic Valve actuator when the valve is open stuck in the end stop learning mode	Fuel Tank Zone Module Pulse 1 Input Sensed Raw Value : Sensed Period Raw Value	≥7,47(msec)	The valve Init time value flag indicates that sufficent time has been allowed for this initialization.	<5(sec)		
			Fuel Tank Zone Module Pulse 1 Input Sensed Raw Value : Sensed Period Raw Value	<7,93(msec)	VEV valve 1 actuator Perfomace Diagnostic is Enable	=TRUE		
			Valve learn state import VALUE is opened status learn	!=TRUE				
		Path 3: Diagnostic Valve actuator when the valve is closed stuck in the end stop learning mode	Fuel Tank Zone Module Pulse 1 Input Sensed Raw Value : Sensed Period Raw Value	≥8,826(msec)	Fault trip disable value	=FALSE		
			Fuel Tank Zone Module Pulse 1 Input Sensed Raw Value : Sensed Period Raw Value	<9,37(msec)	Fuel Tank Zone Module Pulse 1 Input Sensed Raw Value : Sensed Period Raw Value	≥4,85(msec)		

		250BDG07A	Part 2 ECM Summar	y Tables			
		Valve learn state import VALUE is closed status learn	!=TRUE	Fuel Tank Zone Module Pulse 1 Input Sensed Raw Value : Sensed Period Raw Value	<10,3(msec)		
				Fuel Tank Zone Module Pulse 1 Input Sensed Raw Value : Sensed Period Raw Value has a diferent value of INRNGERR	!=TRUE		
				Fuel Tank Zone Module Pulse 1 Input Sensed Raw Value : Sensed Period Raw Value	<3,33(msec)		
				Fuel Tank Zone Module Pulse 1 Input Sensed Raw Value : Sensed Period Raw Value	≥3,33(msec)		
P3171	Monitors for out-of-range high period values on the exhaust valve diagnostic PWM feedback signal.	Fuel Tank Zone Module Pulse 1 Input Sensed Raw Value : Sensed Period Raw Value	≥10,3(msec)	Battery Voltage	≥9000(mV)	4(s)	2 Trip
				Basic enable conditions met	=see sheet enable		
				The valve Init time value flag	tables <5(sec)		
				indicates that sufficent time has been allowed for this initialization.			
				VEV valve 1 actuator Perfomace Diagnostic is Enable	=TRUE		
P3170	Monitors for out-of-range low period values on the exhaust valve diagnostic PWM feedback signal.	Fuel Tank Zone Module Pulse 1 Input Sensed Raw Value : Sensed Period Raw Value	<4,86(msec)	Battery Voltage	≥9000(mV)	4(s)	2 Trip
				Basic enable conditions met	=see sheet enable		
				The valve Init time value flag	tables <5(sec)		
				indicates that sufficent time has been allowed for this initialization.			
				VEV valve 1 actuator Perfomace Diagnostic is Enable	=TRUE		
P3174	Monitors diagnostic feedback from exhuaust valve to determine if the valve end stops have not been learned	Fuel Tank Zone Module Pulse 1 Input Sensed Raw Value : Sensed Period Raw Value	≥6,93(msec)	Battery Voltage	≥9000(mV)	4(s)	2 Trip
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		Fuel Tank Zone Module Pulse 1 Input Sensed Raw Value : Sensed Period Raw Value	<7,36(msec)	Basic enable conditions met	=see sheet enable tables		
				The valve Init time value flag indicates that sufficent time has been allowed for this initialization.	<5(sec)		
				VEV valve 1 actuator Perfomace Diagnostic is Enable Fuel Tank Zone Module Pulse 1 Input Sensed Raw Value : Sensed Period Raw Value	=TRUE ≥4,85(msec)		
				Fuel Tank Zone Module Pulse 1 Input Sensed Raw Value : Sensed Period Raw Value	<10,3(msec)		
				Fuel Tank Zone Module Pulse 1 Input Sensed Raw Value : Sensed Period Raw Value has a diferent value of INRNGERR	!=TRUE		
				Fuel Tank Zone Module Pulse 1 Input Sensed Raw Value : Sensed Period Raw Value	<3,33(msec)		
				Fuel Tank Zone Module Pulse 1 Input Sensed Raw Value : Sensed Period Raw Value	≥3,33(msec)		
				Fuel Tank Zone Module Pulse 1 Input Sensed Raw Value : Sensed Period Raw Value	<3,33(msec)		
				Fuel Tank Zone Module Pulse 1 Input Sensed Raw Value : Sensed Period Raw Value	≥3,33(msec)		
				Fuel Tank Zone Module Pulse 1 Input Sensed Raw Value : Sensed Period Raw Value	<8,82(msec)		

		25OBDG07A Pa	art 2 ECM Summar	y Tables			
				Fuel Tank Zone Module Pulse 1 Input Sensed Raw Value : Sensed Period Raw Value	≥9,37(msec)		
				Fuel Tank Zone Module Pulse 1 Input Sensed Raw Value : Sensed Period Raw Value	<7,46(msec)		
				Fuel Tank Zone Module Pulse 1 Input Sensed Raw Value : Sensed Period Raw Value	≥7,92(msec)		
P316F	Monitors for out-of-range high duty cycle values on the exhaust valve diagnostic PWM feedback signal.	Fuel Tank Zone Module Pulse 1 Input Sensed Raw Value : Sensed Duty Cycle Raw Value	>98(%)	Battery Voltage	≥9000(mV)	4(s)	2 Trip
				Basic enable conditions met	=see sheet enable		
				The valve Init time value flag indicates that sufficent time has been allowed for this initialization.	<5(sec)		
				VEV valve 1 actuator Perfomace Diagnostic is Enable	=TRUE		
P316E	Monitors for out-of-range low duty cycle values on the exhaust valve diagnostic PWM feedback signal.	Fuel Tank Zone Module Pulse 1 Input Sensed Raw Value : Sensed Duty Cycle Raw Value	<2(%)	Battery Voltage	≥9000(mV)	4(s)	2 Trip
				Basic enable conditions met	=see sheet enable		
				The valve Init time value flag indicates that sufficent time has been allowed for this initialization.	<5(sec)		
				VEV valve 1 actuator Perfomace Diagnostic is Enable	=TRUE		
P3173	Monitors the sensed exhaust valve position for values that are out-of-range High.	Value Position sensor	>96,5(%)	Battery Voltage	≥9000(mV)	4(s)	2 Trip
				Basic enable conditions met	=see sheet enable tables		

				The valve Init time value flag indicates that sufficent time has been allowed for this initialization.	<5(sec)		
				VEV valve 1 actuator Perfomace Diagnostic is Enable	=TRUE		
				VEV Valve 1 Position Sensor Circuit Low Diagnostic Failure is present	=FALSE		
				VEV Valve 1 Position Sensor Circuit HIgh Diagnostic Failure is present	=FALSE		
P3172	Monitors the sensed exhaust valve position for values that are out-of-range low.	Value Position sensor	<3,5(%)	Battery Voltage	≥9000(mV)	4(s)	2 Trip
				Basic enable conditions met	=see sheet enable tables		
				The valve Init time value flag indicates that sufficent time has been allowed for this initialization.	<5(sec)		
				VEV valve 1 actuator Perfomace Diagnostic is Enable	=TRUE		
				VEV Valve 1 Position Sensor Circuit Low Diagnostic Failure is present	=FALSE		
				VEV Valve 1 Position Sensor Circuit HIgh Diagnostic Failure is present	=FALSE		
P3177		Fuel Tank Zone Module Pulse 1 Input Sensed Raw Value : Sensed Period Raw Value	≥9,71(msec)	Battery Voltage	≥9000(mV)	4(s)	2 Trip
		Fuel Tank Zone Module Pulse 1 Input Sensed Raw Value : Sensed Period Raw Value	<10,31(msec)	Basic enable conditions met	=see sheet enable tables		
				The valve Init time value flag indicates that sufficent time has been allowed for this initialization.	<5(sec)		

				VEV valve 1 actuator Perfomace Diagnostic is Enable	=TRUE		
				Fault trip disable value Fuel Tank Zone Module Pulse 1 Input Sensed Raw Value : Sensed Period Raw Value	=FALSE ≥4,85(msec)		
				Fuel Tank Zone Module Pulse 1 Input Sensed Raw Value : Sensed Period Raw Value	<10,3(msec)		
				Fuel Tank Zone Module Pulse 1 Input Sensed Raw Value : Sensed Period Raw Value has a diferent value of INRNGERR	!=TRUE		
				Fuel Tank Zone Module Pulse 1 Input Sensed Raw Value : Sensed Period Raw Value	<3,33(msec)		
				Fuel Tank Zone Module Pulse 1 Input Sensed Raw Value : Sensed Period Raw Value	≥3,33(msec)		
P317A	Path 1: Diagnostic Valve actuator when an internal fault is present.	Fuel Tank Zone Module Pulse 2 Input Sensed Raw Value : Sensed Period Raw Value	≥3,33(msec)	Battery Voltage	≥9000(mV)	4(s)	2 Trip
P317A	Path 1: Diagnostic Valve actuator when an internal fault is present.	Fuel Tank Zone Module Pulse 2 Input Sensed Raw Value : Sensed Period Raw Value Fuel Tank Zone Module Pulse 2 Input Sensed Raw Value : Sensed Period Raw Value	≥3,33(msec) <3,33(msec)	Battery Voltage Basic enable conditions met	≥9000(mV) =see sheet enable tables	4(s)	2 Trip
P317A	Path 1: Diagnostic Valve actuator when an internal fault is present. Path 2: Diagnostic Valve actuator when the valve is open stuck in the end stop learning mode	Fuel Tank Zone Module Pulse 2 Input Sensed Raw Value : Sensed Period Raw Value Fuel Tank Zone Module Pulse 2 Input Sensed Raw Value : Sensed Period Raw Value Fuel Tank Zone Module Pulse 2 Input Sensed Raw Value : Sensed Period Raw Value :	≥3,33(msec) <3,33(msec) ≥7,47(msec)	Battery Voltage Basic enable conditions met The valve Init time value flag indicates that sufficent time has been allowed for this initialization.	≥9000(mV) =see sheet enable tables <5(sec)	4(s)	2 Trip
P317A	Path 1: Diagnostic Valve actuator when an internal fault is present. Path 2: Diagnostic Valve actuator when the valve is open stuck in the end stop learning mode	Fuel Tank Zone Module Pulse 2 Input Sensed Raw Value : Sensed Period Raw ValueFuel Tank Zone Module Pulse 2 Input Sensed Raw Value : Sensed Period Raw ValueFuel Tank Zone Module Pulse 2 Input Sensed Raw Value : Sensed Period Raw Value : Sensed Period Raw Value : Sensed Period Raw ValueFuel Tank Zone Module Pulse 2 Input Sensed Raw Value : Sensed Period Raw Value : Sensed Period Raw ValueFuel Tank Zone Module Pulse 2 Input Sensed Raw Value : Sensed Period Raw Value : Sensed Period Raw Value : Sensed Period Raw Value :	≥3,33(msec) <3,33(msec) ≥7,47(msec) <7,93(msec)	Battery Voltage Basic enable conditions met The valve Init time value flag indicates that sufficent time has been allowed for this initialization. VEV valve 2 actuator Perfomace Diagnostic is Enable	≥9000(mV) =see sheet enable tables <5(sec) =TRUE	4(s)	2 Trip

	Path 3: Diagnostic Valve actuator when the valve is closed stuck in the end stop learning mode	Fuel Tank Zone Module Pulse 2 Input Sensed Raw Value : Sensed Period Raw Value	≥8,8263(msec)	Fault trip disable value	=FALSE		
		Fuel Tank Zone Module Pulse 2 Input Sensed Raw Value : Sensed Period Raw Value	<9,37(msec)	Fuel Tank Zone Module Pulse 2 Input Sensed Raw Value : Sensed Period Raw Value	≥4,85(msec)		
		Valve learn state import VALUE is closed status learn	!=TRUE	Fuel Tank Zone Module Pulse 2 Input Sensed Raw Value : Sensed Period Raw Value	<10,3(msec)		
				Fuel Tank Zone Module Pulse 2 Input Sensed Raw Value : Sensed Period Raw Value	!=TRUE		
				Fuel Tank Zone Module Pulse 2 Input Sensed Raw Value : Sensed Period Raw Value	<3,33(msec)		
				Fuel Tank Zone Module Pulse 2 Input Sensed Raw Value : Sensed Period Raw Value	≥3,33(msec)		
P317E	Monitors for out-of-range high period values on the exhaust valve diagnostic PWM feedback signal.	Fuel Tank Zone Module Pulse 2 Input Sensed Raw Value : Sensed Period Raw Value	≥10,31(msec)	Battery Voltage	≥9000(mV)	4(s)	2 Trip
				Basic enable conditions met	=see sheet enable		
				The valve Init time value flag indicates that sufficent time has been allowed	tables <5(sec)		
				for this initialization. VEV valve 2 actuator Perfomace Diagnostic is Enable	=TRUE		
P317D	Monitors for out-of-range low period values on the exhaust valve diagnostic PWM feedback signal.	Fuel Tank Zone Module Pulse 2 Input Sensed Raw Value : Sensed Period Raw Value	<4,8546(msec)	Battery Voltage	≥9000(mV)	4(s)	2 Trip
				Basic enable conditions met	=see sheet enable		
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		250BDG07A	y Tables				
				The valve Init time value flag indicates that sufficent time has been allowed for this initialization.	<5(sec)		
				VEV valve 2 actuator Perfomace Diagnostic is Enable	=TRUE		
P3181	Monitors diagnostic feedback from exhuaust valve to determine if the valve end stops have not been learned	Fuel Tank Zone Module Pulse 2 Input Sensed Raw Value : Sensed Period Raw Value	≥6,94(msec)	Battery Voltage	≥9000(mV)	4(s)	2 Trip
		Fuel Tank Zone Module Pulse 2 Input Sensed Raw Value : Sensed Period Raw Value	<7,36(msec)	Basic enable conditions met	=see sheet enable tables		
				The valve Init time value flag indicates that sufficent time has been allowed for this initialization.	<5(sec)		
				VEV valve 2 actuator Perfomace Diagnostic is Enable	=TRUE		
				Fuel Tank Zone Module Pulse 2 Input Sensed Raw Value : Sensed Period Raw Value	≥4,85(msec)		
				Fuel Tank Zone Module Pulse 2 Input Sensed Raw Value : Sensed Period Raw Value	<10,3(msec)		
				Fuel Tank Zone Module Pulse 2 Input Sensed Raw Value : Sensed Period Raw Value	!=TRUE		
				Fuel Tank Zone Module Pulse 2 Input Sensed Raw Value : Sensed Period Raw Value	<3,33(msec)		
				Fuel Tank Zone Module Pulse 2 Input Sensed Raw Value : Sensed Period Raw Value	≥3,33(msec)		
				Fuel Tank Zone Module Pulse 2 Input Sensed Raw Value : Sensed Period Raw Value	<3,33(msec)		

				Fuel Tank Zone Module Pulse 2 Input Sensed Raw Value : Sensed Period Raw Value	≥3,33(msec)		
				Fuel Tank Zone Module Pulse 2 Input Sensed Raw Value : Sensed Period Raw Value	<8,82(msec)		
				Fuel Tank Zone Module Pulse 2 Input Sensed Raw Value : Sensed Period Raw Value	≥9,37(msec)		
				Fuel Tank Zone Module Pulse 2 Input Sensed Raw Value : Sensed Period Raw Value	<7,46(msec)		
				Fuel Tank Zone Module Pulse 2 Input Sensed Raw Value : Sensed Period Raw Value	≥7,92(msec)		
P317C	Monitors for out-of-range high duty cycle values on the exhaust valve diagnostic PWM feedback signal.	Fuel Tank Zone Module Pulse 1 Input Sensed Raw Value : Sensed Duty Cycle Raw Value	>98(%)	Battery Voltage	≥9000(mV)	4(s)	2 Trip
				Basic enable conditions met	=see sheet enable		
				Basic enable conditions met The valve Init time value flag indicates	=see sheet enable tables <5(sec)		
				Basic enable conditions met The valve Init time value flag indicates that sufficent time has been allowed for this initialization.	=see sheet enable tables <5(sec)		
				Basic enable conditions met The valve Init time value flag indicates that sufficent time has been allowed for this initialization. VEV valve 2 actuator Perfomace Diagnostic is Enable	=see sheet enable tables <5(sec) =TRUE		
P317B	Monitors for out-of-range low duty cycle values on the exhaust valve diagnostic PWM feedback signal.	Fuel Tank Zone Module Pulse 2 Input Sensed Raw Value : Sensed Duty Cycle Raw Value	<2(%)	Basic enable conditions met The valve Init time value flag indicates that sufficent time has been allowed for this initialization. VEV valve 2 actuator Perfomace Diagnostic is Enable Battery Voltage	=see sheet enable tables <5(sec) =TRUE ≥9000(mV)	4(s)	2 Trip
P317B	Monitors for out-of-range low duty cycle values on the exhaust valve diagnostic PWM feedback signal.	Fuel Tank Zone Module Pulse 2 Input Sensed Raw Value : Sensed Duty Cycle Raw Value	<2(%)	Basic enable conditions met The valve Init time value flag indicates that sufficent time has been allowed for this initialization. VEV valve 2 actuator Perfomace Diagnostic is Enable Battery Voltage Basic enable conditions met	=see sheet enable tables <5(sec) =TRUE ≥9000(mV) =see sheet enable	4(s)	2 Trip
P317B	Monitors for out-of-range low duty cycle values on the exhaust valve diagnostic PWM feedback signal.	Fuel Tank Zone Module Pulse 2 Input Sensed Raw Value : Sensed Duty Cycle Raw Value	<2(%)	 Basic enable conditions met The valve Init time value flag indicates that sufficent time has been allowed for this initialization. VEV valve 2 actuator Perfomace Diagnostic is Enable Battery Voltage Basic enable conditions met The valve Init time value flag indicates that sufficent time has been allowed for this initialization. 	=see sheet enable tables <5(sec) =TRUE ≥9000(mV) =see sheet enable tables <5(sec)	4(s)	2 Trip

P3180	Monitors the sensed exhaust valve position for values that are out-of-range High.	Value Position sensor	<96,5(%)	Battery Voltage	≥9000(mV)	4(s)	2 Trip
				Basic enable conditions met	=see sheet enable tables		
				The valve Init time value flag indicates that sufficent time has been allowed for this initialization.	<5(sec)		
				VEV valve 1 actuator Perfomace Diagnostic is Enable	=TRUE		
				VEV Valve 2 Position Sensor Circuit Low Diagnostic Failure is present	=FALSE		
				VEV Valve 2 Position Sensor Circuit HIgh Diagnostic Failure is present	=FALSE		
P317F	Monitors the sensed exhaust valve position for values that are out-of-range low.	Value Position sensor	<3,5(%)	Battery Voltage	≥9000(mV)	4(s)	2 Trip
				Basic enable conditions met	=see sheet enable tables		
				The valve Init time value flag indicates that sufficent time has been allowed for this initialization.	<5(sec)		
				VEV valve 2 actuator Perfomace Diagnostic is Enable	=TRUE		
				VEV Valve 2 Position Sensor Circuit Low Diagnostic Failure is present	=FALSE		
				VEV Valve 2 Position Sensor Circuit HIgh Diagnostic Failure is present	=FALSE		
P3184		Fuel Tank Zone Module Pulse 2 Input Sensed Raw Value : Sensed Period Raw Value	≥9,7(msec)	Battery Voltage	≥9000(mV)	4(s)	2 Trip

			Fuel Tank Zone Module Puls 2 Input Sensed Raw Value : Sensed Period Raw Value	se <10,31(msec)	Basic enable conditions met	=see sheet enable tables		
					The valve Init time value flag indicates that sufficent time has been allowed for this initialization.	<5(sec)		
					VEV valve 2 actuator Perfomace Diagnostic is Enable	=TRUE		
					Fault trip disable value Fuel Tank Zone Module Pulse 2 Input Sensed Raw Value : Sensed Period Raw Value	≥4,85(msec)		
					Fuel Tank Zone Module Pulse 2 Input Sensed Raw Value : Sensed Period Raw Value	<10,3(msec)		
					Fuel Tank Zone Module Pulse 2 Input Sensed Raw Value : Sensed Period Raw Value	!=TRUE		
					Fuel Tank Zone Module Pulse 2 Input Sensed Raw Value : Sensed Period Raw Value	<3,33(msec)		
					Fuel Tank Zone Module Pulse 2 Input Sensed Raw Value : Sensed Period Raw Value	≥3,33(msec)		
97. VARIABLE EXHAUST VALVE RATIONALITY DIAGNOSIS	P3176	Monitors for in-range errors that result when the sensed period of the diagnostic PWM feedback signal for exhaust valve is neither out of range low nor out of range high and does not fall within any of the calibrated ranges defined for	Fuel Tank Zone Module Puls 1 Input Sensed Raw Value : Sensed Period Raw Value is not between the calibrated ranges defined for diagnostic data.	se =TRUE s c	Battery Voltage	≥9000(mV)	4(s)	2 Trip
		ulagnostic recuback data.			Basic enable conditions met	=see sheet enable tables		
					The valve Init time value flag indicates that sufficent time has been allowed for this initialization.	<5(sec)		
				ECM Section 725 of 772	VEV valve 1 actuator Perfomace Diagnostic is Enable	=TRUE		837

P3175	Path 1: Diagnostic in steady state condition the VEV valve is deemed to be within the positive steady state tolerance	VEV Perform Valve 1 Tracking 1 Rationality Diagnostics Class Instance / VEV Valve e System Error	≥10(%)	Battery Voltage	≥9000(mV)	8(s)	2 Trip
		VEV Valve Feedback PWM Percentage Difference	≥3(%)	Basic enable conditions met	=see sheet enable tables		
	Path 2: Diagnostic in steady state condition the VEV valve is deemed to be within the negative steady state tolerance	VEV Perform Valve 1 Tracking 1 Rationality Diagnostics Class Instance / VEV Valve System Error	≤10(%)	and (
		VEV Valve Feedback PWM PercentageDifference	≤3(%)	Count diagnostics delay for valve 1	≥200(counts)		
				That means the next condictions are met:(
				VEV Valve Rate of Change of Command PWM Percentage	>3(%)		
	Path 3: Diagnostic in steady state condition the VEV valve is deemed to be within the absolute steady state tolerance	VEV Perform Valve 1 Tracking 1 Rationality Diagnostics Class Instance / VEV Valve e System Error -absolute Value	<10(%)	and (
				Present system error	>10(%)		
				and (Previous system error	<10(%)		
				or			
				Previous system error	>10(%)		
)			
)			
				or			

		25OBDG07A Par	t 2 ECM Summar	y Tables			
				Absolute value of Previous system error	<10(%)		
				VEV Valve Feedback PWM PercentageDifference	≥3(%)		
)			
P3183	Monitors for in-range errors that result when the sensed period of the diagnostic PWM feedback signal for exhaust valve is neither out of range low nor out of range high and does not fall within any of the calibrated ranges defined for diagnostic feedback data.	Fuel Tank Zone Module Pulse 2 Input Sensed Raw Value : Sensed Period Raw Value is not between the calibrated ranges defined for diagnostic data.	=TRUE	Battery Voltage	≥9000(mV)	4(s)	2 Trip
				Basic enable conditions met	=see sheet enable tables		
				The valve Init time value flag indicates that sufficent time has been allowed for this initialization.	<5(sec)		
				VEV valve 2 actuator Perfomace Diagnostic is Enable	=TRUE		
P3182	Path 1: Diagnostic in steady state condition the VEV valve 2 is deemed to be within the positive steady state tolerance	VEV Perform Valve 2 Tracking Rationality Diagnostics Class Instance / VEV Valve System Error	≥10(%)	Battery Voltage	≥9000(mV)	8(s)	2 Trip
		VEV Valve Feedback PWM Percentage Difference	≥3(%)	Basic enable conditions met	=see sheet enable tables		
	Path 2: Diagnostic in steady state condition the VEV valve 2 is deemed to be within the negative steady state tolerance	VEV Perform Valve 2 Tracking Rationality Diagnostics Class Instance / VEV Valve System Error	≤10(%)	and (
		VEV Valve Feedback PWM PercentageDifference	≤3(%)	Count diagnostics delay for valve 2	≥200(counts)		

		250BDG07A	Part 2 ECIVI Summary	Tables			
				That means the next condictions are met:(
	Path 3: Diagnostic in steady state condition the VEV valve 2 is deemed to be within the absolute steady state tolerance	VEV Perform Valve 2 Tracking Rationality Diagnostics Class Instance / VEV Valve System Error - absolute value	<10(%)	VEV Valve Rate of Change of Command PWM Percentage	>3(%)		
				and (
				Present system error	>10(%)		
				and (
				Previous system error	<10(%)		
				or			
				Previous system error))	>10(%)		
				or			
				Absolute value of Previous system error	<10(%)		
				VEV Valve Feedback PWM PercentageDifference	≥3(%)		
)			
P2BF9	Monitors for ground short circuit faults in the exhuast valve PWM control circuit.	The exhuast valve circuit diagnostics is reporting a Ground Short Circuit Status.	=TRUE	Battery Voltage	≥9000(mV)	4(s)	2 Trip
				Basic enable conditions met	=see sheet enable		
				VEV valve cuircuit Diagnostic short to power is enable	TRUE		
				The valve Init time value flag indicates that sufficent time has been allowed for this initialization.	<5(sec)		
P2BF8	Monitors for open circuit faults in the exhuast valve PWM control circuit.	The exhuast valve circuit diagnostics is reporting an Open Circuit Status.	=TRUE	Battery Voltage	≥9000(mV)	4(s)	2 Trip

					Basic enable conditions met VEV valve cuircuit Diagnostic short to power is enable	=see sheet enable tables =TRUE		
					The valve Init time value flag indicates that sufficent time has been allowed for this initialization.	<5(sec)		
	P2BFA	Monitors for gower short circuit faults in the exhuast valve PWM control circuit.	The exhuast valve circuit diagnostics is reporting an Power Short Circuit Status.	=TRUE	Battery Voltage	≥9000(mV)	4(s)	2 Trip
					Basic enable conditions met	=see sheet enable		
					VEV valve cuircuit Diagnostic short to power is enable	=TRUE		
					The valve Init time value flag indicates that sufficent time has been allowed for this initialization.	<5(sec)		
98. CCM - ENGINE COMPARTME NT	P10B3		Resistance value of engine compartment temperature sensor lies below the	≤53(Ohm)	Ignition is ON Battery Voltage	=TRUE ≥9000(mV)	0,5(s)	2 Trip
EMPERATU RE SENSOR								
DIAGNOSIS	P10B4		Resistance value of engine compartment temperature sensor lies above the	≥650000(Ohm)	Basic enable conditions met	=see sheet enable tables		2 Trip
					Coolant temperature at the output of cooler	>-30,04(°C)		
	P134D		Absolute difference between the raw sensor value and the low-pass filtered raw sensor value	≥14,96(°C)	Ignition is ON	=TRUE	0,1(s)	2 Trip
			for time	≥A+B(sec)	Battery Voltage	≥9000(mV)		
			where:		Basic enable conditions met	=TRUE		
			A: debounce time error detection Loose Connection Check eingine compartment temperature	=2(sec)	Sensor's power stage faults status:			

			B: debounce time error Loose Connection Check eingine compartment temperature sensor	=5(sec)		P10B3=FALSE		
						P10B4=FALSE		
	P10B5		(Filtered sensor value engine compartment temperature) - (Temperature mean value, calculated out of freeze values from provided temperature sensors)	>14,96(°C)	Ignition is ON	=TRUE	0,1(s)	2 Trip
					Battery Voltage	≥9000(mV)		
	P10B5		(Temperature mean value, calculated out of freeze values from provided temperature sensors) - (Filtered sensor value engine compartment temperature)	>14,96(°C)	Basic enable conditions met	=TRUE	0,1(s)	2 Trip
					Engine coolant temperature at start	≤39,96(°C)		
99. TRANSMISSI ON RANGE	P1789		Time of transmition current range unknown	≥0,5(sec)	Ignition is ON	=TRUE	0,01(s)	2 Trip
DIAGNOSTIC					Basic enable conditions met	=see sheet enable tables		
100. ELECTRONIC TRANSMISSI ON PRNDL CORRELATIO N DIAGNOSIS	P17E3	Monitoring Fault information for Shifter A from SIB index 0	r Status value for shifter A DTC from SIB / Diagnostic Status Shifter Interface Board : A Diagnostic Trouble Code Status	=4	Battery Voltage	≥9000(mV)	0,01(s)	2 Trip
			Diagnostic Status Shifter Interface Board : A Diagnostic Trouble Code Index / Com signal for index values shifter A DTC from SIB	=0	Basic enable conditions met	=see sheet enable tables		
					and (_

		250BDG07A F	Part 2 ECM Summary	7 Tables		
P17E4	Monitoring Fault information fo Shifter A from SIB index 1	r Status value for shifter A DTC from SIB / Diagnostic Status Shifter Interface Board : A Diagnostic Trouble Code Status	=4	Status value for shifter C DTC from SIB	=3	2 Trip
		Diagnostic Status Shifter Interface Board : A Diagnostic Trouble Code Index / Com signal for index values shifter A	=1	or		
				Status value for shifter C DTC from SIB)	=4	
P17E5	Monitoring Fault information fo Shifter A from SIB index 2	r Status value for shifter A DTC from SIB / Diagnostic Status Shifter Interface Board : A Diagnostic Trouble Code Status	=4	-		2 Trip
		Diagnostic Status Shifter Interface Board : A Diagnostic Trouble Code Index / Com signal for index values shifter A DTC from SIB	=2			
P17E6	Monitoring Fault information for Shifter A from SIB index 3	r Status value for shifter A DTC from SIB / Diagnostic Status Shifter Interface Board : A Diagnostic Trouble Code Status	=4			2 Trip
		Diagnostic Status Shifter Interface Board : A Diagnostic Trouble Code Index / Com signal for index values shifter A DTC from SIB	=3			
P17E7	Monitoring Fault information fo Shifter A from SIB index 4	r Status value for shifter A DTC from SIB / Diagnostic Status Shifter Interface Board : A Diagnostic Trouble Code Status	=4			2 Trip
		Diagnostic Status Shifter Interface Board : A Diagnostic Trouble Code Index / Com signal for index values shifter A DTC from SIB	=4			

P17E8	Monitoring Fault information for Shifter A from SIB index 5	Status value for shifter A DTC from SIB / Diagnostic Status Shifter Interface Board : A Diagnostic Trouble Code Status	=4	2 Trip
		Diagnostic Status Shifter Interface Board : A Diagnostic Trouble Code Index / Com signal for index values shifter A DTC from SIB	=5	
P17E9	Monitoring Fault information for Shifter A from SIB index 6	Status value for shifter A DTC from SIB / Diagnostic Status Shifter Interface Board : A Diagnostic Trouble Code Status	=4	2 Trip
		Diagnostic Status Shifter Interface Board : A Diagnostic Trouble Code Index / Com signal for index values shifter A DTC from SIB	=6	
P17EA	Monitoring Fault information for Shifter A from SIB index 7	Status value for shifter A DTC from SIB / Diagnostic Status Shifter Interface Board : A Diagnostic Trouble Code Status	=4	2 Trip
		Diagnostic Status Shifter Interface Board : A Diagnostic Trouble Code Index / Com signal for index values shifter A DTC from SIB	=7	
P17EB	Monitoring Fault information for Shifter A from SIB index 8	Status value for shifter A DTC from SIB / Diagnostic Status Shifter Interface Board : A Diagnostic Trouble Code Status	=4	2 Trip
		Diagnostic Status Shifter Interface Board : A Diagnostic Trouble Code Index / Com signal for index values shifter A DTC from SIB	=8	

P17EC	Monitoring Fault information for Shifter A from SIB index 9	r Status value for shifter A DTC from SIB / Diagnostic Status Shifter Interface Board : A Diagnostic Trouble Code Status	=4	2 Trip
		Diagnostic Status Shifter Interface Board : A Diagnostic Trouble Code Index / Com signal for index values shifter A DTC from SIB	=9	
P17ED	Monitoring Fault information for Shifter A from SIB index 10	r Status value for shifter A DTC from SIB / Diagnostic Status Shifter Interface Board : A Diagnostic Trouble Code Status	=4	2 Trip
		Diagnostic Status Shifter Interface Board : A Diagnostic Trouble Code Index / Com signal for index values shifter A DTC from SIB	=10	
P17EE	Monitoring Fault information for Shifter A from SIB index 11	r Status value for shifter A DTC from SIB / Diagnostic Status Shifter Interface Board : A Diagnostic Trouble Code Status	=4	2 Trip
		Diagnostic Status Shifter Interface Board : A Diagnostic Trouble Code Index / Com signal for index values shifter A DTC from SIB	=11	
P17EF	Monitoring Fault information for Shifter A from SIB index 12	r Status value for shifter A DTC from SIB / Diagnostic Status Shifter Interface Board : A Diagnostic Trouble Code Status	=4	2 Trip
		Diagnostic Status Shifter Interface Board : A Diagnostic Trouble Code Index / Com signal for index values shifter A DTC from SIB	=12	

P17F0	Monitoring Fault information for Shifter A from SIB index 13	Status value for shifter A DTC from SIB / Diagnostic Status Shifter Interface Board : A Diagnostic Trouble Code Status	=4	2 Trip)
		Diagnostic Status Shifter Interface Board : A Diagnostic Trouble Code Index / Com signal for index values shifter A DTC from SIB	=13		
P17F8	Monitoring Fault information for Shifter A from SIB index 14	Status value for shifter A DTC from SIB / Diagnostic Status Shifter Interface Board : A Diagnostic Trouble Code Status	=4	2 Trip	>
		Diagnostic Status Shifter Interface Board : A Diagnostic Trouble Code Index / Com signal for index values shifter A DTC from SIB	=14		
P17F9	Monitoring Fault information for Shifter A from SIB index 15	Status value for shifter A DTC from SIB / Diagnostic Status Shifter Interface Board : A Diagnostic Trouble Code Status	=4	2 Trip	>
P17F9	Monitoring Fault information for Shifter A from SIB index 15	Status value for shifter A DTC from SIB / Diagnostic Status Shifter Interface Board : A Diagnostic Trouble Code Status Diagnostic Status Shifter Interface Board : A Diagnostic Trouble Code Index / Com signal for index values shifter A DTC from SIB	=4 =15	2 Trị)
P17F9 P17FD	Monitoring Fault information for Shifter A from SIB index 15 Monitoring Fault information for Shifter A from SIB index 16	Status value for shifter A DTC from SIB / Diagnostic Status Shifter Interface Board : A Diagnostic Trouble Code Status Diagnostic Status Shifter Interface Board : A Diagnostic Trouble Code Index / Com signal for index values shifter A DTC from SIB Status value for shifter A DTC from SIB / Diagnostic Status Shifter Interface Board : A Diagnostic Trouble Code Status	=4 =15 =4	2 Trị: 2 Trị)

P17FE	Monitoring Fault information for Shifter A from SIB index 17	r Status value for shifter A DTC from SIB / Diagnostic Status Shifter Interface Board : A Diagnostic Trouble Code Status	=4	2 Trip
		Diagnostic Status Shifter Interface Board : A Diagnostic Trouble Code Index / Com signal for index values shifter A DTC from SIB	=17	
P1803	Monitoring Fault information for Shifter A from SIB index 18	r Status value for shifter A DTC from SIB / Diagnostic Status Shifter Interface Board : A Diagnostic Trouble Code Status	=4	2 Trip
		Diagnostic Status Shifter Interface Board : A Diagnostic Trouble Code Index / Com signal for index values shifter A DTC from SIB	=18	
P1805	Monitoring Fault information for Shifter A from SIB index 19	r Status value for shifter A DTC from SIB / Diagnostic Status Shifter Interface Board : A Diagnostic Trouble Code Status	=4	2 Trip
		Diagnostic Status Shifter Interface Board : A Diagnostic Trouble Code Index / Com signal for index values shifter A DTC from SIB	=19	
P1806	Monitoring Fault information for Shifter A from SIB index 20	r Status value for shifter A DTC from SIB / Diagnostic Status Shifter Interface Board : A Diagnostic Trouble Code Status	=4	2 Trip
		Diagnostic Status Shifter Interface Board : A Diagnostic Trouble Code Index / Com signal for index values shifter A DTC from SIB	=20	

P1807	Monitoring Fault information for Shifter A from SIB index 21	Status value for shifter A DTC from SIB / Diagnostic Status Shifter Interface Board : A Diagnostic Trouble Code Status	=4
		Diagnostic Status Shifter Interface Board : A Diagnostic Trouble Code Index / Com signal for index values shifter A DTC from SIB	=21
P180C	Monitoring Fault information for Shifter A from SIB index 22	Status value for shifter A DTC from SIB / Diagnostic Status Shifter Interface Board : A Diagnostic Trouble Code Status	=4
		Diagnostic Status Shifter Interface Board : A Diagnostic Trouble Code Index / Com signal for index values shifter A DTC from SIB	=22
P180D	Monitoring Fault information for Shifter A from SIB index 23	Status value for shifter A DTC from SIB / Diagnostic Status Shifter Interface Board : A Diagnostic Trouble Code Status	=4
		Diagnostic Status Shifter Interface Board : A Diagnostic Trouble Code Index / Com signal for index values shifter A DTC from SIB	=23
P180E	Monitoring Fault information for Shifter A from SIB index 24	Status value for shifter A DTC from SIB / Diagnostic Status Shifter Interface Board : A Diagnostic Trouble Code Status	=4
		Diagnostic Status Shifter Interface Board : A Diagnostic Trouble Code Index / Com signal for index values shifter A DTC from SIB	=24

P180F	Monitoring Fault information for Shifter A from SIB index 25	Status value for shifter A DTC from SIB / Diagnostic Status Shifter Interface Board : A Diagnostic Trouble Code Status	=4	2	Гrip
		Diagnostic Status Shifter Interface Board : A Diagnostic Trouble Code Index / Com signal for index values shifter A DTC from SIB	=25		
P1812	Monitoring Fault information for Shifter A from SIB index 26	Status value for shifter A DTC from SIB / Diagnostic Status Shifter Interface Board : A Diagnostic Trouble Code Status	=4	2	Ггір
		Diagnostic Status Shifter Interface Board : A Diagnostic Trouble Code Index / Com signal for index values shifter A DTC from SIB	=26		
P186B	Monitoring Fault information for Shifter A from SIB index 30	Status value for shifter A DTC from SIB / Diagnostic Status Shifter Interface Board : A Diagnostic Trouble Code Status	=4	2	Гrip
		Diagnostic Status Shifter Interface Board : A Diagnostic Trouble Code Index / Com signal for index values shifter A DTC from SIB	=30		
P186C	Monitoring Fault information for Shifter A from SIB index 25	Status value for shifter A DTC from SIB / Diagnostic Status Shifter Interface Board : A Diagnostic Trouble Code Status	=4	2	Гrip
		Diagnostic Status Shifter Interface Board : A Diagnostic Trouble Code Index / Com signal for index values shifter A DTC from SIB	=31		

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P186D	Monitoring Fault information for Shifter B from SIB index 0	 Status value for shifter B DTC from SIB / Diagnostic Status Shifter Interface Board : B Diagnostic Trouble Code Status 	=4	Battery Voltage	≥9000(mV)	0,01(s)	2 Trip
		Diagnostic Status Shifter Interface Board : B Diagnostic Trouble Code Index / Com signal for index values shifter DTC from SIB	=0 B	Basic enable conditions met	=see sheet enable tables		
				and (
P07B4	Monitoring Fault information for Shifter B from SIB index 4	Status value for shifter B DTC from SIB / Diagnostic Status Shifter Interface Board : B Diagnostic Trouble Code Status	=4	Status value for shifter B DTC from SIB	=3		2 Trip
		Diagnostic Status Shifter Interface Board : B Diagnostic Trouble Code Index / Com signal for index values shifter DTC from SIB	=4 B	or			
				Status value for shifter B DTC from SIB)	=4		
P07B3	Monitoring Fault information for Shifter B from SIB index 5	Status value for shifter B DTC from SIB / Diagnostic Status Shifter Interface Board : B Diagnostic Trouble Code Status	=4				2 Trip
		Diagnostic Status Shifter Interface Board : B Diagnostic Trouble Code Index / Com signal for index values shifter DTC from SIB	=5 B				
P07B5	Monitoring Fault information for Shifter B from SIB index 6	Status value for shifter B DTC from SIB / Diagnostic Status Shifter Interface Board : B Diagnostic Trouble Code Status	=4				2 Trip
		Diagnostic Status Shifter Interface Board : B Diagnostic Trouble Code Index / Com signal for index values shifter DTC from SIB	=6 B				
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P07BA	Monitoring Fault information for Shifter B from SIB index 7	r Status value for shifter B DTC from SIB / Diagnostic Status Shifter Interface Board : B Diagnostic Trouble Code Status	=4	2 Trip
		Diagnostic Status Shifter Interface Board : B Diagnostic Trouble Code Index / Com signal for index values shifter B DTC from SIB	=7	
P07B9	Monitoring Fault information for Shifter B from SIB index 8	r Status value for shifter B DTC from SIB / Diagnostic Status Shifter Interface Board : B Diagnostic Trouble Code Status	=4	2 Trip
		Diagnostic Status Shifter Interface Board : B Diagnostic Trouble Code Index / Com signal for index values shifter B DTC from SIB	=8	
P07BB	Monitoring Fault information for Shifter B from SIB index 9	r Status value for shifter B DTC from SIB / Diagnostic Status Shifter Interface Board : B Diagnostic Trouble Code Status	=4	2 Trip
		Diagnostic Status Shifter Interface Board : B Diagnostic Trouble Code Index / Com signal for index values shifter B DTC from SIB	=9	
P17D9	Monitoring Fault information for Shifter B from SIB index 11	r Status value for shifter B DTC from SIB / Diagnostic Status Shifter Interface Board : B Diagnostic Trouble Code Status	=4	1 Trip
		Diagnostic Status Shifter Interface Board : B Diagnostic Trouble Code Index / Com signal for index values shifter B DTC from SIB	=11	

P17DA	Monitoring Fault information for Shifter B from SIB index 12	r Status value for shifter B DTC from SIB / Diagnostic Status Shifter Interface Board : B Diagnostic Trouble Code Status	=4
		Diagnostic Status Shifter Interface Board : B Diagnostic Trouble Code Index / Com signal for index values shifter B DTC from SIB	=12
P17DB	Monitoring Fault information for Shifter B from SIB index 13	r Status value for shifter B DTC from SIB / Diagnostic Status Shifter Interface Board : B Diagnostic Trouble Code Status	=4
		Diagnostic Status Shifter Interface Board : B Diagnostic Trouble Code Index / Com signal for index values shifter B DTC from SIB	=13
P17E0	Monitoring Fault information for Shifter B from SIB index 18	r Status value for shifter B DTC from SIB / Diagnostic Status Shifter Interface Board : B Diagnostic Trouble Code Status	=4
		Diagnostic Status Shifter Interface Board : B Diagnostic Trouble Code Index / Com signal for index values shifter B DTC from SIB	=18
P17E1	Monitoring Fault information for Shifter B from SIB index 19	r Status value for shifter B DTC from SIB / Diagnostic Status Shifter Interface Board : B Diagnostic Trouble Code Status	=4
		Diagnostic Status Shifter Interface Board : B Diagnostic Trouble Code Index / Com signal for index values shifter B	=19

U18C6	Monitoring Fault information for Shifter B from SIB index 24	r Status value for shifter B DTC from SIB / Diagnostic Status Shifter Interface Board : B Diagnostic Trouble Code Status	=4	2 Tr
		Diagnostic Status Shifter Interface Board : B Diagnostic Trouble Code Index / Com signal for index values shifter B DTC from SIB	=24	
U1970	Monitoring Fault information for Shifter B from SIB index 28	r Status value for shifter B DTC from SIB / Diagnostic Status Shifter Interface Board : B Diagnostic Trouble Code Status	=4	1 T
		Diagnostic Status Shifter Interface Board : B Diagnostic Trouble Code Index / Com signal for index values shifter B DTC from SIB	=28	
U1971	Monitoring Fault information for Shifter B from SIB index 29	r Status value for shifter B DTC from SIB / Diagnostic Status Shifter Interface Board : B Diagnostic Trouble Code Status	=4	1 Tı
		Diagnostic Status Shifter Interface Board : B Diagnostic Trouble Code Index / Com signal for index values shifter B DTC from SIB	=29	
U1972	Monitoring Fault information for Shifter B from SIB index 30	r Status value for shifter B DTC from SIB / Diagnostic Status Shifter Interface Board : B Diagnostic Trouble Code Status	=4	2 Tri
		Diagnostic Status Shifter Interface Board : B Diagnostic Trouble Code Index / Com signal for index values shifter B DTC from SIB	=30	

	U2421	Monitoring Fault information fo Shifter C from SIB index 0	or Status value for shifter C DTC from SIB / Diagnostic Status Shifter Interface Board : C Diagnostic Trouble Code Status	=4	Battery Voltage	≥9000(mV)	0,01(s)	2 Trip	
			Diagnostic Status Shifter Interface Board : C Diagnostic Trouble Code Index / Com signal for index values shifter C DTC from SIB	=0	Basic enable conditions met	=see sheet enable tables			
					and (
I	U100B	Monitoring Fault information fo Shifter C from SIB index 1	or Status value for shifter C DTC from SIB / Diagnostic Status Shifter Interface Board : C Diagnostic Trouble Code Status	=4	Status value for shifter B DTC from SIB	=3		2 Trip	
			Diagnostic Status Shifter Interface Board : C Diagnostic Trouble Code Index / Com signal for index values shifter C DTC from SIB	=1	or				
					Status value for shifter B DTC from SIB)	=4			
I	U137B	Monitoring Fault information fo Shifter C from SIB index 3	or Status value for shifter C DTC from SIB / Diagnostic Status Shifter Interface Board : C Diagnostic Trouble Code Status	=4				2 Trip	
			Diagnostic Status Shifter Interface Board : C Diagnostic Trouble Code Index / Com signal for index values shifter C DTC from SIB	=3					
	U2215	Monitoring Fault information fo Shifter C from SIB index 4	or Status value for shifter C DTC from SIB / Diagnostic Status Shifter Interface Board : C Diagnostic Trouble Code Status	=4				2 Trip	
			Diagnostic Status Shifter Interface Board : C Diagnostic Trouble Code Index / Com signal for index values shifter C DTC from SIB	=4					
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U137C	Monitoring Fault information for Shifter C from SIB index 5	Status value for shifter C DTC from SIB / Diagnostic Status Shifter Interface Board : C Diagnostic Trouble Code Status	=4	2	2 Trip
		Diagnostic Status Shifter Interface Board : C Diagnostic Trouble Code Index / Com signal for index values shifter C DTC from SIB	=5		
U137D	Monitoring Fault information for Shifter C from SIB index 6	Status value for shifter C DTC from SIB / Diagnostic Status Shifter Interface Board : C Diagnostic Trouble Code Status	=4	2	2 Trip
		Diagnostic Status Shifter Interface Board : C Diagnostic Trouble Code Index / Com signal for index values shifter C DTC from SIB	=6		
U2405	Monitoring Fault information for Shifter C from SIB index 7	Status value for shifter C DTC from SIB / Diagnostic Status Shifter Interface Board : C Diagnostic Trouble Code Status	=4	2	2 Trip
		Diagnostic Status Shifter Interface Board : C Diagnostic Trouble Code Index / Com signal for index values shifter C DTC from SIB	=7		
P18F3	Monitoring Fault information for Shifter C from SIB index 13	Status value for shifter C DTC from SIB / Diagnostic Status Shifter Interface Board : C Diagnostic Trouble Code Status	=4		1 Trip
		Diagnostic Status Shifter Interface Board : C Diagnostic Trouble Code Index / Com signal for index values shifter C DTC from SIB	=13		

	P139E	Monitoring Fault information for Shifter C from SIB index 14	r Status value for shifter C DTC from SIB / Diagnostic Status Shifter Interface Board : C Diagnostic Trouble Code Status	=4				1 Trip
			Diagnostic Status Shifter Interface Board : C Diagnostic Trouble Code Index / Com signal for index values shifter C DTC from SIB	=14				
	P13FE	Monitoring Fault information for Shifter C from SIB index 15	r Status value for shifter C DTC from SIB / Diagnostic Status Shifter Interface Board : C Diagnostic Trouble Code Status	=4				1 Trip
			Diagnostic Status Shifter Interface Board : C Diagnostic Trouble Code Index / Com signal for index values shifter C DTC from SIB	=15				
	P07E5	Diagnostic if it is able to engage drive	Receive message from ETRS TRCR Diagnostics detecting - Unable to Engage Drive	=TRUE	Ignition is ON	=TRUE	0(s)	2 Trip
					Battery Voltage	≥9000(mV)		
	P073D	Diagnostic if it is able to engage neutral	Receive message from ETRS TRCR Diagnostics detecting - Unable to Engage Neutral	=TRUE	Basic enable conditions are met	=see sheet enable tables	0(s)	2 Trip
	P07E4	Diagnostic if it is able to engage parking	Receive message from ETRS TRCR Diagnostics detecting - Unable to Engage Parking	=TRUE	_		0(s)	2 Trip
	P073E	Diagnostic if it is able to engage reverse	Receive message from ETRS TRCR Diagnostics detecting - Unable to Engage Reverse	=TRUE			0(s)	2 Trip
	P1787	Diagnostic if an unexpected range change is detected	Receive message from ETRS TRCR Diagnostics detecting - Unexpected Range Change Detected	=TRUE			0(s)	2 Trip
101. BOSST PRESSURE BYPASS VALVE	P0035	Circuit continuity check - short circuit to battery voltage	Powerstage on	=TRUE	Battery Voltage	>10900(mV)	1(s)	2 Trip

		Output current	>=2A	Engine speed	>80(rpm)		
				No pending or confirmed DTCs	=see sheet inhibit tables		
P0034	Circuit continuity check - short circuit to ground	Powerstage on	=FALSE		>10900(mV)	1(s)	2 Trip
		Output voltage	<=2V	No pending or confirmed DTCs	>80(rpm) =see sheet inhibit tables		
P0033	Circuit continuity check - open Load	Powerstage on	=FALSE		>10900(mV)	1(s)	2 Trip
		Output voltage OR	>3V		>80(rpm)		
		Output voltage	<=2V	No pending or confirmed DTCs	=see sheet inhibit tables		
P00C2	Circuit continuity check - short circuit to battery voltage, bank 2	Powerstage on	=TRUE		>10900(mV)	1(s)	2 Trip
		Output current	>=2A	No pending or confirmed DTCs	>80(rpm) =see sheet inhibit tables		
P00C1	Circuit continuity check - short circuit to ground, bank 2	Powerstage on	=FALSE		>10900(mV)	1(s)	2 Trip
		Output voltage	<=2V	No pending or confirmed DTCs	>80(rpm) =see sheet inhibit tables		
P00C0	Circuit continuity check - open Load, bank 2	Powerstage on	=FALSE		>10900(mV)	1(s)	2 Trip
		Output voltage OR	>3V		>80(rpm)		
		Output voltage	<=2V	No pending or confirmed DTCs	=see sheet inhibit tables		
P23AA	Diagnosing a stuck closed bypass valve by counting the pressure pulsations detected	Pulsation counter	> 10 counts	Ignition is on	= TRUE		2 Trip
		For time Determination of a pulse: As air flow ratio oscillates, it must exceed an upper threshold and then exceed a	>= 1 sec	Turbo charger bypass valve commanded on Intake air temperature Air mass flow is valid	= TRUE > 14,96 °C = TRUE		
		lower threshold to be counted as a pulse					

25OBDG07A Part 2 ECM Summary Tables									
		All pulses need to be counted in the measurement period		Intake air temperature is valid	= TRUE				
		Pressure downstream compressor after high pass filtering	> 10 kPa	Driving the output stage of the dump valve is active	= TRUE				
		litering		For time Enabled by diagnostic scheduler	= 0,1 sec				
P2C29	Diagnosing a stuck closed bypass valve by counting the pressure pulsations detected	Pulsation counter	> 10 counts	Ignition is on	= TRUE		2 Trip		
		For time	>= 1 sec	Turbo charger bypass valve commanded on	= TRUE				
		Determination of pulse:		Intake air temperature	> 14,96 °C				
		As air flow ratio oscillates, it must exceed an upper threshold and then exceed a		Air mass flow is valid	= TRUE				
		All pulses need to be counted in the measurement period		Intake air temperature is valid	= TRUE				
		Pressure downstream compressor after high pass filtering	> 10 kPa	Driving the output stage of the dump valve is active	= TRUE				
				For time	= 0,1 sec				
				Enabled by diagnostic scheduler					
P0243	Status of diagnostic fault checl open load	k Open load error reported by H bridge chip - bank 1	=TRUE	Internal state of powerstage driver - request to drive the actuator - bank 1	=FALSE	1500(ms)	1 Trip		
				Internal state of powerstage driver is used by MoCSOP - bank 1	=FALSE				
				Short circuit diagnosis is running - H-Bridge output switched off for protection of powerstage (SC/OT error exist) -	=FALSE				
				Short circuit diagnosis is running - Test pulse requested and awaited for it's completion (SC/OT error exist) - bank 1	=FALSE				
				Battery voltage	>10900(mV)				
				Diagnosis shutdown request from actuator	=FALSE				

				No pending or confirmed DTCs	=see sheet inhibit tables		
P2ABD	Status of diagnostic fault check current limitation active	Over current error reported by H bridge chip - bank 1	=TRUE	Power stage is actuated - bank 1	=TRUE	1500(ms)	2 Trip
				Battery voltage	>10900(mV)		
				Open load diagnosis is not active - bank 1	=TRUE		
				Plausibility test for short circuit overload is not active - bank 1	=TRUE		
				No pending or confirmed DTCs	=see sheet inhibit tables		
P2ABD	Status of diagnostic fault check IC overtemperature	Over temperature error reported by H bridge chip - bank 1	=TRUE	Battery voltage	>10900(mV)	1000(ms)	2 Trip
				Open load diagnosis is not active -	=TRUE		
				No pending or confirmed DTCs	=see sheet inhibit tables		
P0246	Status of diagnostic fault check short circuit to battery 1	Short circuit to battery for Out1 error reported by H bridge chip - bank 1	=TRUE	Battery voltage	>10900(mV)	1500(ms)	1 Trip
				Open load diagnosis is not active - bank 1	=TRUE		
				No pending or confirmed DTCs	=see sheet inhibit tables		
P30E9	Status of diagnostic fault check short circuit to battery 2	Short circuit to battery for Out2 error reported by H bridge chip - bank 1	=TRUE	Battery voltage	>10900(mV)	1500(ms)	1 Trip
				Open load diagnosis is not active - bank 1	=TRUE		
				No pending or confirmed DTCs	=see sheet inhibit tables		
P0245	Status of diagnostic fault check short circuit to ground 1	Short circuit to ground for Out1 error reported by H bridge chip - bank 1	=TRUE	Battery voltage	>10900(mV)	1500(ms)	1 Trip
				Open load diagnosis is not active - bank 1	=TRUE		
				No pending or confirmed DTCs	=see sheet inhibit tables		

	25OBDG07A Part 2 ECM Summary Tables									
	P30E8	Status of diagnostic fault check short circuit to ground 2	Short circuit to ground for Out2 error reported by H bridge chip · bank 1	=TRUE	Battery voltage	>10900(mV)	1500(ms)	1 Trip		
					Open load diagnosis is not active - bank 1	=TRUE				
					No pending or confirmed DTCs	=see sheet inhibit tables				
ſ	P103A	Status of diagnostic fault check short circuit over load	Short circuit overload error reported by H bridge chip - bank 1	=TRUE	Battery voltage	>10900(mV)	1500(ms)	2 Trip		
					Open load diagnosis is not active - bank 1	=TRUE				
					No pending or confirmed DTCs	=see sheet inhibit tables				
ĺ	P1038	Status of diagnostic fault check IC undervoltage	Under voltage error reported by H bridge chip - bank 1	=TRUE	Battery voltage	>10900(mV)	5000(ms)	2 Trip		
					Open load diagnosis is not active - bank 1	=TRUE				
					No pending or confirmed DTCs	=see sheet inhibit tables				
	P0247	Status of diagnostic fault check open load	Open load error reported by H bridge chip - bank 2	=TRUE	Internal state of powerstage driver - request to drive the actuator - bank 2	=FALSE	1500(ms)	1 Trip		
					Internal state of powerstage driver is used by MoCSOP - bank 2	=FALSE				
					Short circuit diagnosis is running - H-Bridge output switched off for protection of powerstage (SC/OT error exist) - bank 2	=FALSE				
					Short circuit diagnosis is running - Test pulse requested and awaited for it's completion (SC/OT error exist) - bank 2	=FALSE				
					Battery voltage	>10900(mV)				
					Diagnosis shutdown request from actuator	=FALSE				
					No pending or confirmed DTCs	=see sheet inhibit tables				
	P2ABE	Status of diagnostic fault check current limitation active	Over current error reported by H bridge chip - bank 2	=TRUE	Power stage is actuated - bank 2	=TRUE	1500(ms)	2 Trip		

25OBDG07A Part 2 ECM Summary Tables							
				Battery voltage	>10900(mV)		
				Open load diagnosis is not active - bank 2	=TRUE		
				Plausibility test for short circuit overload is not active - bank 2	=TRUE		
				No pending or confirmed DTCs	=see sheet inhibit tables		
P2ABE	Status of diagnostic fault check IC overtemperature	k Over temperature error reported by H bridge chip - bank 2	=TRUE	Battery voltage	>10900(mV)	1000(ms)	2 Trip
				Open load diagnosis is not active -	=TRUE		
				No pending or confirmed DTCs	=see sheet inhibit tables		
P0250	Status of diagnostic fault check short circuit to battery 1	k Short circuit to battery for Out1 error reported by H bridge chip · bank 2	=TRUE	Battery voltage	>10900(mV)	1500(ms)	1 Trip
				Open load diagnosis is not active - bank 2	=TRUE		
				No pending or confirmed DTCs	=see sheet inhibit tables		
P30EB	Status of diagnostic fault check short circuit to battery 2	k Short circuit to battery for Out2 error reported by H bridge chip · bank 2	=TRUE	Battery voltage	>10900(mV)	1500(ms)	1 Trip
				Open load diagnosis is not active - bank 2	=TRUE		
				No pending or confirmed DTCs	=see sheet inhibit tables		
P0249	Status of diagnostic fault check short circuit to ground 1	k Short circuit to ground for Out1 error reported by H bridge chip · bank 2	=TRUE	Battery voltage	>10900(mV)	1500(ms)	1 Trip
				Open load diagnosis is not active - bank 2	=TRUE		
				No pending or confirmed DTCs	=see sheet inhibit tables		
P30EA	Status of diagnostic fault check short circuit to ground 2	k Short circuit to ground for Out2 error reported by H bridge chip · bank 2	=TRUE	Battery voltage	>10900(mV)	1500(ms)	1 Trip
				Open load diagnosis is not active - bank 2	=TRUE		
				No pending or confirmed DTCs	=see sheet inhibit tables		

25OBDG07A Part 2 ECM Summary Tables								
P1	10BE	Status of diagnostic fault check short circuit over load	Short circuit overload error reported by H bridge chip - bank 2	=TRUE	Battery voltage	>10900(mV)	1500(ms)	2 Trip
					Open load diagnosis is not active - bank 2	=TRUE		
					No pending or confirmed DTCs	=see sheet inhibit tables		
P1	10BD	Status of diagnostic fault check IC undervoltage	Under voltage error reported by H bridge chip - bank 2	=TRUE	Battery voltage	>10900(mV)	5000(ms)	2 Trip
					Open load diagnosis is not active - bank 2	=TRUE		
					No pending or confirmed DTCs	=see sheet inhibit tables		
P2	2AB9	Status of diagnostic fault check Phys. SRC Max. senor range error - bank 1	Raw voltage value of position sensor - bank 1	>3834(mV)	No pending or confirmed DTCs	=see sheet inhibit tables	1500(msec)	2 Trip
			Raw voltage value of position sensor - bank 1	<3973(mV)	Ignition is ON	=TRUE		
P2	2AB8	Status of diagnostic fault check Phys. SRC Min. senor range error - bank 1	Raw voltage value of position sensor - bank 1	<427(mV)	No pending or confirmed DTCs	=see sheet inhibit tables	1500(msec)	2 Trip
			Raw voltage value of position sensor - bank 1	>206(mV)	Ignition is ON	=TRUE		
P2	2ABC	Status of diagnostic fault check Phys. SRC Max. senor range error - bank 2	Raw voltage value of position sensor - bank 2	>3834(mV)	No pending or confirmed DTCs	=see sheet inhibit tables	1500(msec)	2 Trip
			Raw voltage value of position sensor - bank 2	<3973(mV)	Ignition is ON	=TRUE		
P2	2ABB	Status of diagnostic fault check Phys. SRC Min. senor range error - bank 2	Raw voltage value of position sensor - bank 2	<427(mV)	No pending or confirmed DTCs	=see sheet inhibit tables	1500(msec)	2 Trip
			Raw voltage value of position sensor - bank 2	>206(mV)	Ignition is ON	=TRUE		
P2	2B81	Monitoring for reporting SENT sensor error - bank 1	Status and communication nibble for turbo charger wastegate position sensor for channel 1 is not valid, bank 1	=TRUE	Value from SENT message for turbo charger wastegate position sensor, bank 1	<4088(-)	500(ms)	2 Trip

				Value from SENT message for turbo charger wastegate position sensor, bank 1	>1(-)		
				Status of SENT sensor error for turbo charger wastegate position sensor, bank 1	=FALSE		
P2B8	2 Monitoring for reporting SENT sensor error - bank 2	Status and communication nibble for turbo charger wastegate position sensor for channel 1 is not valid, bank 2	=TRUE	Value from SENT message for turbo charger wastegate position sensor, bank 2	<4088(-)	500(ms)	2 Trip
				Value from SENT message for turbo charger wastegate position sensor, bank 2	>1(-)		
				Status of SENT sensor error for turbo charger wastegate position sensor, bank 2	=FALSE		
P2B9	3 Status of diagnostic fault check sensor drift at closed stop - bank 1	k Average voltage value of the feedback position (calculated in the closed stop) - bank 1	>3768(mV)	Engine temperature	>=-40(°C)		2 Trip
		OR Average voltage value of the feedback position (calculated in the closed stop) - bank 1	<2866(mV)	Engine temperature Battery voltage	<=129,96(°C) >=9000(mV)		
				Actuator is completely closed For time	=TRUE 300(msec)		
_				No pending or confirmed DTCs	=see sheet inhibit tables		
P2B9	4 Status of diagnostic fault check sensor drift at closed stop - bank 2	k Average voltage value of the feedback position (calculated in the closed stop) - bank 2	>3768(mV)	Engine temperature	>=-40(°C)		2 Trip
		OR Average voltage value of the feedback position (calculated in the closed stop) - bank 2	<2866(mV)	Engine temperature Battery voltage	<=129,96(°C) >=9000(mV)		
				Actuator is completely closed For time	=TRUE 300(msec)		
				No pending or confirmed DTCs	=see sheet inhibit tables		
P25B	4 Status of diagnostic fault check valve jammed closed - bank 1	k Case 1:		(2 Trip

Status of system monitoring - Actuator position 0% means the actuator is closed - bank 1	=FALSE	Status of Governor Deviation Monitoring - Jammed valve condition - bank 1 This means:	=TRUE			
Actual position of electrical WasteGate 1	>50(%)	(
OR Case 2:		Governor deviation - bank 1	<-40(%)			
Status of system monitoring - Actuator position 0% means the actuator is closed - bank 1	=TRUE	Governor deviation - bank 1	>40(%)			
Actual position of electrical WasteGate 1	<50(%))				
		For time Status of Governor Deviation Monitoring - Repeated reactivation triggered by clearing JAMVLV bit - bank 1	>1000(msec) =FALSE			
		, For time	>1000(msec)			
		Disturbance pressure status valid	=TRUE			
		No system error	=TRUE			
		No powerstage disable condition active	=TRUE			
		No cold start detected - no frozen actuator	=TRUE			
		Release of offset learning of environmental air pressure	>TRUE			
		Brake not pressed	=TRUE			
		Engine running time	>0(msec)			
		Actuator is active - bank 1	=TRUE			
		Actuator test is not active - bank 1	=TRUE			
		First learning of endstops not active - bank 1	=TRUE			
		CSERS conditions active	=FALSE			
				No pending or confirmed DTCs	=see sheet inhibit tables	
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P25B3	Status of diagnostic fault check valve jammed open - bank 1	Case 1:		(2 Trip
		Status of system monitoring - Actuator position 0% means the actuator is closed - bank 1	=FALSE	Status of Governor Deviation Monitoring - Jammed valve condition - bank 1 This means:	=TRUE	
		Actual position of electrical WasteGate 1	<50(%)	(
		OR Case 2:		Governor deviation - bank 1 OR	<-40(%)	
		Status of system monitoring - Actuator position 0% means the actuator is closed - bank 1	=TRUE	Governor deviation - bank 1	>40(%)	
		Actual position of electrical WasteGate 1	>50(%))		
				For time Status of Governor Deviation Monitoring - Repeated reactivation triggered by clearing JAMVLV bit - bank 1)	>1000(msec) =FALSE	
				For time	>1000(msec)	
				Disturbance pressure status valid	=TRUE	
				No system error	=TRUE	
				No powerstage disable condition active	=TRUE	
				No cold start detected - no frozen actuator	=TRUE	
				Release of offset learning of environmental air pressure	>TRUE	
				Brake not pressed	=TRUE	
				Engine running time	>0(msec)	
				Actuator is active - bank 1	=TRUE	

				Actuator test is not active - bank 1	=TRUE	
				First learning of endstops not active - bank 1	=TRUE	
				CSERS conditions active No pending or confirmed DTCs	=FALSE =see sheet inhibit tables	
P25B6	Status of diagnostic fault check valve jammed closed - bank 2	Case 1:		(2 Trip
		Status of system monitoring - Actuator position 0% means the actuator is closed - bank 2	=FALSE	Status of Governor Deviation Monitoring - Jammed valve condition - bank 2 This means:	=TRUE	
		Actual position of electrical WasteGate 2	>50(%)	(
		OR Case 2:		Governor deviation - bank 2 OR	<-40(%)	
		Status of system monitoring - Actuator position 0% means the actuator is closed - bank 2	=TRUE	Governor deviation - bank 2	>40(%)	
		Actual position of electrical WasteGate 2	<50(%))		
				For time Status of Governor Deviation Monitoring - Repeated reactivation triggered by clearing JAMVLV bit - bank 2	>1000(msec) =FALSE	
				For time	>1000(msec)	
				Disturbance pressure status valid	=TRUE	
				No system error	=TRUE	
				No powerstage disable condition active	=TRUE	
				No cold start detected - no frozen actuator	=TRUE	
				Release of offset learning of environmental air pressure	>TRUE	
				Brake not pressed	=TRUE	

				Engine running time	>0(msec)	
				Actuator is active - bank 2	=TRUE	
				Actuator test is not active - bank 2	=TRUE	
				First learning of endstops not active - bank 2	=TRUE	
				CSERS conditions active No pending or confirmed DTCs	=FALSE =see sheet inhibit tables	
P25B5	Status of diagnostic fault check valve jammed open - bank 2	k Case 1:		(2 Trip
		Status of system monitoring - Actuator position 0% means the actuator is closed - bank 2	=FALSE	Status of Governor Deviation Monitoring - Jammed valve condition - bank 2 This means:	=TRUE	
		Actual position of electrical	<50(%)	(
		WasteGate 2 OR Case 2:		Governor deviation - bank 2 OR	<-40(%)	
		Status of system monitoring - Actuator position 0% means the actuator is closed - bank 2	=TRUE	Governor deviation - bank 2	>40(%)	
		Actual position of electrical WasteGate 2	>50(%))		
				For time Status of Governor Deviation Monitoring - Repeated reactivation triggered by clearing JAMVLV bit - bank 2	>1000(msec) =FALSE	
) For time	>1000(msec)	
				Disturbance pressure status valid	=TRUE	
				No system error	=TRUE	
				No powerstage disable condition active	=TRUE	
				No cold start detected - no frozen actuator	=TRUE	

				Release of offset learning of environmental air pressure	>TRUE	
				Brake not pressed	=TRUE	
				Engine running time	>0(msec)	
				Actuator is active - bank 2	=TRUE	
				Actuator test is not active - bank 2	=TRUE	
				First learning of endstops not active - bank 2	=TRUE	
				CSERS conditions active No pending or confirmed DTCs	=FALSE =see sheet inhibit tables	
P2C9B	Status of diagnostic fault check valve jammed closed - bank 1 during CSERS	Case 1:		(1 Trip
		Status of system monitoring - Actuator position 0% means the actuator is closed - bank 1	=FALSE	Status of Governor Deviation Monitoring - Jammed valve condition - bank 1	=TRUE	
		Actual position of electrical WasteGate 1	>50(%)	(
		OR Case 2:		Governor deviation - bank 1 OR	<-40(%)	
		Status of system monitoring - Actuator position 0% means the actuator is closed - bank 1	=TRUE	Governor deviation - bank 1	>40(%)	
		Actual position of electrical	<50(%))		
		Wastebale		For time Status of Governor Deviation Monitoring - Repeated reactivation triggered by clearing JAMVLV bit - bank 1	>1000(msec) =FALSE	
				, For time	>1000(msec)	
				Disturbance pressure status valid	=TRUE	
				No system error	=TRUE	

				No powerstage disable condition active	=TRUE	
				No cold start detected - no frozen actuator	=TRUE	
				Release of offset learning of environmental air pressure	>TRUE	
				Brake not pressed	=TRUE	
				Engine running time	>0(msec)	
				Actuator is active - bank 1	=TRUE	
				Actuator test is not active - bank 1	=TRUE	
				First learning of endstops not active - bank 1	=TRUE	
				CSERS conditions active No pending or confirmed DTCs	=TRUE =see sheet inhibit tables	
P2C9B	Status of diagnostic fault check valve jammed open - bank 1 during CSERS	Case 1:		(1 Trip
		Status of system monitoring - Actuator position 0% means the actuator is closed - bank 1	=FALSE	Status of Governor Deviation Monitoring - Jammed valve condition -	=TRUE	
				bank 1 This means:		
		Actual position of electrical	<50(%)	bank 1 This means: (
		Actual position of electrical WasteGate 1 OR	<50(%)	bank 1 This means: (Governor deviation - bank 1 OR	<-40(%)	
		Actual position of electrical WasteGate 1 OR Case 2: Status of system monitoring - Actuator position 0% means the actuator is closed - bank 1	<50(%) =TRUE	bank 1 This means: (Governor deviation - bank 1 OR Governor deviation - bank 1	<-40(%) >40(%)	
		Actual position of electrical WasteGate 1 OR Case 2: Status of system monitoring - Actuator position 0% means the actuator is closed - bank 1 Actual position of electrical WasteGate 1	<50(%) =TRUE >50(%)	bank 1 This means: (Governor deviation - bank 1 OR Governor deviation - bank 1)	<-40(%) >40(%)	
		Actual position of electrical WasteGate 1 OR Case 2: Status of system monitoring - Actuator position 0% means the actuator is closed - bank 1 Actual position of electrical WasteGate 1	<50(%) =TRUE >50(%)	bank 1 This means: (Governor deviation - bank 1 OR Governor deviation - bank 1) For time Status of Governor Deviation Monitoring - Repeated reactivation triggered by clearing JAMVLV bit - bank 1)	<-40(%) >40(%) >1000(msec) =FALSE	

				Disturbance pressure status valid	=TRUE	
				No system error	=TRUE	
				No powerstage disable condition active	=TRUE	
				No cold start detected - no frozen actuator	=TRUE	
				Release of offset learning of environmental air pressure	>TRUE	
				Brake not pressed	=TRUE	
				Engine running time	>0(msec)	
				Actuator is active - bank 1	=TRUE	
				Actuator test is not active - bank 1	=TRUE	
				First learning of endstops not active - bank 1	=TRUE	
				CSERS conditions active No pending or confirmed DTCs	=TRUE =see sheet inhibit tables	
P2C9C	Status of diagnostic fault check valve jammed closed - bank 2 during CSERS	k Case 1:		(1 Trip
		Status of system monitoring - Actuator position 0% means the actuator is closed - bank 2	=FALSE	Status of Governor Deviation Monitoring - Jammed valve condition - bank 2 This means:	=TRUE	
		Actual position of electrical WasteGate 2 OR	>50(%)	(Governor deviation - bank 2	<-40(%)	
		Case 2: Status of system monitoring - Actuator position 0% means the actuator is closed - bank 2	=TRUE	OR Governor deviation - bank 2	>40(%)	
		Actual position of electrical	<50(%))		
		WASICUAIC 2		For time	>1000(msec)	

				Status of Governor Deviation Monitoring - Repeated reactivation triggered by clearing JAMVLV bit - bank 2	=FALSE	
) For time	>1000(msec)	
				Disturbance pressure status valid	=TRUE	
				No system error	=TRUE	
				No powerstage disable condition active	=TRUE	
				No cold start detected - no frozen actuator	=TRUE	
				Release of offset learning of environmental air pressure	>TRUE	
				Brake not pressed	=TRUE	
				Engine running time	>0(msec)	
				Actuator is active - bank 2	=TRUE	
				Actuator test is not active - bank 2	=TRUE	
				First learning of endstops not active - bank 2	=TRUE	
				CSERS conditions active No pending or confirmed DTCs	=TRUE =see sheet inhibit tables	
P2C9C	Status of diagnostic fault chec valve jammed open - bank 2	k Case 1:		(1 Trip
	during CSERS	Status of system monitoring - Actuator position 0% means the actuator is closed - bank 2	=FALSE	Status of Governor Deviation Monitoring - Jammed valve condition - bank 2	=TRUE	
		Actual position of electrical WasteGate 2	<50(%)	(
		OR Case 2:		(Governor deviation - bank 2	<-40(%)	

		Status of system monitoring - Actuator position 0% means the actuator is closed - bank 2	=TRUE	OR	>40(%)	
		Actual position of electrical WasteGate 2	>50(%)	Governor deviation - bank 2		
) For time	>1000(msec) =FALSE	
) For time	>1000(msec)	
				Disturbance pressure status valid	=TRUE	
				No system error	=TRUE	
				No powerstage disable condition active	=TRUE	
				No cold start detected - no frozen actuator	=TRUE	
				Release of offset learning of environmental air pressure	>TRUE	
				Brake not pressed	=TRUE	
				Engine running time	>0(msec)	
				Actuator is active - bank 2	=TRUE	
				Actuator test is not active - bank 2	=TRUE	
				First learning of endstops not active - bank 2	=TRUE	
				CSERS conditions active No pending or confirmed DTCs	=TRUE =see sheet inhibit tables	
P0114	Max. error of the Gradient- Check for the intake air temperature sensor after air filter	Absolute difference between temperature raw value and filtered temperature of the intake air temperature sensor 1	>10(K)	Ignition is ON	=TRUE	2 Trip

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		For time	20(sec)	No pending or confirmed DTCs	=see sheet inhibit tables	
P0113	Max. error of the Physical- Range-Check for the intake air temperature sensor after air	Intake air temperature (value sensor 1)	>122,76(deg C)	Ignition is ON	=TRUE	2 Trip
	Tilter	For time	2(sec)	No pending or confirmed DTCs	=see sheet inhibit tables	
P0112	Min. error of the Physical- Range-Check for the intake air temperature sensor after air filter	Intake air temperature (value sensor 1)	<-42,04(deg C)	Ignition is ON	=TRUE	2 Trip
		For time	2(sec)	No pending or confirmed DTCs	=see sheet inhibit tables	
P00E9 Max. error by cold sta temperatur	Max. error of the Cross-Check by cold start for the intake air temperature sensor in manifold	Difference between intake air temperature (value sensor 2) and avarage temperature delta (max. error)	>14,96(deg C)	Ignition is ON	=TRUE	2 Trip
				No pending or confirmed DTCs	=see sheet inhibit tables	
P00E9	Min. error of the Cross-Check by cold start for the intake air temperature sensor in manifold	Difference between intake air temperature (value sensor 2) and avarage temperature delta (min. error)	>14,96(deg C)	Ignition is ON	=TRUE	2 Trip
				No pending or confirmed DTCs	=see sheet inhibit tables	
P00EC	Electrical error (non plausible signal) of the intake air temperature sensor in manifold. Bank 1	Absolute difference between local and filtered voltage-signal of intake air temperature sensor Snsr2	>120(mV)	SRC Min Error is debounced	=FALSE	2 Trip
		For time	>=20(sec)	SRC Max Error is debounced No pending or confirmed DTCs	=FALSE =see sheet inhibit tables	
DOOED	Manager (the Director)		400 70(10 0)		=IRUE	0.7.1
FUUEB	Range-Check for the intake air temperature sensor in manifold, Bank 1	sensor 2)	>122,10(deg C)	Ignition is ON	=IKUE	2 Trip
		For time	2(sec)	No pending or confirmed DTCs	=see sheet inhibit tables	
P00EA	Min. error of the Physical- Range-Check for the intake air temperature sensor in manifold, Bank 1	Intake air temperature (value sensor 2)	<-42,04(deg C)	Ignition is ON	=TRUE	2 Trip
		For time	2(sec)	No pending or confirmed DTCs	=see sheet inhibit tables	
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P00E	3 Max. error of the electrical check for the intake air temperature sensor in manifold, Bank 1	Local voltage-signal from intake air temperature sensor 2	>4800(mV)	No pending or confirmed DTCs	=see sheet inhibit tables	2 Trip
		For time	2(sec)	Ignition is ON	=TRUE	
P00E/	A Min. error of the electrical check for the intake air temperature sensor in manifold Bank 1	Local voltage-signal from intake air temperature sensor 2	<195(mV)	No pending or confirmed DTCs	=see sheet inhibit tables	2 Trip
	mannoid, Dank T	For time	2(sec)	Ignition is ON	=TRUE	
P00E	 Stuck-Check for the intake air temperature sensor in manifold, Bank 1 	Difference between maximum and minimum value of intake air temperature (value sensor 2) (see Look-Up-Table #74)	<(4,96)(deg C)	Ignition is ON	=TRUE	2 Trip
		,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,		No pending or confirmed DTCs	=see sheet inhibit tables	
P011 ⁻	Max.error of the Cross-Check by cold start for the intake air temperature sensor after air filter, Bank 1	The difference between the intake air temperature and the temperture mean value, calculated out of freeze values from provided temperature sensors	>14,96(deg C)	Ignition is ON	=TRUE	2 Trip
				Coldstart detected No pending or confirmed DTCs	=TRUE =see sheet inhibit tables	
P011	Min.error of the Cross-Check by cold start for the intake air temperature sensor after air filter, Bank 1	The difference between the temperture mean value, calculated out of freeze values from provided temperature sensors and the intake air	>14,96(deg C)	Ignition is ON	=TRUE	2 Trip
		temperature		Coldstart detected No pending or confirmed DTCs	=TRUE =see sheet inhibit tables	
U061 ⁻	Line high error for SENT transmission the intake air temperature sensor after air filter	Line high error detected and reported via SENT	=TRUE	Ignition is ON	=TRUE	2 Trip
		For time	>=0,5(sec)	No pending or confirmed DTCs	=see sheet inhibit tables	
U061	Line low error for SENT transmission the intake air temperature sensor after air filter	Line low error detected and reported via SENT	=TRUE	Ignition is ON	=TRUE	2 Trip
		For time	>=0,5(sec)	No pending or confirmed DTCs	=see sheet inhibit tables	
U1370	 Diagnosis of the initialization error for SENT transmission of the intake air temperature sensor after air filter, Bank 1, SENT 	Data raw value from intake air temperature sensor 1 via SENT interface	=0(-)	Ignition is ON	=TRUE	2 Trip

		For time	>0,5(sec)	No pending or confirmed DTCs	=see sheet inhibit tables	
U1370	Sensor internal diagnosis of the intake air temperature sensor after air filter, Bank 1, SENT	Data raw value from intake air temperature sensor 1 via SENT interface	>=4089(-)	Ignition is on	=TRUE(-)	2 Trip
		For time	>0,5(sec)	No pending or confirmed DTCs	=see sheet inhibit tables	
P0111	Stuck-Check for the intake air temperature sensor after air filter	Difference between maximum and minimum value of intake air temperature (value sensor 1) (see Look-Up-Table #73)	<(0,360 to 1,560)(deg C)	Ignition is ON	=TRUE	2 Trip
		., (No pending or confirmed DTCs	=see sheet inhibit tables	
U1372	Diagnosis of the initialization error for SENT transmission of the intake air temperature sensor after air filter, Bank 2, SENT	Data raw value from intake air temperature sensor 3 via SENT interface	=0(-)	Flag to enable reporting of diagnosis results to DSM (after DSM Re- Initialization) for 100ms task	=TRUE(-)	2 Trip
		For time	>0,5(sec)	Ignition is on No pending or confirmed DTCs	=TRUE(-) =see sheet inhibit tables	
U1372 S ti s	Sensor internal diagnosis of the intake air temperature sensor after air filter, Bank 2, SENT	Data raw value from intake air temperature sensor 3 via SENT interface	>=4089(-)	Flag to enable reporting of diagnosis results to DSM (after DSM Re- Initialization) for 100ms task	=TRUE(-)	2 Trip
		For time	>0,5(sec)	Ignition is on No pending or confirmed DTCs	=TRUE(-) =see sheet inhibit tables	
P00AE	Max. error of the Gradient- Check for the intake air temperature sensor after air filter, Bank 2	Absolute difference between temperature raw value and filtered temperature of the intake air temperature sensor 1	>10(K)	Ignition is ON	=TRUE	2 Trip
		For time	20(sec)	No pending or confirmed DTCs	=see sheet inhibit tables	
P00AD	Max. error of the Physical- Range-Check for the intake air temperature sensor after air filter, Bank 2	Intake air temperature (value sensor 3)	>122,76(deg C)	Ignition is ON	=TRUE	2 Trip
		For time	2(sec)	No pending or confirmed DTCs	=see sheet inhibit tables	
P00AC	Min. error of the Physical- Range-Check for the intake air temperature sensor after air filter, Bank 2	Intake air temperature (value sensor 3)	<-42,04(deg C)	Ignition is ON	=TRUE	2 Trip
		For time	2(sec)	No pending or confirmed DTCs	=see sheet inhibit tables	~
		EC	M Section 763 of 772		lubico	875 (

ſ	P00A6	Max. error of the Cross-Check by cold start for the intake air temperature sensor in manifold, Bank 2	Difference between intake air temperature (value sensor 4) and avarage temperature delta (max. error)	>14,96(deg C)	Ignition is ON	=TRUE	2 Trip
					No pending or confirmed DTCs	=see sheet inhibit tables	
	P00A6	Min. error of the Cross-Check by cold start for the intake air temperature sensor in manifold, Bank 2	Difference between intake air temperature (value sensor 4) and avarage temperature delta (min. error)	>14,96(deg C)	Ignition is ON	=TRUE	2 Trip
					No pending or confirmed DTCs	=see sheet inhibit tables	
[P00A6	Stuck-Check for the intake air temperature sensor in manifold, Bank 2	Difference between maximum and minimum value of intake air temperature (value sensor 4) (see Look-Up-Table #72)	<(4,96)(deg C)	Ignition is ON	=TRUE	2 Trip
					No pending or confirmed DTCs	=see sheet inhibit tables	
[P00A8	Max. error of the Physical- Range-Check for the intake air temperature sensor in manifold, Bank 2	Intake air temperature (value sensor 4)	>122,76(deg C)	Ignition is ON	=TRUE	2 Trip
			For time	2(sec)	No pending or confirmed DTCs	=see sheet inhibit tables	
[P00A7	Min. error of the Physical- Range-Check for the intake air temperature sensor in manifold, Bank 2	Intake air temperature (value sensor 4)	<-42,04(deg C)	Ignition is ON	=TRUE	2 Trip
			For time	2(sec)	No pending or confirmed DTCs	=see sheet inhibit tables	

		250BDG07A	Part 2 ECM Summary	/ Tables		
P00/	A9 Electrical error (non plausible signal) of the intake air temperature sensor in manifold, Bank 2	Absolute difference between local and filtered voltage-signal of intake air temperature sensor Snsr4	>120(mV)	SRC Min Error is debounced	=FALSE	2 Trip
		For time	>=20(sec)	SRC Max Error is debounced	=FALSE	
				No pending or confirmed DTCs	=see sheet inhibit tables	
				Ignition is ON	=TRUE	
P00/	A7 Min. error of the electrical check for the intake air temperature sensor in manifold, Bank 2	Local voltage-signal from intake air temperature sensor Snsr4	<195(mV)	No pending or confirmed DTCs	=see sheet inhibit tables	2 Trip
		For time	2(sec)	Ignition is ON	=TRUE	
P00/	48 Max. error of the electrical check for the intake air temperature sensor in manifold, Bank 2	Local voltage-signal from intake air temperature sensor Snsr4	>4800(mV)	No pending or confirmed DTCs	=see sheet inhibit tables	2 Trip
_		For time	2(sec)	Ignition is ON	=TRUE	
P00/	AB Max.error of the Cross-Check by cold start for the intake air temperature sensor after air filter, Bank 2	The difference between the intake air temperature and the temperture mean value, calculated out of freeze values from provided temperature sensors	>14,96(deg C)	Ignition is ON	=TRUE	2 Trip
				Coldstart detected No pending or confirmed DTCs	=TRUE =see sheet inhibit tables	
P00/	AB Min.error of the Cross-Check by cold start for the intake air temperature sensor after air filter, Bank 2	The difference between the temperture mean value, calculated out of freeze values from provided temperature sensors and the intake air temperature	>14,96(deg C)	Ignition is ON	=TRUE	2 Trip
		501	1 Section 765 of 770	Coldstart detected No pending or confirmed DTCs	=TRUE =see sheet inhibit tables	077 -

	U0612	Line high error for SENT transmission the intake air	Line high error detected and reported via SENT	=TRUE	Ignition is ON	=TRUE		2 Trip
		hank 7	For time	>=0,5(sec)	No pending or confirmed DTCs	=see sheet inhibit tables		
	U0612	Line low error for SENT transmission the intake air temperature sensor after air filter -	Line low error detected and reported via SENT	=TRUE	Ignition is ON	=TRUE		2 Trip
			For time	>=0,5(sec)	No pending or confirmed DTCs	=see sheet inhibit tables		
	P00AB	Stuck-Check for the intake air temperature sensor after air filter	Difference between maximum and minimum value of intake air temperature (value sensor 3) (see Look-Up-Table #71)	<(0,360 to 1,560)(deg C)	Ignition is ON	=TRUE		2 Trip
					No pending or confirmed DTCs	=see sheet inhibit tables		
103. AUXILIARY PRESSURE SENSOR	P227D	Monitoring of barometric pressure sensor range high bank 1	Raw data of digital sensor - bank 1	>=4088(-)	Status for HFM chip heating and standby function	=FALSE(-)	50(msec)	2 Trip
olinoon					No pending or confirmed DTCs	=see sheet inhibit tables(-)		
					Ignition is on	=TRUE()		
	P222D	Monitoring of barometric pressure sensor range high bank 2	Raw data of digital sensor - bank 2	>=4088(-)	Status for HFM chip heating and standby function	=FALSE(-)	50(msec)	2 Trip
					No pending or confirmed DTCs	=see sheet inhibit tables(-)		
						=TRUE()		
	P227C	Monitoring of barometric pressure sensor range low bank 1	Raw data of digital sensor - bank 1	<=1(-)	Status for HFM chip heating and standby function	=FALSE(-)	50(msec)	2 Trip
					No pending or confirmed DTCs	=see sheet inhibit tables(-)		
						=IRUE()		
	P222C	Monitoring of barometric pressure sensor range low bank 2	Raw data of digital sensor - bank 2	<=1(-)	Status for HFM chip heating and standby function	=FALSE()	50(msec)	2 Trip
					No pending or confirmed DTCs	=see sheet inhibit tables()		
					Ignition is on	=IRUE()		
	U1371	Monitoring of barometric pressure sensor self diagnosis bank 1	Raw data of digital sensor - bank 1	>=A-B(-)	Status for HFM chip heating and standby function	=FALSE(-)	50(msec)	2 Trip
			Maximum digital value (bits for resolution SENT)	=12()	No pending or confirmed DTCs	=see sheet inhibit tables(-)		
			B: Fixed value	=7()	Ignition is on	=TRUE()		

			25OBDG07A	Part 2 ECM Summa	ary Tables			
	U1373	Monitoring of barometric pressure sensor self diagnosis bank 2	Raw data of digital sensor - bank 2	>=A-B(-)	Status for HFM chip heating and standby function	=FALSE()	50(msec)	2 Trip
			Maximum digital value (bits for resolution SENT)	=12()	No pending or confirmed DTCs	=see sheet inhibit tables()		
			B: Fixed value	=7()	Ignition is on	=TRUE()		
	U068A	Signal range check - high of air filter pressure sensor Bank 1	 Sensor signal voltage of bank 1 	>4,878(V)	Ignition is ON	=TRUE		2 Trip
l					No pending or confirmed DTCs	=see sheet inhibit tables()		
	U0680	Signal range check - high of air filter pressure sensor Bank 2	Sensor signal voltage of bank 2	>4,878(V)	Ignition is ON	=TRUE		2 Trip
l.					No pending or confirmed DTCs	=see sheet inhibit tables()		
	U068A	Signal range check - low of air filter pressure sensor Bank 1	Sensor signal voltage of bank 1	<0,2(V)	Ignition is ON	=TRUE		2 Trip
l					No pending or confirmed DTCs	=see sheet inhibit tables()		
	U0680	Signal range check - low of air filter pressure sensor Bank 2	Sensor signal voltage of bank 2	<0,2(V)	Ignition is ON	=TRUE		2 Trip
l					No pending or confirmed DTCs	=see sheet inhibit tables()		
	U068A	Data Transmission Error of pressure sensor - SENT Bank1	Data Transmission Error of pressure sensor - SENT detected	=TRUE	Ignition is ON	=TRUE		2 Trip
L					No pending or confirmed DTCs	=see sheet inhibit tables()		
	U0680	Data Transmission Error of pressure sensor - SENT Bank2	Data Transmission Error of pressure sensor - SENT detected	=TRUE	Ignition is ON	=TRUE		2 Trip
l		Dame			No pending or confirmed DTCs	=see sheet inhibit tables()		
	P227B	Physical range check high fault auxiliary pressure sensor bank	t Physical range check high fault detected	=TRUE	Ignition is ON	=TRUE		2 Trip
l					No pending or confirmed DTCs	=see sheet inhibit tables()		
	P222B	Physical range check high fault auxiliary pressure sensor bank 2	t Physical range check high fault detected	=TRUE	Ignition is ON	=TRUE		2 Trip
					No pending or confirmed DTCs	=see sheet inhibit tables()		
	P227B	Physical range check low fault auxiliary pressure sensor bank 1	Physical range check low fault detected	=TRUE	Ignition is ON	=TRUE		2 Trip

					No pending or confirmed DTCs	=see sheet inhibit tables()		
	P222B	Physical range check low fault auxiliary pressure sensor bank 2	Physical range check low fault detected	=TRUE	Ignition is ON	=TRUE		2 Trip
					No pending or confirmed DTCs	=see sheet inhibit tables()		
	P227B	Sensor cross check high for auxillary pressure sensor - Bank 1	Sensor cross check maximum fault for auxillary pressure sensor detected	=TRUE	Ignition is ON	=TRUE		2 Trip
					No pending or confirmed DTCs	=see sheet inhibit tables()		
	P222B	Sensor cross check high for auxillary pressure sensor - Bank 2	Sensor cross check maximum fault for auxillary pressure sensor detected	=TRUE	Ignition is ON	=TRUE		2 Trip
					No pending or confirmed DTCs	=see sheet inhibit tables()		
	P227B	Sensor cross check low for auxillary pressure sensor - Bank 1	Sensor cross check minimum fault for auxillary pressure sensor detected	=TRUE	Ignition is ON	=TRUE		2 Trip
					No pending or confirmed DTCs	=see sheet inhibit tables()		
	P222B	Sensor cross check low for auxillary pressure sensor - Bank 2	Sensor cross check minimum fault for auxillary pressure sensor detected	=TRUE	Ignition is ON	=TRUE		2 Trip
					No pending or confirmed DTCs	=see sheet inhibit tables()		
104. CRANKCASE VENTILATION SYSTEM	P04E2	SRC Error High	Sensor signal raw voltage	>4,849984(V)	Ignition is ON	=TRUE	0,05(s)	2 Trip
					Basic enable conditions are met	=see sheet enable tables		
	P04E3	SRC Error Low	Sensor signal raw voltage	<0,149986(V)	Ignition is ON	=TRUE	0,05(s)	2 Trip
					Basic enable conditions are met	=see sheet enable tables		
	P04FB	Plausibility check for maximum error of the pressure sensor	Pressure raw value of the crankcase ventilation difference pressure sensor without offset-correction	<20(hPa)	crankcase ventilation difference pressure sensor rawsignal is valid	=TRUE		2 Trip
					Engine Speed	=0(rpm)		

			200000171		iry rabics			
					For time	≥5(sec)		
					Basic enable conditions are met	=see sheet enable tables		
	P04FB	Plausibility check for minimum error of the pressure sensor	Pressure raw value of the crankcase ventilation difference pressure sensor without offset-correction	>-20(hPa)	crankcase ventilation difference pressure sensor rawsignal is valid	=TRUE		2 Trip
					Engine Speed For time	=0(rpm) ≥5(sec)		
					Basic enable conditions are met	=see sheet enable tables		
105. BOOST PRESSURE WASTEGATE POSITION SENSOR	U0644	Diagnosis of Turbo charger wastegate position sensor bank 1 for SENT data - Communication Check	Communication Error bit status for turbo charger wastegate position sensor, bank 1	=TRUE	No pending or confirmed DTCs	=see sheet inhibit tables	1(-)	2 Trip
			OR Pulse length of SENT message is out of range for turbo charger wastegate, bank 1	=TRUE	Ignition is ON	=TRUE		
			OR No signal on the line for turbo charger wastegate, bank 1	=TRUE				
	U1376	Invalid data from SENT device for Turbo charger wastegate	Fast Data error bits status for turbo charger wastegate	=TRUE	No pending or confirmed DTCs	=see sheet inhibit tables	1(-)	2 Trip
		position sensor, bank 1	position sensor, bank 1		Ignition is ON	=TRUE		

	U0674	Diagnosis of Turbo charger wastegate position sensor bank 2 for SENT data - Communication Check	Communication Error bit status for turbo charger wastegate position sensor, bank 2	=TRUE	No pending or confirmed DTCs	=see sheet inhibit tables	1(-)	2 Trip
			OR Pulse length of SENT message is out of range for turbo charger wastegate, bank 2	=TRUE	Ignition is ON	=TRUE		
			OR No signal on the line for turbo charger wastegate, bank 2	=TRUE				
I	U1377	Invalid data from SENT device for Turbo charger wastegate position sensor, bank 2	Fast Data error bits status for turbo charger wastegate position sensor, bank 2	=TRUE	No pending or confirmed DTCs	=see sheet inhibit tables	1(-)	2 Trip
					Ignition is ON	=TRUE		
106. FUEL TANK MODULE	P139D	Fuel Tank Zone Module Sensed Run Crank Maximum	FTZM Crank voltage	≥16,02(V)	State: pinion starter is active	=FALSE	50(sec)	2 Trip
		Voltage						
		Voltage			No pending or confirmed DTCs	=see sheet inhibit tables		
I	P139C	Voltage Fuel Tank Zone Module Sensed Run Crank Voltage Minimum	FTZM Crank voltage	<9(V)	No pending or confirmed DTCs State: pinion starter is active	=see sheet inhibit tables =FALSE	50(sec)	2 Trip
	P139C	Voltage Fuel Tank Zone Module Sensed Run Crank Voltage Minimum	FTZM Crank voltage	<9(V)	No pending or confirmed DTCs State: pinion starter is active No pending or confirmed DTCs	=see sheet inhibit tables =FALSE =see sheet inhibit tables	50(sec)	2 Trip
107. TANK TRANSFER PUMP	P139C P2634	Voltage Fuel Tank Zone Module Sensed Run Crank Voltage Minimum DFC for checking the error percent in Tank transfer pump High voltage diagnostics	FTZM Crank voltage Fuel Tank Zone Module Diagnosis Signal: Short Circuit to Battery	<9(V) =1(-)	No pending or confirmed DTCs State: pinion starter is active No pending or confirmed DTCs No pending or confirmed DTCs	=see sheet inhibit tables =FALSE =see sheet inhibit tables =see sheet inhibit tables	50(sec) 500(ms)	2 Trip 2 Trip

			250BDG07A P	Part 2 ECM Summa	ary Tables			
			Fuel Tank Zone Module Diagnosis Signal: Short Circuit to Battery	=2(-)	Fuel transfer pump activation status	=FALSE		
1	P2633	DFC for checking the error percent in Tank transfer pump Low voltage diagnostics	Fuel Tank Zone Module Diagnosis Signal: Short Circuit to Ground	=1(-)	No pending or confirmed DTCs	=see sheet inhibit tables	500(ms)	2 Trip
					FTZM crank voltage	<14.52(V)		
			Fuel Tank Zone Module Diagnosis Signal: Short Circuit to Ground	=2(-)	Fuel transfer pump activation status	=TRUE		
	P2632	DFC for checking the error percent in Tank transfer pump Open circuit diagnostics	Fuel Tank Zone Module Diagnosis Signal: Open Load	=1(-)	No pending or confirmed DTCs	=see sheet inhibit tables	500(ms)	2 Trip
					FTZM crank voltage	<14.52(V)		
			Fuel Tank Zone Module Diagnosis Signal: Open Load	=2(-)	Fuel transfer pump activation status	=FALSE		
108. TURBO CHARGER	P2581	Bank 1 Error Signal Level High	Bank 1 Turbo Charger Speed Sensor Signal State	=TRUE	Counter for state (A & B)	>=50(-)	655350(ms)	2 Trip
SENSOR					A: Bank 1 Sensor Pulse Time Difference	=0(-)		
					B: Pulse Number Difference between 2 Raster	=0(-)		
					Flag for condition boost control active	=FALSE		
					Engine speed Battery voltage	>1500(rpm) >=9000(mV)		
	P2596	Bank 2 Error Signal Level High	Bank 2 Turbo Charger Speed Sensor Signal State	=TRUE	Counter for state (A & B)	>=50(-)	655350(ms)	2 Trip
					A: Bank 2 Sensor Pulse Time Difference	=0(-)		
					B: Pulse Number Difference between 2 Raster	=0(-)		
					Flag for condition boost control active	=FALSE		
					Engine speed Battery voltage	>1500(rpm) >=9000(mV)		
	P2580	Bank 1 Error Signal Level Low	Bank 1 Turbo Charger Speed Sensor Signal State	=FALSE	Counter for state (A & B)	>=50(-)	500(ms)	2 Trip
					A: Bank 1 Sensor Pulse Time Difference	=0(-)		
					B: Pulse Number Difference between 2 Raster	=0(-)		

				Flag for condition boost control active	=FALSE		
				Engine speed Battery voltage	>1500(rpm) >=9000(mV)		
P2595	Bank 2 Error Signal Level Low	Bank 2 Turbo Charger Speed Sensor Signal State	=FALSE	Counter for state (A & B)	>=50(-)	500(ms)	2 Trip
				A: Bank 2 Sensor Pulse Time	=0(-)		
				B: Pulse Number Difference between 2 Raster	=0(-)		
				Flag for condition boost control active	=FALSE		
				Engine speed Battery voltage	>1500(rpm) >=9000(mV)		
P2594	Plausibility defect	Absolute difference between gradient-limited turbo charger speed and current turbocharger speed, bank 1	>250000(rpm)	Engine Speed	>1000rpm	50(ms)	2 Trip
				No pending or confirmed DTCs	=see sheet inhibit tables		
P00C5	Turbo charger speed above maximum threshold	gradient-limited turbo charger speed (bank1)	>250000(rpm)	No pending or confirmed DTCs	>0rpm	50(ms)	2 Trip
					=see sheet inhibit tables		
P2EFF	Turbo charger speed below minimum threshold	gradient-limited turbo charger speed (bank1)	<0(rpm)	Engine Speed	>0rpm	50(ms)	2 Trip
				No pending or confirmed DTCs	=see sheet inhibit tables		
P2579	Plausibility defect	Absolute difference between gradient-limited turbo charger speed and current turbocharger speed, bank 2	>250000(rpm)	Engine Speed	>1000rpm	50(ms)	2 Trip
				No pending or confirmed DTCs	=see sheet inhibit tables		
P0049	Turbo charger speed above maximum threshold	gradient-limited turbo charger speed (bank2)	>250000(rpm)	No pending or confirmed DTCs	>0rpm	50(ms)	2 Trip
					=see sheet inhibit tables		
P2EFE	Turbo charger speed below minimum threshold	gradient-limited turbo charger speed (bank2)	<0(rpm)	Engine Speed	>0rpm	50(ms)	2 Trip
				No pending or confirmed DTCs	=see sheet inhibit tables		

1	Absolute differe sensor 1 voltag	ence between a e (a) and sens	accelerator pe sor 2 voltage (k	dal position ວ)
	mV	500,0	2.100,0	2.100,2
	mV	120,0	180,0	180,0

2	difference of th	e brake senso	r voltage corre	sponds to a co	prrected value					
	mV	0	34,6	35	40	45	51	51,2	4999	5000
	-	0	0	0	0	0	0	1	1	1

3 Upper on the	threshold for the rela engine speed nmot	ative air charge ir for automatic trai	n order to deter nsmission	rmine the oper	ating range LC	W depending
kPa	/ rpm 1520	1840	1880	2000	2040	2320
	0 60	60	60	60	60	60
	1 60	60	60	60	60	60
	,5 60	60	60	60	60	60
	2 60	60	60	60	60	60
	3 60	60	60	60	60	60

4

Lower threshold for the relative air charge in order to determine the operating range LOW depending on the low resolution engine speed for automatic transmission

kPa / rpm	0	1520	3000	4520	6000	7520
280	22,5	22,5	22,5	22,5	22,5	22,5
320	23,3	23,3	23,3	23,3	23,3	23,3
420	24	24	24	24	24	24
520	24,8	24,8	24,8	24,8	24,8	24,8
650	26,3	26,3	26,3	26,3	26,3	26,3
	,-	,-	,-	,-	,-	,-

5	Propulsion torque after driving assistance coordination

Propulsion torq	que after driving	g assistance co	oordination											
rpm	500	1000	1500	2000	2500	3000	3500	4000	4500	5000	5500	6000	6500	7000
Nm	900	900	900	900	1000	1150	1300	1300	1300	1300	1300	1300	1300	1300
	-													

6	(d1) temperatu	e model correc	tion dependen	t on vehicle sp	beed and ambi	ent temperatur	e		
		_							
	km/h / °C	-40,04	-15,04	-10,04	-0,04	19,96	39,96	59,96	79,96
	0	-0,0000488	-0,0000488	-0,0000488	-0,0000488	-0,0000488	-0,0000488	-0,0000488	-0,0000488
	30	-0,0370605	-0,0360596	-0,0350586	-0,0330566	-0,0310547	-0,0300537	-0,0290527	-0,0280518
	50	-0,0520508	-0,0510498	-0,0500488	-0,0480469	-0,0515625	-0,0540527	-0,0528564	-0,0516602
	80	-0,0570557	-0,0560547	-0,0550537	-0,0530518	-0,0571777	-0,0600586	-0,0588623	-0,0576660
	120	-0,0630371	-0,0620605	-0,0610596	-0,0590576	-0,0684570	-0,0560547	-0,0550537	-0,0540527
	150	-0,0690430	-0,0680420	-0,0670410	-0,0650391	-0,0684082	-0,0620605	-0,0610596	-0,0600586
	180	-0,0750488	-0,0740479	-0,0730469	-0,0710449	-0,0690430	-0,0680420	-0,0670410	-0,0660400
	200	-0,0810547	-0,0800537	-0,0790527	-0,0770508	-0,0750488	-0,0740479	-0,0730469	-0,0720459

7	(c) correction fa	actor for temp	erature differer	nce over the ra	adiator											
	°C	-20	-10	0	5	10	15	20	25	30	35	40	50	60	75	90

Г								<u>г</u>	r							
	°C/s	0	0	0	0	0	0	0,03999023	0,04499512	0,05	0,05	0,05214844	0,05275879	0,05441895	0,075	0,1
_																

8 (a) temperature increment depending on inner torque and ambient temperature

°C / W	0	508,9	2507,0	4995,1	7502,1	12007,2	35003,6	50007,9	99996,9	150004,8	199993,8	250
-10,04	0	0,0050049	0,0500000	0,0748291	0,0774658	0,0822266	0,1514648	0,2006836	0,2160156	0,2160156	0,2399902	0,26
9,96	0	0,0050049	0,0510010	0,0592773	0,0676270	0,0931396	0,2006592	0,2006836	0,2187012	0,2203125	0,2447998	0,269

(b) Correction f	actor depende	nt on vehicle s	speed and am	bient temperat	ure							
°C / km/h	0	4	7	10	20	40	60	80	90	100	120	
-40,04	1	1	1	1	1,04003906	1,06005859	1,08996582	1,10998535	1,13000488	1,14001465	1,15002441	1,1
-10,04	1	1	1	1	1,0300293	1,05004883	1,07495117	1,0949707	1,11499023	1,125	1,13500977	1,1
9,96	1	1	1	1	1,02001953	1,04003906	1,06005859	1,07995605	1,09997559	1,10998535	1,11999512	1,1
29,96	1	1	1	1	1,00195313	1,02197266	1,04199219	1,06201172	1,08203125	1,09204102	1,10205078	1,1
39,96	1	1	1	1	1,00097656	1,02099609	1,04101563	1,06103516	1,08105469	1,09094238	1,10095215	1,1
69,96	1	1	1	1	1	1,02001953	1,04003906	1,06005859	1,07995605	1,08996582	1,09997559	1,1

К -40 -10 0 10 30 50 70			engine start						
		К -40	-10	0	10	30	50	70	90
s 60 45 25 15 10 10 10		s 60	45	25	15	10	10	10	10

11	(b) Upstream	O2 sensor hea	t threshold for	release of hea	ting (kJ)						
	°C / °C	-30,04	-20,04	-10,04	-0,04	9,96	19,96	29,96	49,96	74,96	99,96
	-30,04	500	500	500	500	500	500	500	500	500	500
	-20,04	500	400	400	400	400	400	400	400	400	400
	-10,04	500	400	310	310	310	310	310	310	310	310
	-0,04	500	400	310	280	280	280	280	280	280	280
	9,96	500	400	310	280	240	240	240	240	240	240
	19,96	500	400	310	280	240	200	200	200	200	200
	29,96	500	400	310	280	240	200	100	100	100	100
	49,96	500	400	310	280	240	200	100	60	60	60
	74,96	500	400	310	280	240	200	100	60	10	10
	99,96	500	400	310	280	240	200	100	60	10	10

12	(c) Instance of adjust the heat and the start te	dew point enc energy thresh mperature	l class of sens old depending	or 1 at bank 1 on the could s	/ Factor to tart counter
	°C	-20,04	-0,04	19,96	54,96
	-	0,4	0,5	0,25	0

01,7	
9893	
2627	

13	(b) Upstream(O2 sensor hea	t threshold for	release of hea	iting (kJ)						
	°C / °C	-30,04	-20,04	-10,04	-0,04	9,96	19,96	29,96	49,96	74,96	99,96
	-30,04	500	500	500	500	500	500	500	500	500	500
	-20,04	500	400	400	400	400	400	400	400	400	400
	-10,04	500	400	310	310	310	310	310	310	310	310
	-0,04	500	400	310	280	280	280	280	280	280	280
	9,96	500	400	310	280	240	240	240	240	240	240
	19,96	500	400	310	280	240	200	200	200	200	200
	29,96	500	400	310	280	240	200	100	100	100	100
	49,96	500	400	310	280	240	200	100	60	60	60
	74,96	500	400	310	280	240	200	100	60	10	10
	99,96	500	400	310	280	240	200	100	60	10	10
								-	-	-	-

14	(c) Instance of adjust the heat and the start te	dew point end energy thresh mperature	l class of sens old depending	or 1 at bank 2 on the could s	/ Factor to start counter				
	°C	20.04	0.04	10.06	54.06				
	-C	°C -20,04 -0,04 19,96 54,96							
	- 0,4 0,5 0,25 0								
		-	-	-	-				

15	(b) Downstrear	n O2 sensor h	neat threshold	for release of h	neating (kJ)						
	°C / °C	-30,04	-20,04	-10,04	-0,04	9,96	19,96	29,96	49,96	74,96	99,96
	-30,04	2200	2200	2200	2200	2200	2200	2200	2200	2200	2200
	-20,04	2200	1800	1800	1800	1800	1800	1800	1800	1800	1800
	-10,04	2200	1800	1600	1600	1600	1600	1600	1600	1600	1600
	-0,04	2200	1800	1600	1300	1300	1300	1300	1300	1300	1300
	9,96	2200	1800	1600	1300	1000	1000	1000	1000	1000	1000
	19,96	2200	1800	1600	1300	1000	800	800	800	800	800
	29,96	2200	1800	1600	1300	1000	800	600	600	600	600
	49,96	2200	1800	1600	1300	1000	800	600	300	300	300
	74,96	2200	1800	1600	1300	1000	800	600	300	200	200
	99,96	2200	1800	1600	1300	1000	800	600	300	200	200
								-		-	

16	(c) Instance of adjust the heat and the start te	(c) Instance of dew point end class of sensor 2 at bank 1 / Factor to adjust the heat energy threshold depending on the could start counter and the start temperature									
			r								
	°C	-20,04	-0,04	19,96	54,96						
	-	0,4	0,5	0,25	0						
			-								

		1	1	•	•	•	•	•		T
°C / °C	-30,04	-20,04	-10,04	-0,04	9,96	19,96	29,96	49,96	74,96	
-30,04	2200	2200	2200	2200	2200	2200	2200	2200	2200	
-20,04	2200	1800	1800	1800	1800	1800	1800	1800	1800	
-10,04	2200	1800	1600	1600	1600	1600	1600	1600	1600	
-0,04	2200	1800	1600	1300	1300	1300	1300	1300	1300	
9,96	2200	1800	1600	1300	1000	1000	1000	1000	1000	
19,96	2200	1800	1600	1300	1000	800	800	800	800	
29,96	2200	1800	1600	1300	1000	800	600	600	600	
49,96	2200	1800	1600	1300	1000	800	600	300	300	
74,96	2200	1800	1600	1300	1000	800	600	300	200	
99,96	2200	1800	1600	1300	1000	800	600	300	200	

18	(c) Instance of adjust the heat and the start te	dew point end energy thresh mperature	l class of sens old depending	or 2 at bank 2 on the could s	/ Factor to start counter			
	°C	-20,04	-0,04	19,96	54,96			
	- 0,4 0,5 0,25 0							

19	integrated exha	aust gas mass	flow bank 1 si	nce engine sta	rt			
	°C	-20,04	-10,04	-0,04	19,96	39,96	59,96	79,96
	g	10000	3000	3000	3000	2250	2250	2250

20	engine load										
	rpm	800	1000	1120	1240	1400	1520	2000	2400	2720	3000
	%	1535,977	12	12	12	12	12	12	12	12	12

21	Relative air ma	SS			
	rpm	800	1000	3000	4000
	%	1535,977	16,992	15	15
	%	1535,977	16,992	15	15

22	(b) Exhaust ma sensor Lean to	ss flow depend Rich	dent correction	i for delay resp	oonse time of s	econdary O2
	kg/h	10	20	40	80	120
	s	0,04	0,02	0	0	0

23	(b) Exhaust ma sensor Rich to	ss flow depend Lean	dent correction	ı for delay resp	oonse time of s	secondary O2
	kg/h	10	20	40	80	120
	S	0,08	0,06	0,04	0,04	0,04

24	(b) Exhaust ma Lean to Rich	ss flow depend	dent correction	n for transition	response time	of secondary (O2 S2B1
	kg/h	10	30	40	60	80	120
	s	0,08	0,06	0,05	0,04	0,03	0,03

25	(b) Exhaust ma Rich to Lean	ss flow depend	dent correctior	n for transition	response time	of secondary	O2 S2B1
	kg/h	10	30	40	60	80	120
	S	0,1	0,08	0,07	0,06	0,05	0,04

26	for number of s	ynchronous co	ounts				
	°C	-30,04	-20,04	-0,04	19,96	59,96	89,96
	-	150	150	150	150	150	150

27	A: Number of w	vorking cycle d	uring preinject	ion										
	°C	-30,04	-15,04	-5,04										
	-	1	1	0										
				-										

28	Fuel rail pressu	ire							
	°C	-20,04	-15,04	-10,04	-0.04	19,96	59,96	89.96	109,96
	MPa	20	15	12	7	7	3	3	7

29	for time (Max. waiting ti	me for high fue	el pressure)				
	°C	-20	-10	-0,04	19,96	59,96	89,96
	S	10	10	5	5	5	5
1				•			

30	Ratio of heat q sensor 1 bank	uantity for dew 1	-point end det	ection sensor	1 and heat qua	antity threshold	for dew-point	end detection
	°C / °C	-40,04	-10,04	-0,04	9,96	19,96	59,96	99,96
	-40,04	1	1	1	1	1	0	0
	-10,04	1	1	1	1	1	0	0
	-0,04	1	1	1	1	1	0	0
	9,96	1	1	1	1	1	0	0
	19,96	1	1	1	1	1	0	0
	59,96	0	0	0	0	0	0	0
	99,96	0	0	0	0	0	0	0
		-			•			

31	Ratio of heat o sensor 1 bank	juantity for dev 2	<i>i</i> -point end det	ection sensor 1	and heat qua	antity threshold	l for dew-point	end detec
	°C / °C	-40,04	-10,04	-0,04	9,96	19,96	59,96	99,96
	-40,04	1	1	1	1	1	0	0
	-10,04	1	1	1	1	1	0	0
	-0,04	1	1	1	1	1	0	0
	9,96	1	1	1	1	1	0	0
	19,96	1	1	1	1	1	0	0
	59,96	0	0	0	0	0	0	0
	99,96	0	0	0	0	0	0	0
32	99,96 Ratio of heat o	0 Juantity for dev	0 v-point end det	0 ection sensor 1	0 and heat qua	0 antity threshold	0 I for dew-point	end det
	°C / °C	-40,04	-10,04	-0,04	9,96	19,96	59,96	99,9
	-40,04	0,40625	0,203125	0,203125	0	0	0	0
	10.04	0.000105	0.000105	0 101562	0	0	0	

-40,04	0,40625	0,203125	0,203125	0	0	0	0
-10,04	0,203125	0,203125	0,101563	0	0	0	0
-0,04	0,203125	0,101563	0,101563	0	0	0	0
9,96	0	0	0	0	0	0	0
19,96	0	0	0	0	0	0	0
59,96	0	0	0	0	0	0	0
99,96	0	0	0	0	0	0	0

33	Ratio of heat q sensor 1 bank	uantity for dew 2	-point end det	ection sensor ²	I and heat qua	untity threshold	for dew-point	end detection
	°C / °C	-40,04	-10,04	-0,04	9,96	19,96	59,96	99,96
	-40,04	0,40625	0,203125	0,203125	0	0	0	0
	-10,04	0,203125	0,203125	0,101563	0	0	0	0
	-0,04	0,203125	0,101563	0,101563	0	0	0	0
	9,96	0	0	0	0	0	0	0
	19,96	0	0	0	0	0	0	0
	59,96	0	0	0	0	0	0	0
	99,96	0	0	0	0	0	0	0

34	Actual fan spee	ed - Max estim	ated fan speed	I														
	rpm	0	1000	1001	2100	3500	3750	3751	3752	3753	3754	3755	3756	3757	3758	3759	3760	3761
	rpm	1300	1300	1300	2400	3800	4050	4050	4050	4050	4050	4050	4050	4050	4050	4050	4050	4050

35	Actual fan spe	ed																
	rpm	0	1000	1001	2100	3500	3750	3751	3752	3753	3754	3755	3756	3757	3758	3759	3760	3761
	rpm	0	800	800	1900	3300	3550	3550	3550	3550	3550	3550	3550	3550	3550	3550	3550	3550
			-	-				-		-		-	-					

36	Actual fan spee	ed - Max estim	ated fan speed	d														
	rpm	0	1100	1101	3750	3751	3752	3753	3754	3755	3756	3757	3758	3759	3760	3761	3762	3763
	rpm	1400	1400	1400	4050	4050	4050	4050	4050	4050	4050	4050	4050	4050	4050	4050	4050	4050
					-				-	-					-			

37	Actual fan spee	ed																
[rpm	0	1100	1101	3750	3751	3752	3753	3754	3755	3756	3757	3758	3759	3760	3761	3762	3763
[rpm	0	900	900	3550	3550	3550	3550	3550	3550	3550	3550	3550	3550	3550	3550	3550	3550

3	8	Actual fan spee	ed - Max estima	ated fan speed	ł														
		rpm	0	1000	1001	4500	4501	4502	4503	4504	4505	4506	4507	4508	4509	4510	4511	4512	4513
		rpm	1300	1300	1300	4800	4800	4800	4800	4800	4800	4800	4800	4800	4800	4800	4800	4800	4800

rpm 0 1000 1	1001 4500 4501	4502 4503 4504	4505 4506	4507 4508	4509 4510	4511	4512 4513
rpm 0 800 8	800 4250 4250	4250 4250 4250	4250 4250	4250 4250	4250 4250	4250	4250 4300

Actual fan speed - Max estimated fan speed 40

rpm	0	1000	1001	4500	4501	4502	4503	4504	4505	4506	4507	4508	4509	4510	4511	4512	4513
rpm	1300	1300	1300	4800	4800	4800	4800	4800	4800	4800	4800	4800	4800	4800	4800	4800	4800

41

Actual fan spee	ed																
rpm	0	1000	1001	4500	4501	4502	4503	4504	4505	4506	4507	4508	4509	4510	4511	4512	4513
rpm	0	800	800	4250	4250	4250	4250	4250	4250	4250	4250	4250	4250	4250	4250	4250	4300
	_			-	-			-					-		-		

42	The low-pass f values	filtered absolu	te value of the	difference of th	ne two rail pres	ssure data
	-	0	300	1000	2000	3500
	-	100	100	100	200	200

40 -	gine Speed						
	٩C	-10.04	14 96	24.96	49.96	69 96	89 96
	rpm	520,00	520,00	520,00	520,00	520,00	520,00

44	Engine Speed						
	°C	-10,04	14,96	24,96	49,96	69,96	89,96
	rpm	520,00	520,00	520,00	520,00	520,00	520,00

45	Internal resista	nce of Second	lary HO2S ser	isor bank 1											
	-/°C 350,006 500,006 599,991 699,998 849,998														
	0,6 10000 3500 3150 3000 3000														
	0,65 1000 850 750 650 500														
	0,7	1000	850	750	650	500									
	0,85 1000 850 750 650 500														
	1 1000 850 750 650 500														

46	Internal resista	nce of Second	lary HO2S ser	isor bank 2											
	-/°C 350,006 500,006 599,991 699,998 849,998														
	0,6 10000 3500 3150 3000 3000														
	0,65 1000 850 750 650 500														
	0,7	1000	850	750	650	500									
	0,85	1000	850	750	650	500									
	1 1000 850 750 650 500														

47	Normalized refe	erence level of	knock control														
	rpm	800	1500	2000	2500	3000	3500	4000	4500	5000	5500	6000	6500	7000	7500	8000	8500
	V*ms	0,00156	0,00234	0,00273	0,00352	0,0043	0,00508	0,00547	0,00586	0,00664	0,00703	0,00781	0,00898	0,01016	0,0125	0,01484	0,01758

Normalized refe	erence level of	knock control														
rpm	800	1500	2000	2500	3000	3500	4000	4500	5000	5500	6000	6500	7000	7500	8000	8500
V*ms	0,67109	0,67109	0,67109	0,67109	0,67109	0,725	0,79961	0,9	1	1,1	1,2	1,35	1,5	1,75	2	2,5

Intake manifold pressure 49

intake manifold	pressure															
% / rpm	800	1500	2000	2500	3000	3500	4000	4500	5000	5500	6000	6500	7000	7500	8000	8500
60	400	200	230	250	280	280	300	330	280	280	260	240	240	220	220	220
90	400	200	230	250	280	280	300	330	280	280	260	260	260	280	280	280
120	400	200	230	250	280	280	300	330	280	280	300	300	300	300	320	320
150	400	200	230	250	280	280	300	330	280	280	300	300	300	300	320	320

50	Engine speed g	Engine speed gradient averaged during one working cycle															
	rpm	800	1500	2000	2500	3000	3500	4000	4500	5000	5500	6000	6500	7000	7500	8000	8500
	1/min/s	400	400	400	600	800	1200	1500	1900	2200	2600	2900	3000	3000	3000	3000	3000

51	maintained acti (Knock control	naintained active for time (Knock control: time for load-dynamic action on knock detection)											
	rpm	1000	1400	2000	2720	3520	4520	6000	7520				
	S	0,44	0,3	0,3	0,3	0,36	0,34	0,31	0,29				

52	maintained acti (Knock control:	ve for time time for dynar	nic adaptation))					
	rpm	1000	1400	2000	2720	3520	4520	6000	7520
	S	0,5	0,42	0,4	0,37	0,36	0,34	0,31	0,29

53 Relative charge of air in the cylinder

rpm	800	1500	2000	2500	3000	3500	4000	4500	5000	5500	6000	65
%	49,992	49,992	55,008	55,008	55,008	55,008	55,008	55,008	55,008	55,008	55,008	55,

54		Deviat	tion of idle spe	Deviation of idle speed precontrol (set point - current)											
	- / °C	-48,04	-20,04	-10,04	-0,04	19,96	99,96								
	0,099976	-200	-200	-200	-200	-200	-200								
	0,200012	-200	-200	-200	-200	-200	-200								
	0,299988	-200	-200	-200	-200	-200	-200								
	0,400024	-200	-200	-200	-200	-200	-200								
	0,5	-200	-200	-200	-200	-200	-200								
	0,599976	-200	-200	-200	-200	-200	-200								

55				For time			
	- / °C	-48,04	-20,04	-10,04	-0,04	19,96	99,96
	0,099976	10	10	10	10	10	10
	0,200012	10	10	10	10	10	10
	0,299988	10	10	10	10	10	10
	0,400024	10	10	10	10	10	10
	0,5	10	10	10	10	10	10
	0,599976	10	10	10	10	10	10

56		Deviat	ion of idle spe	ed precontrol	(set point - cur	rrent)	
	- / °C	-48,04	-20,04	-10,04	-0,04	19,96	99,96
	0,099976	100	100	100	100	100	100
	0,200012	100	100	100	100	100	100

00	7000	7500	8000	8500
800	55,008	55,008	55,008	55,008

0,299988	100	100	100	100	100	100
0,400024	100	100	100	100	100	100
0,5	100	100	100	100	100	100
0,599976	100	100	100	100	100	100

57				For time			
	- / °C	-48,04	-20,04	-10,04	-0,04	19,96	99,96
	0,099976	10	10	10	10	10	10
	0,200012	10	10	10	10	10	10
	0,299988	10	10	10	10	10	10
	0,400024	10	10	10	10	10	10
	0,5	10	10	10	10	10	10
	0,599976	10	10	10	10	10	10

58	Difference between max. tank differential pressure & min. tank differential pressure (A-B)											
	I/°C	-7,5	-2,3	3,8	9	14,3	20,3	25,5	30,8	36,8		
	8	5,50049	5,50049	6,09985	6,60034	7,39990	7,90039	8,49976	9,00024	9,59961		
	15	5,25024	5,25024	5,79956	6,40015	7,19971	7,60010	8,19946	8,80005	9,39941		
	22	5,00000	5,00000	5,60059	5,99976	6,80054	7,19971	7,80029	8,59985	9,20044		
	29	4,74976	4,74976	5,30029	5,89966	6,60034	6,99951	7,60010	8,19946	8,80005		
	36	4,49951	4,49951	5,00000	5,60059	6,40015	6,80054	7,19971	7,80029	8,39966		
	43	4,25049	4,25049	4,79980	5,40039	6,19995	6,60034	6,99951	7,60010	8,19946		
	50	4,00024	4,00024	4,59961	5,20020	5,99976	6,40015	6,80054	7,39990	8,00049		
	57	3,49976	3,49976	4,00024	4,59961	5,40039	5,99976	6,40015	6,99951	7,60010		
	64	3,00049	3,00049	3,49976	3,59985	4,39941	4,79980	3,39966	4,00024	4,59961		

59	Torque commanded to charge control									
	rpm	720	1240	4520	5000					
	%	39,99939	39,99939	39,99939	0					

60	Torque comma	Torque commanded to charge control									
	rpm	720	1240	4520	5000						
	%	99,99847	13,00049	13,00049	13,00049						

61	Canister purge	Canister purge mass flow								
	-	0	0,5	1	1,5					
	kg/h	5,000	5,000	5,000	5,000					

62	Charge air cooler pump current high limit for a given pump speed									
	rpm	0	1750	3500	5250	7000				
	А	22	22	22	22	22				
	А	22	22	22	22	22				

63	Engine speed with low resolution							
	hPa	600	980					
	rpm	3200,000	2800,000					

64	For time										
	- / °C	-48,04	-20,04	-10,04	-0,04	19,96	99,96				
	0,099976	0	0	0	0	0	0				
	0,200012	0	0	0	0	0	0				
	0,299988	0	0	0	0	0	0				
	0,400024	0	0	0	0	0	0				
	0,5	0	0	0	0	0	0				
	0,599976	0	0	0	0	0	0				

65	where A - delay time for lambda fuel adaption (rich condition)							
	S	1	5	15				
	S	3	4	5				
			-					

66	where B - delay time for lambda fuel adaption (lean condition)							
	s 1 5 1							
	3	-	5	15				
	S	3	4	5				

67	Relative fuel mass transient component threshold for deceleration enleanment										
	°C	-30,00	-20,30	-9,80	0,00	9,80	20,30	39,80	60,00	90,00	
	%	-1500,00	-1311,98	-936,98	-750,00	-375,00	-186,98	-93,00	-45,98	-23,02	
		-	-				-				

68	Relative fuel mass transient component threshold for deceleration enleanment in bank 2									
	°C	-30,00	-20,30	-9,80	0,00	9,80	20,30	39,80	60,00	90,00
	%	-1500,00	-1311,98	-936,98	-750,00	-375,00	-186,98	-93,00	-45,98	-23,02

69	Time after end of start											
	- / °C	-48,04	-20,04	-10,04	-0,04	19,96	99,96					
	0,099976	2	2	2	2	2	2					
	0,200012	2	2	2	2	2	2					
	0,299988	2	2	2	2	2	2					
	0,400024	2	2	2	2	2	2					
	0,5	2	2	2	2	2	2					
	0,599976	2	2	2	2	2	2					

'0	1	Mean deviation	of actual ignit	ion effciency a	and desired cat	alyst heating i	gnition efficien	cy during idle	
Г	-	-12,040	-11,940	-0,040	9,960	19,960	39,960	65,96	66,06
F	0,73999	1,000	0,270	0,270	0,270	0,270	0,270	0,27002	0,999969
Γ	0,800049	1,000	0,270	0,270	0,270	0,270	0,270	0,27002	0,999969
	0,900024	1,000	0,270	0,270	0,270	0,270	0,270	0,27002	0,999969
Γ	1	0,999969	0,27002	0,27002	0,27002	0,27002	0,27002	0,27002	0,999969

71	Difference between maximum and minimum value of intake air temperature (value sensor 3)																				
	degC	-48,04	-39,74	-30,04	-20,24	-9,74	-0,04	9,76	24,76	39,76	50,26	59,96	69,76	80,26	89,96	99,76	110,26	119,96	129,76	140,26	143,26
	degC	1,56	1,56	1,56	1,36	1,16	0,66	0,36	0,36	0,36	0,46	0,56	0,76	0,96	1,06	1,16	1,16	1,16	1,16	1,16	1,16

72	12 Difference between maximum and minimum value of intake air temperature (value sensor 4)																				
	degC	-48,04	-39,74	-30,04	-20,24	-9,74	-0,04	9,76	24,76	39,76	50,26	59,96	69,76	80,26	89,96	99,76	110,26	119,96	129,76	140,26	143,26
	degC	4,96	4,96	4,96	4,96	4,96	4,96	4,96	4,96	4,96	4,96	4,96	4,96	4,96	4,96	4,96	4,96	4,96	4,96	4,96	4,96

73	73 Difference between maximum and minimum value of intake air temperature (value sensor 1)																				
	degC	-48,04	-39,74	-30,04	-20,24	-9,74	-0,04	9,76	24,76	39,76	50,26	59,96	69,76	80,26	89,96	99,76	110,26	119,96	129,76	140,26	143,26
	degC	1,56	1,56	1,56	1,36	1,16	0,66	0,36	0,36	0,36	0,46	0,56	0,76	0,96	1,06	1,16	1,16	1,16	1,16	1,16	1,16

14 Difference between maximum and minimum value of intake air temperature (value sensor 2)																			
-48,04	-39,74	-30,04	-20,24	-9,74	-0,04	9,76	24,76	39,76	50,26	59,96	69,76	80,26	89,96	99,76	110,26	119,96	129,76	140,26	143,26
4,96	4,96	4,96	4,96	4,96	4,96	4,96	4,96	4,96	4,96	4,96	4,96	4,96	4,96	4,96	4,96	4,96	4,96	4,96	4,96
-	-48,04 4,96	-48,04 -39,74 4,96 4,96	-48,04 -39,74 -30,04 4,96 4,96 4,96	-48,04-39,74-30,04-20,244,964,964,964,96	-48,04 -39,74 -30,04 -20,24 -9,74 4,96 4,96 4,96 4,96 4,96	-48,04-39,74-30,04-20,24-9,74-0,044,964,964,964,964,964,96	-48,04-39,74-30,04-20,24-9,74-0,049,764,964,964,964,964,964,964,96	-48,04-39,74-30,04-20,24-9,74-0,049,7624,764,964,964,964,964,964,964,964,964,96	-48,04-39,74-30,04-20,24-9,74-0,049,7624,7639,764,964,964,964,964,964,964,964,964,964,96	-48,04-39,74-30,04-20,24-9,74-0,049,7624,7639,7650,264,964,964,964,964,964,964,964,964,964,96	-48,04-39,74-30,04-20,24-9,74-0,049,7624,7639,7650,2659,964,964,964,964,964,964,964,964,964,964,964,964,96	-48,04-39,74-30,04-20,24-9,74-0,049,7624,7639,7650,2659,9669,764,964,964,964,964,964,964,964,964,964,964,964,96	-48,04-39,74-30,04-20,24-9,74-0,049,7624,7639,7650,2659,9669,7680,264,964,964,964,964,964,964,964,964,964,964,964,96	-48,04-39,74-30,04-20,24-9,74-0,049,7624,7639,7650,2659,9669,7680,2689,964,964,964,964,964,964,964,964,964,964,964,964,964,964,96	-48,04-39,74-30,04-20,24-9,74-0,049,7624,7639,7650,2659,9669,7680,2689,9699,764,964,964,964,964,964,964,964,964,964,964,964,964,964,964,96	-48,04 -39,74 -30,04 -20,24 -9,74 -0,04 9,76 24,76 39,76 50,26 59,96 69,76 80,26 89,96 99,76 110,26 4,96	-48,04 -39,74 -30,04 -20,24 -9,74 -0,04 9,76 24,76 39,76 50,26 59,96 69,76 80,26 89,96 99,76 110,26 119,96 4,96	-48,04 -39,74 -30,04 -20,24 -9,74 -0,04 9,76 24,76 39,76 50,26 59,96 69,76 80,26 89,96 99,76 110,26 119,96 129,76 4,96 4,96 4,96 4,96 4,96 4,96 4,96 4,96 4,96 4,96 4,96 4,96	-48,04 -39,74 -30,04 -20,24 -9,74 -0,04 9,76 24,76 39,76 50,26 59,96 69,76 80,26 89,96 99,76 110,26 119,96 129,76 140,26 4,96

75	Charge air coo	oler pump facto	or low limit for a	a given coolan	t temperature
	degC	-50,04	19,96	89,96	159,96
	-	1	1	1	1
				-	

76	Charge air coo	ler pump curre	nt low limit for	a given pump	speed						
	rpm 0 1750 3500 5250 7000										
	A	0	0	0	0	0					

77	Charge air coo	ler pump facto	r high limit for	a given coolan	t temperature
	degC	-50,04	19,96	89,96	159,96
	-	1	1	1	1

78	Difference betw	Difference between desired pressure and measured pressure upstream throttle valve, bank 2												
	hPa	-500	-250	0	250	500	750	1000	1270					
	hPa	750	750	550	450	400	300	200	200					

79	Difference between desired pressure and measured pressure upstream throttle valve, bank 1												
	hPa	-500	-250	0	250	500	750	1000	1270				
	hPa	750	750	550	450	400	300	200	200				

80	Coordinated to	rque request fo	or charge		
	1/min	440	520	880	7000
	%	99,998	2,499	2,499	2,499

81	Coordinated to	rque request fo	or charge		
	1/min	440	520	920	1000
	%	18	18	18	0

82	Borderline OSC													
	°C / kg/h	450	500	600	650	700	750	800	850					
	15	125	125	200	225	260	300	300	300					
	25	125	125	200	225	260	300	300	300					
	35	125	125	200	225	260	300	300	300					
	50	125	125	200	225	260	300	300	300					
	100	125	125	200	225	260	300	300	300					
	140	125	125	200	225	260	300	300	300					
	180	125	125	200	225	260	300	300	300					
	250	125	125	200	225	260	300	300	300					

83	Power stage fe	edback voltage	9							
	mV 4000 5000 6000 7000 8000 9									
	mv	1950	2500	2950	3350	4000	4500			

84	engine speed fo	or normal, non	-repeated, key	starts									
	kPa/°C -40,04 -0,04 39,96 79,96												
	800 700 600 600 600												
	900 700 600 600 600												
	1000 700 600 600 600												
	1100	700	600	600	600								

mV 241,8 500,0 1000,0 1500,0 2000,0 3000,0 3500,0 4000,0 4500,0 5000 hPa 0.0 570,0 1673,0 2776,0 3879,0 6085,0 7188,0 8292,0 9395,0 10498	85	Engine Oil Pressure											
mV 241,8 500,0 1000,0 1500,0 2000,0 3000,0 3500,0 4000,0 4500,0 5000 hPa 0.0 570,0 1673,0 2776,0 3879,0 6085,0 7188,0 8292,0 9395,0 10498													
hPa 0.0 570.0 1673.0 2776.0 3879.0 6085.0 7188.0 8292.0 9395.0 10498		mV	241,8	500,0	1000,0	1500,0	2000,0	3000,0	3500,0	4000,0	4500,0	5000,0	
		hPa	0,0	570,0	1673,0	2776,0	3879,0	6085,0	7188,0	8292,0	9395,0	10498,0	

86	Relative engine oil pressure														
	°C / rpm	0	399,5	400	5000	6000	6500	7000	8600						
	-0,04	0	0	135	135	213	236	259	342						
	19,96	0	0	135	135	213	236	259	342						
	39,96	0	0	135	135	213	236	259	342						
	59,96	0	0	135	135	213	236	259	342						
	79,96	0	0	135	135	213	236	259	342						
	99,96	0	0	135	135	213	236	259	342						
	119,96	0	0	135	135	213	236	259	342						
	139,96	0	0	135	135	213	236	259	342						
	100,00	0	0	100	133	215	230	233	042						

87	for time (debounce time	for low oil pre	ssure warning)	
	°C	-40,04	-10,04	19,96	89,96
	s	5	3,5	1,2	1,2

88	Difference between measured engine oil pressure and oil pressure surface set point												
	°C / rpm	0	400	550	800	2400	2800	4000	4800	5400	6000		
	-40,04	800	800	300	300	300	300	300	300	300	300		
	-10,04	800	800	300	300	300	300	300	300	300	300		
	-0,04	800	800	800	800	800	800	800	800	800	800		
	19,96	800	800	800	800	800	800	800	800	800	800		
	39,96	800	800	800	800	800	800	800	800	800	800		
	59,96	800	800	800	800	800	800	800	800	800	800		
	79,96	800	800	800	800	800	800	800	800	800	800		
	99,96	800	800	800	800	800	800	800	800	800	800		
	119,96	800	800	800	800	800	800	800	800	800	800		
	149,96	800	800	800	800	800	800	800	800	800	800		
								-					

Engine oil pressure minus oil pressure set point													
0	400	550	800	2400	2800	4000	4800	5400	6000				
-800	-800	-500	-500	-500	-500	-500	-500	-500	-500				
-800	-800	-500	-500	-500	-500	-500	-500	-500	-500				
-800	-800	-500	-500	-500	-500	-500	-500	-500	-500				
-800	-800	-200	-200	-200	-200	-200	-200	-200	-200				
-800	-800	-200	-200	-200	-200	-200	-200	-200	-200				
-800	-800	-200	-200	-200	-200	-200	-200	-200	-200				
-800	-800	-200	-200	-200	-200	-200	-200	-200	-200				
-800	-800	-200	-200	-200	-200	-200	-200	-200	-200				
-800	-800	-200	-200	-200	-200	-200	-200	-200	-200				
-800	-800	-200	-200	-200	-200	-200	-200	-200	-200				
	essure minus oil 0 -800 -800 -800 -800 -800 -800 -800 -800 -800 -800 -800 -800	0 400 -800 -800 -800 -800 -800 -800 -800 -800 -800 -800 -800 -800 -800 -800 -800 -800 -800 -800 -800 -800 -800 -800 -800 -800 -800 -800 -800 -800 -800 -800 -800 -800	0 400 550 -800 -800 -500 -800 -800 -500 -800 -800 -500 -800 -800 -500 -800 -800 -200 -800 -800 -200 -800 -800 -200 -800 -800 -200 -800 -800 -200 -800 -800 -200 -800 -800 -200 -800 -800 -200 -800 -800 -200 -800 -800 -200 -800 -800 -200	0 400 550 800 -800 -800 -500 -500 -800 -800 -500 -500 -800 -800 -500 -500 -800 -800 -500 -500 -800 -800 -500 -500 -800 -800 -200 -200 -800 -800 -200 -200 -800 -800 -200 -200 -800 -800 -200 -200 -800 -800 -200 -200 -800 -800 -200 -200 -800 -800 -200 -200 -800 -800 -200 -200 -800 -800 -200 -200 -800 -800 -200 -200 -800 -800 -200 -200	0 400 550 800 2400 -800 -800 -500 -500 -500 -800 -800 -500 -500 -500 -800 -800 -500 -500 -500 -800 -800 -500 -500 -500 -800 -800 -200 -200 -200 -800 -800 -200 -200 -200 -800 -800 -200 -200 -200 -800 -800 -200 -200 -200 -800 -800 -200 -200 -200 -800 -800 -200 -200 -200 -800 -800 -200 -200 -200 -800 -800 -200 -200 -200 -800 -800 -200 -200 -200	0 400 550 800 2400 2800 -800 -800 -500 -500 -500 -500 -800 -800 -500 -500 -500 -500 -800 -800 -500 -500 -500 -500 -800 -800 -500 -500 -500 -500 -800 -800 -200 -200 -200 -200 -800 -800 -200 -200 -200 -200 -800 -800 -200 -200 -200 -200 -800 -800 -200 -200 -200 -200 -800 -800 -200 -200 -200 -200 -800 -800 -200 -200 -200 -200 -800 -800 -200 -200 -200 -200 -800 -800 -200 -200 -200 -200 -800 -800 -200	0 400 550 800 2400 2800 4000 -800 -800 -500 -500 -500 -500 -500 -800 -800 -500 -500 -500 -500 -500 -800 -800 -500 -500 -500 -500 -500 -800 -800 -500 -500 -500 -500 -500 -800 -800 -200 -200 -200 -200 -200 -800 -800 -200 -200 -200 -200 -200 -800 -800 -200 -200 -200 -200 -200 -800 -800 -200 -200 -200 -200 -200 -800 -800 -200 -200 -200 -200 -200 -800 -800 -200 -200 -200 -200 -200 -200 -800 -800 -200 -200 -200	0 400 550 800 2400 2800 4000 4800 -800 -800 -500 -200 -200 -200 -200 -200 -200 -200 -200 -200 -200 -200 -200 -200 -200 <td>0 400 550 800 2400 2800 4000 4800 5400 -800 -800 -500 -200 -200 -200 -200 -200 -200 -200 -200 -200 -200 -200 -200 -200</td>	0 400 550 800 2400 2800 4000 4800 5400 -800 -800 -500 -200 -200 -200 -200 -200 -200 -200 -200 -200 -200 -200 -200 -200				

90	Pre Supply Pur	np output volta	age				
	mV	4000	5000	6000	7000	8000	9000
	mV	1950	2500	2950	3350	4000	4500

91	Relative fuel mass transient componet threshold for acceleration enrichment (Bank 1)											
	°C	-30,00	-20,30	-9,80	0,00	9,80	20,30	39,80	60,00	90,00		
	%	37,50	75,00	150,00	225,00	300,00	375,00	450,00	525,00	600,00		

92	Relative fuel m	iass transient c	omponet thres	shold for accele	eration enrichm	1ent (Bank 2)				
	°C	-30,00	-20,30	-9,80	0,00	9,80	20,30	39,80	60,00	90,00
	%	37,50	75,00	150,00	225,00	300,00	375,00	450,00	525,00	600,00
		<u>. </u>								
Table no.

93	Absolute difference sensor 1 and se	Absolute difference between relative actual angle calculated based on voltages from sensor 1 and sensor 2												
	06	0	5	10	15	100								
	70	0	5	10	15	100								
	%	5	5	6,25	6,25	6,25								

94	Absolute difference sensor 1 and se	Absolute difference between relative actual angle calculated based on voltages from sensor 1 and sensor 2												
	%	0	5	10	15	100								
	%	5	5	6,25	6,25	6,25								

95	Relative air ma	Relative air mass												
														
	rpm	1000	1120	1520	1800	2120	2520	3600	7000					
	%	39,75	18,75	18,75	18,75	18,75	18,75	17,25	15,75					

96	Current integrator value of P-part balanced primary control enable										
	-	0,300	0,700								
	g	200	300								

97	Exhaust gas mass flow sensor 2										
	OSC Factor	0,30	0,70								
	g	219,73	320,00								

Component/System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL IIIum.
Steering Wheel Positon Sensor	C0051	Monitoring for steering angle sensor intitialization. Emissions neutral default action: disable steering angle based auto stop inhibit and perform auto-stops.	The Steering Angle Sensor is not initialized	TRUE	Diagnostic Voltage Vehicle Power Mode	= Enabled = 6V < voltage < 16V = RUN	INSTANT	Safety Emissions Neutral Diagnostic - Type C
Steering Wheel Positon Sensor	C0051	Monitoring for steering angle sensor calibration status. Emissions neutral default action: disable steering angle based auto-stop inhibit and perform auto-stops.	The Steering Angle Sensor is not calibrated	TRUE	Diagnostic Voltage Vehicle Power Mode	= Enabled = 6V < voltage < 16V = RUN	INSTANT	Safety Emissions Neutral Diagnostic - Type C
Steering Wheel Positon Sensor	C0051	This monitoring checks if the steering angle signal is constant when it should change. Emissions neutral default action: disable steering angle based auto-stop inhibit and perform auto-stops.	Variation of steering angle signal during left and right curve since last vechicle standstill	< 5 [deg]	Diagnostic Voltage Vehicle Power Mode	= Enabled = 6V < voltage < 16V = RUN	40 ms	Safety Emissions Neutral Diagnostic - Type C
Steering Wheel Positon Sensor	C0051	This monitoring checks if the steering angle velocity is plausible or not. Emissions neutral default action: disable steering angle based auto-stop inhibit and perform auto-stops.	Variation of steering angle signal during left and right curve since last vechicle standstill	< 5 [deg]	Diagnostic Voltage Vehicle Power Mode	= Enabled = 6V < voltage < 16V = RUN	40 ms	Safety Emissions Neutral Diagnostic - Type C
Steering Wheel Positon Sensor	C0051	This monitoring checks if the steering angle velocity is plausible or not. Emissions neutral default action: disable steering angle based auto-stop inhibit and perform auto-stops.	Steering angle signal gradient OR Steering angle signal gradient after 2 messages OR Steering angle signal gradient after 3 messages	> 30 [deg]/0.020 [s] > 60 [deg]/0.020 [s] > 90 [deg]/0.020 [s]	Diagnostic Voltage Vehicle Power Mode	= Enabled = 6V < voltage < 16V = RUN	60 ms	Safety Emissions Neutral Diagnostic - Type C
Steering Wheel Positon Sensor	C0051	This monitoring checks if the Steering angle offset has an acceptable valueEmissions neutral default action: disable steering angle based auto-stop inhibit and perform auto-stops.	Steering angle offset	> 15 [deg]	Diagnostic Voltage Vehicle Power Mode	= Enabled = 6V < voltage < 16V = RUN	INSTANT	Safety Emissions Neutral Diagnostic - Type C
Steering Wheel Positon Sensor	C0051	This monitoring checks the Steering Angle Sensor's range by checking the raw sensor signal. Emissions neutral default action: disable steering angle based auto-stop inhibit and perform auto-stops.	Absolute value of received raw sensor signal	> 810 [deg]	Diagnostic Voltage Vehicle Power Mode	= Enabled = 6V < voltage < 16V = RUN	300 ms	Safety Emissions Neutral Diagnostic - Type C
Steering Wheel Positon Sensor	C0051	This monitoring checks if the steering angle signal is physically plausible. Emissions neutral default action: disable steering angle based auto-stop inhibit and perform auto-stops.	Difference between measured steering angle and model calculated value based on yaw rate signal	> 10-100 [deg/s] velocity dependent (the bigger the velocity, the lower the threshold)	Diagnostic Voltage Vehicle Power Mode	= Enabled = 6V < voltage < 16V = RUN	0.4 [s] - 4.8 [s] depending on the extent of the deviation - the larger the deviation is, the smaller the detection time	Safety Emissions Neutral Diagnostic - Type C
Steering Wheel Positon Sensor	C0051	This monitoring checks if the sign of the steering angle signal is incorrect. Emissions neutral default action: disable steering angle based auto-stop inhibit and perform auto-stops.	Calculated integral value during forward driving OR Calculated integral value independently from driving direction	> -30 [deg] '> -90 [deg]	Diagnostic Voltage Vehicle Power Mode	= Enabled = 6V < voltage < 16V = RUN	INSTANT	Safety Emissions Neutral Diagnostic - Type C

Component/System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL illum.
Transmission Control Module (TCM)	P0601	TCM Read Only Memory	program/calibrations checksum failure at powerup	= True			>= 1 fail count	А
					Enable Conditions: OTA Program State Flag	g = INACTIVE		
Transmission Control Module (TCM)	P0602	TCM Hardware configuration	HW configuration differs from SW configuration at powerup OR	= True			>= 1 fail count	А
x - ,			TCM end of line data checksum failure at powerup	= True				
					Enable Conditions: OTA Program State Flag	g = INACTIVE		
Transmission Control Module (TCM)	P0604	TCM Random Access Memory	Incorrectable RAM fault causing running reset	= True			>= 1 fail count	А
(10.11)			Incorrectable fault in shared memory	= True				
Transmission Control Module (TCM)	P0605	TCM Flash Program Memory	Flash Memory uncorrectable read error	= True			>= 1 fail count	A
					Enable Conditions: OTA Program State Flag	g = INACTIVE		
Transmission Control Module (TCM)	P0606	TCM CPU internal fault monitor	CPU related fault detected at start up initialization	= True			>= 1 fail count	А
(1011)			Runtime CPU fault detected	= True				
Transmission Control Module	P0607	TCM internal fault monitor	One Time Test reports a fault at start up initialization	= True			>= 1 fail count	А
(100)			Internal Communication related fault caused running reset	= True				
Transmission Control Module	P0607	TCM internal fault monitor	Runtime Internal communications fault detected	= True			>= 400ms	A
Transmission Control Module	P0607	TCM internal fault monitor	Consistency check fault on redundant input detected	= True			>= 2 fail count	А
Transmission Control Module	P0607	TCM internal fault monitor	Runtime Internal communications integrity fault related to Received CAN data detected	= True			>= 4 fail count	А
Transmission Control Module	P0607	TCM internal fault monitor	Runtime Internal communications aging fault related to Safety Relevant Received CAN data detected	= True			>= 400 ms	A

Transmission Control Module	P0607	TCM internal fault monitor	Runtime Internal communications aging fault related to Non Safety Relevant Received CAN data detected	= True						>=	10 sec	A
Transmission Control Module (TCM)	P060A	TCM Clock and Timing monitor	Watchdog fault detected at start up initialization	= True						>=	1 fail count	A
(1000)			Clock or PLL related fault detected at start up initialization	= True								
			OR Task / program flow monitoring fault detected	= True								
Transmission Control Module (TCM)	P060B	ADC performance monitor	ADC related fault detected at start up initialization	= True						>=	1 fail count	A
					Enable Conditions:	OTA Program State Flag	=	INACTIVE				
Transmission Control Module (TCM)	P060B	ADC performance monitor	ADC converter related fault detected	= True						>=	1 fail count	А
(1000)			ADC multiplexer related fault detected	= True								
					Enable Conditions:	Stabilization delay Ignition Voltage Ignition Voltage Power Mode OTA Program State Flag	>= < < =	5 8.75 18 RUN INACTIVE	sec Volt Volt			
Transmission Control Module (TCM)	P060C	Supply voltage monitor	Supply related fault detected at start up initialization	= True						>=	1 fail count	A
					Enable Conditions:	OTA Program State Flag	=	INACTIVE				
Transmission Control Module (TCM)	P0610	TCM internal fault monitor	Hot reset caused by faults trying to recover	= True						>=	1 fail count	с
Transmission Control Module (TCM)	P0613	Operating system fault monitor	OS related fault detected at start up initialization	= True						>=	1 fail count	A
Transmission Control Module (TCM)	P062F	Non Volatile parameter monitor	Fault detected related to Non Volatile Memory blocks storing partnumbers, tester serial numbers, VIN and programming date	= True						>=	1 fail count	A
Transmission Control Module (TCM)	P064F	Non Volatile parameter monitor	Fault detected related to application software parameters including MCVM data	= True						>=	1 fail count	A
					Enable Conditions:	OTA Program State Flag	=	INACTIVE				

Transmission Control Module	P1188	Calibration ID verification	Mismatch between Calibration ID and Application ID detected	= True					>=	1 fail count	А
(TCM)					Enable Conditions:	OTA Program State Flag	=	INACTIVE			

Component/System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value Seco		Secondary Parameters		Enable Conditions		Time Required	MIL illum.		
Transmission Clutch 1 Pressure Sensor	P0843	This diagnostic verifies that the input voltage is below the maximum working voltage (with hysteresis). If the voltage is too high a timer is increased, if the fault timeout limit is reached, the DTC is set.	Clutch 1 Pressure Sensor Voltage	>	4530	mV						Runs Continuously	A
			Hysteresis	=	30	mV	Enable Conditions:	Sensor supply voltage (VREF1) Sensor supply voltage (VREF1) Battery voltage Battery voltage Engine Status Key Status	> < != !=	5500 4500 8750 18000 Cranking Stop	mV mV mV mV		
							Debounce:	Fail confirmation time		150	ms		
		996 to d'anno 11 an 1					Disable Conditions:			P0882, P0883, P0642, P0643			
Transmission Clutch 1		above the minimum working voltage (with hysteresis). If the voltage is too low a timer is increased, if the fault timeout limit is reached,	Clutch 1 Pressure Sensor Voltage	<	220		Enable Conditions:	Sensor supply voltage (VREF1)	>	5500	mV	Runs Continuously	
Pressure Sensor	P0842	the DTC is set.	Hysteresis	=	30	mV mV		Sensor supply voltage (VREF1) Battery voltage Battery voltage Engine Status Key Status	< > < != !=	4500 8750 18000 Cranking Stop	mV mV mV		A
							Debounce:	Fail confirmation time	>=	150	ms		
							Disable Conditions:			P0882, P0883, P0642, P0643			
Transmission Clutch 2 Pressure Sensor	P0848	This diagnostic verifies that the input voltage is below the maximum working voltage (with hysteresis). If the voltage is too high a timer is increased, if the fault timeout limit is reached, the DTC is set.	Clutch 2 Pressure Sensor Voltage	>	4530	mV	Enable Conditions:	Sensor supply voltage (VREF2)	>	5500	mV	Runs Continuously	А
			Hysteresis	=	30	mV		Sensor supply voltage (VREF2) Battery voltage Battery voltage Engine Status Key Status	< > < != !=	4500 8750 18000 Cranking Stop	mV mV mV		
							Debounce:	Fail confirmation time	>=	150	ms		
							Disable Conditions:			P0882, P0883, P0652, P0653			
Transmission Clutch 2	00947	This diagnostic verifies that the input voltage is above the minimum working voltage (with hysteresis). If the voltage is too low a timer is increased, if the fault timeout limit is reached, the DTC is cat.	Clutch 2 Pressure Sensor Voltage	<	220	m)/	Enable Conditions:	Sensor supply voltage (VREF2)	>	5500	mV	Runs Continuously	
Fressure sellsof	ru84/	ure proisset.	Hysteresis	=	30	mV		Sensor supply voltage (VREF2) Battery voltage Battery voltage Engine Status Key Status	< > != !=	4500 8750 18000 Cranking Stop	mV mV mV		~
							Debounce:	Fail confirmation time	>=	150	ms		
							Disable Conditions:			P0882, P0883, P0652, P0653			

	r							_	r				
		This diagnostic verifies that the input voltage is											
		below the maximum working voltage (with											
		hystorogic) If the voltage is too high a timer is	Contraction Contraction		4520		Fachly Cardina	() (D552)		5500		Dura Canting and	
		nysteresis). If the voltage is too high a timer is	System pressure Sensor Voltage	>	4530		Enable Conditions:	Sensor supply voltage (VREF2)	>	5500	mv	Runs Continuously	
Transmission system		increased, if the fault timeout limit is reached,											
Pressure Sensor	P0873	the DTC is set.				mV							A
			Hystoresis	-	30	mV		Sensor supply voltage (VREE2)	<	4500	m\/		
			Trysteresis	_	50			Detterministry voltage (viter 2)		4300			
								Battery voltage	>	8750	mv		
								Battery voltage	<	18000	mV		
								Engine Status	!=	Cranking			
								Key Status	1-	Ston			
								Key Status		Stop			
							Debounce:	Fail confirmation time	>=	150	ms		
										DU663 DU663			
							Disable Conditions:			PU002, PU005,			
										P0652, P0653			
		This diagnostic verifies that the input voltage is											
		below the maximum working voltage (with											
		hysteresis) If the voltage is too high a timer is	System procesure Sensor Voltage		220		Enable Conditions	Soncor supply voltage (V/BEE2)		FEOO	m\/	Runs Continuously	
		hysteresis). If the voltage is too high a timer is	system pressure sensor voltage		220		Enable Conditions:	Sensor supply voltage (VREF2)	>	5500	mv	Runs Continuously	
Transmission system		increased, if the fault timeout limit is reached,											
Pressure Sensor	P0872	the DTC is set.				mV							A
			Hysteresis	-	30	mV		Sensor supply voltage (VPEE2)	~	4500	m\/		
			1135616515	[⁻	50			Sensor Suppry Voltage (VREFZ)		4300	III V		
								Battery voltage	>	8750	mV		
								Battery voltage	<	18000	mV		
								Engine Status	!=	Cranking			
								Koy Status		Stop			
								Key Status	!=	stop			
							Debounce:	Fail confirmation time	>=	150	ms		
										D0000 D0000			
							Disable Conditions:			P0882, P0883,			
							Bibable contactorion			P0652, P0653			
		This diagnostic verifies that the input voltage is											
		below the maximum working voltage (with											
		hysteresis). If the voltage is too high a timer is	LSD pressure Sensor Voltage	>	4530		Enable Conditions:	Sensor supply voltage (VREF1)	>	5500	mV	Runs Continuously	
Transmission LSD		increased, if the fault timeout limit is reached,											
Pressure Sensor	P0878	the DTC is set.				mV							В
			1 hustonoolo		20	m\/				4500			-
			nysteresis	=	30	IIIV		Sensor supply voltage (VREF1)	<	4500	mv		
								Battery voltage	>	8750	mV		
								Battery voltage	<	18000	mV		
								Engine Status	1-	Cranking			
								Lingine Status	-	Cranking			
								Key Status	!=	Stop			
							Debounce:	Fail confirmation time	>=	150	ms		
									1	B0000 5			
							Disable Conditions:			P0882, P0883,			
									L	P0642, P0643			
		This diagnostic verifies that the input voltage is											
		above the minimum working voltage (with							1				
		above the minimum working voltage (with											
		hysteresis). If the voltage is too low a timer is	LSD pressure Sensor Voltage	<	220		Enable Conditions:	Sensor supply voltage (VREF1)	>	5500	mV	Runs Continuously	
Transmission LSD		increased, if the fault timeout limit is reached,											
Pressure Sensor	P0877	the DTC is set.				mV			1				В
			Hustorosis	I_	20	m\/		Soncor supply voltage (VDEE1)		4500	m) /		
			nysteresis	-	50	IIIV		Sensor Supply Voltage (VREF1)	`	4500	mv		
								Battery voltage	>	8750	mV		
1				1				Battery voltage	<	18000	mV		
								Engine Status	1=	Cranking			
								Kan Chattan	1.7	Crunking			
								Key Status	!=	Stop			
									1				
							Debounce:	Fail confirmation time	>=	150	ms		
									1				
		1	1	1			1		1			1	
										B0000 B0007			
							Disable Conditions:			P0882, P0883,			

-	-							_				i	
		This diagnostic verifies that the input voltage is											
		below the maximum working voltage (with								0750			
Coolor tomporatura		hysteresis). If the voltage is too high a timer is	Cooler temperature Sensor resistance	>	4745		Enable Conditions:	Battery voltage	>	8750	mv	Runs Continuously	
Sensor	D27/12	the DTC is set				m\/							P
501301	12/45		Hysteresis	-	5	mV		Battery voltage	<	18000	mV		U U
			in yaceresis		5			Engine Status	!=	Cranking			
								Key Status	!=	Stop			
								- ,	-				
							Debounce:	Fail confirmation time	>=	500	ms		
							Disable Conditions:			P0882, P0883			
		This diagnostic verifies that the input voltage is											
		above the minimum working voltage (with	Capitar terretura Concer resistence		200		Fuchia Conditions	Detter weltere		0750		Dune Centinueuslu	
Cooler temperature		increased if the fault timeout limit is reached	cooler temperature sensor resistance	<	200		Enable Conditions:	Battery voltage	`	8750	mv	Runs Continuousiy	
Sensor	P2742	the DTC is set.				mV							в
			Hysteresis	=	30	mV		Battery voltage	<	18000	mV		-
			,					Engine Status	!=	Cranking			
								Key Status	!=	Stop			
							Debounce:	Fail confirmation time	>=	500	ms		
		This diagnostic varifies that the input voltage is					Disable Conditions:			P0882, P0883			
		helow the maximum working voltage (with											
		hysteresis) If the voltage is too high a timer is	Sump temperature Sensor resistance		4745		Enable Conditions:	Batteny voltage		8750	m\/	Pupe Continuously	
Sump temperature		increased, if the fault timeout limit is reached.	Sump temperature sensor resistance	-	4745		chable conditions.	Dattery voltage	-	8750	IIIV	Nulls Continuously	
Sensor	P0713	the DTC is set.				mV							В
			Hysteresis	=	5	mV		Battery voltage	<	18000	mV		
								Engine Status	!=	Cranking			
								Key Status	!=	Stop			
							Debounce:	Fail confirmation time	>=	500	ms		
										D0002 D0002			
		This diagnostic verifies that the input voltage is					Disable Conditions:			P0882, P0883			
		above the minimum working voltage (with											
		hysteresis). If the voltage is too low a timer is	Sump temperature Sensor resistance	<	200		Enable Conditions:	Battery voltage	>	8750	mV	Runs Continuously	
Sump temperature		increased, if the fault timeout limit is reached,										,	
Sensor	P0712	the DTC is set.				mV							В
			Hysteresis	=	30	mV		Battery voltage	<	18000	mV		
								Engine Status	!=	Cranking			
								Key Status	!=	Stop			
							Debounce:	Fail confirmation time	>=	500	ms		
							Disable Conditions:			D0883 D0883			
		This diagnostic verifies that the input voltage is					Disable conditions.			F0882, F0883			
		below the maximum working voltage (with											
		hysteresis). If the voltage is too high a timer is	Speed sensor supply voltage VSS1	>	10500		Enable Conditions:	Battery voltage	>	8750	mV	Runs Continuously	
Speed sensor		increased, if the fault timeout limit is reached,											
supply 1	P06A5	the DTC is set.		1		mV							A
			Hysteresis	=	500	mV		Battery voltage	<	18000	mV		
				1				Engine Status	!=	Cranking			
				1				Key Status	!=	Stop			
				1			D .1	Fall and finanching of	1.				
				1			Debounce:	Fail confirmation time	>=	/5	ms		
				1			Disable Conditions:			P0882 P0882			
1	1	1	1	1			2.Subic contantions.			10002, 10003		1	1

		This diagnostic verifies that the input voltage is											
		above the minimum working voltage (with											
		hysteresis). If the voltage is too low a timer is	Speed sensor supply voltage VSS1	<	8000		Enable Conditions:	Battery voltage	>	8750	mV	Runs Continuously	
Speed sensor		increased, if the fault timeout limit is reached,											
supply 1	P06A4	the DTC is set.				mV							A
			hysteresis	=	250	mV		Battery voltage	<	18000	mV		
								Engine Status	!=	Cranking			
								Key Status	!=	Stop			
								,					
							Debounce:	Fail confirmation time	>=	75	ms		
							Disable Conditions:			P0882 P0883			
		This diagnostic verifies that the input voltage is					Distance contactions			10002,10000			
		helow the maximum working voltage (with											
		hysteresis) If the voltage is too high a timer is	Speed concor supply voltage VSS2		10500		Enable Conditions	Patton voltage		9750	m)/	Bung Continuously	
Speed concor		ingrouped if the fault timeout limit is reached	speed sensor supply voltage v352	-	10500		Enable Conditions.	Battery voltage	-	8750	IIIV	Kulls Continuously	
speed sensor	DOCD4	the DTC is set				m)/							•
supply 2	P00D4	the DTC is set.	hustovoja	_	500	m\/		Detter veltere		18000			~
			nysteresis	-	500	IIIV		Battery Voltage		18000	mv		
								Engine Status	!=	Cranking			
								Key Status	!=	Stop			
							Debounce:	Fail confirmation time	>=	75	ms		
							Disable Conditions:			P0882, P0883			
		This diagnostic verifies that the input voltage is											
		above the minimum working voltage (with											
		hysteresis). If the voltage is too low a timer is	Speed sensor supply voltage VSS2	<	8000		Enable Conditions:	Battery voltage	>	8750	mV	Runs Continuously	
Speed sensor		increased, if the fault timeout limit is reached,											
supply 2	P06D3	the DTC is set.				mV							A
			Hysteresis	=	250	mV		Battery voltage	<	18000	mV		
								Engine Status	!=	Cranking			
								Key Status	!=	Stop			
								,					
							Debounce:	Fail confirmation time	>=	75	ms		
							Disable Conditions:			P0882 P0883			
		This diagnostic verifies that the input voltage is					Distance contactions			10002,10000			
		below the maximum working voltage (with											
		hysteresis) If the voltage is too high a timer is	Sonsor supply voltage VREE1		5500		Enable Conditions	Patton voltage		9750	m)/	Runs Continuously	
		ingrouped if the fault timeout limit is reached	Sensor supply voltage VKEF1	-	3300		Enable Conditions.	Battery Voltage	-	8750	IIIV	Kulls Continuously	
Soncor cumply 1	DOC 42	the DTC is set				m)/							•
Sensor suppry 1	P0045	the DTC is set.	U. at a set of a		50	111V		Detter second to an		10000			~
			nysteresis	-	50	шv		Dattery Voltage	È.	18000	mv		
				1				Engine Status	!=	Cranking			
								Key Status	!=	Stop			
							Debounce:	Fail confirmation time	>=	40	ms		
							Disable Conditions:			P0882, P0883			
		This diagnostic verifies that the input voltage is		1									
		above the minimum working voltage (with		1					1			1	
1		hysteresis). If the voltage is too low a timer is	Sensor supply voltage VREF1	<	4500		Enable Conditions:	Battery voltage	>	8750	mV	Runs Continuously	
		increased, if the fault timeout limit is reached,		1					1			1	
Sensor supply 1	P0642	the DTC is set.		1		mV							A
			Hysteresis	=	50	mV		Battery voltage	<	18000	mV	1	
				1				Engine Status	!=	Cranking		1	
				1				Key Status	!=	Stop			
				1				-					
				1			Debounce:	Fail confirmation time	>=	40	ms		
				1					1			1	
				1			Disable Conditions:		1	P0882, P0883		1	

		This diagnostic verifies that the input voltage is below the maximum working voltage (with hysteresis). If the voltage is too high a timer is	Sensor supply voltage VREF2	>	5500		Enable Conditions:	Battery voltage	> 8750	mV	Runs Continuously	
Sensor supply 2	P0653	increased, if the fault timeout limit is reached, the DTC is set.	Hysteresis	=	50	mV mV		Battery voltage Engine Status	< 18000 != Cranking	mV		А
								Key Status	!= Stop			
							Debounce:	Fail confirmation time	>= 40	ms		
		This discussifies that the input values is		-			Disable Conditions:		P0882, P0883			
		above the minimum working voltage (with hysteresis). If the voltage is too low a timer is increased if the fault timeout limit is reached	Sensor supply voltage VREF2	<	4500		Enable Conditions:	Battery voltage	> 8750	mV	Runs Continuously	
Sensor supply 2	P0652	the DTC is set.	Hysteresis	=	50	mV mV		Battery voltage	< 18000	mV		А
								Key Status	!= Stop			
							Debounce:	Fail confirmation time	>= 40	ms		
							Disable Conditions:		P0882, P0883			
		This diagnostic verifies that the input voltage is below the maximum working voltage (with hysteresis). If the voltage is too high a timer is	TAPUP paddle input	>	4774		Enable Conditions:	Battery voltage	> 8750	mV	Runs Continuously	
Paddle plus input	P2777	the DTC is set.				mV						с
			Hysteresis	=	30	mV		Battery voltage Engine Status Key Status	< 18000 != Cranking != Stop	mV		
							Debounce:	Fail confirmation time	>= 150	ms		
							Disable Conditions:		P0882, P0883			
		This diagnostic verifies that the input voltage is above the minimum working voltage (with hysteresis). If the voltage is too low a timer is	TAPUP paddle input	<	2519		Enable Conditions:	Battery voltage	> 8750	mV	Runs Continuously	
Paddle plus input	P2776	increased, if the fault timeout limit is reached, the DTC is set.				mV						с
			Hysteresis	=	30	mV		Battery voltage Engine Status Key Status	< 18000 != Cranking != Stop	mV		
							Debounce:	Fail confirmation time	>= 150	ms		
							Disable Conditions:		P0882, P0883			<u> </u>
		This diagnostic verifies that the input voltage is below the maximum working voltage (with hysteresis). If the voltage is too high a timer is	TAPDN paddle input	>	4774		Enable Conditions:	Battery voltage	> 8750	mV	Runs Continuously	
Paddle min input	P2781	increased, if the fault timeout limit is reached, the DTC is set.				mV						с
			Hysteresis	=	30	mV		Battery voltage Engine Status Key Status	< 18000 != Cranking != Stop	mV		
							Debounce:	Fail confirmation time	>= 150	ms		
							Disable Conditions:		P0882, P0883			

Paddle min input	P2780	This diagnostic verifies that the input voltage is above the minimum working voltage (with hysteresis). If the voltage is too low a timer is increased, if the fault timeout limit is reached, the DTC is set.	TAPDN paddle input Hysteresis	<	2519 30	mV mV	Enable Conditions:	Battery voltage Battery voltage Engine Status Key Status	> < != !=	8750 18000 Cranking Stop	mV mV	Runs Continuously	C
							Debounce:	Fail confirmation time	>=	150	ms		
							Disable Conditions:			P0882, P0883			
	20002	This diagnostic verifies that the supply voltage on KL30 is below the maximum working voltage (with hysteresis). If the voltage is too high a timer is increased, if the fault timeout limit is	Battery voltage	>	18300		Enable Conditions:	Engine Status	!=	Cranking		Runs Continuously	
I CIVI Input voltage	P0883	reached, the DTC is set.	Hysteresis	=	300	mv mV		Key Status	!=	Stop			A
							Debounce:	Fail confirmation time	>=	500	ms		
		This discussion of the the input veloces is					Disable Conditions:						
TCM input voltage	P0882	above the minimum working voltage (with hysteresis). If the voltage is too low a timer is increased, if the fault timeout limit is reached, the DTC is set	Battery voltage	<	8500	mV	Enable Conditions:	Engine Status	!=	Cranking		Runs Continuously	۵
rom input voltage			Hysteresis	=	250	mV		Key Status	!=	Stop			
							Debounce:	Fail confirmation time	>=	500	ms		
							Disable Conditions:						

Component/System	Fault Code	Monitor Strategy Description	Malfunction Criteria		Threshold Value		Secondary Parameter	s		Enable		Time Required	MIL illum.
		This diagnostic verifies that there are pulses detected on the input. If there are no pulses								conditions		Runs	
Rod 1 Position Sensor	P2834	detected and the input level is high a timer is increased. If the fault timeout limit is reached, the DTC is set.	No pulses detected	=	True		Enable Conditions:	Sensor supply voltage (VREF1)	>	5500	mV	Continuously	A
			Pin voltage	>	3500	mV		Sensor supply voltage (VREF1) Battery voltage	< >	4500 8750	mV mV		
		This diagnostic verifies that the input duty cycle is below the maximum working duty cycle. If the	Sensor Duty Cycle	>	92	%		Battery voltage		18000	mV		
		fault timeout limit is reached, the DTC is set.						Engine Status	< !=	Cranking			
								Key Status	!=	Stop			
							Debounce:	Fail confirmation time	>=	150 P0882, P0883,	ms		
				_			Disable Conditions:			P0642, P0643			
		Inis diagnostic verifies that there are pulses detected on the input.If there are no pulses detected and the input level is low a timer is increased. If the fault timeout limit is reached,	No pulses detected	=	True		Enable Conditions:	Sensor supply voltage (VREF1)		5500	mV	Runs Continuously	A
Rod 1 Position Sensor	P2833	the DTC is set.	Pin voltage	<	2000	mV		Sensor supply voltage (VREF1) Battery voltage	> < >	4500 8750	mV mV		
		This diagnostic verifies that the input duty cycle is above the minimum working duty cycle. If the duty cycle is too low a timer is increased, if the	Sensor Duty Cycle	<	8	%		Battery voltage		18000	mV		
		fault timeout limit is reached, the DTC is set.						Engine Status Key Status	< != !=	Cranking Stop			
							Debounce:	Fail confirmation time	>=	150	ms		
							Disable Conditions:			P0882, P0883, P0642, P0643			
		This diagnosit checks the frequency of the digital input signal. If the frequency is outside the valid working range of the sensor a fault timer is increased. If the fault timeout is reached, the	Minimum sensor frequency	<	1500	Hz	Enable Conditions:	Sensor supply voltage (VREF1)		5500	mV	Runs Continuously	А
Rod 1 Position Sensor	P2835	DTC is set.	Maximum sensor frequency	>	2500	Hz		Sensor supply voltage (VREF1) Battery voltage Battery voltage Engine Status	> < < !=	4500 8750 18000 Cranking	mV mV mV		
								Key Status	!=	Stop			
							Debounce:	Fail confirmation time		150	ms		
		This diagnostic varifies that there are pulses					Disable Conditions:			P0882, P0883, P0642, P0643			
Rod 2 Position Sensor	p2920	detected on the input. If there are no pulses detected and the input level is high a timer is increased. If the fault timeout limit is reached, the DTC is set	No pulses detected	=	True		Enable Conditions:	Sensor supply voltage (VREF1)		5500	mV	Runs Continuously	A
	F 2033		Pin voltage	>	3500	mV		Sensor supply voltage (VREF1) Battery voltage	< >	4500 8750	mV mV		

		This diagnostic verifies that the input duty cycle is below the maximum working duty cycle. If the duty cycle is too high a timer is increased, if the fault timeout limit is reached, the DTC is set.	Sensor Duty Cycle	>	92	%		Battery voltage Engine Status Key Status	< = =	18000 Cranking Stop	mV		
							Debounce:	Fail confirmation time	>=	150	ms		
							Disable Conditions:			P0882, P0883, P0642, P0643			
Rod 2 Position Sensor	P2838	This diagnostic verifies that there are pulses detected on the input.If there are no pulses detected and the input level is low a timer is increased. If the fault timeout limit is reached, the DTC is set.	No pulses detected	=	True		Enable Conditions:	Sensor supply voltage (VREF1)	>	5500	mV	Runs Continuously	А
			Pin voltage	<	2000	mV		Sensor supply voltage (VREF1) Battery voltage	< >	4500 8750	mV mV		
		This diagnostic verifies that the input duty cycle is above the minimum working duty cycle. If the duty cycle is too low a timer is increased, if the fault timeout limit is reached, the DTC is set.	Sensor Duty Cycle	<	8	%		Battery voltage	<	18000	mV		
								Engine Status Key Status	!= !=	Cranking Stop			
							Debounce:	Fail confirmation time	>=	150	ms		
							Disable Conditions:			P0882, P0883,			
	02024	This diagnosit checks the period of the digital input signal. If the period is outside the valid working range of the sensor a fault timer is increased. If the fault timeout is reached, the	Minimum sensor frequency	<	1500	Hz	Enable Conditions:	Sensor supply voltage (VREF1)		5500	mV	Runs Continuously	A
Koa 2 Position Sensor	P283A	DTC IS Set.	Maximum sensor frequency	>	2500	Hz		Sensor supply voltage (VREF1) Battery voltage Battery voltage Engine Status Key Status	> < != !=	4500 8750 18000 Cranking Stop	mV mV mV		
							Debounce:	Fail confirmation time	>=	150	ms		
							Disable Conditions:			P0882, P0883, P0642, P0643			
Rod 3 Position Sensor	P283F	This diagnostic verifies that there are pulses detected on the input.If there are no pulses detected and the input level is high a timer is increased. If the fault timeout limit is reached, the DTC is set	No pulses detected	=	True		Enable Conditions:	Sensor supply voltage (VREF2)	``	5500	mV	Runs Continuously	A
	12032		Pin voltage	>	3500	mV		Sensor supply voltage (VREF2) Battery voltage	< >	4500 8750	mV mV		
		This diagnostic verifies that the input duty cycle is below the maximum working duty cycle. If the duty cycle is too high a timer is increased, if the fault timeout limit is reached the DTC is set	Sensor Duty Cycle	>	92	%		Battery voltage	~	18000	mV		
		instruction interest reached, the Dire is set.						Engine Status Key Status	!= !=	Cranking Stop			
							Debounce:	Fail confirmation time	>=	150	ms		

							Disable Conditions:		P0882, P0883			
Rod 3 Position Sensor	P283D	This diagnostic verifies that there are pulses detected on the input. If there are no pulses detected and the input level is low a timer is increased. If the fault timeout limit is reached, the DTC is cert	No pulses detected	=	True		Enable Conditions:	Sensor supply voltage (VREF2)	5500	mV	Runs Continuously	А
	12050		Pin voltage	<	2000	mV		Sensor supply voltage (VREF2) Battery voltage	< 4500 > 8750	mV mV		
		This diagnostic verifies that the input duty cycle is above the minimum working duty cycle. If the duty cycle is too low a timer is increased, if the fault timeout limit is reached. the DTC is set.	Sensor Duty Cycle	<	8	%		Battery voltage	18000	mV		
								Engine Status Key Status	!= Cranking != Stop			
							Debounce:	Fail confirmation time	>= 150	ms		
							Disable Conditions:		P0882, P0883 P0652, P0653			
Rod 3 Position Sensor	P283F	This diagnosit checks the period of the digital input signal. If the period is outside the valid working range of the sensor a fault timer is increased. If the fault timeout is reached, the DTC is set	Minimum sensor frequency	<	1500	Hz	Enable Conditions:	Sensor supply voltage (VREF2)	5500	mV	Runs Continuously	A
neu s'r osken sensor	12031		Maximum sensor frequency	>	2500	Hz		Sensor supply voltage (VREF2) Battery voltage Battery voltage Engine Status Kav Status	< 4500 > 8750 < 18000 != Cranking != Stop	mV mV mV		
							Debounce:	Fail confirmation time	150	ms		
							Disable Conditions:		P0882, P0883			
		This diagnostic verifies that there are pulses detected on the input. If there are no pulses detected and the input level is high a timer is increased. If the fault timeout limit is reached,	No pulses detected	=	True		Enable Conditions:	Sensor supply voltage (VREF2)	5500	mV	Runs Continuously	А
Rod 4 Position Sensor	P2843	the DTC is set.	Pin voltage	>	3500	mV		Sensor supply voltage (VREF2) Battery voltage	> < 4500 > 8750	mV mV		
		This diagnostic verifies that the input duty cycle is below the maximum working duty cycle. If the duty cycle is too high a timer is increased, if the fault timeout limit is reached, the DTC is set.	Sensor Duty Cycle	>	92	%		Battery voltage	18000 <	mV		
								Engine Status Key Status	!= Cranking != Stop			
							Debounce:	Fail confirmation time	150	ms		
							Disable Conditions:		P0882, P0883 P0652, P0653			
Rod 4 Position Sensor	P2842	This diagnostic verifies that there are pulses detected on the input. If there are no pulses detected and the input level is low a timer is increased. If the fault timeout limit is reached, the DTC is set.	No pulses detected	=	True		Enable Conditions:	Sensor supply voltage (VREF2)	>	mV	Runs Continuously	А
	12012		Pin voltage	<	2000	mV		Sensor supply voltage (VREF2) Battery voltage	< 4500 > 8750	mV mV		

		This diagnostic verifies that the input duty cycle is above the minimum working duty cycle. If the duty cycle is too low a timer is increased, if the fault timeout limit is reached, the DTC is set.	Sensor Duty Cycle	<	8	%		Battery voltage Engine Status Key Status	< != !=	18000 Cranking Stop	mV		
							Debounce:	Fail confirmation time		150	ms		
							Disable Conditions:			P0882, P0883, P0652, P0653			
Rod 4 Position Sensor	P2844	This diagnosit checks the period of the digital input signal. If the period is outside the valid working range of the sensor a fault timer is increased. If the fault timeout is reached, the DTC is set.	Minimum sensor frequency	<	1500	Hz	Enable Conditions:	Sensor supply voltage (VREF2)	>	5500	mV	Runs Continuously	A
nou in osidon sensor	12011		Maximum sensor frequency	>	2500	Hz		Sensor supply voltage (VREF2)	<	4500	mV		
								Battery voltage	>	8750	mV		
								Engine Status	!=	Cranking	IIIV		
								Key Status	!=	Stop			
							Debounce:	Fail confirmation time	>=	150	ms		
							Disable Conditions:			P0882, P0883, P0652, P0653			
		This diagnostic verifies that there are pulses detected on the input. If there are no pulses detected and the input level is high a timer is increased. If the fault timeout limit is reached,	No pulses detected	=	True		Enable Conditions:	Sensor supply voltage (VREF2)		5500	mV	Runs Continuously	А
Rod 5 Position Sensor	P2866	the DTC is set.	Pin voltage	>	3500	mV		Sensor supply voltage (VREF2)	> <	4500	mV		
			~					Battery voltage	>	8750	mV		
		This diagnostic verifies that the input duty cycle is below the maximum working duty cycle. If the duty cycle is too high a timer is increased, if the foult timeout limit is reached the DTC is cat	Sensor Duty Cycle	>	92	%		Battery voltage		18000	mV		
								Engine Status	!=	Cranking			
								Key Status	!=	Stop			
							Debounce:	Fail confirmation time	>=	150	ms		
										P0882. P0883.			
							Disable Conditions:			P0652, P0653			
Pod 5 Position Sensor	P2865	This diagnostic verifies that there are pulses detected on the input. If there are no pulses detected and the input level is low a timer is increased. If the fault timeout limit is reached, the DTC is set	No pulses detected	=	True		Enable Conditions:	Sensor supply voltage (VREF2)		5500	mV	Runs Continuously	А
Nou 5 Position SellSU	r 2005	are breaster.	Pin voltage	<	2000	mV		Sensor supply voltage (VRFF2)	<	4500	mV		
			· · ·					Battery voltage	>	8750	mV		
		This diagnostic verifies that the input duty cycle is above the minimum working duty cycle. If the duty cycle is too low a timer is increased, if the	Sensor Duty Cycle	<	8	%		Battery voltage		18000	mV		
		fault timeout limit is reached, the DTC is set.							<				
								Engine Status Key Status	!= !=	Cranking Stop			
							Debounce:	Fail confirmation time	>=	150	ms		

							Disable Conditions:			P0882, P0883, P0652, P0653			
Rod 5 Position Sensor	P2867	This diagnosit checks the period of the digital input signal. If the period is outside the valid working range of the sensor a fault timer is increased. If the fault timeout is reached, the DTC is set	Minimum sensor frequency	<	1500	Hz	Enable Conditions:	Sensor supply voltage (VREF2)	``	5500	mV	Runs Continuously	А
	12007		Maximum sensor frequency	>	2500	Hz	Debounce:	Sensor supply voltage (VREF2) Battery voltage Battery voltage Engine Status Key Status Fail confirmation time	< > < != != >=	4500 8750 18000 Cranking Stop 150	mV mV mV ms		
							Disable Conditions:			P0882, P0883, P0652, P0653			

										Enable			
Component/System	Fault Code	Monitor Strategy Description	Malfunction Criteria		Threshold Value		Secondary Parameter	s		Conditions		Time Required	MIL illum.
		If the parklock position sensor value is above the											
Parklock position		funtional range, too high fault is set after	Parklock position sensor value	>	90	%	Enable Conditions:	Sensor supply voltage (VREE2)	>	5500	mV	Runs	
sensor	P17F7	confirmation time.	· · · · · · · · · · · · · · · · · · ·									Continuously	В
		If the parklock sensor SENT input didn't receive										,	
		any new value and the input pin is high. A too	Receive timestamp	=	previous receive timstamp			Sensor supply voltage (VREE2)	<	4500	mV		
		high fault is set after a confirmation time		_	previous receive anistamp			School Supply Voltage (Viter 2)	`	4500			
			Parklock position input his voltage	~	2500	m\/		Batteny voltage		8750	m\/		
			i arkieck position input pin voltage	-	3500			Battery voltage	_	18000	m\/		
								Engine Status	1-	Cranking			
								Key Status		Chanking			
								Key Status	:-	Stop			
							Dehauraa	Fail confirmation time		150			
							Debounce:	Fair commation time		150	ms		
										P0002 P0002			
							Disable Conditions:			PU882, PU883,			
		If the parklack position concorvalue is below the								PU052, PU053			
Parklock position		functional range too high fault is set after			10	07	Fuchia Conditiona			5500		Pupe	
concor	D1756	confirmation time	Parkiock position sensor value	< <	10	70	Enable Conditions:	Sensor supply voltage (VREF2)	`	5500	mv	Continuouchu	Р
Selisor	P1/F0	If the parklack concer SENT input didn't receive										Continuousiy	В
		any new value and the input nin is Low A too	Rossivo timostama	_	provious rosoluo timstamp			Sonsor supply voltage (V/REE2)		4500	m)/		
		any new value and the input pin is Low. A too	Receive timestamp	=	previous receive timstamp			Sensor supply voltage (VREF2)		4500	mv		
		low fault is set after a commitmation time.	Dealth all a still as insuch a in using a		2000			Dette serve he es		0750			
			Parklock position input pin voltage	<	2000	mv		Battery voltage	>	8750	mV		
								Battery voltage	<	18000	mv		
								Engine Status	!=	Cranking			
								Key Status	!=	Stop			
							Debounce:	Fail confirmation time	>=	150	ms		
							Disable Conditions:			P0882, P0883,			
										P0652, P0653			
		This diagnostic checks if a new values is received											
		from the parklock postion SENT sensor. If no new	Rossivo timostama	_	provious rosoluo timstamp		Enable Conditions	Sonsor supply voltage (V/REE2)		5500	m)/		
Parklack position		value is received and the input pip is toggling a	Receive timestamp	-	previous receive timstamp		enable conditions.	Sensor supply voltage (VREFZ)	-	3300	IIIV	Bunc	
concor	P101C	DTC is set after a confirmation timeout										Continuouchu	Р
5611501	F 151C	This diagnostic chocks if the SENT signal reveised										continuousiy	D
		from the parklock position sensor is within the											
		rom the parkieck position sensor is within the	Parklock position sensor value	>	99.78	%		Sensor supply voltage (VREF2)	<	4500	mV		
		confirmation time											
		commation time.			0.05	07		Dattanusaltana		0750			
		This diagnosis checks if the received SENT signal		<u>`</u>	0.05	70		Battery voltage	`	8/50	mv		
		is OK If the CPC is wrong or the no End of frame											
		is ok. If the ckc is wrong of the ho end of frame	Parklock position sencor CRC	=	wrong			Battery voltage	<	18000	mV		
		confirmation time											
		commation time.	Dealling and the second of CENT and aff	1				Facility Chattan	l. –	Creati			
			Parklock position sencor SENT end of frame	=	wrong			Engine Status	!=	Cranking			
								key status	i=	Stop			
							Dahaumaa	Fail confirmation time	L	150			
							Debounce:	Fail confirmation time	>=	150	1115		
									1	DU883 DU863			
							Disable Conditions:		1	D0652 D0652			
	1								1	F0032, F0033			

Component/System	Fault Code	Monitor Strategy Description	Malfunction Criteria		Threshold Value		Secondary Parameter	s		Enable Conditions		Time Required	MIL illum.
		This diagnostic verifies that the average voltage											
Output Speed Sensor	P077D	on the speed input pin is below the maximum working range limit. If it's too high, a timer is increased. If the fault timeout limit is reached,	Speed Level Voltage	>	4230	mV	Enable Conditions:	Sensor supply voltage (VSS1)	>	8250	mV	Runs Continuously	A
		the DTC is set.	Hysteresis	=	30	mV		Sensor supply voltage (VSS1)	<	10000	mV		
		This diagnositic verifies that the speed input pulse time is within the valid ranges. If the pulse time is outside all valid ranges, a fault timer increases. If the fault timeout limit is reached,	Speed Sensor Pulse Width	<	29	μs		Battery voltage	-	18000			
		the DTC is set.	OB					Engine Status	< I=	Cranking	mv		
			Speed Sensor Pulse Width Speed Sensor Pulse Width	> <	63 67	μs μs		Key Status	!=	Stop			
			Speed Sensor Pulse Width	>	115	μs							
			Speed Sensor Pulse Width	<	144	μs							
			OR Speed Sensor Pulse Width	>	218	μs							
		This diagnositic verifies that there are no non- direction pulses when the speed is high enough to guarantee stable pulses.	Speed Sensor Frequency	>=	40	Hz							
			Speed Sensor Pulse Width	<	144	μs							
			Speed Sensor Pulse Width	>	218	μs							
		This diagnositic verifies that there are no jumps in pulse width when the speed is high enough to guarantee stable pulses.	Speed Sensor Frequency	>=	40	Hz							
			Speed sensor Pulse Width difference inside valid range	>	15	μs				200			
							Debounce:	Fail confirmation time	>=	300	ms		
		This diagnostic verifies that the average voltage on the speed input pin is below the maximum possible voltage when there are no pulses. If it's too high a timer is increased. If the fault timeout limit is carched the DTC is set	Speed Sensor Frequency	=	0	Hz							
		initia is reached, the breas set.	Speed Level Voltage	>	2640	mv	Disable Conditions:			P0882, P0883			
		This diagnostic verifies that the average voltage								•			
Output Speed Sensor	P077C	on the speed input pin is above the minimum working range limit. If it's too low a timer is increased. If the fault timeout limit is reached,	Speed Level Voltage	<	980	mV	Enable Conditions:	Sensor supply voltage (VSS1)	>	8250		Runs Continuously	A
		the DTC is set.	Hysteresis	=	20	mV		Sensor supply voltage (VSS1) Battery voltage Battery voltage Engine Status Key Status	< > !=	10000 8750 18000 Cranking Stop	mV mV mV mV		
							Debounce:	Fail confirmation time	>=	300	ms		
							Disable Conditions			D0002 D0002			
Odd Clutch Speed Sensor	P07C6	This diagnostic verifies that the average voltage on the speed input pin is below the maximum working range limit. If it's too high, a timer is increased. If the fault timeout limit is reached,	Speed Level Voltage	>	4230	mV	Enable Conditions:	Sensor supply voltage (VSS1)	>	8250	mV	Runs Continuously	А
		the DTC is set.	Hysteresis	=	30	mV		Sensor supply voltage (VSS1)	<	10000	mV		
		This diagnositic verifies that the speed input						Battery voltage	>	8750	mV		
		pulse time is within the valid ranges. If the pulse time is outside all valid ranges, a fault timer increases. If the fault timeout limit is reached,	Speed Sensor Pulse Width	<	29	μs				18000			
		the DTC is set.	08					Battery voltage Engine Status	<	Cranking	mV		
			Speed Sensor Pulse Width	>	63	μs		Key Status	!=	Stop			
			Speed Sensor Pulse Width	<	67	μs							
			OR Speed Sensor Pulse Width		115								
			Speed Sensor Pulse Width	<	115	μs μs							
			OR Speed Sensor Pulse Width	>	218	μs							
		This diagnositic verifies that there are no non-				Pr							
		direction pulses when the speed is high enough to guarantee stable pulses.	Speed Sensor Frequency	>=	40	Hz							
			Speed Sensor Pulse Width	<	144	μs							

1	1	1	Spood Sopcor Bulco Width	1.	219		1		1		i.		i i
		This diagnositic verifies that there are no jumps	Speed Sensor Pulse Width	-	210	μs							
		in pulse width when the speed is high enough to guarantee stable pulses.	Speed Sensor Frequency	>=	40	Hz							
			Speed sensor Pulse Width difference inside valid range	>	15	μs	Debounce:	Fail confirmation time	>=	300	ms		
		This diagnostic verifies that the average voltage on the speed input pin is below the maximum possible voltage when there are no pulses. If it's too high a timer is increased. If the fault timeout limit is reached, the DTC is set.	Speed Sensor Frequency	=	0	Hz							
		This diagnostic verifies that the average voltage	Speed Level Voltage	>	2640	mv	Disable Conditions:			P0882, P0883			-
Odd Clutch Speed Sensor	P07C5	on the speed input pin is above the minimum working range limit. If it's too low a timer is increased. If the fault timeout limit is reached, the DTC is cet	Speed Level Voltage	<	980	mV	Enable Conditions:	Sensor supply voltage (VSS1)	>	8250	F	Runs Continuously	A
		ure dr.C. is set.	Hysteresis	=	20	mV		Sensor supply voltage (VSS1) Battery voltage Battery voltage Engine Status Key Status	< > !=	10000 8750 18000 Cranking Stop	mV mV mV		
							Debounce:	Fail confirmation time		300	ms		
							Disable Conditions:			P0882 P0883			
		This diagnostic verifies that the average voltage					- source contractions.			1 0002, 1 0005			
Even Clutch Speed Sensor	P07C8	on the speed input pin is below the maximum working range limit. If it's too high, a timer is increased. If the fault timeout limit is reached, the DTC is set.	Speed Level Voltage	>	4230	mV	Enable Conditions:	Sensor supply voltage (VSS2)	>	8250	mV F	Runs Continuously	A
			Hysteresis	=	30	mV		Sensor supply voltage (VSS2) Battery voltage	< >	10000 8750	mV mV		
		This diagnositic verifies that the speed input pulse time is within the valid ranges. If the pulse time is outside all valid ranges, a fault timer increases. If the fault timeout limit is reached.	Speed Sensor Pulse Width	<	29	μs				18000			
		the DTC is set.						Battery voltage	<	Caralian	mV		
			Speed Sensor Pulse Width Speed Sensor Pulse Width	> <	63 67	μs μs		Key Status	i= i=	Stop			
			Speed Sensor Pulse Width Speed Sensor Pulse Width	> <	115 144	μs μs							
			Speed Sensor Pulse Width	>	218	μs							
		This diagnositic verifies that there are no non- direction pulses when the speed is high enough to guarantee stable pulses.	Speed Sensor Frequency	>=	40	Hz							
			Speed Sensor Pulse Width	<	144	μs							
			Speed Sensor Pulse Width	>	218	μs							
		This diagnositic verifies that there are no jumps in pulse width when the speed is high enough to guarantee stable pulses.	Speed Sensor Frequency	>=	40	Hz							
			Speed sensor Pulse Width difference inside valid range	>	15	μs	Debounce:	Fail confirmation time	>=	300	ms		
		This diagnostic verifies that the average voltage on the speed input pin is below the maximum possible voltage when there are no pulses. If it's too high a timer is increased. If the fault timeout limit is reached, the DTC is set.	Speed Sensor Frequency	=	0	Hz							
			Speed Level Voltage	>	2640	mv	Disable Conditions:			P0882, P0883			
iven Clutch Speed ensor	P07C7	I his diagnostic verifies that the average voltage on the speed input pin is above the minimum working range limit. If it's too low a timer is increased. If the fault timeout limit is reached, the DTC is not	Speed Level Voltage	<	980	mV	Enable Conditions:	Sensor supply voltage (VSS2)	>	8250	F	Runs Continuously	А
		uie dic is set.	Hysteresis	=	20	mV		Sensor supply voltage (VSS2) Battery voltage Battery voltage Engine Status Key Status	< > !=	10000 8750 18000 Cranking Stop	mV mV mV		
								Ney Status		Stop			
	1	1	l	1			Debounce:	Fail confirmation time	>=	300	ms		1

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Disable Conditions:	P0882, P0883	

										Enable			
Component/System	Fault Code	Monitor Strategy Description	Malfunction Criteria		Threshold Value		Secondary Parameters	5		Conditions		Time Required	MIL illum.
HSO1	P0658	This diagnosis checks that the HSO is not shorted too ground. If the Measured voltage at the HSO is lower than a percentage of the supply voltage or if the average measured current is too high a fault timer is increased. If the timer reaches the fault timeout limit a DTC is set.	HSO1 voltage level OR HSO1 current feedback	<	40 10000	% off Vbatt mA	Enable Conditions:	Shutdownpath test OK Battery voltage Battery voltage Engine Status Key Status	= =	True 8750 18000 Cranking Stop	mV mV	Runs Continuously	A
							Debounce: Disable Conditions:	Fail confirmation time	>= F	60 20882, P0883	ms		
HSO2	P2670	This diagnosis checks that the HSO is not shorted too ground. If the Measured voltage at the HSO is lower than a percentage of the supply voltage or if the average measured current is too high a fault timer is increased. If the timer reaches the fault timeout limit a DTC is set.	HSO2 voltage level	<	40	% off Vbatt	Enable Conditions:	Shutdownpath test OK	=	True		Runs Continuously	A
			OR HSO2 current feedback	>	10000	mA	Debource	Battery voltage Battery voltage Engine Status Key Status	> < != !=	8750 18000 Cranking Stop	mV mV		
							bebounce.		-	00	1115		
							Disable Conditions:		F	P0882, P0883			
н507	P2685	This diagnosis checks that the HSO is not shorted too ground. If the Measured voltage at the HSO is lower than a percentage of the supply voltage or if the average measured current is too high a fault timer is increased. If the timer reaches the fault timeout limit a DTC is set.	HSO7 voltage level	<	40	% off Vbatt	Enable Conditions:	Shutdownpath test OK	=	True		Runs Continuously	A
			OR HSO7 current feedback	>	5000	mA	Debounce:	Battery voltage Battery voltage Engine Status Key Status Fail confirmation time	> < != != >=	8750 18000 Cranking Stop 60	mV mV ms		
							Disable Conditions:		F	0882, P0883			
нѕов	P26E8	This diagnosis checks that the HSO is not shorted too ground. If the Measured voltage at the HSO is lower than a percentage of the supply voltage or if the average measured current is too high a fault timer is increased. If the timer reaches the fault timeout limit a DTC is set.	HSO8 voltage level	<	40	% off Vbatt	Enable Conditions:	Shutdownpath test OK	=	True		Runs Continuously	Α
			OR HSO8 current feedback	>	5000	mA		Battery voltage Battery voltage Engine Status Key Status	> < != !=	8750 18000 Cranking Stop	mV mV		
							Depounce:	Fail confirmation time	>=	60	ms		
	1			1			Disable Conditions:		F	·uooz, ruoos		1	

Component/System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value		Secondary Parameters		Enab Conditi	e ons	Time Required	MIL illum.
Odd Clutch Proportional Pressure Valve	P0960	Open load is checked when the solenoid is switched off. The voltage at the Vpos pin between sense resistor and load should be pulled to the battery supply by the load. The current driver tries to regulate the output pin to a defined low voltage with a very low current. If this succeeds Open load is detected.	TLE8242 component/driver diagnostic status LSO turned off Tested timer Vpos Vpos LSO turn off time	= Open load = True > 19.2 < 3000 (+/-500) > 1700 (+/-500) > 5	μs mV mV ms	Enable Conditions: Debounce:	System not in safe state Battery voltage Battery voltage Engine Status Key Status Fail confirmation time	= True > 875(< 1800 != Cranki != Stop >= 150	mV) mV Ig ms	Runs continuously	A
						Disable Conditions:		P0882, P)883		
Odd Clutch Proportional Pressure Valve	P0963	Short to battery is checked when the solenoid is switched on. The voltage at the Vpos pin between sense resistor and load should be pulled towards ground. If this voltage is higher than a limit depending on the supply voltage,shorted load is detected.	TLE8242 component/driver diagnostic status Tested timer Vpos (battery voltage < 11500 mV) Vpos (12000 mV < battery voltage < 15000 mV) Vpos (battery voltage > 15500 mV)	= Short to Vbatt > 19.2 > 700 (+/-100) > 900 (+/-100) > 1100 (+/-100)	μs mV mV mV	Enable Conditions:	System not in safe state Battery voltage Battery voltage Engine Status Key Status	= True > 875 < 1800 != Cranki != Stop	mV) mV Ig	Runs continuously	А
		This diagnostic checks the error between the target current and the estimated current based upon the current driver duty cycle and the battery voltage. If the error is too big a DTC is set.	LSO turned on Error on current estimation versus target current Time with big error	= True > 70 > 60	% ms						
			OR Error on current estimation versus target current	> 200	mA	Debounce:	Fail confirmation time	>= 150	ms		
		Short to ground is checked when the solenoid is	Time with small error	> 300	ms	Disable Conditions:		P0882, P)883		
Odd Clutch Proportional Pressure Valve	P0962	switched on. The voltage at the Vpos pin between sense resistor and load should be pulled towards ground. If this voltage is lower than a limit, short to ground is detected.	TLE8242 component/driver diagnostic status LSO turned on Tested timer Vpos LSO turn off time Tested timer	= Short to ground = True > 19.2 < 1700 (+/-500) = 5 > 19.2	μs mV ms μs	Enable Conditions: Debounce:	System not in safe state Battery voltage Battery voltage Engine Status Key Status Fail confirmation time	= True > 8751 < 1800 != Cranki != Stop >= 150	mV) mV Ig ms	Runs continuously	А
						Disable Conditions:		P0882, P)883		
Even Clutch Proportional Pressure Valve	P0964	Open load is checked when the solenoid is switched off. The voltage at the Vpos pin between sense resistor and load should be pulled to the battery supply by the load. The current driver tries to regulate the output pin to a defined low voltage with a very low current. If this succeeds Open load is detected.	LSO turned off Tested timer Vpos LSO turn off time	= Open load = True > 19.2 < 3000 (+/-500) > 1700 (+/-500) > 5	μs mV mV ms	Enable Conditions: Debounce:	System not in safe state Battery voltage Battery voltage Engine Status Key Status Fail confirmation time	= Truc > 8750 < 1800 != Cranki != Stop >= 150	mV) mV ng ms	Runs continuously	A

	1						Disable Conditions:			P0882, P0883			1
Even Clutch Proportional Pressure Valve	P0967	Short to battery is checked when the solenoid is switched on. The voltage at the Vpos pin between sense resistor and load should be pulled towards ground. If this voltage is higher than a limit depending on the supply voltage,shorted load is detected. This diagnostic checks the error between the	TLE8242 component/driver diagnostic status Tested timer Vpos (battery voltage < 11500 mV) Vpos (12000 mV < battery voltage < 15000 mV) Vpos (battery voltage > 15500 mV) LSO turned on	= > > =	19.2 700 (+/-100) 900 (+/-100) 1100 (+/-100) True	μs mV mV mV	Enable Conditions:	System not in safe state Battery voltage Battery voltage Engine Status Key Status	= > < <u> </u> =	True 8750 18000 Cranking Stop	mV mV	Runs continuously	A
		target current and the estimated current based upon the current driver duty cycle and the battery voltage. If the error is too big a DTC is set.	Error on current estimation versus target current	>	70	%							
			OR	-	00	1115	Debounce:	Fail confirmation time	>=	150	ms		
			Error on current estimation versus target current	>	200	mA				D0000 D0000			
Even Clutch Proportional Pressure		Short to ground is checked when the solenoid is switched on. The voltage at the Vpos pin between sense resistor and load should be pulled towards ground. If this voltage is lower	TLE8242 component/driver diagnostic status	=	Short to ground	ms	Enable Conditions:			10882, 10883		Runs	
Valve	P0966	than a limit, short to ground is detected.	LSO turned on Tested timer Vpos LSO turn off time Tested timer	= > < = >	True 19.2 1700 (+/-500) 5 19.2	μs mV ms μs	Debounce:	System not in safe state Battery voltage Battery voltage Engine Status Key Status Fail confirmation time	= > < != != >=	True 8750 18000 Cranking Stop 150	mV mV ms	continuously	A
							Disable Conditions:			P0882, P0883			
Odd Clutch Redundant Shutdown Valve	P0968	Open load is checked when the solenoid is switched off. The voltage at the Vpos pin between sense resistor and load should be pulled to the battery supply by the load. The current driver tries to regulate the output pin to a defined low voltage with a very low current. If this succeeds Open load is detected.	TLE8242 component/driver diagnostic status	=	Open load		Enable Conditions:	System not in safe state	=	True 8750	۳V	Runs continuously	A
			Vpos Vpos LSO turn off time	- > < > > >	19.2 3000 (+/-500) 1700 (+/-500) 5	μs mV mV ms	Debounce:	Battery voltage Engine Status Key Status Fail confirmation time	< != != >=	18000 Cranking Stop 100	mV		
	──	Short to battery is checked when the colongid is					Disable Conditions:			P0882, P0883			
Odd Clutch Redundant Shutdown Valve	P0971	switched on. The voltage at the Vpos pin between sense resistor and load should be pulled towards ground. If this voltage is higher than a limit depending on the supply voltage.shorted load is detected.	TLE8242 component/driver diagnostic status	=	Short to Vbatt		Enable Conditions:	System not in safe state	=	True		Runs continuously	А
			Tested timer Vpos (battery voltage < 11500 mV) Vpos (12000 mV < battery voltage < 15000 mV) Vpos (battery voltage > 15500 mV) LSO turned on	> > > =	19.2 700 (+/-100) 900 (+/-100) 1100 (+/-100) True	μs mV mV mV		Battery voltage Battery voltage Engine Status Key Status	> < != !=	8750 18000 Cranking Stop	mV mV		

		This diagnostic checks the error between the target current and the estimated current based upon the current driver duty cycle and the battery voltage. If the error is too big a DTC is set.	Error on current estimation versus target current Time with big error	>	70 60	% ms							
			OR Error on current estimation versus target current	>	200	mA	Debounce:	Fail confirmation time	>=	100	ms		
			Time with small error	>	300	ms	Disable Conditions:			P0882, P0883			
Odd Clutch Redundant	0070	Short to ground is checked when the solenoid is switched on. The voltage at the Vpos pin between sense resistor and load should be pulled towards ground. If this voltage is lower then a limit host to ground is detected.	TLE8242 component/driver diagnostic status	=	Short to ground		Enable Conditions:	Surtom pot in cofe state	_	True		Runs	
Shutuuwii vaive	20370	than a minit, short to ground is detected.	LSO turned on Tested timer Vpos LSO turn off time Tested timer	= > < >	True 19.2 1700 (+/-500) 5 19.2	μs mV ms μs	Debounce:	Sattery voltage Battery voltage Engine Status Key Status Fail confirmation time	- > != >=	8750 18000 Cranking Stop 100	mV mV ms	Continuousiy	A
		Open load is checked when the solenoid is					Uisable Conditions:			20882, 20883		+	
Even Clutch Redundant		switched off. The voltage at the Vpos pin between sense resistor and load should be pulled to the battery supply by the load. The current driver tries to regulate the output pin to a defined low voltage with a very low current. If	TLE8242 component/driver diagnostic status	=	Open load		Enable Conditions:					Runs	
Shutdown Valve	P2718	this succeeds Open load is detected.	LSO turned off Tested timer Vpos Vpos LSO turn off time	= > < > >	True 19.2 3000 (+/-500) 1700 (+/-500) 5	μs mV mV ms	Debounce:	System not in safe state Battery voltage Engine Status Key Status Fail confirmation time	= > != != >=	True 8750 18000 Cranking Stop 100	mV mV	continuously	A
							Disable Conditions:			P0882, P0883			
Even Clutch Redundant Shutdown Valve	P2721	Short to battery is checked when the solenoid is switched on. The voltage at the Vpos pin between sense resistor and load should be pulled towards ground. If this voltage is higher than a limit depending on the supply voltage,shorted load is detected.	TLE8242 component/driver diagnostic status	=	Short to Vbatt		Enable Conditions:	System not in safe state	=	True		Runs continuously	A
		This diagnostic checks the error between the	Tested timer Vpos (battery voltage < 11500 mV) Vpos (12000 mV < battery voltage < 15000 mV) Vpos (battery voltage > 15500 mV) LSO turned on	> > > =	19.2 700 (+/-100) 900 (+/-100) 1100 (+/-100) True	μs mV mV mV		Battery voltage Battery voltage Engine Status Key Status	> < != !=	8750 18000 Cranking Stop	mV mV		
		target current and the estimated current based upon the current driver duty cycle and the battery voltage. If the error is too big a DTC is set.	Error on current estimation versus target current	>	70	%							
			Time with big error	>	60	ms	Debounce:	Fail confirmation time	>=	100	ms		
			Error on current estimation versus target current	>	200	mA							
			Time with small error	>	300	ms	Disable Conditions:			P0882, P0883			
Even Clutch Redundant	07720	Short to ground is checked when the solenoid is switched on. The voltage at the Vpos pin between sense resistor and load should be pulled towards ground. If this voltage is lower then a limit check to ground is distanted	TLE8242 component/driver diagnostic status	=	Short to ground		Enable Conditions:	Suctom not in cofe state	_	T		Runs	
Shutdown valve	P2/20	unan a imit, short to ground is detected.	LSO turned on	=	True			Battery voltage	- >	8750	mV	continuousiy	А

			Tested timer	>	19.2	μs		Battery voltage	<	18000	mV		
			Vpos	<	1700 (+/-500)	mV		Engine Status	!=	Cranking			
			LSO turn off time	=	5	ms		Key Status	!=	Stop			
			Tested timer	>	19.2	us							
						Pre-	Debounce:	Fail confirmation time	>=	100	ms		
							Disable Conditions:			P0882, P0883			
		Open load is checked when the solenoid is											
		switched off. The voltage at the Vpos pin											
		between sense resistor and load should be											
		pulled to the battery supply by the load. The	TLE8242 component/driver diagnostic status	=	Open load		Enable Conditions:						
		current driver tries to regulate the output pin to											
System Pressure Pilot		a defined low voltage with a very low current. If										Runs	
Valve	P2727	this succeeds Open load is detected.						System not in safe state	=	True		continuously	A
			LSO turned off	=	True			Battery voltage	>	8750	mV		
			Tested timer	>	19.2	μs		Battery voltage	<	18000	mV		
			Vpos	<	3000 (+/-500)	mV		Engine Status	!=	Cranking			
			Vpos	>	1700 (+/-500)	mV		Key Status	!=	Stop			
			LSO turn off time	>	5	ms							
							Debounce:	Fail confirmation time	>=	150	ms		
										50003 50003			
		Short to battery is checked when the solenoid is					Disable Conditions:			PU882, PU883		+	
		switched on. The voltage at the Vnos nin											
		between sense resistor and load should be											
		pulled towards ground. If this voltage is higher	TLE8242 component/driver diagnostic status	=	Short to Vbatt		Enable Conditions:						
System Pressure Pilot		than a limit depending on the supply										Runs	
Valve	P2730	voltage shorted load is detected.						System not in safe state	=	True		continuously	А
			Tested timer	>	19.2	us		Battery voltage	>	8750	mV	,	
			Vpos (battery voltage < 11500 mV)	>	700 (+/-100)	mV		Battery voltage	<	18000	mV		
			Vpos (12000 mV < battery voltage < 15000 mV)	>	900 (+/-100)	mV		Engine Status	!=	Cranking			
			Vpos (battery voltage > 15500 mV)	>	1100 (+/-100)	mV		Key Status	!=	Stop			
			LSO turned on	=	True					•			
		This diagnostic checks the error between the											
		target current and the estimated current based											
		upon the current driver duty cycle and the	Error on current estimation versus target current	>	70	%							
		battery voltage. If the error is too big a DTC is											
		set.											
			Time with big error	>	60	ms							
			OR				Debounce:	Fail confirmation time	>=	150	ms		
			Error on current estimation versus target current		400	m۸							
			End on current estimation versus target current	-	400	ША							
			Time with small error	>	300	ms	Disable Conditions:			P0882, P0883		-	
		Short to ground is checked when the solenoid is											
		switched on. The voltage at the vpos pin	TI 50242		Charles and								
System Drossure Bilet		between sense resistor and load should be	TLE8242 component/driver diagnostic status	=	Short to ground							Bunc	
Valvo	02720	than a limit short to ground is detected						System pat in cafe state	_	True		continuously	•
valve	F2/29	chan a minit, short to ground is detected.	ISO turned on	L	True			Batten voltage	5	11ue	m\/	continuousiy	A
			LSO turned on	=	Irue 10.2			Battery voltage	2	8750	mV		
			Vince		13.2	μs m\/		Engine Status	-	Cranking	IIIV		
			ISO turn off time	_	1/00 (+/-500)	ms		Koy Status	:- I-	Ston			
			Tested timer	-	10.2	1113		Key Status		Stop			
			resce amer	-	13.2	دىم	Debounce:	Fail confirmation time	>=	150	ms		
							Debounce.		-	150	1115		
							Disable Conditions:			P0882, P0883			
		Open load is checked when the solenoid is											
		switched off. The voltage at the Vpos pin											
		between sense resistor and load should be											
		pulled to the battery supply by the load. The	TLE8242 component/driver diagnostic status	=	Open load		Enable Conditions:						
		current driver tries to regulate the output pin to											
Synchronizer Actuation		a defined low voltage with a very low current. If										Runs	
Valve 1	P08C8	this succeeds Open load is detected.						System not in safe state	=	True		continuously	A
			LSO turned off	=	True			Battery voltage	>	8750	mV		
	1		Tested timer	>	19.2	μs	1	Battery voltage	<	18000	mV	1	1

Image: second				Vpos	<	3000 (+/-500)	mV		Engine Status	!=	Cranking			
And Process and Pro				Vpos	>	1700 (+/-500)	mV		Key Status	!=	Stop			
Image: control in the section in t				LSO turn off time	>	5	ms	Debounce:	Fail confirmation time	>=	150	ms		
Image: second														
Note: And and and state in the			Short to batteny is checked when the solenoid is					Disable Conditions:			P0882, P0883			
Note: Note: <th< td=""><td></td><td></td><td>switched on. The voltage at the Vpos pin</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></th<>			switched on. The voltage at the Vpos pin											
Anderson Actions Appendix to indication indicati			between sense resistor and load should be	TI E9242 component (driver diagnostic status	_	Short to Matt		Enable Conditions						
Production bits shades Production bits shades<			pulled towards ground. If this voltage is higher	TLE8242 component/driver diagnostic status	-	Short to voatt		Enable Conditions:						
Model Model Manual statements	Synchronizer Actuation	DODCD	than a limit depending on the supply								T		Runs	
Note: Section: Section	Valve 1	POSCB	voltage, shorted load is detected.	Tostod timor		10.2			System not in safe state	=	I rue	m\/	continuously	A
Image: problem in the second control to decry the second control to d				Vpos (battery voltage < 11500 mV)	>	700 (+/-100)	μs mV		Battery voltage	<	18000	mV		
Image: problem with the second sec				Vpos (12000 mV < battery voltage < 15000 mV)	>	900 (+/-100)	mV		Engine Status	!=	Cranking			
Image: problem in the second construction of the second co				Vpos (battery voltage > 15500 mV)	>	1100 (+/-100)	mV		Key Status	!=	Stop			
$ \left \begin{array}{cccccccccccccccccccccccccccccccccccc$				LSO turned on	=	True								
$ \left $			This diagnostic checks the error between the											
			target current and the estimated current based	Error on current estimation versus target current	、 、	70	%							
nnn <th< td=""><td></td><td></td><td>battery voltage. If the error is too big a DTC is</td><td>End of current estimation versus target current</td><td>-</td><td>70</td><td><i>,</i>,,</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></th<>			battery voltage. If the error is too big a DTC is	End of current estimation versus target current	-	70	<i>,</i> ,,							
Application Intervent lugger			set.											
And spectrometer futures (weight in the spectra of and a spectra o				Time with big error	>	60	ms							
Image: spectral sector in curved standard wards target carry in curved standard wards targe				OR				Debounce:	Fail confirmation time	>=	150	ms		
Image: Note of point the character and is statubility of the character and is statubi				Error on current estimation versus target current	>	400	mA							
Support basis Spectro for yound is divided when the solenoid is when the solenoid is divided by the divide is your established by the divide is				Time with small error	>	300	ms	Disable Conditions:			P0882, P0883			
Synchronizer Austrik Vice 1 PROFA Image and de on the outget of the bit types and sense interpretation in the outget of the bit types and the a limit, but to ground is detected. PROFA ProfAu ProfAu Synchronizer and types			Short to ground is checked when the solenoid is											
Sprichwards Autors of the specific spec			switched on. The voltage at the Vpos pin	TI E9242 component (driver diagnostic status	_	Short to ground		Enable Conditions						
Vishe 1 NB50/ Field inter Inter, short to ground is detected. Note: Inter, short to ground is detected. Since: Inter, short to ground is detected. Note: Inter, short to she state. Note: Inter, short to she short she short to short she short to short she short to she sh	Synchronizer Actuation		pulled towards ground. If this voltage is lower	TLE8242 component/driver diagnostic status	-	Short to ground		Enable Conditions:					Runs	
Image: space of the section of the sectin of the section of the section of the section of the s	Valve 1	P08CA	than a limit, short to ground is detected.						System not in safe state	=	True		continuously	А
Image: series of the series				LSO turned on	=	True			Battery voltage	>	8750	mV		
$ \left \begin{array}{cccccccccccccccccccccccccccccccccccc$				Tested timer	>	19.2	μs		Battery voltage	<	18000	mV		
Surthomize Actuation Spectromize Actuation				Vpos	<	1700 (+/-500)	mV		Engine Status	!=	Cranking			
Image: second				LSO turn off time	=	5	ms		Key Status	!=	Stop			
Image: Synchronizer Actuation Valve 2 Spectronizer Actuation Valve 2 <t< td=""><td></td><td></td><td></td><td>rested timer</td><td>-</td><td>15.2</td><td>μ3</td><td>Debounce:</td><td>Fail confirmation time</td><td>>=</td><td>150</td><td>ms</td><td></td><td></td></t<>				rested timer	-	15.2	μ3	Debounce:	Fail confirmation time	>=	150	ms		
Image: synchronizer Actuation Valve 2 Open load is checked when the solenoid is swritched off. The voltage at the Vyos pin between serie resistor and load should be pulled to the battery supply by the load. The current diver trists regulate the output pin to a defined low voltage with a very low current. If Valve 2 TLE224 component/driver diagnostic status = Open load Enable Conditions: Enable Conditions: P278D File														
Synchronizer Actuation P2780 switched off. The voltage at the voltag in the voltage of the volt		-	Open load is checked when the solenoid is					Disable Conditions:			P0882, P0883			
synchronizer Actuation Valve 2 P27BD between sense resistor and load should be current diver tries to regulate the output jubit this succeeds Open load is detected. LE232 component/driver diagnostic status voice = Nume Fable Conditions: = Ture Runs. Runs. Runs. Runs. Runs. Continuously A Valve 2 Jubit Participant = Ture Ture Ture Sourced off Ture Runs. Runs. Continuously A Valve 2 P27BD Sourced off = Ture Sourced off Ture Sourced off Ture Sourced Patter voltage = Ture Continuously A Voice Voice Sourced off = Ture Ture Ture Continuously A Synchronizer Actuation Source 5 ms Debonce: Fail confirmation time = 100 Ture Runs. Run			switched off. The voltage at the Vpos pin											
Synchronizer Actuation Valve 2 P2/B0 Field to the battery supply by the load. The defined low voltage with a very low current. if this succeeds Open load is detected. TE8242 component/driver diagnostic status P2/E0 Field time? P2/E0 P2/E0			between sense resistor and load should be											
Synchronizer Actuation a defined own yolkage with a very low current. If a defined own yolkage with a very low current. If a defined own yolkage with a very low current. If Synchronizer Actuation			pulled to the battery supply by the load. The	TLE8242 component/driver diagnostic status	=	Open load		Enable Conditions:						
Synchronizer Actuation Valve 2	Currenzia en Antontia e		current driver tries to regulate the output pin to										Dura	
Norse True Optimizer Actuation Optimizer Ac	Valve 2	P278D	this succeeds Open load is detected						System not in safe state	-	True		continuously	<u>م</u>
Image: space of the space	Valle 2	12/00	this sublectus open lood is detected.	LSO turned off	=	True			Battery voltage	>	8750	mV	continuousiy	
Normal Superior Voice < 3000 (4/-500)				Tested timer	>	19.2	μs		Battery voltage	<	18000	mV		
Normal Synchronizer Actuation				Vpos	<	3000 (+/-500)	mV		Engine Status	!=	Cranking			
Synchronizer Actuation P27C0 Short to battery is checked when the solenoid is switched on. The voltage at the Vpos pin between sense resistor and load should be pulled towards ground. If this voltage is higher than a limit depending on the supply voltage (1500 mV) Short to Vbatt Fail confirmation time >= 150 ms N Yalve 2 P27C0 P27C0 Fail depending on the supply voltage (1500 mV) > 19.2 µs Battery voltage System not in safe state = True Runs Runs Runs A Valve 2 P27C0 P27C0 Fail timer > 19.2 µs Battery voltage 5 8750 mV P P Continuously A A Valve 2 P27C0 P27C0 P27C0 No (1200 mV < battery voltage <11500 mV)				Vpos	>	1700 (+/-500)	mV		Key Status	!=	Stop			
And Commendation And Commendation <th< td=""><td></td><td></td><td></td><td>LSO turn off time</td><td>></td><td>5</td><td>ms</td><td>Debource:</td><td>Fail confirmation time</td><td>>=</td><td>150</td><td>ms</td><td></td><td></td></th<>				LSO turn off time	>	5	ms	Debource:	Fail confirmation time	>=	150	ms		
Image: Not not provide the solution of the solution is checked when the solution is short to battery is checked when the solution is short to battery is checked when the solution is short to battery is checked when the solution is short to battery is checked when the solution is short to battery is checked when the solution is short to battery is checked when solution is short to battery is checked when the solution is short to battery is checked when solution is short to battery is checked. Disable Conditions: Disable Conditions: Possible Conditions:								Debounce.		-	150			
Sind L D alterly is cricked within the Solenou is solenou is switched on. The voltage at the Yoos pind is between sense resistor and load should be pulled towards ground. If this voltage is higher than a limit depending on the supply P270 P270 Valve 2 P270 Valve 2 P270 Valve 2 P270 Valve 2 Tested timer > 19.2 µS Battery voltage System not in safe state System not in safe state S								Disable Conditions:			P0882, P0883			
Note:			switched on. The voltage at the Vnos nin											
Synchronizer Actuation P2700 pulled towards ground. If this voltage is higher IL&24 component/driver diagnostic status = Short to Vbatt Enable Conditions: No Na Valve 2 P2700 voltage,shorted load is detected. Exect timer > 10.2 System not in safe statu = True continuously A Valve 2 Voltage,shorted load is detected. Exect timer > 10.2 µs Battery voltage 1800 NV A Voltage 1 Yoos (battery voltage <1500 mV)			between sense resistor and load should be	7 502 42		Charles 11 and		5						
Synchronizer Actuation Nan a limit depending on the supply Han a limit depending on the supply Han a limit depending on the supply Runs Valve 2 Valve 2, so priority Valve 2, so priority Texted timer > 19.2 µs System not no safe state = True continuously A Valve 2 Valve 2, so priority Texted timer > 19.2 µs Battery voltage 1800 NU A Valve 2 Valve 2, so priority > 700 (r/-100) mV Battery voltage 1800 NU A Valve 2, so priority > 900 (r/-100) mV Engine Status Image: So priority Image: So priority A Valve 2, so priority > 900 (r/-100) mV Engine Status Image: So priority Image: So priority <td></td> <td></td> <td>pulled towards ground. If this voltage is higher</td> <td>ILE8242 component/driver diagnostic status</td> <td>=</td> <td>Short to Vbatt</td> <td></td> <td>Enable Conditions:</td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td>			pulled towards ground. If this voltage is higher	ILE8242 component/driver diagnostic status	=	Short to Vbatt		Enable Conditions:						
Value 2 P27C0 voltage,shorted load is detected. Faced timer > 19.2 Max System not in safe state = True continuously A Value 2 Tested timer > 19.2 µs Battery voltage 8750 mV F Vpos (battery voltage <11500 mV	Synchronizer Actuation		than a limit depending on the supply								_		Runs	
Instant Instant Instant Instant Instant Vpos (battery voltage < 11500 mV)	Valve 2	P27C0	voltage, shorted load is detected.	Tested times		10.2			System not in safe state	=	True	m)/	continuously	A
Vpos (12000 mV < battery voltage < 15000 mV) > 900 (+/100) mV Engine Status I= Cranking Vpos (battery voltage > 15500 mV) > 1100 (+/100) mV Key Status I= Status				Vnos (battery voltage < 11500 mV)	>	19.2	μs mV		Battery voltage	<	8750 18000	mV		
Vpos (battery voltage > 15500 mV) > 1100 (+/-100) mV Key Status I= Stop				Vpos (12000 mV < battery voltage < 15000 mV)	>	900 (+/-100)	mV		Engine Status	!=	Cranking			
				Vpos (battery voltage > 15500 mV)	>	1100 (+/-100)	mV		Key Status	!=	Stop			

			LSO turned on	=	True		4						
		This diagnostic checks the error between the target current and the estimated current based upon the current driver duty cycle and the	Error on current estimation versus target current	>	70	%							
		battery voltage. If the error is too big a DTC is set.											
			Time with big error OR	>	60	ms	Debounce:	Fail confirmation time	>=	150	ms		
			Error on current estimation versus target current	>	400	mA							
			Time with small error	>	300	ms	Disable Conditions:			P0882, P0883			
Synchronizer Actuation		Short to ground is checked when the solenoid is switched on. The voltage at the Vpos pin between sense resistor and load should be nulled towards ground. If this voltage is lower	TLE8242 component/driver diagnostic status	=	Short to ground		Enable Conditions:					Runs	
Valve 2	P27BF	than a limit, short to ground is detected.						System not in safe state	=	True		continuously	А
			LSO turned on	=	True			Battery voltage	>	8750	mV		
			Tested timer	>	19.2	μs		Battery voltage	<	18000	mV		
			Vpos	<	1700 (+/-500)	mV		Engine Status	!=	Cranking			
			LSO turn off time	=	5	ms		Key Status	!=	Stop			
			Tested timer	>	19.2	μs							
							Debounce:	Fail confirmation time	>=	150	ms		
							Disable Conditions:			P0882, P0883			
		Open load is checked when the solenoid is switched off. The voltage at the Vpos pin between sense resistor and load should be											
		pulled to the battery supply by the load. The current driver tries to regulate the output pin to	TLE8242 component/driver diagnostic status	=	Open load		Enable Conditions:						
Synchronizer Actuation		a defined low voltage with a very low current. If										Runs	
Valve 3	P27C5	this succeeds Open load is detected.						System not in safe state	=	True		continuously	А
			LSO turned off	=	True			Battery voltage	>	8750	mV		
			Tested timer	>	19.2	μs		Battery voltage	<	18000	mV		
			Vpos	<	3000 (+/-500)	mV		Engine Status	!=	Cranking			
			Vpos	>	1700 (+/-500)	mV		Key Status	!=	Stop			
			LSO turn off time	>	5	ms				-			
							Debounce:	Fail confirmation time	>=	150	ms		
							Disable Conditions:			P0882, P0883			
		Short to battery is checked when the solenoid is											
		switched on. The voltage at the Vpos pin											
		between sense resistor and load should be pulled towards ground. If this voltage is higher	TLE8242 component/driver diagnostic status	=	Short to Vbatt		Enable Conditions:					_	
Synchronizer Actuation	D27C9	than a limit depending on the supply						System not in safe state	_	True		Runs	۵
VUIVE J	r2/00	יסונעקב,אוטו נבע וטמע וא עצוצנונצע.	Tested timer	<u>,</u>	19.2	115		Battery voltage	>	8750	mV	continuousiy	A
			Vnos (battery voltage < 11500 mV)	- 	700 (+/-100)	mV		Battery voltage	<	18000	mV		
			Vnos (12000 mV \leq hattery voltage \leq 1500 mV)	- 	900 (+/-100)	mV		Engine Status	I=	Cranking			
			Vpos (battery voltage > 15500 mV)	>	1100 (+/-100)	mV		Key Status	!=	Stop			
		This diagnostic checks the error between the	LSO turned on	=	True		4						
		target current and the estimated current based											
		upon the current driver duty cycle and the	Error on current estimation versus target current	>	70	%							
		battery voltage. If the error is too big a DTC is	en carrent estimation versus target carrent										
		set.	we have the first second		<u> </u>								
			וות with big error OR	>	60	ms	Debounce:	Fail confirmation time	>=	150	ms		
			Error on current estimation versus target current	>	400	mA							
			- Time with small error	>	300	ms	Disable Conditions:			P0882, P0883			
		Short to ground is checked when the solenoid is								,		1	
		switched on. The voltage at the Vpos pin											
		between sense resistor and load should be	TLE8242 component/driver diagnostic status	=	Short to ground		Enable Conditions:						
Synchronizer Actuation		pulled towards ground. If this voltage is lower		1								Runs	
Valve 3	P27C7	than a limit, short to ground is detected.		l			1	System not in safe state	=	True		continuously	A

	1		LSO turned on	=	True			Battery voltage	>	8750	mV		1
			Tested timer	>	19.2	μs		Battery voltage	<	18000	mV		
			Vpos	<	1700 (+/-500)	mV		Engine Status	!=	Cranking			
			LSO turn off time	=	5	ms		Key Status	!=	Stop			
			Tested timer	>	19.2	μs				•			
							Debounce:	Fail confirmation time	>=	150	ms		
							Disable Conditions:			P0882, P0883			
		Open load is checked when the solenoid is											
		switched off. The voltage at the Vpos pin											
		between sense resistor and load should be											
		pulled to the battery supply by the load. The	TLE8242 component/driver diagnostic status	=	Open load		Enable Conditions:						
		current driver tries to regulate the output pin to											
Synchronizer Actuation		a defined low voltage with a very low current. If										Runs	
Valve 4	P27CD	this succeeds Open load is detected.			_			System not in safe state	=	True		continuously	A
			LSO turned off	=	True			Battery voltage	>	8750	mV		
			Tested timer	>	19.2	μs		Battery voltage	<	18000	mV		
			Vpos	<	3000 (+/-500)	mV		Engine Status	!=	Cranking			
			Vpos	>	1700 (+/-500)	mV		Key Status	!=	Stop			
			LSO turn off time	>	5	ms	- ·						
							Debounce:	Fail confirmation time	>=	150	ms		
										D0002 D0002			
		Short to bottony is shocked when the selencid is					Disable Conditions:			P0882, P0883			
		short to battery is checked when the solenoid is											
		between sense resistor and load should be											
		nulled towards ground. If this voltage is higher	TLE8242 component/driver diagnostic status	=	Short to Vbatt		Enable Conditions:						
Sunchronizer Actuation		than a limit depending on the supply										Rupe	
Valve 4	P27D0	voltage shorted load is detected						System not in safe state	-	True		continuously	Δ.
Vuive 4	12/00	voltage, shorted load is detected.	Tested timer	<u>`</u>	19.2			Battery voltage	-	8750	m\/	continuousiy	~
			Vnos (battery voltage < 11500 mV)	- -	700 (+/-100)	mV		Battery voltage	-	18000	mV		
			Vpos (12000 mV \leq battery voltage \leq 15000 mV)	- -	900 (+/-100)	mV		Engine Status) =	Cranking			
			Vpos (hattery voltage > 15500 mV)	- -	1100 (+/-100)	mV		Key Status	 !=	Ston			
			ISO turned on	=	True			hey status		5100			
		This diagnostic checks the error between the			inde		-						
		target current and the estimated current based											
		upon the current driver duty cycle and the	Error on current estimation versus target current	>	70	%							
		battery voltage. If the error is too big a DTC is											
		set.											
			Time with big error	>	60	ms							
			OR				Debounce:	Fail confirmation time	>=	150	ms		
					400	4							
			Error on current estimation versus target current	>	400	mA							
			Time with small error	>	300	ms	Disable Conditions:			P0882, P0883			
		Short to ground is checked when the solenoid is											
		switched on. The voltage at the Vpos pin											
		between sense resistor and load should be	TLE8242 component/driver diagnostic status	=	Short to ground		Enable Conditions:						
Synchronizer Actuation		pulled towards ground. If this voltage is lower										Runs	
Valve 4	P27CF	than a limit, short to ground is detected.						System not in safe state	=	True		continuously	A
			LSO turned on	=	True			Battery voltage	>	8750	mV		
			Tested timer	>	19.2	μs		Battery voltage	<	18000	mV		
			Vpos	<	1700 (+/-500)	mV		Engine Status	!=	Cranking			
			LSO turn off time	=	5	ms		Key Status	!=	Stop			
			lested timer	>	19.2	μs		Call confirmation time	×	450			
							Debounce:	Fan commation time	/=	150	ms		1
							Disable Conditions:			C0000 C0000			
		Open load is checked when the solenoid is					Disable conditions:			r 0002, PU883			1
		switched off. The voltage at the Vnos nin											1
1		between sense resistor and load should be											1
		pulled to the battery supply by the load. The	TLE8242 component/driver diagnostic status	=	Open load		Enable Conditions:						1
		current driver tries to regulate the output pin to											1
Synchronizer Actuation		a defined low voltage with a very low current. If										Runs	1
Valve 5	P27D5	this succeeds Open load is detected.						System not in safe state	=	True		continuously	А
			LSO turned off	=	True			Battery voltage	>	8750	mV	,	1
•	-	-	-	•			•		•			•	•

			Tested timer	>	19.2	μs		Battery voltage	<	18000	mV		
			Vpos	<	3000 (+/-500)	mV		Engine Status	!=	Cranking			
			Vpos	>	1700 (+/-500)	mV		Key Status	!=	Stop			
			LSO turn off time	>	5	ms				·			
							Debounce:	Fail confirmation time	>=	150	ms		
		Short to battery is checked when the solenoid is		-			Disable Conditions:			P0882, P0883			
		switched on. The voltage at the Vnos nin											
		between sense resistor and load should be											
		nulled towards ground. If this voltage is higher	TLE8242 component/driver diagnostic status	=	Short to Vbatt		Enable Conditions:						
Synchronizer Actuation		than a limit depending on the supply										Runs	
Valve 5	P27D8	voltage.shorted load is detected.						System not in safe state	=	True		continuously	А
			Tested timer	>	19.2	μs		Battery voltage	>	8750	mV	,	
			Vpos (battery voltage < 11500 mV)	>	700 (+/-100)	mV		Battery voltage	<	18000	mV		
			Vpos (12000 mV < battery voltage < 15000 mV)	>	900 (+/-100)	mV		Engine Status	!=	Cranking			
			Vpos (battery voltage > 15500 mV)	>	1100 (+/-100)	mV		Key Status	!=	Stop			
			LSO turned on	=	True								
		This diagnostic checks the error between the		1									
		target current and the estimated current based											
		upon the current driver duty cycle and the	Error on current estimation versus target current	>	70	%							
		battery voltage. If the error is too big a DTC is											
		set.											
			Time with big error	>	60	ms							
			OR				Debounce:	Fail confirmation time	>=	150	ms		
			Error on current estimation versus target current	>	400	mA							
			Time with small error	>	300	ms	Disable Conditions:			P0882, P0883			
		Short to ground is checked when the solenoid is											
		switched on. The voltage at the vpos pin	TI 502.42		Charles and								
Sunchronizor Actuation		between sense resistor and load should be	TLE8242 component/driver diagnostic status	=	Short to ground		Enable Conditions:					Bunc	
Synchronizer Actuation	77750	than a limit, chart to ground is detected						System pot in cofe state	_	True		Kuns	•
valve 5	P2/0/	than a limit, short to ground is detected.	ICO humand an		True			Batton voltage	-	1100	m)/	continuousiy	A
			LSO turned on Tested timer	=	10.2			Battery voltage	,	18000	m\/		
			Vnos	-	1700 (+/-500)	μ3 mV		Engine Status	\ =	Cranking	111 V		
			ISO turn off time	-	1700 (+7-500)	ms		Key Status	:- !=	Ston			
			Tested timer	-	19.2	1115		hey status		5100			
				-	15.2	μ	Debounce:	Fail confirmation time	>=	150	ms		
							Debbunce.		-	150	1115		
							Disable Conditions:			P0882, P0883			
		Open load is checked when the solenoid is											
		switched off. The voltage at the Vpos pin											
		between sense resistor and load should be											
		pulled to the battery supply by the load. The	TLE8242 component/driver diagnostic status	=	Open load		Enable Conditions:						
		current driver tries to regulate the output pin to											
		a defined low voltage with a very low current. If										Runs	
Selector pilot valve	P282D	this succeeds Open load is detected.						System not in safe state	=	True		continuously	А
			LSO turned off	=	True			Battery voltage	>	8750	mV		
			Tested timer	>	19.2	μs		Battery voltage	<	18000	mV		
			Vpos	<	3000 (+/-500)	mV		Engine Status	!=	Cranking			
			Vpos	>	1700 (+/-500)	mV		Key Status	!=	Stop			
			LSO turn off time	>	5	ms							
							Debounce:	Fail confirmation time	>=	100	ms		
							Disable Canditions			0000 0000			
		Short to battery is checked when the solenoid is		<u> </u>			Disable Conditions:			ruððz, puð83			
		switched on. The voltage at the Vnos nin											
		hetween sense resistor and load should be		1									
		pulled towards ground. If this voltage is higher	TLE8242 component/driver diagnostic status	=	Short to Vbatt		Enable Conditions:						
		than a limit depending on the supply		1								Runs	
Selector pilot valve	P2830	voltage, shorted load is detected.		1				System not in safe state	=	True		continuously	А
		<u>.</u>	Tested timer	>	19.2	μs		Battery voltage	>	8750	mV	,	
			Vpos (battery voltage < 11500 mV)	>	700 (+/-100)	mV		Battery voltage	<	18000	mV		
			Vpos (12000 mV < battery voltage < 15000 mV)	>	900 (+/-100)	mV		Engine Status	!=	Cranking			
•		•		•			•		•	0		•	

			Vpos (battery voltage > 15500 mV) LSO turned on	> =	1100 (+/-100) True	mV		Key Status	!=	Stop			
		This diagnostic checks the error between the target current and the estimated current based upon the current driver duty cycle and the battery voltage. If the error is too big a DTC is set.	Error on current estimation versus target current	>	70	%							
			Time with big error OR	>	60	ms	Debounce:	Fail confirmation time	>=	100	ms		
			Error on current estimation versus target current	>	400	mA							
			Time with small error	>	300	ms	Disable Conditions:			P0882, P0883			
Selector pilot valve	P282F	Short to ground is checked when the solenoid is switched on. The voltage at the Vpos pin between sense resistor and load should be pulled towards ground. If this voltage is lower than a limit, short to ground is detected.	TLE8242 component/driver diagnostic status	=	Short to ground		Enable Conditions:	System not in safe state	=	True		Runs continuously	А
			LSO turned on	=	True			Battery voltage	>	8750	mV		
			Tested timer	>	19.2	μs		Battery voltage	<	18000	mV		
			Vpos	<	1700 (+/-500)	mV		Engine Status	!=	Cranking			
			LSO turn off time	=	5	ms		Key Status	!=	Stop			
			Tested timer	>	19.2	μs							
							Debounce:	Fail confirmation time	>=	100	ms		
							Disable Conditions:			P0882, P0883			
		Open load is checked when the solenoid is switched off. The voltage at the Vpos pin between sense resistor and load should be pulled to the battery supply by the load. The current driver tries to regulate the output pin to a defined low voltage with a very low current. If	TLE8242 component/driver diagnostic status	=	Open load		Enable Conditions:					Runs	
Clutch Cooling Valve	P2736	this succeeds Open load is detected.						System not in safe state	=	True		continuously	А
			LSO turned off	=	True			Battery voltage	>	8750	mV		
			Tested timer	>	19.2	μs		Battery voltage	<	18000	mV		
			Vpos	<	3000 (+/-500)	mV		Engine Status	!=	Cranking			
			Vpos	>	1700 (+/-500)	mV		Key Status	!=	Stop			
			LSO turn off time	>	5	ms		-,					
							Debounce:	Fail confirmation time	>=	150	ms		
							Disable Conditions:			P0882, P0883			
		Short to battery is checked when the solenoid is											
Clutch Cooling Valve	P7739	switched on. The voltage at the Vpos pin between sense resistor and load should be pulled towards ground. If this voltage is higher than a limit depending on the supply voltage shorted load is detected	TLE8242 component/driver diagnostic status	=	Short to Vbatt		Enable Conditions:	System not in cafe state	_	Тгие		Runs	۵
clatch cooling valve	12/33	totage,shorted todd is detected.	Tested timer	>	19.2	115		Battery voltage	>	8750	mV	continuousiy	5
			Vnos (hattery voltage $< 11500 \text{ mV}$)	~	700 (+/-100)	μs mV		Battery voltage	<	18000	mV		
			Vpos (12000 mV < hatten voltage < 1500 mV)	~	900 (+/-100)	m\/		Engine Status	1=	Cranking			
			V_{pos} (12000 IIIV < ballery voltage < 15000 IIIV)	~	1100 (+/-100)	m)/		Key Status	:- I-	Stop			
			ISO turned on	=	True			Ney Status		Stop			
		This diagnostic checks the error between the					-1						
		target current and the estimated current based upon the current driver duty cycle and the battery voltage. If the error is too big a DTC is set.	Error on current estimation versus target current	>	70	%							
			Time with big error OR	>	60	ms	Debounce:	Fail confirmation time	>=	150	ms		
			Error on current estimation versus target current	>	400	mA							
			Time with small error	>	300	ms	Disable Conditions:			P0882, P0883			

									-				
		Short to ground is checked when the solenoid is											
		switched on. The voltage at the Vpos pin											
		between sense resistor and load should be	TLE8242 component/driver diagnostic status	=	Short to ground		Enable Conditions:						
		pulled towards ground. If this voltage is lower	, , , ,		Ū.							Runs	
Clutch Cooling Valve	P2738	than a limit, short to ground is detected.						System not in safe state	=	True		continuously	А
cluten cooling func	. 2755	chan a linit, shore to ground is detected	LSO turned on	_	True			Battery voltage		8750	mV	continuousiy	
			Tasked times	-	10.2			Batton voltage	-	18000	m\/		
			rested timer	>	19.2	μs		Battery Voltage	ì	18000	IIIV		
			Vpos	<	1/00 (+/-500)	mV		Engine Status	!=	Cranking			
			LSO turn off time	=	5	ms		Key Status	!=	Stop			
			Tested timer	>	19.2	μs							
							Debounce:	Fail confirmation time	>=	150	ms		
							Disable Conditions:			P0882, P0883			
		Open load is checked when the solenoid is											
		switched off. The voltage at the Vpos pin											
		between sense resistor and load should be											
		pulled to the battery supply by the load. The	TI F8242 component/driver diagnostic status	=	Onen load		Enable Conditions:						
Limited Slin Differential		current driver tries to regulate the output nin to	TEED242 component/univer diagnostic status	-	openioda		Enable conditions.						
Directional Direction		a defined low values of regulate the output pin to										Dura	
Proportional Pressure	02042	a defined low voltage with a very low current. If						Contract to a final state		T		Kulls	
valve	P2812	this succeeds Open load is detected.			_			System not in safe state	=	True		continuousiy	в
			LSO turned off	=	True			Battery voltage	>	8750	mV		
			Tested timer	>	19.2	μs		Battery voltage	<	18000	mV		
			Vpos	<	3000 (+/-500)	mV		Engine Status	!=	Cranking			
			Vpos	>	1700 (+/-500)	mV		Key Status	!=	Stop			
			LSO turn off time	>	5	ms							
							Debounce:	Fail confirmation time	>=	150	ms		
							Disable Conditions:			P0882, P0883			
		Short to battery is checked when the solenoid is								,			
		switched on. The voltage at the Vnos nin											
		between concernsister and load should be											
		between sense resistor and road should be	TLE8242 component/driver diagnostic status	=	Short to Vbatt		Enable Conditions:						
Limited Slip Differential		pulled towards ground. If this voltage is higher	, , , ,									_	
Proportional Pressure		than a limit depending on the supply										Runs	
Valve	P2815	voltage, shorted load is detected.						System not in safe state	=	True		continuously	В
			Tested timer	>	19.2	μs		Battery voltage	>	8750	mV		
			Vpos (battery voltage < 11500 mV)	>	700 (+/-100)	mV		Battery voltage	<	18000	mV		
			Vpos (12000 mV < battery voltage < 15000 mV)	>	900 (+/-100)	mV		Engine Status	!=	Cranking			
			Vpos (battery voltage > 15500 mV)	>	1100 (+/-100)	mV		Kev Status	!=	Stop			
			ISO turned on	_	, True								
		This diagnostic checks the error between the			inde		•						
		target current and the estimated current based											
		upon the current driver duty cycle and the			70	0/							
		upon the current unver duty cycle and the	error on current estimation versus target current	>	70	70							
		battery voltage. If the error is too big a DTC is		1								1	
		set.		1					1			1	
			Time with big error	>	60	ms			1				
			OR				Debounce:	Fail confirmation time	>=	150	ms	1	
			Error on current estimation vorsus target		200	mA						1	
			chor on current estimation versus target current	Ĺ.	200	IIIA			1			1	
			Time with small error	>	300	ms	Disable Conditions:		1	P0882, P0883			
		Short to ground is checked when the solenoid is											
		switched on. The voltage at the Vpos pin		1					1			1	
Limited Slip Differential		between sense resistor and load should be	TLE8242 component/driver diagnostic status	=	Short to ground		Enable Conditions		1				
Proportional Pressure		nulled towards ground. If this voltage is lower	component, and angliostic status		Short to ground				1			Runs	
Valvo	D291/	than a limit short to ground is detected						System not in safe state	_	True		continuously	P
valve	r2014	than a mint, short to ground is detected.	ISO turned on	L	Terri			System not in sale state	L.	arrue		continuousiy	в
			LSU turnea on	=	Irue			Battery voltage	>	8750	mv	1	
			Tested timer	>	19.2	μs		Battery voltage	<	18000	mV		
			Vpos	<	1700 (+/-500)	mV		Engine Status	!=	Cranking			
			LSO turn off time	=	5	ms		Key Status	!=	Stop		1	
			Tested timer	>	19.2	μs						1	
				1		-	Debounce:	Fail confirmation time	>=	150	ms	1	
				1								1	
				1			Disable Conditions:			P0882, P0883		1	
										,			

				_					_				
Limited Slip Differential Redundant Shutdown Valve	P281B	Open load is checked when the solenoid is switched off. The voltage at the Vpos pin between sense resistor and load should be pulled to the battery supply by the load. The current driver tries to regulate the output pin to a defined low voltage with a very low current. If this succeeds Open load is detected.	TLE8242 component/driver diagnostic status LSO turned off Tested timer Vpos Vpos LSO turn off time	= > < > > > >	Open load True 19.2 3000 (+/-500) 1700 (+/-500) 5	μs mV mV ms	Enable Conditions: Debounce: Disable Conditions:	System not in safe state Battery voltage Battery voltage Engine Status Key Status Fail confirmation time	= > < - - -	True 8750 18000 Cranking Stop 150 P0882, P0883	mV mV ms	Runs continuously	В
Limited Slip Differential Redundant Shutdown Valve	P281E	Short to battery is checked when the solenoid is switched on. The voltage at the Vpos pin between sense resistor and load should be pulled towards ground. If this voltage is higher than a limit depending on the supply voltage,shorted load is detected.	TLE8242 component/driver diagnostic status Tested timer Vpos (battery voltage < 11500 mV) Vpos (12000 mV < battery voltage < 15000 mV)	= > > >	19.2 700 (+/-100) 900 (+/-100)	μs mV mV	Enable Conditions:	System not in safe state Battery voltage Battery soltage Engine Status	= > < !=	True 8750 18000 Cranking	mV mV	Runs continuously	в
		This diagnostic checks the error between the target current and the estimated current based upon the current driver duty cycle and the battery voltage. If the error is too big a DTC is set.	Vpos (battery voltage > 15500 mV) LSO turned on Error on current estimation versus target curren Time with big error	> = t >	1100 (+/-100) True 70 60	mV % ms	-	Key Status	!=	Stop			
			OI Error on current estimation versus target current	R t>	200	mA	Debounce:	Fail confirmation time	>=	150	ms		
			Time with small error		200	-	Disable Conditions			DU003 DU003			
Limited Slip Differential Redundant Shutdown Valve	P281D	Short to ground is checked when the solenoid is switched on. The voltage at the Vpos pin between sense resistor and load should be pulled towards ground. If this voltage is lower than a limit, short to ground is detected.	TLE8242 component/driver diagnostic status LSO turned on Tested timer Vpos LSO tur off time	= = > < =	Short to ground True 19.2 1700 (+/-500) 5	μs mV ms	Enable Conditions:	System not in safe state Battery voltage Battery voltage Engine Status Kev Status	= > != !=	True 8750 18000 Cranking Stop	mV mV	Runs continuously	В
			Tested timer	>	19.2	μs	Debounce: Disable Conditions:	Fail confirmation time	>=	150 P0882, P0883	ms		
Parking Lock Engaging Valve	P2824	Open load is checked when the solenoid is switched off. The voltage at the Vpos pin between sense resistor and load should be pulled to the battery supply by the load. The current driver tries to regulate the output pin to a defined low voltage with a very low current. If this succeeds Open load is detected.	TLE8242 component/driver diagnostic status LSO turned off Tested timer Vpos Vpos LSO turn off time	= = > < > >	Open load True 19.2 3000 (+/-500) 1700 (+/-500) 5	μs mV mV ms	Enable Conditions:	System not in safe state Battery voltage Battery voltage Engine Status Key Status Fail confirmation time	= > < != != >=	True 8750 18000 Cranking Stop 150	mV mV	Runs continuously	В
							Disable Conditions:			P0882, P0883			

									_				
Parking Lock Engaging Valve	P2827	Short to battery is checked when the solenoid is switched on. The voltage at the Vpos pin between sense resistor and load should be pulled towards ground. If this voltage is higher than a limit depending on the supply voltage,shorted load is detected. This diagnostic checks the error between the target current and the estimated current based upon the current driver duty cycle and the battery voltage. If the error is too big a DTC is	TLE8242 component/driver diagnostic status Tested timer Vpos (battery voltage < 11500 mV) Vpos (12000 mV < battery voltage < 15000 mV) Vpos (battery voltage > 15500 mV) LSO turned on Error on current estimation versus target current	= > > > > > > = = = > > > > > > > > > >	19.2 700 (+/-100) 900 (+/-100) 1100 (+/-100) True 70	μs mV mV mV	Enable Conditions:	System not in safe state Battery voltage Battery voltage Engine Status Key Status	= < != !=	True 8750 18000 Cranking Stop	mV mV	Runs continuously	В
		set.	Time with big error OR Error on current estimation versus target current	>	60 200	ms mA	Debounce:	Fail confirmation time	>=	150	ms		
Parking Lock Engaging Valve	P2826	Short to ground is checked when the solenoid is switched on. The voltage at the Vpos pin between sense resistor and load should be pulled towards ground. If this voltage is lower than a limit, short to ground is detected.	Time with small error TLE8242 component/driver diagnostic status LSO turned on Tested timer Vpos LSO turn off time Tested timer	> = > < = > >	300 Short to ground 19.2 1700 (+/-500) 5 19.2	μs mV ms μs	Disable Conditions: Enable Conditions: Debounce:	System not in safe state Battery voltage Battery voltage Engine Status Key Status Fail confirmation time	= > < != != >=	P0882, P0883 True 8750 18000 Cranking Stop 150	mV mV	Runs continuously	В
Parking Lock Hold Solenoid	P18A3	Open load is checked when the solenoid is switched off. The voltage at the Vpos pin between sense resistor and load should be pulled to the battery supply by the load. The current driver tries to regulate the output pin to a defined low voltage with a very low current. If this succeeds Open load is detected.	TLE8242 component/driver diagnostic status LSO turned off Tested timer Vpos Vpos LSO turn off time	= > < >	Open load True 19.2 3000 (+/-500) 1700 (+/-500) 5	μs mV mV ms	Disable Conditions: Enable Conditions: Debounce: Disable Conditions:	System not in safe state Battery voltage Battery voltage Engine Status Key Status Fail confirmation time	= > < !! = :	P0882, P0883 True 8750 18000 Cranking Stop 150 P0882, P0883	mV mV ms	Runs continuously	в
Parking Lock Hold Solenoid	P18A4	Short to battery is checked when the solenoid is switched on. The voltage at the Vpos pin between sense resistor and load should be pulled towards ground. If this voltage is higher than a limit depending on the supply voltage,shorted load is detected. This diagnostic checks the error between the target current and the estimated current based upon the current driver duty cycle and the battery voltage. If the error is too big a DTC is set.	TLE8242 component/driver diagnostic status Tested timer Vpos (battery voltage < 11500 mV) Vpos (12000 mV < battery voltage < 15000 mV) Vpos (battery voltage > 15500 mV) LSO turned on Error on current estimation versus target current	= > > > >	19.2 700 (+/-100) 900 (+/-100) 1100 (+/-100) True 70	μs mV mV mV	Enable Conditions:	System not in safe state Battery voltage Battery voltage Engine Status Key Status	= > != !=	True 8750 18000 Cranking Stop	mV mV	Runs continuously	В

			Time with big error	>	60	ms							
			01	R			Debounce:	Fail confirmation time	>=	150	ms		
			Error on current estimation versus target current	: >	200	mA							
			Time with small error	>	300	ms	Disable Conditions:			P0882, P0883			
		Short to ground is checked when the solenoid is											
		switched on. The voltage at the Vpos pin											
		between sense resistor and load should be	TLE8242 component/driver diagnostic status	=	Short to ground		Enable Conditions:						
Parking Lock Hold		pulled towards ground. If this voltage is lower										Runs	
Solenoid	P18A2	than a limit, short to ground is detected.						System not in safe state	=	True		continuously	В
			LSO turned on	=	True			Battery voltage	>	8750	mV		
			Tested timer	>	19.2	μs		Battery voltage	<	18000	mV		
			Vpos	<	1700 (+/-500)	mV		Engine Status	!=	Cranking			
			LSO turn off time	=	5	ms		Key Status	!=	Stop			
			Tested timer	>	19.2	μs							
							Debounce:	Fail confirmation time	>=	150	ms		
							Disable Conditions:			P0882, P0883			

								Enable			
Component/System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Va	lue	Secondary Parameter	s	Conditions		Time Required	MIL illum.
Speed sensor supply VSS1 enable	P06B1	If the speed sensor supply switch for VSS 1 reports overtemperature or over current a fault timer is increased. If the fault timer reaches the limit a DTC is set.	VSS 1 supply current	> 220	mA	Enable Conditions:	Battery voltage	> 8750	mV	Runs Continuously	A
			OI VSS1 switch temperature too high	= True	mV		Battery voltage Engine Status Key Status	< 18000 != Crankin != Stop	mV		
						Debounce:	Fail confirmation time	>= 60	ms		
						Disable Conditions:		P0882, P088	3		
Speed sensor supply VSS2 enable	P06B4	If the speed sensor supply switch for VSS 2 reports overtemperature or over current a fault timer is increased. If the fault timer reaches the limit a DTC is set.	VSS2 supply current	> 220	mA	Enable Conditions:	Battery voltage	> 8750	mV	Runs Continuously	А
			OI VSS2 switch temperature too high	= True	mV		Battery voltage Engine Status Key Status	< 18000 != Crankin != Stop	mV		
						Debounce:	Fail confirmation time	>= 60	ms		
						Disable Conditions:		P0882, P088	3		

Component/System	Fault Code	Monitor Strategy Description						Enable				
component, oystem	. uun couc		Malfunction Criteria	Threshold Va	lue	Secondary Parameters		Conditions		Time Required	MIL IIIum.	
HSO1	P0657	This diagnosis checks that the HSO is not open load. This is done at powerdown. When the HSO is disabled, the voltage at the HSO is defined by a resitor network. When the HSO is disabled and a corresponding LSO is enabled, the voltage at the HSO should be pulled down by the LSO through the load. If the voltage stays too high, open load is saved in NVM. Next startup the fault is read from NVM and the DTC is set.	HSO1 voltage level	> 40	% off Vbatt	Enable Conditions:	Shutdown path test busy	shutdown		Runs at shutdown	A	
							Battery voltage Battery voltage Battery voltage change during the	> 8750 < 18000	mV mV			
							test	< 1500	mV			
							Engine Status Key Status	!= Cranking != Stop				
						Debounce:	Fail confirmation time	>= 60	ms			
						Disable Conditions:		P0882, P0883				
H501	P0659	This diagnosis checks that the HSO is not shorted switch. This is done at powerdown. When the HSO is disabled a defined voltage is expected at the HSO. If the voltage stays too high, shorted switch is saved in NVM. Next startup the fault is read from NVM and the DTC is set.	HSO1 voltage level	> 70	% off Vbatt	Enable Conditions:	Shutdown path test busy	shutdown		Runs at shutdown	A	
							Battery voltage Battery voltage Battery voltage change during the test Engine Status Key Status	> 8750 < 18000 < 1500 != Cranking != Stop	mV mV mV			
						Debounce:	Fail confirmation time	>= 60	ms			
						Disable Conditions:		P0882, P0883				
HSO2	P2669	This diagnosis checks that the HSO is not open load. This is done at powerdown. When the HSO is disabled, the voltage at the HSO is defined by a resitor network. When the HSO is disabled and a corresponding LSO is enabled, the voltage at the HSO should be pulled down by the LSO through the load. If the voltage stays too high, open load is saved in NVM. Next startup the fault is read from NVM and the DTC is set.	HSO2 voltage level	> 40	% off Vbatt	Enable Conditions:	Shutdown path test busy	shutdown		Runs at shutdown		
							Battery voltage Battery voltage Battery voltage change during the test Engine Status Key Status	> 8750 < 18000 < 1500 != Cranking != Stop	mV mV mV			
						Debounce:	Fail confirmation time	>= 60	ms			
						Disable Conditions:		P0882, P0883				
												_
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HSO2	P2671	This diagnosis checks that the HSO is not shorted switch. This is done at powerdown. When the HSO is disabled a defined voltage is expected at the HSO. If the voltage stays too high, shorted switch is saved in NVM. Next startup the fault is read from NVM and the DTC is set.	HSO2 voltage level	>	70	% off Vbatt	Enable Conditions:	Shutdown path test busy	shutdo	wn	Runs at shutdown	A
								Battery voltage Battery voltage Battery voltage change during the test Engine Status Key Status	> 875(< 1800 < 1500 != Cranki != Stop) mV 0 mV) mV		
							Debounce:	Fail confirmation time	>= 60	ms		
							Disable Conditions:		P0882, P	0883		
HSO7	P2684	This diagnosis checks that the HSO is not open load. This is done at powerdown. When the HSO is disabled, the voltage at the HSO is defined by a resitor network. When the HSO is disabled and a corresponding LSO is enabled, the voltage at the HSO should be pulled down by the LSO through the load. If the voltage stays too high, open load is saved in NVM. Next startup the fault is read from NVM and the DTC is set.	HSO7 voltage level	>	40	% off Vbatt	Enable Conditions:	Shutdown path test busy	shutdo	wn	Runs at shutdown	A
								Battery voltage Battery voltage Battery voltage change during the test Engine Status Key Status	> 8750 < 1800 < 1500 != Cranki != Stop) mV 0 mV) mV		
							Debounce:	Fail confirmation time	>= 60	ms		
							Disable Conditions:		P0882, P	0883		
HSO7	P2686	This diagnosis checks that the HSO is not shorted switch. This is done at powerdown. When the HSO is disabled a defined voltage is expected at the HSO. If the voltage stays too high, shorted switch is saved in NVM. Next startup the fault is read from NVM and the DTC is set.	HSO7 voltage level	>	70	% off Vbatt	Enable Conditions:	Shutdown path test busy	shutdo	wn	Runs at shutdown	в
								Battery voltage Battery voltage Battery voltage change during the test Engine Status Key Status	> 8750 < 1800 < 1500 != Cranki != Stop) mV 0 mV) mV		
							Debounce:	Fail confirmation time	>= 60	ms		
							Disable Conditions:		P0882, P	0883		
HSO8	P26E7	This diagnosis checks that the HSO is not open load. This is done at powerdown. When the HSO is disabled, the voltage at the HSO is defined by a resitor network. When the HSO is disabled and a corresponding LSO is enabled, the voltage at the HSO should be pulled down by the LSO through the load. If the voltage stays too high, open load is saved in NVM. Next startup the fault is read from NVM and the DTC is set.	HSO8 voltage level	>	40	% off Vbatt	Enable Conditions:	Shutdown path test busy	shutdo	wn	Runs at shutdown	A

					Debounce:	Battery voltage Battery voltage Battery voltage change during the test Engine Status Key Status Fail confirmation time	> 8750 < 18000 < 1500 != Cranking != Stop >= 60	mV mV mV		
					Disable Conditions:		P0882, P088	3		
HSO8	P26E9	This diagnosis checks that the HSO is not shorted switch. This is done at powerdown. When the HSO is disabled a defined voltage is expected at the HSO. If the voltage stays too high, shorted switch is saved in NVM. Next startup the fault is read from NVM and the DTC is set.	HSO8 voltage level	> 70 % o	ff Vbatt Enable Conditions:	Shutdown path test busy	shutdown		Runs at shutdown	A
						Battery voltage Battery voltage Battery voltage change during the test Engine Status Key Status	> 8750 < 18000 < 1500 != Cranking != Stop	mV mV mV		
					Debounce: Disable Conditions:	Fail confirmation time	>= 60 P0882, P088	ms		

Component/System	Fault Code	Monitor Strategy Description	Malfunction Criteria		Threshold Value	Secondary Parameters	5	Ena	ible itions	Time Required	MIL illum.
Odd Clutch Proportional	50063	Short to neighbour is checked at shutdown. The test enables all LSO's one by one. If this LSO reports short to ground while it is disabled and 1 other LSO is enabled and vice versa, both LSO's are shorted together. This will be saved to nvm at shutdown. At startup the nvm info will be read and the DTC will be are	TLE8242 component/driver diagnostic status for this LSO	-	Short to ground	Enable Conditions:	System not in safe state	= Tr	ue	Runs at shutdown	А
Pressure Valve	P0963	and the DTC will be set.	LSO turned off Other LSO on AND	= =	True True		Battery voltage Battery voltage Engine Status	> 87 < 18 != Crai	50 mV 000 mV Iking		
			TLE8242 component/driver diagnostic status for another LSO The other LSO turned OFF	=	Short to ground True		Key Status	!= S1	ор		
			This LSO is turned on	=	True	Debounce:	Fail confirmation time	>= 1	50 ms		
		Short to neighbour is checked at shutdown. The				Disable Conditions:		P0882	P0883		
Even Clutch Proportional Pressure Valve	P0967	test enables all LSO's one by one. If this LSO reports short to ground while it is disabled and 1 other LSO is enabled and vice versa, both LSO's are shorted together. This will be saved to nvm at shutdown. At startup the nvm info will be read and the DTC will be set.	TLE8242 component/driver diagnostic status for this LSO	=	Short to ground	Enable Conditions:	System not in safe state	= Tı	ue	Runs at shutdown	Α
			LSO turned off Other LSO on AND	=	True True		Battery voltage Battery voltage Engine Status	> 87 < 18 != Crai	50 mV D00 mV Iking		
			TLE8242 component/driver diagnostic status for another LSO The other LSO turned OFF	=	Short to ground True		Key Status	!= S1	ор		
			This LSO is turned on	=	True	Debounce:	Fail confirmation time	>= 1	50 ms		
		Character a stable construction of a data data should be an The				Disable Conditions:		P0882	P0883		
Odd Clutch Redundant Shutdown Valve	P0971	Short to neignbour is checked at shutdown. The test enables all LSO's one by one. If this LSO reports short to ground while it is disabled and 1 other LSO is enabled and vice versa, both LSO's are shorted together. This will be saved to nvm at shutdown. At startup the nvm info will be read and the DTC will be set.	TLE8242 component/driver diagnostic status for this LSO	=	Short to ground	Enable Conditions:	System not in safe state	= Tr	ue	Runs at shutdown	А
			LSO turned off Other LSO on	=	True True		Battery voltage Battery voltage	> 87 < 18	50 mV 000 mV		
			AND				Engine Status	!= Crai	iking		
			another LSO	=	Short to ground		Key Status	!= St	ор		
			The other LSO turned OFF This LSO is turned on	=	True True	Debounce:	Fail confirmation time	>= 1	00 ms		
						Disable Conditions:		P0882	P0883		
Even Clutch Redundant		Short to neighbour is checked at shutdown. The test enables all LSO's one by one. If this LSO reports short to ground while it is disabled and 1 other LSO is enabled and vice versa, both LSO's are shorted together. This will be saved to nvm at shutdown. At startup the nvm info will be read	TLE8242 component/driver diagnostic status for this LSO	=	Short to ground	Enable Conditions:	System not in safe state	= Tı	ue	Runs at shutdown	Α
Shutdown Valve	P2721	and the DTC will be set.	LSO turned off Other LSO on TI F8242 component/driver diagnostic status for	=	True True		Battery voltage Battery voltage Engine Status	> 87 < 18 != Crai	50 mV 000 mV Iking		
			another LSO	=	Short to ground		Key Status	!= St	ор		
			The other LSO turned OFF This LSO is turned on	=	True True	Debounce:	Fail confirmation time	>= 1	00 ms		

		Short to neighbour is checked at shutdown. The			Disable Conditions:		P0882, P088	3		
System Pressure Pilot Valve	P2730	Into the legislound is checked a structown. The test enables all LSO's one by one. If this LSO reports short to ground while it is disabled and 1 other LSO is enabled and vice versa, both LSO's are shorted together. This will be saved to nvm at shutdown. At startup the nvm info will be read and the DTC will be set.	TLE8242 component/driver diagnostic status for this LSO	= Short to ground	Enable Conditions:	System not in safe state	= True		Runs at shutdown	A
			LSO turned off	= True		Battery voltage	> 8750	mV		
			Other LSO on	= True		Battery voltage	< 18000	mV		
			AND			Engine Status	!= Cranking			
			TLE8242 component/driver diagnostic status for another LSO	= Short to ground		Key Status	!= Stop			
			This ISO is turned on	= True	Debounce	Fail confirmation time	>= 150	ms		
				- 1100	bebounce.		- 150	1115		
		Short to peighbour is checked at shutdown. The			Disable Conditions:		P0882, P088	3		
Synchronizer Actuation Valve 1	P08CB	Short to heighbour is checked at shutdown. The test enables all LSO's one by one. If this LSO reports short to ground while it is disabled and 1 other LSO is enabled and vice versa, both LSO's are shorted together. This will be saved to nvm at shutdown. At startup the nvm info will be read and the DTC will be set.	TLE8242 component/driver diagnostic status for this LSO	= Short to ground	Enable Conditions:	System not in safe state	= True		Runs at shutdown	А
			LSO turned off	= True		Battery voltage	> 8750	mV		
			Other LSO on	= True		Battery voltage	< 18000	mV		
			AND			Engine Status	!= Cranking			
			another LSO	= Short to ground		Key Status	!= Stop			
			The other LSO turned OFF	= True						
			This LSO is turned on	= True	Debounce:	Fail confirmation time	>= 150	ms		
					Disable Conditions:		P0882, P088	3		
Synchronizer Actuation Valve 2	P27C0	Short to neighbour is checked at shutdown. The test enables all LSO's one by one. If this LSO reports short to ground while it is disabled and 1 other LSO is enabled and vice versa, both LSO's are shorted together. This will be saved to nvm at shutdown. At startup the nvm info will be read and the DTC will be set.	TLE8242 component/driver diagnostic status for this LSO	= Short to ground	Enable Conditions:	System not in safe state	= True		Runs at shutdown	A
			LSO turned off	= True		Battery voltage	> 8750	mV		
			Other LSO on	= True		Battery voltage	< 18000	mV		
			AND			Engine Status	!= Cranking			
			another LSO	= Short to ground		Key Status	!= Stop			
			The other LSO turned OFF This LSO is turned on	= True = True	Debounce:	Fail confirmation time	>= 150	ms		
					Disable Conditions:		P0882, P088	3		
		Short to neighbour is checked at shutdown. The								
Synchronizer Actuation Valve 3	P27C8	test enables all LSO's one by one. If this LSO reports short to ground while it is disabled and 1 other LSO is enabled and vice versa, both LSO's are shorted together. This will be saved to nvm at shutdown. At startup the nvm info will be read and the DTC will be set.	TLE8242 component/driver diagnostic status for this LSO	= Short to ground	Enable Conditions:	System not in safe state	= True		Runs at shutdown	A
			LSO turned off	= True		Battery voltage	> 8750	mV		
			Other LSO on	= True		Battery voltage	< 18000	mV		
			AND TLE8242 component/driver diagnostic status for	= Short to ground		Engine Status Key Status	!= Cranking != Stop			
			The other LSO turned OFF	= True						
			This LSO is turned on	= True	Debounce:	Fail confirmation time	>= 150	ms		

						Disable Conditions:		P0883	0883		
		Short to neighbour is checked at shutdown. The				Disable conditions.		F0002,	0005		
Synchronizer Actuation	52750	test enables all LSO's one by one. If this LSO reports short to ground while it is disabled and 1 other LSO is enabled and vice versa, both LSO's are shorted together. This will be saved to nvm at shutdown. At startup the nvm info will be read	TLE8242 component/driver diagnostic status for this LSO	= Short t	o ground	Enable Conditions:	System not in safe state	= Tru	2	Runs at shutdown	А
Valve 4	P27D0	and the DTC will be set.	LSQ turned off	= т	rue		Battery voltage	> 875) mV		
			Other LSO on	= T	rue		Battery voltage	< 180	0 mV		
			AND TLE8242 component/driver diagnostic status for				Engine Status	!= Crank	ing		
			another LSO	= Short t	o grouna		Key Status	!= 5to)		
			This LSO is turned on	= T	rue	Debounce:	Fail confirmation time	>= 15	ms		
						Disable Conditions:		P0882.	0883		
		Short to neighbour is checked at shutdown. The						,			
Synchronizer Actuation		reports short to ground while it is disabled and 1 other LSO is enabled and vice versa, both LSO's are shorted together. This will be saved to nvm at shutdown. At startup the nvm info will be read	TLE8242 component/driver diagnostic status for this LSO	= Short t	o ground	Enable Conditions:	System not in safe state	= Tru	2	Runs at shutdown	А
Valve 5	P27D8	and the DTC will be set.		-			Dettermine				
			Other LSO on	= I = T	rue		Battery voltage Battery voltage	< 8/5 < 180	0 mV 10 mV		
			AND				Engine Status	!= Cranl	ing		
			another LSO	= Short t	o ground		Key Status	!= Sto)		
			The other LSO turned OFF This LSO is turned on	= T = T	rue	Debounce:	Fail confirmation time	>= 15	ms		
		Short to neighbour is checked at shutdown. The				Disable Conditions:		P0882,	0883		
Selector pilot valve	P2830	test enables all LSO's one by one. If this LSO reports short to ground while it is disabled and 1 other LSO is enabled and vice versa, both LSO's are shorted together. This will be saved to nvm at shutdown. At startup the nvm info will be read and the DTC will be set.	TLE8242 component/driver diagnostic status for this LSO	= Short t	o ground	Enable Conditions:	System not in safe state	= Tru	2	Runs at shutdown	A
			LSO turned off Other LSO on	= T = T	rue		Battery voltage Battery voltage	> 875	0 mV 10 mV		
			AND				Engine Status	!= Crank	ing		
			TLE8242 component/driver diagnostic status for another LSO	= Short t	o ground		Key Status	!= Sto	0		
			The other LSO turned OFF This LSO is turned on	= T = T	rue	Debounce:	Fail confirmation time	>= 10	ms		
		Short to neighbour is checked at shutdown. The				Uisable Conditions:		20882,	085		
Clutch Cooling Valve	P2739	test enables all LSO's one by one. If this LSO reports short to ground while it is disabled and 1 other LSO is enabled and vice versa, both LSO's are shorted together. This will be saved to nvm at shutdown. At startup the nvm info will be read and the DTC will be set.	TLE8242 component/driver diagnostic status for this LSO	= Short t	o ground	Enable Conditions:	System not in safe state	= Tru	2	Runs at shutdown	A
			LSO turned off	= T	rue		Battery voltage	> 875	0 mV		
			AND	= T	rue		Battery voitage Engine Status	< 180 != Crank	iu mv ing		
			TLE8242 component/driver diagnostic status for another LSO	= Short t	o ground		Key Status	!= Sto	0		
			The other LSO turned OFF This LSO is turned on	= T = T	rue	Debounce:	Fail confirmation time	>= 15	ms		

						Disable Conditions			0000 00000	l		l
		Short to neighbour is checked at shutdown. The				Disable conditions.			F0882, F0885			
Limited Slip Differential Proportional Pressure		test enables all LSO's one by one. If this LSO reports short to ground while it is disabled and 1 other LSO is enabled and vice versa, both LSO's are shorted together. This will be saved to nvm at shutdown. At startup the nvm info will be read	TLE8242 component/driver diagnostic status for this LSO	=	Short to ground	Enable Conditions:	System not in safe state	=	True		Runs at shutdown	В
Valve	P2815	and the DTC will be set.	ISO turned off	-	True		Battery voltage	`	8750	m\/		l
			Other LSO on	=	True		Battery voltage	<	18000	mV		l
			AND TLE8242 component/driver diagnostic status for				Engine Status	!=	Cranking			I
			another LSO	=	Short to ground		Key Status	!=	Stop			I
			The other LSO turned OFF This LSO is turned on	=	True True	Debounce:	Fail confirmation time	>=	150	ms		l
						Disable Conditions:			DU663 DU663			l
		Short to neighbour is checked at shutdown. The				Disable conditions.			PU662, PU665			
Limited Slip Differential Redundant Shutdown		test enables all LSO's one by one. If this LSO reports short to ground while it is disabled and 1 other LSO is enabled and vice versa, both LSO's are shorted together. This will be saved to nvm at shutdown. At startup the nvm info will be read	TLE8242 component/driver diagnostic status for this LSO	=	Short to ground	Enable Conditions:	System not in safe state	=	True		Runs at shutdown	В
Valve	P281E	and the DTC will be set.	ICO turned off	_	True		Dattanuskana		0750			l
			Other LSO on	=	True		Battery voltage	<	18000	mV		l
			AND				Engine Status	!=	Cranking			l
			another LSO	=	Short to ground		Key Status	!=	Stop			I
			The other LSO turned OFF This LSO is turned on	=	True True	Debounce:	Fail confirmation time	>=	150	ms		I
												l
		Short to neighbour is checked at shutdown. The				Disable Conditions:			P0882, P0883			[
Parking Lock Engaging Valve	P2827	test enables all LSO's one by one. If this LSO reports short to ground while it is disabled and 1 other LSO is enabled and vice versa, both LSO's are shorted together. This will be saved to nvm at shutdown. At startup the nvm info will be read and the DTC will be set.	TLE8242 component/driver diagnostic status for this LSO	=	Short to ground	Enable Conditions:	System not in safe state	=	True		Runs at shutdown	В
			LSO turned off	=	True		Battery voltage	>	8750	mV		I
			AND	-	ITue		Engine Status	!=	Cranking	IIIV		l
			TLE8242 component/driver diagnostic status for another LSO	=	Short to ground		Key Status	!=	Stop			l
			The other LSO turned OFF	=	True	Deheureer	Fail confirmation time		150			l
				-	ITue	Debounce:	Fail commation time	>=	150	ms		l
		Short to neighbour is checked at shutdown. The		-		Disable Conditions:			P0882, P0883		 	
Parking Lock Hold Solenoid	P18A4	test enables all LSO's once to versative with LSO reports short to ground while it is disabled and 1 other LSO is enabled and vice versa, both LSO's are shorted together. This will be saved to nvm at shutdown. At startup the nvm info will be read and the DTC will be set.	TLE8242 component/driver diagnostic status for this LSO	=	Short to ground	Enable Conditions:	System not in safe state	=	True		Runs at shutdown	В
			LSO turned off	=	True		Battery voltage	>	8750	mV		l
			Other LSO on AND	=	True		Battery voltage Engine Status	< !=	18000 Cranking	mV		l
			TLE8242 component/driver diagnostic status for	=	Short to ground		Key Status	!=	Stop			
			The other LSO turned OFF	=	True							
1			This LSO is turned on	=	True	Debounce:	Fail confirmation time	>=	150	ms	i l	1

Disa	isable Conditions:	P0882, P0883	

Component/System	Fault Code	Monitor Strategy Description	Malfunction Criteria		Threshold Value			Secondary Parameters		Enable Conditions		Time Required	MIL illum.
Longitudinal acceleration sensor out- of-range high	C0554	This diagnostic detects an out of range high fault with the longitudinal acceleration sensor.	Longitudinal acceleration value from CAN	>=	3.8501743386815117	g	Enable conditions	Longitudinal acceleration data available on CAN	=	True		Runs Continuously	с
		I he data from the acceleration sensor is received over CAN. If the acceleration sensor value received from						Diagnostic reset event	=	False			
		CAN is higher than threshold for too long during a sampling window, the sensor is diagnosed out of range high.						Application state is unequal to error state	=	True			
								Application state is unequal to bypass state	=	True			
							Fault confirmation	Stability timer before increasing the fault timer Fault confirmation timer Diagnostic sampling time window	>= >= =	30000 75000 120000	ms ms ms		
Longitudinal acceleration sensor out- of-range low	C0553	This diagnostic detects an out of range low fault with the longitudinal acceleration sensor.	Longitudinal acceleration value from CAN	<=	-3.8501743386815117	g	Enable conditions	Longitudinal acceleration data available on CAN	=	True		Runs Continuously	с
		The data from the acceleration sensor is received over CAN.						Diagnostic reset event	=	False			
		If the acceleration sensor value received from CAN is low than threshold for too long during a sampling window, the sensor is diagnosed out of range low						Application state is unequal to error state	=	True			
								Application state is unequal to bypass state	=	True			
							Fault confirmation	Stability timer before increasing the fault timer Fault confirmation timer Diagnostic sampling time window	>= >= =	30000 75000 120000	ms ms ms		
Lateral acceleration sensor out-of-range high	C0698	This diagnostic detects an out of range high fault with the lateral acceleration sensor.	Lateral acceleration value from CAN	>=	3.8501743386815117	g	Enable conditions	Lateral acceleration data available on CAN	=	True		Runs Continuously	с
		The data from the acceleration sensor is received over CAN.						Diagnostic reset event	=	False			
		If the acceleration sensor value received from CAN is higher than threshold for too long during a sampling window, the sensor is diagnosed out of range high						Application state is unequal to error state	=	True			
								Application state is unequal to bypass state	=	True			
							Fault confirmation	Stability timer before increasing the fault timer	>=	30000	ms		
								Fault confirmation timer Diagnostic sampling time window	>= =	75000 120000	ms ms		
Lateral acceleration sensor out-of-range low	C0697	This diagnostic detects an out of range low fault with the lateral acceleration sensor.	Lateral acceleration value from CAN	<=	-3.8501743386815117	g	Enable conditions	Lateral acceleration data available on CAN	=	True		Runs Continuously	с
		The data from the acceleration sensor is received over CAN.						Diagnostic reset event	=	False			
		CAN is low than threshold for too long during a sampling window, the sensor is diagnosed out of range low						Application state is unequal to error state	=	True			
								Application state is unequal to bypass state	=	True			

		50	oult confirmation	Stability timer before increasing the		20000		1	1
		ra	ault confirmation	fault timer	>=	30000	ms	1	
				Fault confirmation timer	>=	75000	ms	1	
				Diagnostic sampling time window	=	120000	ms		

Component/System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Tł	hreshold Value			Secondary Parameters		Enable Conditions		Time Required	MIL illum.
Longitudinal acceleration sensor stuck at high value	C0552	This diagnostic detects a stuck at high value fault with the longitudinal acceleration sensor.	Absolute difference between Longitudinal acceleration value from CAN and longitudinal acceleration based on wheel/ouput speed data.	>= 0.530	00149496868873	g	Enable conditions	Longitudinal acceleration data available on CAN	=	True		Runs Continuously	C
		over CAN and compared to the calculated longitudinal acceleration based on wheel/output speed data under certain driving conditions. If the difference between the longitudinal acceleration from the sensor versus the						Diagnostic reset event	=	False			
		longitudinal acceleration calculated is too high for too long during the sample window of the diagnostic, the longitudinal acceleration sensor is diagnosed stuck at high value.						Application state is unequal to error state	=	True			
								Application state is unequal to bypass state	=	True			
								range high electrical fault active	=	False			
								range low electrical fault active Absolute Vehicle speed	= >=	False 15	kph		
							Fault confirmation	Stability timer before increasing the fault timer	>=	10000	ms		
								Stability timer decrease rate when vehicle conditons are not met	=	20	ms		
								Fault confirmation timer Diagnostic sampling time window	>= =	75000 120000	ms ms		
Lateral acceleration sensor stuck at high value	C0699	This diagnostic detects a stuck at high value fault with the lateral acceleration sensor. The data from the acceleration sensor is received	Absolute lateral acceleration value from CAN	>= 0.530	00149496868873	g	Enable conditions	Lateral acceleration data available on CAN	=	True		Runs Continuously	С
		over CAN and compared to a threshold under certain driving conditions. If the lateral acceleration sensor is reading a too						Diagnostic reset event	=	False			
		high value for too long during the sample window of the diagnostic, the lateral acceleration sensor is diagnostic stuck at high value.						Application state is unequal to error state	=	True			
								Application state is unequal to bypass state	=	True			
								Lateral acceleration out-of-range high electrical fault active	=	False			
								low electrical fault active	=	False			
								Absolute clutch slip for driving gear	<=	100	rpm		
								Brake pedal	<=	1	% Nm		
								Absolute Vehicle speed	>=	15	kph		
								Absolute Vehicle speed	<=	200	kph		
								Longitudinal acceleration based on wheel/output speed	>=	0.100049779195 21446	g		
								Longitudinal acceleration based on wheel/output speed	<=	0.530014949686 8873	g		
							Fault confirmation	Stability timer before increasing the fault timer	>=	30000	ms		

		Stability timer decrease rate when		22		1	Í
		vehicle conditons are not met	=	20	ms		
		Fault confirmation timer	>=	75000	ms		
		Diagnostic sampling time window	=	120000	ms		

Component/System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters		Enable Conditions		Time Required	MIL illum.
Auxiliary Pump	P2797	The auxiliary pump controller reports detected faults to the transmission controller on a dedicated CAN bus.	Transmission auxiliary pump reports one of the following faults via EPUMP1.RawDrvSts	Internal temperature sensor out-of- range	Engine cranking	=	False		Runs continuously	В
		The transmission controller considers enable conditions and confirmation time to store the auxilary pump controller faults DTC.		External temperature sensor out-of- range	Key Status	!=	Off			
					TCM battery voltage too low	!=	True			
					EPUMP_1 message fault detected	=	False			
					Supply voltage for auxiliary pump controller low (1), see Summary table attachments C SID ASY, CMP ALIX PMP	=	False			
					Fault confirmation time:	=	0	ms		
			Transmission auxiliary pump reports one of the following faults via EPUMP1.DiagSts	= Stalled due to Short-Circuit within the Actuator uC	Engine cranking	=	False			
				Motor Over-Current Fault	Key Status	!=	Off			
					TCM battery voltage too low	!=	True			
					EPUMP_1 message fault detected	=	False			
					Supply voltage for auxiliary pump					
					controller low (1), see Summary	=	False			
					table attachments					
					C_SID_ASV_CMP_AUX_PMP Fault confirmation time:	_	0	mc		
	1	1			Faut commution time.	-	0	1115		

Component/System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Tł	hreshold Value			Secondary Parameters	Er Co	nable onditions		Time Required	MIL illum.
Paddle Plus Stuck Switches	P0815	The diagnostic detects if the upshift paddle is pulled too long indicating a stuck switch. If times how long voltage is measured within the paddle pulled voltage window.	Paddle plus analogue input voltage	>=	2200	mV	Enable Conditions:	Electrical fault for paddle plus detected	=	False		Runs Continuously	с
			Paddle plus analogue input voltage	<=	3520	mV		Diagnostic reset event Application state is unequal to error state	=	False True			
								Application state is unequal to bypass state	=	True			
								Paddle min analogue input voltage is outside paddle min pressed voltage (3), see Summary table attachments C_SID_ASV_CMP_PADDLE	=	True			
							Fault confirmation time:			120000	ms		
Paddle Plus plausibility	P2775	The diagnostic detects if the upshift paddle not within valid voltage windows for a certain time. The acceptable voltage windows correspond to the paddle being pulled or being released.	Paddle plus analogue input voltage is outside paddle plus pressed voltage (1), see Summary table attachments C_SID_ASV_CMP_PADDLE	=	True		Enable Conditions:	Electrical fault for paddle plus detected	=	False		Runs Continuously	с
			Paddle plus analogue input voltage is outside paddle plus released voltage (2), see Summary table attachments C SID ASV CMP PADDLE	=	True			Diagnostic reset event	=	False			
								Application state is unequal to error state	=	True			
								Application state is unequal to bypass state	=	True			
							Fault confirmation time:			2000	ms		
Paddle Min Stuck Switches	P0816	The diagnostic detects if the downshift paddle is pulled too long indicating a stuck switch. If times how long voltage is measured within the paddle pulled voltage window.	Paddle min analogue input voltage	>=	2200	mV	Enable Conditions:	Electrical fault for paddle min detected	=	False		Runs Continuously	с
		, 	Paddle min analogue input voltage	<=	3520	mV		Diagnostic reset event Application state is unequal to error	=	False			
								state Application state is unequal to	=	True			
								Paddle plus analogue input voltage is outside paddle plus pressed	_	True			
								attachments C_SID_ASV_CMP_PADDLE	-	nue			
							Fault confirmation time:			120000	ms		
Paddle Min plausibility	P2779	The diagnostic detects if the downshift paddle not within valid voltage windows for a certain time. The acceptable voltage windows correspond to the paddle being pulled or being released.	Paddle min analogue input voltage is outside paddle min pressed voltage (3), see Summary table attachments C_SID_ASV_CMP_PADDLE	=	True		Enable Conditions:	Electrical fault for paddle min detected	=	False		Runs Continuously	с
			Paddle min analogue input voltage is outside paddle min released voltage (4), see Summary table attachments C SID ASV CMP PADDI F	=	True			Diagnostic reset event	=	False			
								Application state is unequal to error state	=	True			

			Application state is unequal to bypass state	=	True		
		Fault confirmation time:			2000	ms	

Component/System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value		Secondary Parameters	(Enable Conditions	Time Required	MIL illum.
Selector pilot valve hydraulically stuck on	P282A	This diagnostic detects a hydraulically stuck on selector pilot valve. This is by use of the synchronizer recovery routine which is triggered by the setting of a gear system or compoment diagnostic failure. The recovery routine uses the synchronizer integrity routine which performs small rod movement actuations and evaluates the actual rod movements cause by this.	Selector mechanism confirmed hydraulically stuck on by synchronizer integrity routine	= True	Enable Conditions:	Synchronizer integrity intrusive routine triggered by the synchronizer recovery routine (1), see Summary table attachments C_SID_ASV_CMP_SEL_SY	=	True	Runs continuously	в
		When a rod movement is detected for a rod corresponding to the inverse position of the selector target positon corresponding to the test case, the selector mechanism is determined to be stuck. If the selector target postion was hydraulic off during the test case, and the actual rod	Current profile consistently indicates fail for selector pilot valve current profile check	= True		Synchronizer integrity routine running conditions (2), see Summary table attachments C_SID_ASV_CMP_SEL_SY	=	True		
		movement show movement corresponding to the selector mechanism in the hydraulic on position, the selector mechanism is considered hydrualically faulted stuck on.				Cooler out temperature	>=	40 °C		
		To further pinpoint the actual failed component within the selector mechanism either the selector pilot valve or the selector spool for the corresponding clutch shaft, the current profile check feature of the current driver is used. If the current profile check for the selector pilot valve consistenly indicates a fail, the selector pilot valve is diagnosed hydraulically stuck on.	Fault condition for synchronizer integrity test case selector mechanism stuck on detection: Selector target position for the test case	= Hydraulic off	Fault confirmation	Selector mechansim hydraulically stuck on detected by synchronizer integrity test cases (3) confirmation counter, see Summary table attachments C_SID_ASV_CMP_SEL_SY	>=	2 count		
			Rod movement in intended move direction during a synchronizer integrity test case (6), see Summary table attachments C_SID_ASA_CMP_SEL_SY Complement rod movement for actuated shift solenoid during a test case (6), see Summary table attachments C_SID_ASV_CMP_SEL_SY	<= 100 μm > 100 μm		Synchronizer integrity selector stuck off fault test suite confirmation runs Selector pilot valve current profile check fail confirmation counter	= >=	3 count 3 count		
Selector pilot valve hydraulically stuck off	P2829	This diagnostic detects a hydraulically stuck off selector pilot valve. This is by use of the synchronizer recovery routine which is triggered by the setting of a gear system or compoment diagnostic failure. The recovery routine uses the synchronizer integrity routine which performs small rod movement actuations and evaluates the actual rod movements cause by this. When a rod movement is detected for a rod	Selector mechanism confirmed stuck off by synchronizer integrity routine	= True	Enable Conditions:	Synchronizer integrity intrusive routine triggered by the synchronizer recovery routine (1), see Summary table attachments C_SID_ASV_CMP_SEL_SY	=	True	Runs continuously	в
		corresponding to the inverse position of the selector target positon corresponding to the test case, the selector mechanism is determined to be stuck. If the selector target postion was hydraulic on during the test case and the actual rod movement show movement corresponding to the selector mechanism in the hydraulic off position, the selector mechanism is considered hydrualically faulted stuck off.	Current profile consistently indicates fail for selector pilot valve current profile check	= True		synchronizer integrity routine running conditions (2), see Summary table attachments C_SID_ASV_CMP_SEL_SY Cooler out temperature	=	True 40 °C		

		To further pinpoint the actual failed component within the selector mechanism either the selector pilot valve or the selector spool for the corresponding clutch shaft, the current profile check feature of the current driver is used.	Fault condition for synchronizer integrity test case selector mechanism stuck off detection:					Selector mechansim hydraulically stuck on detected by synchronizer					
		If the current profile check for the selector pilot valve consistenly indicates a fail, the selector pilot valve is diagnosed hydraulically stuck off.	Selector target position for the test case	=	Hydraulic on		Fault confirmation	contrination counter, see Summary table attachments C_SID_ASV_CMP_SEL_SY	>=	2	count		
			Rod movement in intended move direction during a synchronizer integrity test case (6), see Summary table attachments C_SID_ASV_CMP_SEL_SY	<=	100	μm		Synchronizer integrity selector stuck off fault test suite confirmation runs	=	3	count		
			Complement rod movement for actuated shift solenoid during a test case (6), see Summary table attachments C_SID_ASV_CMP_SEL_SY	>	100	μm		Selector pilot valve current profile check fail confirmation counter	>=	3	count		
elector valve 1 ydraulically stuck on	P1956	This diagnostic detects a hydraulically stuck on selector pilot valve. This is by use of the synchronizer recovery routine which is triggered by the setting of a gear system or compoment diagnostic failure. The recovery routine uses the synchronizer integrity routine which performs small rod movement actuations and evaluates the actual rod movements cause by this. When a rod movement is detected for a rod corresponding to the inverse position of the	Selector mechanism confirmed hydraulically stuck on by synchronizer integrity routine	Ξ	True		Enable Conditions:	Synchronizer integrity intrusive routine triggered by the odd clutch shaft synchronizer recovery routine (1), see Summary table attachments C_SID_ASV_CMP_SEL_SY Odd clutch shaft synchronizer	=	True		Runs continuously	В
		selector target positon corresponding to the test case, the selector mechanism is determined to be stuck. If the selector target postion was hydraulic off during the test case and the actual rod movement show movement corresponding to the selector mechanism in the hydraulic on position. the selector mechanism is considered	selector pilot valve current profile check	=	True			integrity routine running conditions (2), see Summary table attachments C_SID_ASV_CMP_SEL_SY	= >=	True 40	°C		
		hydrualically faulted stuck on. To further pinpoint the actual failed component within the selector mechanism either the selector pilot valve or the selector spool for the corresponding clutch shaft, the current profile check feature of the current driver is used.	Fault condition for synchronizer integrity test case selector mechanism stuck on detection:					Cooler out temperature					
		If the current profile check for the selector pilot valve consistenly indicates a pass the selector spool corresponding with the tested clutch shaft is diagnosed hydraulically stuck on.	Selector target position for the test case	-	Hydraulic off		Fault confirmation	Selector mechansim hydraulically stuck on detected by synchronizer integrity test cases (3) confirmation counter, see Summary table attachments C. SID. ASY. CMP. SEL. SY.	>=	2	count		
			Rod movement in intended move direction during a synchronizer integrity test case (6), see Summary table attachments	<=	100	μm		Synchronizer integrity selector stuck		-	count		
			IC_SID_ASV_CMP_SEL_SY Complement rod movement for actuated shift solenoid during a test case (6), see Summary table attachments C_SID_ASV_CMP_SEL_SY	>	100	μm		on rauit test suite confirmation runs Selector pilot valve current profile check fail confirmation counter	= >=	3	count		

		_					_						
Selector valve 1 hydraulically stuck off	P1957	This diagnostic detects a hydraulically stuck on selector pilot valve. This is by use of the synchronizer recovery routine which is triggered by the setting of a gear system or compoment diagnostic failure. The recovery routine uses the synchronizer integrity routine which performs small rod movement actuations and evaluates the actual rod movements cause by this. When a rod movement is detected for a rod corresponding to the inverse position of the selector target positon corresponding to the test case, the selector mechanism is determined to be stuck. If the selector target postion was hydraulic off during the tot case and the actual rod mode	Selector mechanism confirmed hydraulically stuck off by synchronizer integrity routine Current profile consistently indicates pass for selector pilot valve current profile check	=	True		Enable Conditions:	Synchronizer integrity intrusive routine triggered by the odd clutch shaft synchronizer recovery routine (1), see Summary table attachments C_SID_ASV_CMP_SEL_SY Odd clutch shaft synchronizer integrity routine running conditions (2), see Summary table attachments C_SID_ASV_CMP_SEL_SY	=	True		Runs continuously	В
		during the test case and the actual rod movement show movement corresponding to the selector mechanism in the hydraulic on position, the selector mechanism is considered hydraulically faulted stuck on.						Cooler out temperature	>=	40	°C		
		To further pinpoint the actual failed component within the selector mechanism either the selector pilot valve or the selector spool for the corresponding clutch shaft, the current profile	Fault condition for synchronizer integrity test										
		If the current profile check for the selector pilot valve consistenly indicates a pass the selector spool corresponding with the tested clutch shaft	case selector mechanism stuck on detection.				Fault confirmation	Selector mechansim hydraulically stuck on detected by synchronizer integrity test cases (3) confirmation counter, see Summary table attachments					
		is diagnosed hydraulically stuck off.	Selector target position for the test case Rod movement in intended move direction during a synchronizer integrity test case (6), see	= <=	Hydraulic on 100	um		C_SID_ASV_CMP_SEL_SY	>=	2	count		
			Summary table attachments C_SID_ASV_CMP_SEL_SY Complement rod movement for actuated shift solenoid during a test case (6), see Summary	>	100	μm		Synchronizer integrity selector stuck off fault test suite confirmation runs Selector pilot valve current profile	= >=	3 3	count count		
			table attachments C_SID_ASV_CMP_SEL_SY					check fail confirmation counter					
Selector valve 2 hydraulically stuck on	P1958	This diagnostic detects a hydraulically stuck on selector pilot valve. This is by use of the synchronizer recovery routine which is triggered by the setting of a gear system or compoment diagnostic failure. The recovery routine uses the synchronizer integrity routine which performs small rod movement actuations and evaluates the actual rod movement is detected for a rod	Selector mechanism confirmed hydraulically stuck on by synchronizer integrity routine	=	True		Enable Conditions:	Synchronizer integrity intrusive routine triggered by the even clutch shaft synchronizer recovery routine (1), see Summary table attachments C_SID_ASV_CMP_SEL_SY	=	True		Runs continuously	в
		corresponding to the inverse position of the selector target positon corresponding to the test case, the selector mechanism is determined to be stuck. If the selector target postion was hydraulic off during the test case and the actual rod	Current profile consistently indicates pass for selector pilot valve current profile check	=	True			Even clutch shaft synchronizer integrity routine running conditions (2), see Summary table attachments C_SID_ASV_CMP_SEL_SY	=	True			
		the selector mechanism in the hydraulic on position, the selector mechanism is considered hydrualically faulted stuck on.						Cooler out temperature	>=	40	°C		

		To further pinpoint the actual failed component											
		within the selector mechanism either the selector pilot valve or the selector spool for the corresponding clutch shaft, the current profile corresponding clutch shaft, the current profile sheal for the selector of the sum of the selector set of the set o	Fault condition for synchronizer integrity test										
		check feature of the current driver is used.	case selector mechanism stuck on detection:					Selector mechansim hydraulically stuck on detected by synchronizer					
		valve consistently indicates a pass the selector pilot spool corresponding with the tested clutch shaft is diagnosed hydraulically stuck on.	Selector target position for the test case	-	Hydraulic off		Fault confirmation	counter, see Summary table attachments C. SID. ASV. CMP. SEL. SY	>=	2	count		
			Rod movement in intended move direction during a synchronizer integrity test case (6), see	<=	100	μm		Synchronizer integrity selector stuck		-			
			C_SID_ASV_CMP_SEL_SY Complement rod movement for actuated shift		100			off fault test suite confirmation runs	=	3	count		
			solenoid during a test case (6), see Summary table attachments C_SID_ASV_CMP_SEL_SY	>	100	μm		check fail confirmation counter	>=	3	count		
		This diagnostic detects a hydraulically stuck on selector pilot valve. This is by use of the synchronizer recovery routine which is triggered											
		by the setting of a gear system or compoment diagnostic failure. The recovery routine uses the synchronizer integrity routine which performs	Selector mechanism confirmed hydraulically stuck off by synchronizer integrity routine	=	True		Enable Conditions:	Synchronizer integrity intrusive routine triggered by the even clutch shaft synchronizer recovery routine		True			
elector valve 2 ydraulically stuck off	P1959	small rod movement actuations and evaluates the actual rod movements cause by this. When a rod movement is detected for a rod						(1), see Summary table attachments C_SID_ASV_CMP_SEL_SY	=			Runs continuously	В
		corresponding to the inverse position of the selector target positon corresponding to the test case, the selector mechanism is determined to be stuck	Current profile consistently indicates pass for selector pilot valve current profile check	=	True			Even clutch shaft synchronizer integrity routine running conditions (2), see Summary table attachments C_SID_ASV_CMP_SEL_SY	=	True			
		If the selector target postion was hydraulic off during the test case and the actual rod movement show movement corresponding to						0_00_00_00		40	*		
		the selector mechanism in the hydraulic on position, the selector mechanism is considered hydrualically faulted stuck on.						Cooler out temperature	>=	40	ι,		
		To further pinpoint the actual failed component within the selector mechanism either the selector pilot valve or the selector spool for the											
		corresponding clutch shaft, the current profile check feature of the current driver is used.	Fault condition for synchronizer integrity test case selector mechanism stuck off detection:					Selector mechansim hydraulically					
		If the current profile check for the selector pilot valve consistenly indicates a pass the selector					Fault confirmation	stuck on detected by synchronizer integrity test cases (3) confirmation counter, see Summary table					
		spool corresponding with the tested clutch shaft is diagnosed hydraulically stuck off.	Selector target position for the test case Rod movement in intended move direction	=	Hydraulic on			attachments C_SID_ASV_CMP_SEL_SY	>=	2	count		
			auring a synchronizer integrity test case (6), see Summary table attachments C_SID_ASV_CMP_SEL_SY	<=	100	μm		Synchronizer integrity selector stuck off fault test suite confirmation runs	=	3	count		
			solenoid during a test case (6), see Summary table attachments C_SID_ASV_CMP_SEL_SY	>	100	μm		Selector pilot valve current profile check fail confirmation counter	>=	3	count		

Component/System	Fault Code	Monitor Strategy Description	Malfunction Criteria		Threshold Value			Secondary Parameters		Enable Conditions		Time Required	MIL illum.
Park lock position		This diagnostic detects a parking lock position sensor consistency fault during parking lock	Parking lock logical position (1) , see Summary table attachments	!=	Open		Enable Conditions:	Parking lock actuation strategy	=	Parking lock open error strategy			
sensor consistency	P18E7	open error strategy. The parking lock open error strategy is used when electrical faults are present of when parking lock unintentionally engaged before, it keeps the parking lock disengaged by forcing high system pressure and setting the parking latching valve, engagement valve and hold solenoid to their respecitive parking lock disengaged states.	C_SID_ASV_CMP_SNS_POS_PLK Parking lock logical position (1) , see Summary table attachments C_SID_ASV_CMP_SNS_POS_PLK	!=	Hold			Parking lock engagement valve position target	=	Hydraulic On		Runs continuously	В
		If the parking lock is disengaged based on output/vehicle speed and the parking lock position sensor is reading something different from open or hold, the parking lock position sensor is diagnosed faulted.						Parking lock latching valve position target	=	Hydraulic On			
			Absolute vehicle speed	>	10	kph		Parking lock engagement valve logical position Parking lock latching valve logical	=	Hydraulic On Hydraulic On			
			Output speed	>	100	rpm		position Electrical fault detected for the parking lock position sensor	=	False			
								Measured system pressure System pressure sensor electrical	>	15 False	bar		
								System pressure sensor electrical fault detected	=	False			
								System pressure low confirmation timer	>=	100	ms		
							Fault confirmation time	Parking lock position sensor fault confirmation timer	>=	200	ms		
		This diagnostic detects a parking lock position senosr consistency fault during parking lock locked error strategy.	Parking lock logical position (1) , see Summary table attachments C_SID_ASV_CMP_SNS_POS_PLK	!=	Locked			Parking lock actuation strategy	=	Parking lock locked error strategy		Runs continuously	
		The parking lock locked error strategy is used when electrical faults are present of when parking lock unintentionally disengaged before, it keeps the parking lock engaged by forcing low system pressure and setting the parking latching valve, engagement valve and hold solenoid to their respecitive parking lock engaged states.	Parking lock logical position (1) , see Summary table attachments C_SID_ASV_CMP_SNS_POS_PLK	!=	Hold			Parking lock engagement valve position target	=	Hydraulic Off			
		If the parking lock position sensor is reading something different from locked or hold, the parking lock position sensor is diagnosed faulted.						Parking lock latching valve position target	=	Hydraulic Off			
								Parking lock engagement valve logical position Parking lock latching valve logical	=	Hydraulic Off			
								position Electrical fault detected for the	=	Hydraulic Off			
								parking lock position sensor Measured system pressure	<	8	bar		
								system pressure sensor electrical fault detected System pressure sensor electrical	=	False			
								fault detected System pressure low confirmation	=	False			
	l	I	1				1	timer	>=	100	ms		l

			Fault time	lt confirmation e	Parking lock position sensor fault confirmation timer	>=	100	ms	
This diagnostic detects a parking lock position sensor consistency fault during parking lock engage error strategy.	Parking lock logical position (1) , see Summary table attachments C_SID_ASV_CMP_SNS_POS_PLK	!= Locked			Parking lock actuation strategy	=	Parking lock engage error strategy		Runs continuously
The parking lock locked error strategy is used when electrical faults are present of when parking lock unintentionally disengaged before, it keeps the parking lock engaged by forcing low system pressure and setting the parking latching valve, engagement valve and hold solenoid to their respecitive parking lock engaged states.	Parking lock logical position (1) , see Summary table attachments C_SID_ASV_CMP_SNS_POS_PLK	!= Hold			Absolute vehicle speed	<	0.8125	kph	
If the parking lock position sensor is reading something different from locked or hold, the parking lock position sensor is diagnosed faulted					Parking lock latching valve position target	=	Hydraulic Off		
r					Parking lock engagement valve logical position Parking lock latching valve logical position Electrical fault detected for the parking lock position sensor Measured system pressure System pressure sensor electrical	= = = <	Hydraulic Off Hydraulic Off False 8	bar	
					fault detected System pressure sensor electrical fault detected	=	False False		
					System pressure low confirmation timer	>=	100	ms	
			Fault time	It confirmation e	Parking lock position sensor fault confirmation timer	>=	1000	ms	
This diagnostic detects a parking lock position sensor consistency fault during parking lock standstill engagement strategy. During the parking lock standstill engagement	Parking lock logical position (1) , see Summary table attachments C_SID_ASV_CMP_SNS_POS_PLK	= Open	Enab	ble Conditions:	Diagnostic reset event	=	False		Runs continuously
routine, the parking lock components are tested by first attempting to drain the parking lock piston by setting the parking lock latching valve to drain. The parking lock hold solenoid is set to the electrical off position immediately. When the parking lock engragement by use of the					Application state is unequal to error state	=	True		
parking lock latchting valve has succeeded or if parking lock engagement with parking lock latching valve attempt times out, the parking lock engagement valve is set to the hydraulic off position.					Application state is unequal to bypass state	=	True		
If both the parking lock latching valve and the parking lock engagement valve are set hydraulic off and the parking lock position sensor does not read locked, the system pressure is forced low to attempt parking lock engagement.					Electrical fault detected for the parking lock hold solenoid	-	False		
the parking lock position sensor still reads open the parking lock engagement valve is diagnosed					Electrical fault detected for the parking lock engagement valve	=	False		
rauiteo.					Electrical fault detected for the parking lock latching valve	=	False		

				Electrical fault detected for the parking lock stepper motor Electrical fault detected for the parking lock position sensor Parking lock actuation strategy Parking lock engagment valve logical position Parking lock latching valve logical position Measured system pressure System pressure sensor electrical fault detected System pressure sensor electrical fault detected System pressure low confirmation timer	= = = = = = =	False False Parking lock standstill engage strategy Hydraulic Off Hydraulic Off 8 False False 100	bar ms	
			Fault confirmation time	Parking lock forced low system pressure timer	>=	600	ms	
This diagnostic detects a parking lock position sensor consistency fault during parking lock low speed engagement strategy.	Parking lock logical position (1) , see Summary table attachments C_SID_ASV_CMP_SNS_POS_PLK	= Open	Enable Conditions:	Diagnostic reset event	=	False		Runs continuously
During the parking lock low speed engagement routine, the parking lock components are tested by first attempting to drain the parking lock piston by setting the parking lock latching valve to drain. The parking lock hold solenoid is kept in the electrical on position untill the vehicle speed falls below the parking lock engagement speed.				Application state is unequal to error state	=	True		
When the parking lock engagement by use of the parking lock latchting valve has succeeded or if parking lock engagement with parking lock latching valve attempt times out, the parking lock engagement valve is set to the hydraulic off position.				Application state is unequal to bypass state	=	True		
If both the parking lock latching valve and the parking lock engagement valve are set hydraulic off and the parking lock position sensor does not read locked, the system pressure is forced low to attempt parking lock engagement.				Electrical fault detected for the parking lock hold solenoid	=	False		
If at the end of the low system pressure phase, the parking lock position sensor still reads open the parking lock engagement valve is diagnosed faulted				Electrical fault detected for the parking lock engagement valve	=	False		
				Electrical fault detected for the parking lock latching valve Electrical fault detected for the	=	False		
				parking lock stepper motor Electrical fault detected for the	-	False		
				parking lock position sensor Parking lock actuation strategy	=	Parking lock low speed engage strategy		
				Parking lock engagment valve logical position	=	Hydraulic Off		
				Parking lock latching valve logical position	=	Hydraulic Off		i l

					Measured system pressure System pressure sensor electrical fault detected System pressure sensor electrical fault detected System pressure low confirmation timer	< = = >=	8 False False 100	bar ms	
				Fault confirmation	Parking lock forced low system	>=	600	ms	
This diagnostic detects a parking lock position sensor consistency fault during parking lock diagnostic disengage strategy at the initial disengagement. During the parking lock diagnostic	Parking lock logical position (1) , see Summary table attachments C_SID_ASV_CMP_SNS_POS_PLK	!=	Locked	Enable Conditions:	Diagnostic reset event	=	False		
disengagement routine, the parking lock components are tested by first disengaging the parking lock completely. This is done by setting both the parking lock latching valve and parking lock engagement valve to the hydraulic on position.	Parking lock logical position (1) , see Summary table attachments C_SID_ASV_CMP_SNS_POS_PLK	!=	Open		Application state is unequal to error state	=	True		
If after a timeout for the initial disengagement, the parking lock sensor is not reading open or locked, the parking lock position sensor is diagnosed faulted.					Application state is unequal to bypass state	=	True		
					Electrical fault detected for the parking lock hold solenoid	=	False		
					Electrical fault detected for the parking lock engagement valve	=	False		
					Electrical fault detected for the	=	False		
					Electrical fault detected for the	=	False		
					Electrical fault detected for the parking lock position sensor	=	False		
					Parking lock actuation strategy	=	Parking lock low diagnostic disengage strategy		
					Measured system pressure System pressure sensor electrical	>	15	bar	
					fault detected System pressure sensor electrical	=	False		
					fault detected System pressure high confirmation timer	>=	100	ms	
					Parking lock engagment valve logical position	=	Hydraulic On		
					Parking lock latching valve logical position	=	Hydraulic On		
					Absolute vehicle speed	<=	3	kph	
				Fault confirmation time	Parking lock initial disengagement time	>=	1250	ms	
This diagnostic detects a parking lock position sensor consistency fault during parking lock diagnostic disengage strategy at the disengagement when vehicle speed is detected.	Parking lock logical position (1) at the end of initial disengagement , see Summary table attachments C_SID_ASV_CMP_SNS_POS_PLK	=	Locked		Diagnostic reset event	=	False		

During the parking lock diagnostic	1		l			Ì
disengagement routing the parking lock						
uisengagement routille, tile parking lock						
components are tested by first disengaging the		Application state is unequal to error		_		
parking lock completely. This is done by setting		state	=	True		
both the parking lock latching valve and parking						
lock engagement valve to the hydraulic on						
position.						
Once the parking position sensor shows parking						
lock disengagement, the parking hold solenoid is		A contraction state to concern the				
actuated to keep the parking lock disengaged		Application state is unequal to	=	True		
even if hydraulic pressure to the parking lock		bypass state				
piston is lost.						
After the narking lock has been disengaged and						
the parking lock hald calenaid is actuated, the						
the parking lock hold solehold is actuated, the		Electrical fault detected for the		E . I		
parking lock engagement valve is tested by		parking lock hold solenoid	=	False		
draining the parking lock piston with the parking						
lock engagement valve only.						
After the parking lock engagement valve						
hydraulic off test, the parking lock is disengaged		Electrical fault detected for the				
again and a similar test is performed for the		parking lock angagement value	=	False		
latching valve by setting the latching valve to the		parking lock engagement valve				
hydraulic off position.						
The latching valve is kept at the hydraulic off						
position until vehicle speed is detected at which		Electrical fault detected for the				
point the latching valve is set to the hydraulic on		narking lock latching valve	=	False		
nosition		Parking lock laterning valve				
if the parking lock position censor is reading						
In the parking rock position sensor is reduing		Electrical fault detected for the		E-l		
nockeu ac the enu of the initial disengagement		parking lock stepper motor	=	False		
the parking lock position sensor is suspicious.						
When the parking lock is disengaged confirmed						
by the presence of vehicle speed.and the parking		Electrical fault detected for the				
lock position sensor was considered suspicious,		narking lock position sensor	=	False		
the parking lock position sensor is diagnosed		parking lock position sensol				
faulted.						
				Parking lock low		
				diagnostic		
		Parking lock actuation strategy	=	disengage		
				strategy		
		Absolute vehicle speed		2	knh	
		Absolute vehicle speed		a Darking lock low	крп	
				r ar King IUCK IUW		
		Parking lock actuation strategy	=	diagnostic		
				disengage		
				strategy		
		Measured system pressure	>	15	bar	
		System pressure sensor electrical	_	Falco		
		fault detected	-	1 0150		
		System pressure sensor electrical		E . I		
		fault detected	=	False		
		System pressure high confirmation				
		timer	>=	100	ms	
		Parking lock engagment value logical				
		r arking lock engagment valve logical	=	Hydraulic On		
		posicion Desking leak latching within the later				
		Parking lock latching valve logical	=	Hydraulic On		
		position				
	Fault confirmation	Parking lock initial disengagement	\-	1250	me	
	time	time		1250	1115	

Component/System	Fault Code	Monitor Strategy Description	Malfunction Criteria	т	hreshold Value			Secondary Parameters		Enable Conditions		Time Required	MIL illum.
Position sensor for rod 1 consistency	P2832	During gear engagements, the dynamic gear diagnosis monitors the position sensor readings and the clutch/output speed sensor readings.	Gear to be enaged located on rod 1 at the A side	=	True		Enable Conditions:	Hydraulic power available	=	True		Runs continuously	A
		If the speeds sensor indicate the gear is properly engaged while enough force is applied to engage the gear and the position sensor does not indicate gear engagement, a rod positon sensor fault is cat after a confirmation time	Difference between rod 1 position sensor measured and learned engaged A position	>	1100	μm		Application state is equal to error state	=	False			
								Application state is equal to bypass state	=	False			
			OR					Rod 1 force target in gear engament direction	>	600	N		
								engaged (1), see Summary table attachments C SID ASV CMP SNS POS ROD	=	True			
			Gear to be engaged located on rod 1 at the B side	=	True			Rod 1 position sensor electrical fautl detected	=	False			
			Difference between learned engaged B position and rod 1 position sensor measured	>	1100	μm		Rod 1 gear engagement active	=	True			
								Sensor electrical fault detected	>=	100	ms		
								electrical fault detected	>=	100	ms		
							Fault confirmation time:		=	50			
		During gear disengagements, the dynamic gear diagnosis monitors the position sensor readings and the clutch/output speed sensor readings.	Gear to be disengaged located on rod 1 at the A side	=	True			Hydraulic power available	=	True		Runs continuously	
		If the speeds sensor indicate the gear is properly disengaged position sensor still indicates gear engagement, a rod positon sensor fault is set after a confirmation time.	Difference between rod 1 position sensor measured and rod 1 position at start of the shift	<	1000	μm		Application state is equal to error state	=	False			
			Difference between rod 1 learned blocking ring A position and rod 1 position sensor measured	>	1500	μm		Application state is equal to bypass state	=	False			
								Rod 1 force target in gear engament direction Speed sensors indicate gear is	>	600	Ν		
			OR					engaged (1), see Summary table attachments C_SID_ASV_CMP_SNS_POS_ROD	=	False			
								Rod 1 position sensor electrical fautl detected	=	False			
			Gear to be disengaged located on rod 1 at the B side	=	True			Rod 1 gear disengagement active	=	True			
			Difference between rod 1 position senosr at start of the shift and rod 1 position sensor measured	<	1000	μm		Time since last odd clutch speed sensor electrical fault detected	>=	100	ms		
			Difference between rod 1 position senosr measured and rod 1 learned blocking ring B position	>	1500	μm		Time since last output speed sensor electrical fault detected	>=	100	ms		
							Fault confirmation time:		=	Gear disengagement timeout (2)			

1		1			1					
Wh the ser lea cor If t tim sus	then no outside forces are applied on the rod, e static rod diagnostic monitors the position nsor reading within tolerance bands of the rredengaged or neutral position for the rresponding logical current gear for the rod. he rod positon sensor is measuring a value tside these tolerance bands for a confirmation the the rod position sensor is considered spicious.	Rod 1 position measurement OR	Rod drift fault high limit (6), see Summary table attachments C_SID_ASV_CMP_SNS_POS_ROD >	μm	Enable Conditions:	No rod 1 force present condition (8) confirmation time, see Summary table attachments C_SID_ASV_CMP_SNS_POS_ROD Electrical fault for rod 1 position sensor	>=	100 False	ms	Runs continuously
the	e time of the detected fault, the clutch speed									
and	d output speed can be indepently verified by mparing clutch speed with engine speed		 Rod drift fault low limit (7), see Summary table attachments 					False		
du	ring clutch closed situations and comparing		C_SID_ASV_CMP_SNS_POS_ROD			Consistency fault and 1 position				
the	e driven wheel speeds.	Rod 1 position measurement		μm		sensor	=			
						Synchronizer shift busy on corresponding clutch shaft	=	False		
						sensor OR output speed sensor fault		100		
						time Logically engaged gear matches rod	>=		ms	
						1 speed gear (9), see Summary table		True		
						C_SID_ASV_CMP_SNS_POS_ROD	=			
						Output speed available from sensor OR substituted by CAN info	=	True		
						Odd clutch speed available from	_	True		
						End-of-line rod 1 position learn	-	False		
						routine busy End-of-line rod 2 position learn	=			
						routine busy	=	False		
						routine busy	=	False		
						End-of-line rod 4 position learn routine busy	=	False		
						End-of-line rod 5 position learn routine busy	=	False		
						Application state is unequal to error	=	True		
						state Application state is unequal to	_	True		
						bypass state	-	nue		
					Foult confirmation	Fault confirmation time for rod		500	mc	
						limits		500	1113	
						Fault confirmation conditions to consider the rod position sensor				
						faulted Driving gear is an odd gear	=	True		
						Difference between odd clutch		250		
						speed sensor and engine speed sensor	<	350	rpm	
						sensor and output speed based on	<	70	rpm	
						Transmission output speed	>	50	rpm	
						Driving gear is located on rod 1 OR	=	True		
						Driving gear is located on rod 2	=	True		

						Difference between rod 1 learned blocking ring A position and rod 1 position sensor measurement OR	>	1000	μm	
						Driving gear is located on rod 2 Difference between rod 1 position sensor measurement and rod 1	=	True 1000	μm	
This diagnostic detects a stuck shift rod position sensor. This is by use of the synchronizer integrity routine which can be triggered by the	C_ROD_1 movement during C_ROD_1 move B to A test case (20), see Summary table attachments					learned blocking ring B position				
actuation of a gear system or component diagnostic failure. The synchronizer integrity routine performs small rod movement actuations and evaluates the actual rod movements caused by this.	C_SID_ASV_LOWSNS_FOS_ROD (Synchronizer pressure control valve C_SPV_1 actuation with selector position target hydraulically S_OOSPOS_ON)	<=	100	μm	Enable Conditions:	Synchronizer integrity intrusive routine triggered (15), see Summary table attachments C_SID_ASV_CMP_SNS_POS_ROD	=	True		Runs continuously
When no rod movement is detected when trying to move the rod in both directions and at least one of the valves needed for these moves is confirmed operational by showing rod	C_ROD_2 movement during C_ROD_1 move B to A test case (20), see Summary table attachments C_SID_ASV_CMP_SNS_POS_ROD	<=	100	μm		Synchronizer integrity routine		True		
movement during a test case for the complement rod move, the rod position sensor is diagnosed faulted.	(synchronizer pressure control valvesvv_1 actuation with selector position target hydraulically S_OOSPOS_ON)					running conditions (16), see Summary table attachments C_SID_ASV_CMP_SNS_POS_ROD C_ROD_1 move A to B test case executed (17) see Summary table	=			
This strategy is possible as two rods share two synchronizer pressure control valves. As such results from different test cases can be combined to determine which component is faulted.	B test case (20), see Summary table attachments C_SID_ASV_CMP_SNS_POS_ROD (Synchronizer pressure control valve C_SPV_2 actuation with selector position target hydraulically S_OOSPOS_ON)	<=	100	μm		attachments C_SID_ASV_CMP_SNS_POS_ROD (Synchronizer pressure control valve C_SPV_2 actuation with selector position target hydraulically S_OOSPOS_ON)	=	True		
	C_ROD_2 movement during C_ROD_1 move A to B test case (20), see Summary table attachments C_SID_ASV_CMP_SNS_POS_ROD (Synchronizer pressure control valve C_SPV_2 actuation with selector position target hydraulically S_OOSPOS_ON)	<=	100	μm		C_ROD_1 move B to A test case executed (17), see Summary table attachments C_SID_ASV_CMP_SNS_POS_ROD (Synchronizer pressure control valve C_SPV_1 actuation with selector position target hydraulically S_OOSPOS_ON)	=	True		
	C_ROD_2 movement during C_ROD_2 move B to A test case (20), see Summary table attachments C_SID_ASV_CMP_SNS_POS_ROD (Synchronizer pressure control valve C_SPV_2 actuation with selector position target hydraulically S_OOSPOS_OFF)	>	100	μm		C_ROD_2 move B to A test case executed (17), see Summary table attachments C_SID_ASV_CMP_SNS_POS_ROD (Synchronizer pressure control valve C_SPV_2 actuation with selector position target hydraulically S_OOSPOS_OFF)	=	True		
	C_ROD_2 movement during C_ROD_2 move A to B test case (20), see Summary table attachments C_SID_ASV_CMP_SNS_POS_ROD (Synchronizer pressure control valve C_SPV_1 actuation with selector position target hydraulically S_OOSPOS_OFF)	>	100	μm		UK C_ROD_2 move A to B test case executed (17), see Summary table attachments C_SID_ASV_CMP_SNS_POS_ROD (Synchronizer pressure control valve C_SPV_1 actuation with selector position target hydraulically S_OOSPOS_OFF)	=	True		
					Fault confirmation	Synchronizer integrity rod position sensor fault test suite confirmation runs	=	1		

Position sensor for rod 2 consistency	P2837	During gear engagements, the dynamic gear diagnosis monitors the position sensor readings and the clutch/output speed sensor readings.	Gear to be enaged located on rod 2 at the A side	=	True		Enable Conditions:	Hydraulic power available	=	True		Runs continuously	А
		If the speeds sensor indicate the gear is properly engaged while enough force is applied to engage the gear and the position sensor does not indicate gear engagement, a rod positon sensor	Difference between rod 2 position sensor measured and learned engaged A position	>	1100	μm		Application state is equal to error state	=	False			
		Tault is set after a confirmation time.	OR					Application state is equal to bypass state Rod 2 force target in gear engament direction	= >	False 600	N		
								engaged (1), see Summary table attachments C_SID_ASV_CMP_SNS_POS_ROD	=	True			
			Gear to be engaged located on rod 2 at the B side	=	True			Rod 2 position sensor electrical fautl detected	=	False			
			and rod 2 position sensor measured	>	1100	μm		Rod 2 gear engagement active Time since last odd clutch speed	=	True			
								sensor electrical fault detected Time since last output speed sensor	>=	100	ms ms		
							Fault confirmation	electrical fault detected					
							time:		=	50			
		During gear disengagements, the dynamic gear diagnosis monitors the position sensor readings and the clutch/output speed sensor readings. If the speed sensor indicate the gear is properly	Gear to be disengaged located on rod 2 at the A side	=	True			Hydraulic power available	=	True		Runs continuously	
		disengaged position sensor still indicates gear engagement, a rod positon sensor fault is set after a confirmation time.	Difference between rod 2 position sensor measured and rod 2 position at start of the shift	<	1000	μm		Application state is equal to error state	=	False			
			Difference between rod 2 learned blocking ring A position and rod 2 position sensor measured	>	1500	μm		Application state is equal to bypass state	=	False			
								Rod 2 force target in gear engament direction	>	600	Ν		
			OR					engaged (1), see Summary table attachments C_SID_ASV_CMP_SNS_POS_ROD	=	False			
								Rod 2 position sensor electrical fautl detected	=	False			
			Gear to be disengaged located on rod 2 at the B side	=	True			Rod 2 gear disengagement active	=	True			
			Difference between rod 2 position senosr at start of the shift and rod 2 position sensor measured	<	1000	μm		Time since last odd clutch speed sensor electrical fault detected	>=	100	ms		
			Difference between rod 2 position senosr measured and rod 2 learned blocking ring B position	>	1500	μm		Time since last output speed sensor electrical fault detected	>=	100	ms		
							Fault confirmation time:		=	Gear disengagement timeout (2)			

										•
When no outside forces are applied on the rod, the static rod diagnostic monitors the position sensor reading within tolerance bands of the	Rod 2 position measurement	Rod drift fault high limit Summary table attachi	t (6), see ments μm	Enable Conditions:	No rod 2 force present condition (8) confirmation time, see Summary		100			
corresponding logical current gear for the rod. If the rod position sensor is measuring a value		<pre>C_SID_ASV_CMP_SNS_PO ></pre>	OS_ROD		C_SID_ASV_CMP_SNS_POS_ROD	>=		ms	Runs continuously	
outside these tolerance bands for a confirmation time the rod position sensor is considered	OR				Electrical fault for rod 2 position		False			
suspicious. The sensor is confirmed to be faulted when at the time of the detected fault, the clutch creed					sensor	=				
and output speed can be indepently verified by comparing clutch speed with engine speed		Rod drift fault low limit Summary table attacht	(7), see ments				False			
during clutch closed situations and comparing output speed with output speed calculated from		C_SID_ASV_CMP_SNS_P	POS_ROD		Consistency fault rod 2 position					
the driven wheel speeds.	Rod 2 position measurement		μm		sensor Synchronizor shift busy on	=				
					corresponding clutch shaft No electrical odd clutch speed	=	False			
					sensor OR output speed sensor fault time	>=	100	ms		
					Logically engaged gear matches rod 2 speed gear (9), see Summary table attachments		True			
					C_SID_ASV_CMP_SNS_POS_ROD Output speed available from sensor	=	_			
					OR substituted by CAN info Odd clutch speed available from	=	True			
					sensor End-of-line rod 1 position learn	=	True			
					routine busy End-of-line rod 2 position learn	=	False			
					routine busy	=	False			
					routine busy End-of-line rod 4 position learn	=	False			
					routine busy	=	False			
					routine busy	=	False			
					Application state is unequal to error state	=	True			
					Application state is unequal to bypass state	=	True			
				Fault confirmation:	Fault confirmation time for rod position sensor measured out of limits		500	ms		
					Fault confirmation conditions to consider the rod position sensor faulted					
					Driving gear is an odd gear	=	True			
					speed sensor and engine speed sensor	<	350	rpm		
					Difference between output speed sensor and output speed based on driven wheel speeds	<	70	rpm		
					Transmission output speed	>	50	rpm		
					Driving gear is located on rod 2 OR	=	True			
					Driving gear is located on rod 1	=	True			l

						Difference between rod 2 learned blocking ring A position and rod 2 position sensor measurement OR Driving gear is located on rod 1 Difference between rod 2 position	>	1000 True	μm	
						learned blocking ring B position	>	1000	μm	
This diagnostic detects a stuck shift rod position sensor. This is by use of the synchronizer integrity routine which can be triggered by the setting by a gear system or component diagnostic failure. The synchronizer integrity routine performs small rod movement actuations and evaluates the actual rod movements caused by this.	C_ROD_2 movement during C_ROD_2 move B to A test case (20), see Summary table attachments C_SID_ASV_CMP_SNS_POS_ROD (Synchronizer pressure control valve C_SPV_2 actuation with selector position target hydraulically S_OOSPOS_OFF)	<=	100	μm	Enable Conditions:	Synchronizer integrity intrusive routine triggered (15), see Summary table attachments C_SID_ASV_CMP_SNS_POS_ROD	=	True		Runs continuously
When no rod movement is detected when trying to move the rod in both directions and at least one of the valves needed for these moves is confirmed operational by showing rod movement during a test case for the complement rod move, the rod position sensor is diagnosed faulted.	C_ROD_1 movement during C_ROD_2 move B to A test case (20), see Summary table attachments C_SID_ASV_CMP_SNS_POS_ROD (Synchronizer pressure control valve C_SPV_2 actuation with selector position target hydraulically S_OOSPOS_OFF)	<=	100	μm		Synchronizer integrity routine running conditions (16), see Summary table attachments C_SID_ASV_CMP_SNS_POS_ROD	=	True		
This strategy is possible as two rods share two synchronizer pressure control valves. As such results from different test cases can be combined to determine which component is faulted.	C_ROD_2 movement during C_ROD_2 move A to B test case (20), see Summary table attachments C_SID_ASV_CMP_SNS_POS_ROD (Synchronizer pressure control valve C_SPV_1 actuation with selector position target hydraulically S_OOSPOS_OFF)	<=	100	μm		C_ROD_2 move A to B test case executed (17), see Summary table attachments C_SID_ASV_CMP_SNS_POS_ROD (Synchronizer pressure control valve C_SPV_1 actuation with selector position target hydraulically S_OOSPOS_OFF)	-	True		
	C_ROD_1 movement during C_ROD_2 move A to B test case (20), see Summary table attachments C_SID_ASV_CMP_SNS_POS_ROD (Synchronizer pressure control valve C_SPV_1 actuation with selector position target hydraulically S_OOSPOS_OFF)	<=	100	μm		C_ROD_2 move B to A test case executed (17), see Summary table attachments C_SID_ASV_CMP_SNS_POS_ROD (Synchronizer pressure control valve C_SPV_2 actuation with selector position target hydraulically S_OOSPOS_OFF)	=	True		
	C_ROD_1 movement during C_ROD_1 move B to A test case (20), see Summary table attachments C_SID_ASV_CMP_SNS_POS_ROD (Synchronizer pressure control valve C_SPV_1 actuation with selector position target hydraulically S_OOSPOS_ON) OR	>	100	μm		C_ROD_1 move B to A test case executed (17), see Summary table attachments C_SID_ASV_CMP_SNS_POS_ROD (Synchronizer pressure control valve C_SPV_1 actuation with selector position target hydraulically S_OOSPOS_ON) OR	=	True		
	C_ROD_1 movement during C_ROD_1 move A to B test case (20), see Summary table attachments C_SID_ASV_CMP_SNS_POS_ROD (Synchronizer pressure control valve C_SPV_2 actuation with selector position target hydraulically S_OOSPOS_ON)	>	100	μm		C_ROD_1 move A to B test case executed (17), see Summary table attachments C_SID_ASV_CMP_SNS_POS_ROD (Synchronizer pressure control valve C_SPV_2 actuation with selector position target hydraulically S_OOSPOS_ON)	-	True		
					Fault confirmation	Synchronizer integrity rod position sensor fault test suite confirmation runs	=	1		

Position sensor for rod 3 consistency	P283C	During gear engagements, the dynamic gear diagnosis monitors the position sensor readings and the clutch/output speed sensor readings.	Gear to be enaged located on rod 3 at the A side	=	True		Enable Conditions:	Hydraulic power available	=	True		Runs continuously	А
		If the speeds sensor indicate the gear is properly engaged while enough force is applied to engage the gear and the position sensor does not indicate gear engagement, a rod positon sensor fault is set after a confirmation time	Difference between rod 3 position sensor measured and learned engaged A position	>	1100	μm		Application state is equal to error state	=	False			
								Application state is equal to bypass state Rod 3 force target in gear engament	=	False			
			OR					direction Speed sensors indicate gear is	>	600	N		
			Gear to be engaged located on rod 3 at the B	=	True			engaged (1) Rod 3 position sensor electrical fautl	=	False			
			side Difference between learned engaged B position	>	1100	μm		detected	=	True			
			and rod 3 position sensor measured					Time since last even clutch speed	>=	100	ms		
								Time since last output speed sensor electrical fault detected	>=	100	ms		
							Fault confirmation		=	50			
		During gear disengagements the dynamic gear	Gear to be disangaged located on rod 3 at the A				time:						
		diagnosis monitors the position sensor readings and the clutch/output speed sensor readings.	side	=	True			Hydraulic power available	=	True		Runs continuously	
		If the speeds sensor indicate the gear is properly disengaged position sensor still indicates gear engagement, a rod positon sensor fault is set offer a confirmation time.	Difference between rod 3 position sensor measured and rod 3 position at start of the shift	<	1000	μm		Application state is equal to error state	=	False			
			Difference between rod 3 learned blocking ring A position and rod 3 position sensor measured	>	1500	μm		Application state is equal to bypass state	=	False			
								Rod 3 force target in gear engament direction	>	600	N		
			OR					Speed sensors indicate gear is engaged (1), see Summary table attachments	=	False			
								C_SID_ASV_CMP_SNS_POS_ROD Rod 3 position sensor electrical fautl detected	=	False			
			Gear to be disengaged located on rod 3 at the B side	=	True			Rod 3 gear disengagement active	=	True			
			Difference between rod 3 position senosr at start of the shift and rod 3 position sensor measured	<	1000	μm		Time since last even clutch speed sensor electrical fault detected	>=	100	ms		
			Difference between rod 3 position senosr measured and rod 3 learned blocking ring B position	>	1500	μm		Time since last output speed sensor electrical fault detected	>=	100	ms		
							Fault confirmation time:		=	Gear disengagement timeout (2)			
		When no outside forces are applied on the rod, the static rod diagnostic monitors the position sensor reading within tolerance bands of the learned engaged or neutral position for the corresponding logical current gear for the rod.	Rod 3 position measurement	>	Rod drift fault high limit (6), see Summary table attachments C_SID_ASV_CMP_SNS_POS_ROD	μm	Enable Conditions:	No rod 3 force present condition (8) confirmation time, see Summary table attachments C_SID_ASV_CMP_SNS_POS_ROD	>=	100 n	ns	Runs continuously	

heiden of hadenerge below on particular bare of hadenerge below on par	If the rod positon sensor is measuring a value outside these tolerance bands for a confirmation time the rod position sensor is considered suspicious. The sensor is confirmed to be faulted when at	OR					Electrical fault for rod 3 position sensor	=	False	
Control Control <t< td=""><td>the time of the detected fault, the clutch speed and output speed can be indepently verified by comparing clutch speed with engine speed during clutch sleed cituations and comparing</td><td></td><td><</td><td>Rod drift fault low limit (7), see Summary table attachments</td><td></td><td></td><td></td><td></td><td>False</td><td></td></t<>	the time of the detected fault, the clutch speed and output speed can be indepently verified by comparing clutch speed with engine speed during clutch sleed cituations and comparing		<	Rod drift fault low limit (7), see Summary table attachments					False	
me driven wheel yards. Not all position measurement of the sport of th	outnut speed with output speed calculated from			C_3ID_A3V_CIVIF_3IV3_F03_K0D			Consistency fault rod 3 position			
	the driven wheel sneeds	Rod 3 position measurement			um		sensor	=		
Image: Section of the section of th	the unventioner specus.	nou s position measurement			μπ		Synchronizer shift busy on			
Image: Second							corresponding clutch shaft	-	False	
service 02 equipations service 02 equipation service 02 equipation ser							No electrical even clutch speed			
Image:							sensor OB output speed sensor fault		100	
Index is in the series of the serie							time	>=	100	ms
side of geor for type serving variable - True C, SD, ANY, CMP, SN, POD - - C, SD, SD, CMP, CMP, CMP, SN, POD - - C, SD, SD, CMP, CMP, CMP, SN, POD - - C, SD, SD, CMP, CMP, CMP, SN, POD - - C, SD, SD, CMP, CMP, CMP, SN, POD - - C, SD, SD, CMP, CMP, CMP, SN, POD, POD, POD, POD, POD, POD, POD, POD							Logically engaged gear matches rod			
Image: Solution in the solutis the solutis the solutis the solution in the solution in the solu							3 speed gear (9), see Summary table			
Image: Section of the constraint of							attachments		True	
Image: state in the state interpret interpret in the state interpret interpret in the state interpret in the state interpret in the state interpret in the state interpret interpret in the state interpret							C SID ASV CMP SNS POS ROD	=		
Rait Consubstituted by CAN into Call True Even Outh special valiable from 01 position learn							Output speed available from sensor		-	
Fault confirmation - True Inde-difier rod position laran - - Inde-difier rod position romon - - Inde-difier rod position romon <t< td=""><td></td><td></td><td></td><td></td><td></td><td></td><td>OR substituted by CAN info</td><td>=</td><td>True</td><td></td></t<>							OR substituted by CAN info	=	True	
sensor							Even clutch speed available from		True	
Image: Contract of the contract							sensor	=	nue	
Image: Source interesting in the section interm image: Source interm image: Source interm Image: Source interm image: Source interm image: Source interm image: Source interm Image: Source interm image: Source interm image: Source interm image: Source interm image: Source interm Image: Source interm image: Source interm image: Source interm image: Source interm image: Source interm image: Source interm Image: Source interm image: Source interm image: Source interm image: Source interm image: Source interm image: Source interm Image: Source interm image: Source interm image: Source interm image: Source interm image: Source interm image: Source interm Image: Source interm image: Source interm image: Source interm image: Source interm image: Source interm image: Source interm Image: Source interm image: Source interm image: Source interm image: Source interm image: Source interm image: Source interm image: Source interm image: Source interm image: Source interm image: Source interm image: Source interm image: Source interm image: Source interm image: Source interm image: Source interm image: Source inter							End-of-line rod 1 position learn		False	
Fuld.confirmation Field-office rod 3 position learn routine busy End-office rod 4 position learn routing a position learn routing a position learn routine busy End-office rod 4 position learn routing a position learn routing end busy End-office rod 4 position learn routing end busy End-office rod 4 position learn routing end busy End-office rod 4 position learn routing end busy End-office routing end busy End-office rod 4 position learn routing end busy End-office routing end busy End-office rod 4 position learn routing end busy End-office rod 4 position							routine busy	=	1 dise	
routine busy = Fould routine busy = Faile routine busy = True state Supplication state is unequal to groot on time for or on state = True state Fault confirmation time for or on constant supplication state = True routine busy Fault confirmation time for or on constant supplication state = True routine busy Fault confirmation time for or on constant supplication state = True routine busy = True = True routine busy = True = = rowitine speed <							End-of-line rod 2 position learn		False	
Image: Section learning in the section of the sect							routine busy	=		
Fault continue busy = False Lind of line = False - Lind of line = False - Lind of line = True - Application state is unequal to error state = True - Application state is unequal to error state = True - Application state is unequal to error state = True - Difference between out of imits = True - Difference between out of essors = True - Difference between out put speed sensor 30 rpm Ofference between out put speed sensor > 50 rpm Ofference between out put speed sensor > 50 <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td>End-of-line rod 3 position learn</td> <td></td> <td>False</td> <td></td>							End-of-line rod 3 position learn		False	
Fault confirmation - Faile Fault confirmation - Faile Fault confirmation - - Ofference between organ dengine speed - - Fault confirmation - - -							routine busy	=		
Image: Control Contro Control Conterve Control Control Control Control Control Control							End-of-line rod 4 position learn	_	False	
Failt confirmation = Fails Application state is unequal to error state is unequal to error durine busy = True Application state is unequal to error durine busy = True Fault confirmation Fault confirmation time for rod position sensor measured out of limits = True Fault confirmation Fault confirmation: Fault confirmation: 500 ms Fault confirmation: Fault confirmation: = True Fault confirmation: = True - Oriving gar is an even gear sensor and engine speed sensor and output speed <							End-of-line rod 5 position learn	-		
Application state is unequal to error state - Application state is unequal to error state - Application state is unequal to error bypass state - Fault confirmation:							routine busy	-	False	
Fault confirmation: istate							Application state is upequal to error	-		
Application state is unequal to bypass state = True Application state is unequal to bypass state = True Fault confirmation time for rod position sensor measured out of limits = 500 ms Imits Fault confirmation time for rod position sensor reasured out of consider the rod position sensor reasured out of position sensor reasurement - - - - - - - - - - - -							state	=	True	
Fault confirmation: Fault confirmation time for rod position sensor measured out of imits Fault confirmation conditions to consider the rod position sensor faulted Driving gear is neven gear Difference between output speed sensor and output speed based on driven wheel speeds sensor and output speed sensor and output speed Sensor and output speed Sensor and output speed Sensor and output speed Difference between rod a learned Driving gear is located on rod 4 or rod 5 So rpm Difference between rod 3 learned Driving gear is located on rod 4 or rod 5 So rpm Difference between rod 3 learned Difference between rod 3 learned							Application state is unequal to			
Fault confirmation: Fault confirmation time for rod position sensor measured out of limits 500 ms Fault confirmation: Fault confirmation conditions to consider the rod position sensor faulted True True Fault confirmation: Fault confirmation conditions to consider the rod position sensor faulted True True Driving gear is an even gear the rod position sensor faulted Sensor Sensor Sensor Driving gear is not even gear on dengine speed sensor and engine speed sensor and output speed based on driven wheel speeds 70 rpm Sensor Triven wheel speeds > 500 rpm OR Truent sensor 500 rpm Sensor and output speed based on or driven wheel speeds 500 rpm OR Truent sensor 500 rpm OR Driving gear is located on rod 3 1 True OR Driving gear is located on rod 4 or driven wheel speeds OR Driving gear is located on rod 3 1 True Driving gear is located on rod 4 or driven wheel speeds in rod 3 1000							bypass state	=	True	
ImitsImitsFault confirmation conditions toFault confirmation conditions toFault confirmation conditionsFault confirmationFault confirmation<						Fault confirmation:	Fault confirmation time for rod position sensor measured out of		500	ms
Fault confirmation conditions to Fault confirmation conditions to consider the rod position sensor = Driving gear is an even gear = Difference between even clutch = Sensor = Difference between output speed <							limits			
Image: Second							Fault confirmation conditions to			
faulted							consider the rod position sensor			
Image: Single							faulted			
Difference between even clutch speed sensor and engine speed speed sensor and engine speed speed sensor and engine speed speed sensor speed sensor </td <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td>Driving gear is an even gear</td> <td>=</td> <td>True</td> <td></td>							Driving gear is an even gear	=	True	
speed sensor and engine speed <							Difference between even clutch			
Interfere to butput speed 70 rpm sensor and output speeds 50 rpm driven wheel speeds Transmission output speed > 50 rpm Driving gear is located on rod 3 = True OR Driving gear is located on rod 4 or rod 5 = True Difference between rod 3 learned Difference between rod 3 learned > 1000 µm							speed sensor and engine speed sensor	<	350	rpm
A model speeds > 7.0 mpin driven wheel speeds Transmission output speed > 5.0 rpm Transmission output speed > 5.0 rpm Driving gear is located on rod 3 = True OR 0R = True Driving gear is located on rod 4 or rod 5 = True Difference between rod 3 learned blocking ring A position and rod 3 > 1000 µm							Difference between output speed		70	
Interference between rod 3 learned > 50 rpm Image: Difference between rod 3 learned = True Difference between rod 3 learned = True Difference between rod 3 learned > 1000 µm							driven wheel speeds		70	ipin
Driving gear is located on rod 3 = True OR Driving gear is located on rod 4 or rod 5 = True Driving gear is located on rod 4 or rod 5 = True Difference between rod 3 learned blocking ring A position and rod 3 > 1000 µm							Transmission output speed	>	50	rpm
OR OR - Hule OR OR - Hule OR Driving gear is located on rod 4 or rod 5 = True Difference between rod 3 learned blocking ring A position and rod 3 > 1000 µm							Driving gear is located on rod 3		Truo	
Driving gear is located on rod 4 or rod 5 = True Difference between rod 3 learned blocking ring A position and rod 3 > 1000 μm Option sensor measurement - 1000 μm							OR	-	True	
rod 5 rod 3 learned Difference between rod 3 learned blocking ring A position and rod 3 > 1000 μm position sensor measurement			1				Driving gear is located on rod 4 or	=	True	
Difference between rod 3 learned blocking ring A position and rod 3 > 1000 μm position sensor measurement							rod 5			
blocking ring A position and rod 3 > 1000 μm position sensor measurement							Difference between rod 3 learned			
position sensor measurement							DIOCKING FING A POSITION and rod 3	>	1000	μm
							OR			

								Driving gear is located on rod 4 or rod 5 Difference between rod 3 position sensor measurement and rod 3 learned blocking ring B position	=	True 1000	μm	
		This diagnostic detects a stuck shift rod position sensor. This is by use of the synchronizer integrity routine which can be triggered by the setting by a gear system or component diagnostic failure. The synchronizer integrity routine performs small rod movement actuations and evaluates the actual rod movements caused by this.	C_ROD_3 movement during C_ROD_3 move B to A test case (20), see Summary table attachments C_SID_ASV_CMP_SNS_POS_ROD (Synchronizer pressure control valve C_SPV_4 actuation with selector position target hydraulically S_OOSPOS_ON)	<=	100	μm	Enable Conditions:	Synchronizer integrity intrusive routine triggered (15), see Summary table attachments C_SID_ASV_CMP_SNS_POS_ROD	=	True		Runs continuously
		When no rod movement is detected when trying to move the rod in both directions and at least one of the valves needed for these moves is confirmed operational by showing rod movement during a test case for the complement rod move, the rod position sensor is diagnosed faulted.	C_ROD_4 movement during C_ROD_3 move B to A test case (20), see Summary table attachments C_SID_ASV_CMP_SNS_POS_ROD (Synchronizer pressure control valve C_SPV_4 actuation with selector position target hydraulically S_OOSPOS_ON)	<=	100	μm		Synchronizer integrity routine running conditions (16), see Summary table attachments C_SID_ASV_CMP_SNS_POS_ROD C_ROD_3 move A to B test case	=	True		
		This strategy is possible as two rods share two synchronizer pressure control valves. As such results from different test cases can be combined to determine which component is faulted.	C_ROD_3 movement during C_ROD_3 move A to B test case (20), see Summary table attachments C_SID_ASV_CMP_SNS_POS_ROD (Synchronizer pressure control valve C_SPV_3 actuation with selector position target hydraulically S_OOSPOS_ON)	<=	100	μm		executed (17), see Summary table attachments C_SID_ASV_CMP_SNS_POS_ROD (Synchronizer pressure control valve C_SPV_3 actuation with selector position target hydraulically S_OOSPOS_ON)	=	True		
			C_ROD_4 movement during C_ROD_3 move A to B test case (20), see Summary table attachments C_SID_ASV_CMP_SNS_POS_ROD (Synchronizer pressure control valve C_SPV_3 actuation with selector position target hydraulically S_OOSPOS_ON)	<=	100	μm		C_ROD_3 move B to A test case executed (17), see Summary table attachments C_SID_ASV_CMP_SNS_POS_ROD (Synchronizer pressure control valve C_SPV_4 actuation with selector position target hydraulically S_OOSPOS_ON)	=	True		
			C_ROD_4 movement during C_ROD_4 move B to A test case (20), see Summary table attachments C_SID_ASV_CMP_SNS_POS_ROD (Synchronizer pressure control valve C_SPV_4 actuation with selector position target hydraulically S_OOSPOS_OFF) op	>	100	μm		C_ROD_4 move B to A test case executed (17), see Summary table attachments C_SID_ASV_CMP_SNS_POS_ROD (Synchronizer pressure control valve C_SPV_4 actuation with selector position target hydraulically S_OOSPOS_OFF)	=	True		
			C_ROD_4 movement during C_ROD_4 move A to B test case (20), see Summary table attachments C_SID_ASV_CMP_SNS_POS_ROD (Synchronizer pressure control valve C_SPV_3 actuation with selector position target hydraulically S_OOSPOS_OFF)	>	100	μm		C_ROD_4 move A to B test case executed (17), see Summary table attachments C_SID_ASV_CMP_SNS_POS_ROD (Synchronizer pressure control valve C_SPV_3 actuation with selector position target hydraulically S_OOSPOS_OFF)	=	True		
							Fault confirmation	Synchronizer integrity rod position sensor fault test suite confirmation runs	=	1		
Ī	P2841	During gear engagements, the dynamic gear diagnosis monitors the position sensor readings and the clutch/output speed sensor readings.	Gear to be enaged located on rod 4 at the A side	=	True		Enable Conditions:	Hydraulic power available	=	True		Runs continuously

Position sensor for rod 4 consistency

If the speeds sensor indicate the gear is properly engaged while enough force is applied to engage the gear and the position sensor does not indicate gear engagement, a rod positon sensor fault is set after a confirmation time.	Difference between rod 4 position sensor measured and learned engaged A position	> 1100) µm		Application state is equal to error state	=	False		
					Application state is equal to bypass state	=	False		
	OR				Rod 4 force target in gear engament direction	>	600	Ν	
					Speed sensors indicate gear is engaged (1)	=	True		
	Gear to be engaged located on rod 4 at the B side	= True			Rod 4 position sensor electrical fauti detected	=	False		
	Difference between learned engaged B position and rod 4 position sensor measured	> 1100	μm		Rod 4 gear engagement active	=	True		
					sensor electrical fault detected	>=	100	ms	
					electrical fault detected	>=	100	ms	
				Fault confirmation time:		=	50		
During gear disengagements, the dynamic gear diagnosis monitors the position sensor readings and the clutch/output speed sensor readings.	Gear to be disengaged located on rod 4 at the A side	= True			Hydraulic power available	=	True		Runs continuously
If the speeds sensor indicate the gear is properly disengaged position sensor still indicates gear engagement, a rod positon sensor fault is set after a confirmation time.	Difference between rod 4 position sensor measured and rod 4 position at start of the shift	< 1000) µm		Application state is equal to error state	=	False		
	Difference between rod 4 learned blocking ring A position and rod 4 position sensor measured	> 1500	μm		Application state is equal to bypass state	=	False		
					Rod 4 force target in gear engament direction	>	600	Ν	
	OR				Speed sensors indicate gear is engaged (1), see Summary table attachments C_SID_ASV_CMP_SNS_POS_ROD	=	False		
					Rod 4 position sensor electrical fautl detected	=	False		
	Gear to be disengaged located on rod 4 at the B side	= True			Rod 4 gear disengagement active	=	True		
	Difference between rod 4 position senosr at start of the shift and rod 4 position sensor measured	< 1000) µm		Time since last even clutch speed sensor electrical fault detected	>=	100	ms	
	Difference between rod 4 position senosr measured and rod 4 learned blocking ring B position	> 1500) µm		Time since last output speed sensor electrical fault detected	>=	100	ms	
				Fault confirmation time:		=	Gear disengagement timeout (2)		
When no outside forces are applied on the rod, the static rod diagnostic monitors the position sensor reading within tolerance bands of the learned engaged or neutral position for the corresponding logical current gear for the rod.	Rod 4 position measurement	Rod drift fault high Summary table a C_SID_ASV_CMP_S >	h limit (6), see attachments μm NS_POS_ROD	Enable Conditions:	No rod 4 force present condition (8) confirmation time, see Summary table attachments C_SID_ASV_CMP_SNS_POS_ROD	>=	100	ms	Runs continuously
If the rod positon sensor is measuring a value outside these tolerance bands for a confirmation time the rod position sensor is considered suspicious.	OR				Electrical fault for rod 4 position sensor	=	False		

The sensor is co the time of the and output spe comparing clut during clutch c	confirmed to be faulted when at e detected fault, the clutch speed eed can be indepently verified by tch speed with engine speed closed situations and comparing		Rod drift fault low limit (7), see < Summary table attachments C_SID_ASV_CMP_SNS_POS_ROD					False		
output speed v	with output speed calculated from					Consistency fault rod 4 position				
the driven whe	eel speeds.	Rod 4 position measurement		μm		sensor Synchronizer shift husy on	=			
						corresponding clutch shaft	_	False		
						No electrical even clutch speed	-			
						sensor OB output speed sensor fault		100		
						time	>=		ms	
						Logically engaged gear matches rod				
						4 speed gear (9), see Summary table		T		
						attachments		True		
						C_SID_ASV_CMP_SNS_POS_ROD	=			
						Output speed available from sensor		True		
						OR substituted by CAN info	=			
						Even clutch speed available from	_	True		
						End-of-line rod 1 position learn	=			
						routine busy	-	False		
						End-of-line rod 2 position learn				
						routine busy	=	False		
						End-of-line rod 3 position learn		E . I		
						routine busy	=	False		
						End-of-line rod 4 position learn		False		
						routine busy	=	T disc		
						End-of-line rod 5 position learn		False		
						routine busy	=			
						Application state is unequal to error	=	True		
						Application state is unequal to				
						bypass state	=	True		
						-,,				
						Fault confirmation time for rod				
					Fault confirmation:	position sensor measured out of		500	ms	
						limits				
						Fault confirmation conditions to				
						consider the rod position sensor				
						Driving gear is an even gear	_	True		
						Difference between even clutch	-	nue		
						speed sensor and engine speed	<	350	rpm	
						sensor				
						Difference between output speed				
						sensor and output speed based on	<	70	rpm	
						driven wheel speeds				
						Transmission output speed	>	50	rpm	
						Driving good is located on red 4		T		
						OR	=	True		
						Driving gear is located on rod 3 or				
						rod 5	=	True		
						Difference between rod 4 learned				
						blocking ring A position and rod 3	>	1000	μm	
						position sensor measurement				
						OR				
						Driving gear is located on rod 3 or	=	True		
						rod 5				
						Difference between rod 4 position		1000		
						learned blocking ring P position	>	1000	μm	

			-								
	This diagnostic detects a stuck shift rod position sensor. This is by use of the synchronizer integrity routine which can be triggered by the setting by a gear system or component diagnostic failure. The synchronizer integrity routine performs small rod movement actuations and evaluates the actual rod movements caused by this.	C_ROD_4 movement during C_ROD_4 move B to A test case (20), see Summary table attachments C_SID_ASY_CMP_SNS_POS_ROD (Synchronizer pressure control valve C_SPV_4 actuation with selector position target hydraulically S_OOSPOS_OFF)	<=	100	μm	Enable Conditions:	Synchronizer integrity intrusive routine triggered (15), see Summary table attachments C_SID_ASV_CMP_SNS_POS_ROD	=	True	Runs continuously	
	When no rod movement is detected when trying to move the rod in both directions and at least one of the valves needed for these moves is confirmed operational by showing rod movement during a test case for the complement rod move, the rod position sensor is diagnosed faulted.	C_ROD_3 movement during C_ROD_4 move B to A test case (20), see Summary table attachments C_SID_ASV_CMP_SNS_POS_ROD (Synchronizer pressure control valve C_SPV_4 actuation with selector position target hydraulically S_OOSPOS_OFF)	<=	100	μm		Synchronizer integrity routine running conditions (16), see Summary table attachments C_SID_ASV_CMP_SNS_POS_ROD	=	True		
	This strategy is possible as two rods share two synchronizer pressure control valves. As such results from different test cases can be combined to determine which component is faulted.	C_ROD_4 movement during C_ROD_4 move A to B test case (20), see Summary table attachments C_SID_ASV_CMP_SNS_POS_ROD (Synchronizer pressure control valve C_SPV_3 actuation with selector position target hydraulically S_OOSPOS_OFF)	<=	100	μm		C_ROD_4 move A to B test case executed (17), see Summary table attachments C_SID_ASV_CMP_SNS_POS_ROD (Synchronizer pressure control valve C_SPV_3 actuation with selector position target hydraulically S_OOSPOS_OFF)	=	True		
		C_ROD_3 movement during C_ROD_4 move A to B test case (20), see Summary table attachments C_SID_ASV_CMP_SNS_POS_ROD (Synchronizer pressure control valve C_SPV_3 actuation with selector position target hydraulically S_OOSPOS_OFF)	<=	100	μm		C_ROD_4 move B to A test case executed (17), see Summary table attachments C_SID_ASV_CMP_SNS_POS_ROD (Synchronizer pressure control valve C_SPV_4 actuation with selector position target hydraulically S_OOSPOS_OFF)	=	True		
		C_ROD_3 movement during C_ROD_3 move B to A test case (20), see Summary table attachments C_SID_ASV_CMP_SNS_POS_ROD (Synchronizer pressure control valve C_SPV_4 actuation with selector position target hydraulically S_OOSPOS_ON)	>	100	μm		C_ROD_3 move B to A test case executed (17), see Summary table attachments C_SID_ASV_CMP_SNS_POS_ROD (Synchronizer pressure control valve C_SPV_4 actuation with selector position target hydraulically S_OOSPOS_ON)	=	True		
		C_ROD_3 movement during C_ROD_3 move A to B test case (20), see Summary table attachments C_SID_ASY_CMP_SNS_POS_ROD (Synchronizer pressure control valve C_SPV_3 actuation with selector position target hydraulically S_OOSPOS_ON)	>	100	μm		OR C_ROD_3 move A to B test case executed (17), see Summary table attachments C_SID_ASV_CMP_SNS_POS_ROD (Synchronizer pressure control valve C_SPV_3 actuation with selector position target hydraulically S_OOSPOS_ON)	=	True		
						Fault confirmation	Synchronizer integrity rod position sensor fault test suite confirmation runs	=	1		
P2864	During gear engagements, the dynamic gear diagnosis monitors the position sensor readings and the clutch/output speed sensor readings.	Gear to be engaged located on rod 5 at the B side	=	True		Enable Conditions:	Hydraulic power available	=	True	Runs continuously	A
	If the speeds sensor indicate the gear is properly engaged while enough force is applied to engage the gear and the position sensor does not indicate gear engagement, a rod positon sensor fault is set after a confirmation time.	Difference between learned engaged B position and rod 5 position sensor measured	>	1100	μm		Application state is equal to error state	=	False		

Position sensor for rod 5 consistency

					Application state is equal to bypass state Rod 5 force target in gear engament direction Speed sensors indicate gear is engaged (1), see Summary table attachments C_SID_ASV_CMP_SNS_POS_ROD Rod 5 position sensor electrical fautl detected Rod 5 gear engagement active Time since last even clutch speed sensor electrical fault detected Time since last output speed sensor electrical fault detected	= = =	False 600 True False True 100 100	N ms ms		
				time:		=	50			
During gear disengagements, the dynamic gear diagnosis monitors the position sensor readings and the clutch/output speed sensor readings. If the speeds sensor indicate the gear is properly	Gear to be disengaged located on rod 5 at the B side	= True			Hydraulic power available	=	True		Runs continuously	
disengaged position sensor still indicates gear engagement, a rod positon sensor fault is set after a confirmation time	Difference between rod 5 position senosr at start of the shift and rod 5 position sensor measured	< 1000	μm		Application state is equal to error state	=	False			
arter a commation time.	Difference between rod 5 position senosr measured and rod 5 learned blocking ring B position	> 1500	μm		Application state is equal to bypass state	=	False			
					Rod 5 force target in gear engament direction	>	600	Ν		
					engaged (1), see Summary table attachments C_SID_ASV_CMP_SNS_POS_ROD	=	False			
					Rod 5 position sensor electrical fautl detected	=	False			
					Rod 5 gear disengagement active Time since last even clutch speed	=	True			
					sensor electrical fault detected	>=	100	ms		
					Time since last output speed sensor electrical fault detected	>=	100	ms		
				Fault confirmation time:		=	Gear disengagement timeout (2)			
When no outside forces are applied on the rod, the static rod diagnostic monitors the position sensor reading within tolerance bands of the learned engaged or neutral position for the corresponding logical current gear for the rod. If the rod position concerc is measuring a value	Rod 5 position measurement	Rod drift fault high limit (6), see Summary table attachments C_SID_ASV_CMP_SNS_POS_ROD >	μm	Enable Conditions:	No rod 5 force present condition (8) confirmation time, see Summary table attachments C_SID_ASV_CMP_SNS_POS_ROD	>=	100	ms	Runs continuously	
outside these tolerance bands for a confirmation time the rod position sensor is considered suspicious. The sensor is confirmed to be faulted when at	OR				Electrical fault for rod 5 position sensor	=	False			
the time of the detected fault, the clutch speed and output speed can be indepently verified by comparing clutch speed with engine speed during clutch closed situations and comparing		Rod drift fault low limit (7), see < Summary table attachments C_SID_ASV_CMP_SNS_POS_ROD					False			
output speed with output speed calculated from the driven wheel speeds.	Rod 5 position measurement		μm		Consistency fault rod 5 position sensor	=				
						Synchronizer shift busy on corresponding clutch shaft No electrical even clutch speed sensor OR output speed sensor fault time Logically engaged gear matches rod 5 speed gear (9), see Summary table attachments C_SID_ASV_CMP_SNS_POS_ROD Output speed available from sensor OR substituted by CAN info Even clutch speed available from sensor End-of-line rod 1 position learn routine busy End-of-line rod 2 position learn routine busy End-of-line rod 3 position learn routine busy End-of-line rod 4 position learn routine busy End-of-line rod 5 position learn routine busy Application state is unequal to error state Application state is unequal to		False 100 True True False False False False True	ms	
---	--	----	-----	----	---------------------	--	-----	--	------------	-------------------
					Fault confirmation:	Fault confirmation time for rod position sensor measured out of limits Fault confirmation conditions to consider the rod position sensor faulted		500	ms	
						Driving gear is an even gear Difference between even clutch speed sensor and engine speed	= <	True 350	røm	
						sensor Difference between output speed		70		
						sensor and output speed based on driven wheel speeds Transmission output speed	>	70 50	rpm rpm	
						Driving gear is located on rod 5 OR	=	True		
						Driving gear is located on rod 3 or rod 4	=	True		
						sensor measurement and rod 5 learned blocking ring B position	>	1000	μm	
This diagnostic detects a stuck shift rod position sensor. This is by use of the synchronizer integrity routine which can be triggered by the setting by a gear system or component diagnostic failure. The synchronizer integrity routine performs small rod movement	C_ROD_5 movement towards A side during C_ROD_5 move B to A test case (20), see Summary table attachments C_SID_ASV_CMP_SNS_POS_ROD (Synchronizer pressure control valve C_SPV_5 actuation with selector position target	<=	100	μm	Enable Conditions:	Synchronizer integrity intrusive routine triggered (15), see Summary		True		
actuations and evaluates the actual rod movements caused by this.	hydraulically S_OOSPOS_OFF)					table attachments C_SID_ASV_CMP_SNS_POS_ROD	=			Runs continuously

When no rod movement is detected when trying to move the rod in both directions the rod position sensor may be stuck at value or the synchronizer pressure control valve may be stuck hydraulically off.	C_ROD_5 movement during C_ROD_5 move B to A test case (20), see Summary table attachments C_SID_ASV_CMP_SNS_POS_ROD (Synchronizer pressure control valve C_SPV_5 actuation with selector position target hydraulically S_OOSPOS_OFF)	<=	100	μm		Synchronizer integrity routine running conditions (16), see Summary table attachments C_SID_ASV_CMP_SNS_POS_ROD C_ROD_S_move A to B test case	=	True		
As there are no shared synchronizer pressure control valves for this rod, the pinpointing between rod position sensor failure and synchronizer pressure control valve failure is done by use of the current profile check for the syncrhonizer pressure control valve.	C_ROD_5 movement during C_ROD_5 move A to B test case (20), see Summary table attachments C_SID_ASV_CMP_SNS_POS_ROD (Synchronizer pressure control valve C_SPV_5 actuation with selector position target hydraulically S_OOSPOS_ON)	<=	100	μm		executed (17), see Summary table attachments C_SID_ASV_CMP_SNS_POS_ROD (Synchronizer pressure control valve C_SPV_5 actuation with selector position target hydraulically S_OOSPOS_ON)	=	True		
If the current profile check for the synchronizer pressure control valve consistently indicates pass, the rod position sensor is diagnosted faulted.	C_ROD_5 movement during C_ROD_5 move A to B test case (20), see Summary table attachments C_SID_ASV_CMP_SNS_POS_ROD (Synchronizer pressure control valve C_SPV_5 actuation with selector position target hydraulically S_OOSPOS_ON)	<=	100	μm		C_ROD_5 move B to A test case executed (17), see Summary table attachments C_SID_ASV_CMP_SNS_POS_ROD (Synchronizer pressure control valve C_SPV_5 actuation with selector position target hydraulically S_OOSPOS_OFF)	=	True		
	Synchronizer pressure control valve 5 current profile check consistently indicates FAIL	=	True			Transmission oil temperature	>=	40	°C	
					Fault confirmation	Synchronizer pressure control valve 5 current profile check fail confirmation count	=	3	count	

Component/System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Thre	shold Value			Secondary Parameters		Enable Conditions		Time Required	MIL illum.
Clutch 1 pressure	D0044	This diagnostic detects a sensor consistency fault for a clutch pressure sensor. This is done by using the clutch recovery routine which is triggered by the setting of of a clutch system or	Absolute difference between odd clutch pressure measured and clutch pressure small step target	>	1	bar	Enable Conditions:	Diagnostic reset event	=	False		Dura Cartinuaria	
sensor consistency	F 0041	The clutch recovery routine first verified indepently from the clutch pressure sensor that the clutch pressure control valve and the clutch pressure redundant shutdown valve are operational.	OR					Odd clutch pressure recovery routine is requested (1), see Summary table attachments C_SID_ASV_VA_CMP_SNS_PRS_CLU _CONSIST	=	True		Kuns Continuousiy	~
		If the clutch pressure control valve and the clutch pressure redundant shutdown valve are confirmed operational, the clutch pressure sensor is diagnosed by attempting to attain a small and a big pressure target	Absolute difference between odd clutch pressure measured and clutch pressure big step target	>	1	bar		Odd clutch pressure recovery routine run conditions met (2), see Summary table attachments	=	True			
		If one of the pressure steps cannot be attained, the clutch pressure sensor is diagnosed faulted.						Odd clutch pressure sensor out-of- window drift fault detected during this instance of the odd clutch recovery routine	=	False			
								Odd clutch redundant shutdown valve stuck on fault detected during this instance of the odd clutch recovery routine	=	False			
								Odd clutch redundant shutdown valve stuck off fault detected during this instance of the odd clutch recovery routine	=	False			
								Odd clutch proportional pressure valve stuck on fault detected during this instance of the odd clutch recovery routine	=	False			
								Odd clutch proportional pressure valve stuck off fault detected during this instance of the odd clutch recovery routine	=	False			
								Small step pressure target Big step pressure target	= =	4 6	bar bar		
							Fault confirmation time		>	100	ms		
Clutch 2 pressure sensor consistency	P0846	This diagnostic detects a sensor consistency fault for a clutch pressure sensor. This is done by using the clutch recovery routine which is triggered by the setting of of a clutch system or component diagnostic failure.	Absolute difference between even clutch pressure measured and clutch pressure small step target	>	1	bar	Enable Conditions:	Diagnostic reset event	=	False		Runs Continuously	A
		The clutch recovery routine first verified indepently from the clutch pressure sensor that the clutch pressure control valve and the clutch pressure redundant shutdown valve are operational.	OR					Even clutch pressure recovery routine is requested (1), see Summary table attachments	=	True			
		If the clutch pressure control valve and the clutch pressure redundant shutdown valve are confirmed operational, the clutch pressure sensor is diagnosed by attempting to attain a small and a big pressure target.	Absolute difference between even clutch pressure measured and clutch pressure big step target	>	1	bar		Even clutch pressure recovery routine run conditions met (2), see Summary table attachments	=	True			
		If one of the pressure steps cannot be attained, the clutch pressure sensor is diagnosed faulted.						Even clutch pressure sensor out-of- window drift fault detected during this instance of the odd clutch recovery routine	=	False			

		Even clutch redundant shutdown valve stuck on fault detected druing this instance of the odd clutch recovery routine Even clutch redundant shutdown	=	False		
		valve stuck off fault detected druing this instance of the odd clutch recovery routine	=	False		
		valve stuck on fault detected during this instance of the odd clutch recovery routine	=	False		
		Even clutch proportional pressure valve stuck off fault detected during this instance of the odd clutch recovery routine	=	False		
		Small step pressure target Big step pressure target	=	4 6	bar bar	
		Fault confirmation time	>	100	ms	

									E	nable		
Component/System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold	l Value			Secondary Parameters	Cor	nditions	Time Required	MIL illum.
Clutch 1 pressure sensor drift out of window	P0844	This diagnostic detects the offset for the clutch pressure sensor is too high by analyzing the raw clutch pressure sensor measured while the clutch pressure should be reading zero.	Absolute raw measured clutch 1 pressure	Pressure sensor drii threshold (2), see attachm C_SID_ASV_CMP_SI > IFT	ft out of window Summary table nents NS_PRS_CLU_DR	bar	Enable Conditions:	Clutch zero pressure condition (4), see Summary table attachments C_SID_ASV_CMP_SNS_PRS_CLU_DR IFT	-	True	Runs Continuously	А
		If the absolute value for the raw clutch pressure sensor reading during the zero pressure condition is too high, the clutch pressure sensor is diagnosed faulted.	Valid raw measured clutch 1 pressure samples found (1), see Summary table attachments C_SID_ASV_CMP_SNS_PRS_CLU_DRIFT	Fals	e			Controller awake time	>	20 ms		
								Application state is unequal to error state	=	True		ſ
								Application state is unequal to bypass state	-	True		
								Code clear event Electrical clutch pressure sensor	= 1	False True		
Clutch 2 pressure		This diagnostic detects the offset for the clutch pressure sensor is too high by analyzing the raw clutch pressure sensor measured while the	Absolute raw measured clutch 2 pressure	Pressure sensor drit threshold (2), see attachm	ft out of window Summary table nents	bar	Enable Conditions:	Clutch zero pressure condition (4), see Summary table attachments		True		
window	P0849	clutch pressure should be reading zero. If the absolute value for the raw clutch pressure		> IFT				IFT	=		Runs Continuously	A
		sensor reading during the zero pressure condition is too high, the clutch pressure sensor	found (1), see Summary table attachments	Fals	e					20		
		is diagnosed faulted.		=				Controller awake time Application state is unequal to bypass state	>	ms True		
								Electrical clutch pressure sensor diagnostic indicates ok	=	True		
								Code clear event Electrical clutch pressure sensor	= 1	False		
	1							diagnostic indicates ok	=	True	1	

Component/System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshol	d Value			Secondary Parameters		Enable Conditions		Time Required	MIL illum.
LSD pressure sensor consistency	P0876	This diagnostic detects a sensor consistency fault for a limited slip differential pressure sensor. This is done by using the limited slip differential recovery routine which is triggered by the setting of of a clutch system or component diagnostic failure.	Absolute difference between limited slip differential pressure measured and limited slip differential pressure small step target	> 1		bar	Enable Conditions:	Diagnostic reset event	=	False		Runs Continuously	в
		The limited slip differential recovery routine first verified indepently from the limited slip differential pressure sensor that the limited slip differential pressure control valve and the limited slip differential pressure redundant shutdown valve are operational.	OR					Limited slip differential recovery routine is requested (1), see Summary table attachments	=	True			
		If the limited slip differential pressure control valve and the limited slip differential pressure redundant shutdown valve are confirmed operational, the limited slip differential pressure sensor is diagnosed by attempting to attain a small and a big pressure target.	Absolute difference between limited slip differential pressure measured and limited slip differential pressure big step target	> 1		bar		Limited slip differential recovery routine run conditions met (2), see Summary table attachments	=	True			
		If one of the pressure steps cannot be attained, the limited slip differential pressure sensor is diagnosed faulted.						Limited slip differential pressure sensor out-of-window drift fault detected during this instance of the odd clutch recovery routine limited slip differential redundant	=	False			
								shutdown valve stuck on fault detected during this instance of the odd clutch recovery routine Limited slip differential redundant	=	False			
								shutdown valve stuck off fault detected during this instance of the odd clutch recovery routine	=	False			
								Limited slip differential proportional pressure valve stuck on fault detected during this instance of the odd clutch recovery routine	=	False			
								Limited slip differential proportional pressure valve stuck off fault detected during this instance of the odd clutch recovery routine	=	False			
								Small step pressure target Big step pressure target	= =	4 6	bar bar		
							Fault confirmation time		=	100	ms		

Component/System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value		Secondary Parameters	Enable Conditions	Time Required	MIL illum.
Limited slip differential pressure sensor drift out of window	P0879	This diagnostic detects the offset for the limited slip differential pressure sensor is too high by analyzing the raw limited slip differential pressure sensor measured while the limited slip differential pressure should be reading zero.	Absolute raw measured limited slip differential pressure	Pressure sensor drift out of window threshold (2), see Summary table attachments bar C_SID_ASV_CMP_SNS_PRS_LSD_DRI > FT	Enable Conditions:	Limited slip differential zero pressure condition (4), see Summary table attachments C_SID_ASV_CMP_SNS_PRS_LSD_DRI FT	True	Runs Continuously	В
		differential pressure sensor reading during the zero pressure condition is too high, the limited slip differential pressure sensor is diagnosed	Valid raw measured raw limited slip differential pressure samples found (1)	False			20		
		faulted.		=		Controller awake time	> ms		
						Electrical limited slip differential pressure sensor diagnostic indicates ok	True =		
						Application state is unequal to error	_ True		
						Application state is unequal to bypass state	= True		
						Code clear event	= False		
						Electrical limited slip differential pressure sensor fault	= False		

Component/System	Fault Code	Monitor Strategy Description	Malfunction Criteria		Threshold Value			Secondary Parameters		Enable Conditions	Time Required	MIL illum.
System pressure sensor	P0871	This diagnostic detects a sensor consistency fault for a system pressure sensor. This is done by using the system recovery routine which is triggered by the setting of system pressure control system or component diagnostic failure	Pressure difference between the system pressure and the clutch pressure of the selected clutch for the sensor consistency check for open loop system pressure target 1	>=	'2.5	bar	Enable Conditions:	Diagnostic reset event	=	False	Runs Continuously	A
		The system pressure recovery routine first attempts to attain different pressure targets. If this fails, the faulted component is determined: system pressure sensor, system pressure pilot valve or the system pressure relief valve.	OR					System pressure recovery routine is requested (1), see Summary table attachments C_SID_ASV_CMP_SNS_PRS_SYS_CO NSIST	=	True	,	
		If the system pressure target check has failed for one of the system pressure target, the system pressure sensor measurement is checked against a clutch pressure sensor by disengaging the gear on a clutch shaft when possible and ramping up the clutch pressure control valve current untilll the clutch is completely closed.	Pressure difference between the system pressure and the clutch pressure of the selected clutch for the sensor consistency check for open loop system pressure target 2	>=	2.5	bar		System pressure recovery routine run conditions met (2), see Summary table attachments C_SID_ASV_CMP_SNS_PRS_SYS_CO NSIST	=	True		
		When the clutch is completely closed, the system pressure and clutch pressure should be reading a similar value. If this is the not the case, the system pressure sensor is diagnosed faulted.						System pressure was unable to attain one of the system pressure steps during this instance of the system pressure recovery routine (3), see Summary table attachments C_SID_ASV_CMP_SNS_PRS_SYS_CO NSIST	=	True		
								System pressure sensor check against clutch pressure sensor conditions met (4), see Summary table attachments C_SID_ASV_CMP_SNS_PRS_SYS_CO NSIST	=	True		
							Fault confirmation time		=	2000 m	s	

											Enable			
Component/System	Fault Code	Monitor Strategy Description	Malfunction Criteria		Threshold Value				Secondary Parameters		Conditions		Time Required	MIL illum.
					Pressure sensor drift out of window									
		This diagnostic detects the offset for the system			threshold (2), see Summary table				System pressure zero condition (4),					
		pressure sensor is too high by analyzing the raw	Absolute raw measured system pressure		attachments	bar	Enable Co	Conditions:	see Summary table attachments		True			
System pressure sensor		system pressure sensor measured while the			C_SID_ASV_VA_CMP_SNS_PRS_SYS				C_SID_ASV_VA_CMP_SNS_PRS_SYS					
drift out of window	P0874	clutch pressure should be reading zero.		>	_DRIFT				_DRIFT	=			Runs Continuously	A
		If the absolute value for the raw system pressure												
		sensor reading during the zero pressure	Valid raw measured system pressure samples		E-l						20			
		condition is too high, the system pressure sensor	found (1)		Faise						20			
		is diagnosed faulted.		=					Controller awake time	>		ms		
									Application state is unequal to error		T			
									state	=	True			
									Application state is unequal to		-			
									bypass state	=	True			
									Code clear event	=	False			
									Electrical system pressure sensor		-			
									diagnostic indicates ok	=	True			

									Enable			
Component/System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value			Secondary Parameters		Conditions		Time Required	MIL illum.
Clutch 1 speed sensor consistency	P0792	This diagnostic detects consistency fault for the clutch speed sensor by comparing the reading for the clutch speed sensor with the engine speed during clutch closed conditons. When the clutch is fully closed and there are no pressure control related issues which could	Absolute difference between measured clutch 1 speed and engine speed	>= 150	rpm	Enable Conditions:	Engine speed available (3), see Summary table attachments C_SID_ASV_CMP_SNS_SPD_CLU	=	True		Runs Continuously	A
		induce clutch slippage, the clutch speed measurement should match the engine speed. If the difference between the two is too high for too long, the clutch speed sensor is diagnosed							False			
		faulted.					Electrical clutch 1 speed sensor fault Clutch 1 state is closed Microslip active Odd clutch pressure pressure	= =	True False			
							Control ok condition (17), see Summary table attachments C_SID_ASV_CMP_SNS_SPD_CLU Odd clutch pressure request - Odd clutch pressure target	= <=	True 0.150390625	bar		
							Diagnostic reset event Application state is unequal to error	=	False			
							state Application state is unequal to bypass state	=	True			
						Fault confirmation time		=	1100	ms		
		Inis alignostic detects consistency faults for the clutch speed sensor by comparing the reading for the clutch speed sensor with the clutch speed calculated from the output speed based on engaged gear ratios. If the logically engaged gear is confirmed by the rod position sensors, the output speed sensor	synchronizer differential speed for clutch 1 engaged gear	Synchronizer differential speed limit >= (1), see Summary table attachments C_SID_ASV_CMP_SNS_SPD_CLU	rpm	Enable Conditions:	Output speed consistency with wheel speeds from CAN (5), see Summary table attachments C_SID_ASV_CMP_SNS_SPD_CLU	=	True		Runs Continuously	
		matches output speed based on driven wheel speeds and the clutch speed differs from the clutch speed based on the output speed, the					Flashind data data data data data data data da		False			
		ciuton speed sensor is diagnosed faulted.					Synchronizer shift busy on clutch 1 shaft	=	False			
							Absolute output speed Current logical gear on matches rod position sensor readings for clutch 1	>=	150 True	rpm		
							shaft (6) Clutch 1 shaft has gear engaged	= =	True			
							Application state is unequal to error state	=	False			
							Application state is unequal to bypass state	=	True			
						Fault confirmation time		=	200	ms		
		This diagnostic detects consistency fault for the clutch speed sensor by monitoring gear engagements.	Engaged gear for clutch 1 based on speed sensor information matches gear to be engaged (11), see Summary table attachments C_SID_ASV_CMP_SNS_SPD_CLU	= False		Enable Conditions:	Synchronizer shift busy on clutch 1 shaft	=	True		Runs Continuously	

		If during gear engagements, the corresponding rod position sensor indicates rod movement towards the intended gear engagement and the rod position sensor indicates the gear has sucesfully engaged while the calculated differential speed for the syncrhonizer remains high, the clutch speed sensor is diagnosed faulted.	Engaged gear based on rod position sensor for shifting rod matches gear to be engaged (12), see Summary table attachments C_SID_ASV_CMP_SNS_SPD_CLU Rod position sensor movement during shift detected (13), see Summary table attachments C_SID_ASV_CMP_SNS_SPD_CLU Synchronizer differential speed for gear to engaged on clutch 1 shaft	= = >	True True 200	rpm	Eault confirmation	Output speed sensor is suspicious (9), see Summary table attachments C_SID_ASV_CMP_SNS_SPD_CLU Clutch 1 speed sensor is suspicious (10), see Summary table attachments C_SID_ASV_CMP_SNS_SPD_CLU Application state is unequal to error state Application state is unequal to bypass state	-	False False True True			
							time		=	50	ms	ļ	
Clutch 2 speed sensor consistency	P2746	This diagnostic detects consistency fault for the clutch speed sensor by comparing the reading for the clutch speed sensor with the engine speed during clutch closed conditons. When the clutch is fully closed and there are no pressure control related issues which could induce glutch clineare the clutch ended.	Absolute difference between measured clutch 2 speed and engine speed	>=	150	rpm	Enable Conditions:	Engine speed available (3), see Summary table attachments C_SID_ASV_CMP_SNS_SPD_CLU	=	True		Runs Continuously	A
		measurement should match the engine speed. If the difference between the two is too high for too long, the clutch speed server is diagnosed.								False			
		faulted.						Electrical clutch 2 speed sensor fault Clutch 2 state is closed Microslip active Even clutch pressure pressure control ok condition (17), see Summary table attachments	= = =	True False True			
								C_SID_ASV_CMP_SNS_SPD_CLU Even clutch pressure request - Even clutch pressure target	= <=	0.150390625	bar		
								Application state is unequal to error	-	False		ļ	
								state Application state is unequal to bypass state	=	True			
							Fault confirmation time		=	1100	ms		
		This diagnostic detects consistency faults for the clutch speed sensor by comparing the reading for the clutch speed sensor with the clutch speed calculated from the output speed based on engaged gear ratios. If the logically engaged gear is confirmed by the	Synchronizer differential speed for clutch 2 engaged gear	Synchronized	r differential speed limit (1)	rpm	Enable Conditions:	Output speed consistency with wheel speeds from CAN (5), see Summary table attachments C_SID_ASV_CMP_SNS_SPD_CLU	=	True		Runs Continuously	
		rod position sensors, the output speed sensor matches output speed based on driven wheel speeds and the clutch speed differs from the clutch speed based on the output speed the								False			
		clutch speed sensor is diagnosed faulted.						Electrical clutch 2 speed sensor fault Synchronizer shift busy on clutch 2 shaft	= =	False			
								Absolute output speed Current logical gear on matches rod	>=	150	rpm		
								position sensor readings for clutch 2 shaft (6)	=	True			

						Clutch 1 shaft has gear engaged Diagnostic reset event Application state is unequal to error state Application state is unequal to bypass state	= = =	True False True True		
					Fault confirmation time		=	200	ms	
This diagnostic detects consistency fault for the clutch speed sensor by monitoring gear	Engaged gear for clutch 2 based on speed sensor information matches gear to be engaged (11), see Summary table attachments	=	False		Enable Conditions:	Synchronizer shift busy on clutch 2		True		******
engagements. If during gear engagements, the corresponding rod position sensor indicates rod movement	C_SID_ASV_CMP_SNS_SPD_CLU					shaft	=			Runs Continuously
towards the intended gear engagement and the rod position sensor indicates the gear has sucesfully engaged while the calculated	Engaged gear based on rod position sensor for	=	True					False		
differential speed for the syncrhonizer remains high, the clutch speed sensor is diagnosed faulted.	shifting rod matches gear to be engaged (12), see Summary table attachments C_SID_ASV_CMP_SNS_SPD_CLU					Output speed sensor is suspicious (9), see Summary table attachments C_SID_ASV_CMP_SNS_SPD_CLU	=			
	Rod position sensor movement during shift detected (13), see Summary table attachments C_SID_ASV_CMP_SNS_SPD_CUU	=	True			(10), see Summary table attachments	=	False		
	Synchronizer differential speed for gear to engaged on clutch 2 shaft	>	200	rpm		Application state is unequal to error state	=	True		
						Application state is unequal to bypass state	=	True		
					Fault confirmation		_	50	me	

Component/System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value			Secondary Parameters		Enable Conditions		Time Required	MIL illum.
Engine speed sensor consistency	P2FD1	This diagnostic detects consistency faults engine speed sensor input towards the transmission controller. The engine speed sensor input for the transmission controller is compared against the	Absolute difference between measured engine speed and engine speed from ECM	> 350	rpm	Enable Conditions:	Electrical engine speed sensor fault	=	False		Runs Continuously	A
		If the difference is too high for too long, the engine speed sensor input towards the					Engine speed from ECM valid (1), see Summary table attachments		True			
		transmission controller is diagnosed faulted.					C_SID_ASV_CMP_SNS_SPD_ENG Engine speed from ECM	= >=	400	rpm		
							Diagnostic clear event Application state is unequal to error	=	False			
							state Application state is unequal to bypass state	=	True			
							High engine speed gradient expected condition (2), see Summary table attachments C_SID_ASV_CMP_SNS_SPD_ENG	=	False			
						Fault confirmation		=	800	ms		

Component/System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value			Secondary Parameters	Enable Condition	5	Time Required	MIL illum.
			Absolute difference between Measured output							· · ·	
Output speed sensor		This diagnostic detects consistency faults for the	speed and Output speed from Wheel Speed on	>= 150	rpm	Enable Conditions:		False			
consistency	P0721	transmission output speed sensor.	CAN				Electrical output peed sensor fault	=		Runs Continuously	A
		The transmission output speed sensor reading is compared against the output speed calculated based on the driven wheel speeds. If there is a mismatch between the output speed	Hysteresis low difference threshold	50	rpm		Wheel speed information from CAN valid (2), see Summary table attachments C_SID_ASV_CMP_SNS_SPD_OUT	True >			
		from the sensor and the output speed calculated based on the driven wheel speeds, the transmission output speed sensor is considered suspicious.	AND				Output speed from clutch 1 available (3), see Summary table attachments C_SID_ASV_CMP_SNS_SPD_OUT	True			
		If one of the transmission clutch speed sensor confirms the mismatch for the output speed sensor while the other clutch speed sensor does not show a match, the output speed sensor is diagnosed faulted. To verify the output speed sensor reading with	Absolute difference between Measured output speed and Output speed from clutch 1 too high (1), see Summary table attachments C_SID_ASV_CMP_SNS_SPD_OUT	True			Output speed from clutch 2 available (3), see Summary table attachments C_SID_ASV_CMP_SNS_SPD_OUT	True =			
		the clutch speed, a gear has to be engaged on the corresponding clutch shaft and the ouput speed is calculated based on the clutch speed sensor reading and the engaged gear ratio.	OR				Application state is unequal to error state	= True			
			Absolute difference between Measured output speed and Output speed from clutch 2 too high (1), see Summary table attachments C_SID_ASV_CMP_SNS_SPD_OUT	= True			Application state is unequal to bypass state	= True			
							Diagnostic clear event	= False			
						Fault confirmation time		= 300	ms		

Component/System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Th	reshold Value			Secondary Parameters	(Enable Conditions		Time Required	MIL illum.
Sump temperature consistency	P0711	This diagnostic detects a consistency fault for the sump temperature sensor by monitoring high temperature gradient. The sump temperature sensor reading physically	: Absolute filtered gradient of sump temperature	>	700	°C/s	Enable Conditions:	Diagnostic reset event	=	False		Runs Continuously	В
		cannot change with high gradients. If a high filtered gradient for the sump temperature sensor reading is detected, the sump temperature sensor is diagnosed faulted.						Application state is unequal to error state	=	True			
								Application state is unequal to bypass state Electrical fault on sump temperature	=	True			
								sensor active Sump temperature gradient valid (enough samples taken)	=	True			
							Fault confirmation	Number of sump temperature measurement samples used for raw sump temperature gradient calculation	=	5	count		
								Number of raw sump temperature gradients used for filtered sump temperature gradient calculation	=	5	count		
		This diagnostic detects a consistency fault for the						confirmation timer	=	60	ms		
		sump temperature sensor by comparing transmission temperature sensor readings with engine water temperature when the engine has	Absolute average difference between sump	>	15	°C	Enable Conditions:		=	False			
		not been running for a long time. When the engine was turned off for a long time	during cold start check	l				Diagnostic reset event				Runs Continuously	
		and the transmission controller is powered up, the two transmission internal temperature sensors are compared. If the transmission temperature sensor values	Absolute difference between cooler out temperature and sump temperature measurement	>	10	°C		Electrical fault on sump temperature sensor active	=	False			
		read values that differ greatly from each other, the average difference between the transmission temperature sensors and the engine water temperature are calcuted. If the difference between the sump and cooler out temperature sensor readings is high, the difference between the sump and engine water	Average absolute difference between cooler out and engine water temperature received from CAN	<	7	°C		Electrical fault on cooler out temperature sensor active	=	False			
		temperature is high and the difference between the cooler out temperature and the engine							=	True			
		temperature sensor is diagnosed faulted.						received from CAN Propulsion system off time received from CAN	>=	28800	s		
				1				Engine is running Application state is unequal to error	=	False			
				1				state Application state is unequal to	=	True			
				l				bypass state Engine coolant water temperature	=	True			
				l				valid received from CAN Time since controller initialization Time since controller initialization	>= <=	2000	ms ms		
							Fault confirmation	Difference between measured cooler out temperature and measured sump temperature confirmation timer	>	1000	ms		

								Difference between transmission temperature sensors and valid engine water temperature from CAN sample counter	>	200	count		
Cooler out temperature consistency	P2741	This diagnostic detects a consistency fault for the cooler out temperature sensor by monitoring high temperature gradient. The cooler out temperature sensor reading busically cannot charge with high gradients. If a	Absolute filtered gradient of cooler out temperature	>	700	°C/s	Enable Conditions:	Diagnostic reset event	=	False		Runs Continuously	В
		high filtered gradient for the cooler out temperature sensor reading is detected, the cooler out temperature sensor is diagnosed faulted.						Application state is unequal to error state	=	True			
								Application state is unequal to bypass state	=	True			
								Electrical fault on cooler out temperature sensor active	=	False			
								Cooler out temperature gradient valid (enough samples taken)	=	True			
							Fault confirmation	Number of cooler out temperature measurement samples used for raw cooler out temperature gradient calculation	=	5	count		
								Number of raw cooler out temperature gradients used for filtered cooler out temperature gradient calculation	=	5	count		
								Cooler out temperature gradient fault confirmation timer	=	60	ms		
		This diagnostic detects a consistency fault for the cooler out temperature sensor by comparing transmission temperature sensor readings with	Absolute average difference between cooler	>	15	°C	Enable Conditions:		=	False			
		engine water temperature when the engine has not been running for a long time. When the engine was turned off for a long time	temperature and engine water temperature during cold start check					Diagnostic reset event				Runs Continuously	
		and the transmission controller is powered up, the two transmission internal temperature sensors are compared. If the transmission temperature sensor values	Absolute difference between cooler out temperature and sump temperature measurement	>	10	°C		Electrical fault on sump temperature sensor active	=	False			
		read values that differ greatly from each other, the average difference between the transmission temperature sensors and the engine water temperature are calcuted. If the difference between the sump and cooler.	Average absolute difference between sump temperature and engine water temperature received from CAN	<	7	°C		Electrical fault on cooler out temperature sensor active	=	False			
		out temperature sensor readings is high, the difference between the cooler out and engine water temperature is high and the difference between the sump temperature and the engine							=	True			
		engine water temperature is low, the cooler out temperature sensor is diagnosed faulted.						Propulsion system off time valid received from CAN Propulsion system off time received	>=	28800	s		
								from CAN Engine is running	=	False			
								Application state is unequal to error state	=	True			
								Application state is unequal to bypass state	=	True			
								valid received from CAN	=	True			
								Time since controller initialization Time since controller initialization	>= <=	2000 20000	ms ms		

	F	Fault confirmation	Difference between measured cooler out temperature and measured sump temperature confirmation timer	>	1000	ms	
			Difference between transmission temperature sensors and valid engine water temperature from CAN sample counter	>	200	count	

Component/System	Fault Code	Monitor Strategy Description	Malfunction Criteria		Threshold Value		Secondary Parameters		Enable		Time Required	MII illum.
component/system	rault coue	This diagnostic detects a mechanical stuck off			Theshold value		Secondary Parameters		conditions		Time Required	IVIL III.
Park lock hold solenoid stuck off	P18A9	hold solenoid during the parking lock engagement valve off test state of the parking lock diagnostic disengage routine. During the parking lock diagnostic	Parking lock logical position (1), see Summary table attachments C_SID_ASV_CMP_SOL_HLD_PLK_STUCK_OFF	=	Between Locked and Hold	Enable Conditions:	Diagnostic reset event	=	False	kph	Runs Continuously	В
		disengagement routine, the parking lock components are tested by first disengaging the parking lock completely. This is done by setting both the parking lock latching valve and parking lock engagement valve to the hydraulic on					Application state is unequal to error state	=	True			
		position. Once the parking position sensor shows parking lock disengagement, the parking hold solenoid is actuated to keep the parking lock disengaged even if hydraulic pressure to the parking lock piston is lost.	OR Parking lock logical position (1) , see Summary table attachments C_SID_ASV_CMP_SOL_HLD_PLK_STUCK_OFF	=	Locked		Application state is unequal to bypass state	=	True			
		After the parking lock has been disengaged and the parking lock hold solenoid is actuated, the parking lock engagement valve is tested by draining the parking lock piston with the parking lock engagement valve only.					Electrical fault detected for the parking lock hold solenoid	=	False			
		If the parking lock position sensor reads a value below the hold position, this means the hold solenoid was unable to keep the parking lock out of park and the parking lock hold solenoid is diagnosed mechanically stuck off.					Electrical fault detected for the parking lock engagement valve	=	False			
							Electrical fault detected for the parking lock latching valve	=	False			
							Electrical fault detected for the parking lock stepper motor	=	False			
							Electrical fault detected for the parking lock position sensor	=	False Parking lock			
							Parking lock actuation strategy	=	diagnostic disengage strategy			
							Parking lock engagement valve position target	=	Hydraulic Off			
							Parking lock latching valve position target Parking lock hold solenoid position	=	Hydraulic On			
							target	=	Electrical On			
						Fault confirmation time	Parking lock hold solenoid stuck off fault confirmation timer	>=	25	ms		
		This diagnostic detects a mechanical stuck off hold solenoid during the parking lock latching valve off test state of the parking lock diagnostic	Parking lock logical position (1) , see Summary table attachments	=	Between Locked and Hold	Enable Conditions:	Absolute vehicle speed	<=	3			
		disengage routine. During the parking lock diagnostic disengagement routine, the parking lock components are tested by first disengaging the parking lock completely. This is done by setting both the parking lock latching valve and parking lock engagement valve to the hydraulic on position.	0R				Transmission oil temperature	<=	120	kph ℃	Runs Continuously	

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Once the parking position sensor shows parking lock disengagement, the parking hold solenoid is actuated to keep the parking lock disengaged even if hydraulic pressure to the parking lock piston is lost.	Parking lock logical position (1) , see Summary table attachments C_SID_ASV_CMP_SOL_HLD_PLK_STUCK_OFF	= Locked		Battery voltage	>=	10000	mV	
the parking lock had seen usering actual the parking lock engagement valve is tested by draining the parking lock piston with the parking lock engagement valve only.				Parking lock latching valve logical position	=	Hydraulic Off		
After the parking lock engagement hydraulic stuck on test, the parking lock engagement valve is set to the hydraulic on position. When the parking lock position sensor reads				Parking lock actuation strategy	=	Parking lock diagnostic disengage strategy		
open after the parking engagement valve test, the parking lock latching valve is tested by drianing the parking lock pisiton with the parking lock latching valve only.				Parking lock engagement valve position target	=	Hydraulic On		
If the parking lock position sensor reads a value below the hold position, this means the hold solenoid was unable to keep the parking lock out of park and the parking lock hold solenoid is diagnosed mechanically stuck off				Parking lock latching valve position target	=	Hydraulic Off		
				Parking lock hold solenoid position target	=	Electrical On		
				Diagnostic reset event	=	False		
				Application state is unequal to error	=	True		
				state Application state is unequal to bypass state	=	True		
				Electrical fault detected for the	=	False		
				parking lock hold solenoid Electrical fault detected for the	=	False		
				Electrical fault detected for the		Falsa		
				parking lock latching valve	=	Faise		
				Electrical fault detected for the parking lock stepper motor	=	False		
				Electrical fault detected for the	=	False		
				parking lock position sensor		i disc		
			Fault confirmation	Parking lock hold solenoid stuck off	>=	25		
This diagnostic detects a mechanical stuck off			time	tault confirmation timer			ms	
hold solenoid during the wait for vehicle speed	Parking lock logical position (1) , see Summary table attachments	= Between Locked and Hold		Absolute vehicle speed	<=	3		
state of the parking lock diagnostic disengage routine	C_SID_ASV_CMP_SOL_HLD_PLK_STUCK_OFF						knh	Runs Continuously
During the parking lock diagnostic							Kpii	Kuns continuousiy
disengagement routine, the parking lock								
components are tested by first disengaging the				Transmission oil temperature	<i>/</i> -	120	۰c	
both the parking lock latching valve and parking					-	120	c	
lock engagement valve to the hydraulic on								
Once the parking position sensor shows parking	UK							
lock disengagement, the parking hold solenoid is	Parking lock logical position (1) , see Summary							
actuated to keep the parking lock disengaged	table attachments	= Locked		Battery voltage	>=	10000		
piston is lost.	C_SID_ASV_CIVIP_SUL_HLD_PLK_STUCK_OFF						mV	

r t c	After the parking lock has been disengaged and the parking lock hold solenoid is actuated, the parking lock engagement valve is tested by draining the parking lock piston with the parking ock engagement valve only.				Parking lock latching valve logical position	=	Hydraulic Off		
A s i:	After the parking lock engagement hydraulic stuck on test, the parking lock engagement valve s set to the hydraulic on position.				Parking lock actuation strategy	=	Parking lock diagnostic disengage strategy		
c t d	When the parking lock position sensor reads open after the parking engagement valve test, the parking lock latching valve is tested by drianing the parking lock pisiton with the parking ock latching valve only.				Parking lock engagement valve position target	=	Hydraulic On		
A le is t	After the parking lock engagement and parking ock latching valve tests of the parking lock diagnostic disengage sequence, the parking lock s kept disengage using the hold solenoid with he latching valve in the hydraulic off position until vehicle speed is detected.				Parking lock latching valve position target	=	Hydraulic Off		
li b c	f the parking lock position sensor reads a value below the hold position, this means the hold solenoid was unable to keep the parking lock out of park and the parking lock hold solenoid is dispaced mechanically stuck off				Parking lock hold solenoid position target	=	Electrical On		
U	hagnoseu mechanically stuck on.				Diagnostic reset event	=	False	ł	
					Application state is unequal to error	=	True		
					Application state is unequal to	=	True	ſ	
					bypass state Electrical fault detected for the			ł	
					parking lock hold solenoid	=	False	ł	
					Electrical fault detected for the parking lock engagement valve	=	False	ľ	
					Electrical fault detected for the parking lock latching valve	=	False	ľ	
					Electrical fault detected for the	=	False	ľ	
					Electrical fault detected for the	=	False	ľ	
					parking lock position sensor			ľ	
				Fault confirmation time	Parking lock hold solenoid stuck off fault confirmation timer	>=	25	ms	
T h c	This diagnostic detects a mechanical stuck off nold solenoid during parking lock latching valve off state of the parking lock diagnostic disengage routine.	Parking lock logical position (1) , see Summary table attachments C_SID_ASV_CMP_SOL_HLD_PLK_STUCK_OFF	= Between Locked and Hold	Enable Conditions:	Diagnostic reset event	=	False		Runs Continuously
C r t t	During the parking lock low speed engagement routine, the parking lock components are tested by first attempting to drain the parking lock biston by setting the parking lock latching valve to drain. The parking lock hold solenoid is kept in the electrical on position untill the vehicle speed alls below the parking lock engagement speed	OR			Application state is unequal to error state	=	True		
V F Ii Ii	When the parking lock engagement by use of the barking lock latchting valve has succeeded or if parking lock engagement with parking lock atching valve attempt times out, the parking ock engagement valve is set to the hydraulic off position.	Parking lock logical position (1) , see Summary table attachments C_SID_ASV_CMP_SOL_HLD_PLK_STUCK_OFF	= Locked		Application state is unequal to bypass state	=	True		

If the parking lock position sensor reads a value below the hold position, this means the hold solenoid was unable to keep the parking lock out of park and the parking lock hold solenoid is dispresed mechanically sturk off				Electrical fault detected for the parking lock hold solenoid	=	False		
diagnosed mechanically stack on.				Electrical fault detected for the parking lock engagement valve	=	False		
				parking lock latching valve	=	False		
				Electrical fault detected for the parking lock stepper motor	=	False		
				Electrical fault detected for the parking lock position sensor	=	False		
				Parking lock actuation strategy	=	Parking lock low speed engage strategy		
				Parking lock engagement valve	=	Hydraulic On		
				Parking lock latching valve position target	=	Hydraulic Off		
				Parking lock hold solenoid position target	=	Electrical On		
				Absolute vehicle speed	>=	0.8125	kph	
			Fault confirmation time	Parking lock hold solenoid stuck off fault confirmation timer	>=	25	ms	
This diagnostic detects a mechanical stuck off hold solenoid during parking lock engagement valve off state of the parking lock diagnostic disengage routine.	Parking lock logical position (1) , see Summary table attachments C_SID_ASV_CMP_SOL_HLD_PLK_STUCK_OFF	= Between Locked and Hold	Enable Conditions:	Diagnostic reset event	=	False		
During the parking lock low speed engagement routine, the parking lock components are tested by first attempting to drain the parking lock piston by setting the parking lock latching valve to drain. The parking lock hold solenoid is kept in the electrical on position untill the vehicle speed				Application state is unequal to error state	=	True		
falls below the parking lock engagement speed. When the parking lock engagement by use of the parking lock latchting valve has succeeded or if parking lock engagement with parking lock latching valve attempt times out, the parking lock engagement valve is set to the hydraulic off position. If the parking lock position sensor reads a value below the hold position, this means the hold	OR Parking lock logical position (1) , see Summary table attachments C_SID_ASV_CMP_SOL_HLD_PLK_STUCK_OFF	= Locked		Application state is unequal to bypass state	=	True		
solenoid was unable to keep the parking lock out of park and the parking lock hold solenoid is diagnosed mechanically stuck off				Electrical fault detected for the parking lock hold solenoid	=	False		
diagnosed meenanically stack on.				Electrical fault detected for the parking lock engagement valve	=	False		
				Electrical fault detected for the parking lock latching valve	=	False		
				Electrical fault detected for the parking lock stepper motor	=	False		
				Electrical fault detected for the parking lock position sensor	=	False		
				Parking lock actuation strategy	=	Parking lock low speed engage		
				Parking lock angagement value		strategy		
				position target	=	Hydraulic Off		i I

		Parking lock latching valve position target	=	Hydraulic Off		
		Parking lock hold solenoid position target Absolute vehicle speed	=	Electrical On	kph	
	Fault confirmation	Parking lock hold solenoid stuck off	>-	25		
	time	fault confirmation timer	~=	25	ms	

							í	Enable			
Component/System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value		Secondary Parameters	<u> </u>	Conditions		Time Required	MIL illum.
Park lock hold solenoid stuck on	P18A8	This diagnostic detects a mechanical stuck on parking lock hold solenoid by use of the parking standstill engagement routine. This routine is used when parking lock engagement is requested at standstill based on PRND and there are no electrical faults present for the parking lock components.	Parking lock logical position (1) , see Summary table attachments C_SID_ASV_CMP_SOL_HLD_PLK_STUCK_ON	= Hold	Enable Conditions:	Diagnostic reset event	=	False		Runs Continuously	В
		routine, the parking lock standshift engagement routine, the parking lock components are tested by first attempting to drain the parking lock piston by setting the parking lock latching valve to drain. The parking lock hold solenoid is set to the electrical off position immediately.				Application state is unequal to error state	=	True			
		When the parking lock engagement by use of the parking lock latching valve has succeeded or if parking lock engagement with parking lock latching valve attempt times out, the parking lock engagement valve is set to the hydraulic off position.				Application state is unequal to bypass state	=	True			
		If both the parking lock latching valve and the parking lock engagement valve are set hydraulic off and the parking lock position sensor does not read locked, the system pressure is forced low to attempt parking lock engagement.				Electrical fault detected for the parking lock hold solenoid	=	False			
		the parking lock position sensor reads hold the parking lock hold solenoid is diagnosed				Electrical fault detected for the parking lock engagement valve	=	False			
						Electrical fault detected for the parking lock latching valve Electrical fault detected for the	=	False			
						Electrical fault detected for the parking lock stepper motor Electrical fault detected for the parking lock position sensor	=	False			
						Parking lock actuation strategy	=	Parking lock standstill engage strategy			
						Parking lock engagment valve logical position	=	Hydraulic Off			
						Parking lock latching valve logical position Parking lock hold solenoid logical	=	Hydraulic Off			
						position Measured system pressure	- <	8	bar		
						System pressure sensor electrical	=	False			
						System pressure sensor electrical fault detected	=	False			
						System pressure low confirmation timer	>=	100	ms		
					Fault confirmation time	Parking lock forced low system pressure timer	>=	600	ms		

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This diagnostic detects a mechanical stuck on parking lock hold solenoid by use of the parking low speed engagement routine. This routine is used when parking lock engagement is requested at low speed based on PRND and there are no electrical faults present for the	Parking lock logical position (1), see Summary tabel attachments C_SID_ASV_CMP_SOL_HLD_PLK_STUCK_ON	= +	łold	Enable Conditions:		=	False		
parking lock components.					Diagnostic reset event				Runs Continuously
During the parking lock low speed engagement routine, the parking lock components are tested by first attempting to drain the parking lock piston by setting the parking lock latching valve to drain. The parking lock hold solenoid is kept in the electrical on position untill the vehicle speed					Application state is unequal to error state	=	True		
falls below the parking lock engagment speed. When the parking lock engagement by use of the parking lock latchting valve has succeeded or if parking lock engagement with parking lock latching valve attempt times out, the parking lock engagement valve is set to the hydraulic off position.					Application state is unequal to bypass state	-	True		
If both the parking lock latching valve and the parking lock engagement valve are set hydraulic off and the parking lock position sensor does not read locked, the system pressure is forced low to attempt parking lock engagement.					Electrical fault detected for the parking lock hold solenoid	=	False		
If during the low system pressure phase, the parking lock position sensor reads hold the parking lock hold solenoid is diagnosed mechanical stuck on.					Electrical fault detected for the parking lock engagement valve	=	False		
					Electrical fault detected for the parking lock latching valve	=	False		
					Electrical fault detected for the	=	False		
					parking lock stepper motor Electrical fault detected for the parking lock position sensor	=	False		
					Parking lock actuation strategy	=	Parking lock low speed engage strategy		
					Parking lock engagment valve logical	_	Hydraulic Off		
					position Parking lock latching valve logical	-	Hydraulic Off		
					position Parking lock hold solenoid logical	=	Mechanical Off		
					Measured system pressure	<	8	bar	
					System pressure sensor electrical	=	False		
					System pressure sensor electrical fault detected	=	False		
					System pressure low confirmation timer	>=	100	ms	
				Fault confirmation time	Parking lock forced low system pressure timer	>=	600	ms	

Component/System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value		Secondary Parameters		Enable Conditions		Time Required	MIL illum.
System pressure relief valve stuck	P1955	This diagnostic detects a system pressure relief valve performance fault. This is done by using the system recovery routine which is triggered by the setting of system pressure control system or component diagnostic failure. The system pressure recovery routine first	Current profile check consistently indicated pass for the system pressure pilot valve	= True	Enable Conditions:	Diagnostic reset event	=	False		Runs Continuously	A
		attempts to attain different pressure targets. If this fails, the faulted component is determined: system pressure sensor, system pressure pilot valve or the system pressure relief valve.	System pressure target checks fail (3), see Summary table attachments C_SID_ASV_CMP_SPL_PRS_SYS	= True		System pressure recovery routine is requested (1), see Summary table attachments C_SID_ASV_CMP_SPL_PRS_SYS	=	True			
		If the system pressure target check has failed for one of the system pressure target, the system pressure sensor measurement is checked against a clutch pressure sensor by disengaging the gear on a clutch shaft when possible and ramping up the clutch pressure control valve current untilll the clutch is completely closed.				System pressure recovery routine run conditions met (2), see Summary table attachments C_SID_ASV_CMP_SPL_PRS_SYS	=	True			
		If the system pressure sensor is diagnosed operational during the system pressure versus clutch pressure check, current profile checks are triggered for the system pressure pilot valve.				System pressure was unable to attain one of the system pressure steps during this instance of the system pressure recovery routine (3), see Summary table attachments C_SID_ASV_CMP_SPL_PRS_SYS	-	True			
		If the current profile check for the system pressure pilot valve consistenly indicates pass, the system pressure relief valve is diagnostic stuck by process of elimination				System pressure sensor check against clutch pressure sensor check passed during this instance of the system pressure recovery routine (4), see Summary table attachments C_SID_ASV_CMP_SPL_PRS_SYS	=	True			
						Transmission oil temperature Engine speed during forced zero current on the system pressure pilot	>= <=	60 2000	°C rpm		
						vaive Time zero current is commanded for the system pressure pilot valve before triggering the current profile check	>=	300	ms		
					Fault confirmation	System pressure pilot valve current profile check consist fail confirmation count	=	3			

								Enable			
Component/System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value		Secondary Parameters		Conditions		Time Required	MIL illum.
Park lock engaging valve stuck off	P2820	This diagnostic detects a hydraulic stuck off parking lock engagemenent valve. If driver attempts to drive away and the parking lock position sensor indicate the parking remains	Parking lock logical position (1) , see Summary table attachments C_SID_ASV_CMP_VA_EN_PLK_STUCK_OFF	= Locked	Enable Conditions:	Absolute vehicle speed	<=	10	kph	Runs Continuously	В
		detected, the parking lock is considered stuck in park.	Currently profile check for the parking lock engagement valve consistently indicate fails	=		Output speed	ζ=	100	rpm		
		by either the parking lock engagement value or the parking lock latching value not pressurizing the parking lock piston which corresponds to parking lock engagement value hydraulically stuck off or latching value hydraulically stuck.				Clutch torque	>	75			
		To dimerentiate between the parking lock engagement valve and the parking lock latchinng valve hydraulically stuck off, the current profile check is used for the parking lock engagement valve. If the current profile check for the parking lock				Brake bressed	=	False			
		engagement valve consistenly fails, the parking lock engagement valve is diagnosed hydraulically stuck off.				Parking lock position sensor electrical fault detected	=	False			
						Parking lock latching valve electrical fault detected	=	False			
						Parking lock latching valve logical position	=	Hydraulic On			
						Transmission oil temperature Diagnostic reset event	>= =	40 False	°C		
						Application state is unequal to error state	=	True			
						Application state is unequal to bypass state	=	True			
					Fault confirmation	Drive away fail confirmation time	>=	3000	ms		
						confirmation count	>=	3	count		

Component/System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value		Secondary Parameters		Enable Conditions		Time Required	MIL illum.
Park lock engaging valve stuck on	P2821	This diagnostic detects a hydraulic stuck on parking lock engagemenent valve by use of the parking lock diagnostic disengagement routine. This routine is used when parking lock disengagement is requested based on PRND and there are no electrical faults present for the parking lock components.	Parking lock logical position (1) at the end of parking lock engagement valve hydraulic off test state, see Summary tabel attachments C_SID_ASV_CMP_VA_EN_PLK_STUCK_ON	= Open	Enable Conditions:	Absolute vehicle speed	<=	3		Runs Continuously	в
		disengagement routine, the parking lock components are tested by first disengaging the parking lock completely. This is done by setting both the parking lock latching valve and parking lock engagement valve to the hydraulic on position.				Transmission oil temperature	<=	120	°C		
		Once the parking position sensor shows parking lock disengagement, the parking hold solenoid is actuated to keep the parking lock disengaged even if hydraulic pressure to the parking lock piston is lost.				Battery voltage	>=	10000	mV		
		After the parking lock has been disengaged and the parking lock hold solenoid is actuated, the parking lock engagement valve is tested by draining the parking lock piston with the parking lock engagement where a pack				Parking lock engagment valve logical position	=	Hydraulic Off			
		If the parking lock position sensor keeps reading open instead of hold when the parking lock engagement valve is set to the hydraulic off after a time, the parking lock engagement valve is diagnosed hydraulic stuck on.				Parking lock actuation strategy	=	Parking lock diagnostic disengage strategy			
						Parking lock engagement valve position target Parking lock latching valve position	=	Hydraulic Off			
						target Parking lock hold solenoid position	=	Electrical On			
						Diagnostic reset event	=	False			
						Application state is unequal to error state	=	True			
						Application state is unequal to bypass state	=	True			
						parking lock hold solenoid	=	False			
						Electrical fault detected for the parking lock engagement valve	=	False			
						parking lock latching valve	=	False			
						parking lock stepper motor	=	False			
						Electrical fault detected for the parking lock position sensor	=	False			
					Fault confirmation	Parking lock engagement valve off test state timer	``	200	ms		
		This diagnostic detects a hydraulic stuck on parking lock engagemenent valve by use of the parking standstill engagement routine. This routine is used when parking lock engagement is requested at standstill based on PRND and there are no electrical faults present for the parking lock components.	Parking lock logical position (1) at the end of parking lock engagement valve and latching valve hydraulic off state, see Summary tabel attachments C_SID_ASV_CMP_VA_EN_PLK_STUCK_ON	= Open	Enable Conditions:	Diagnostic reset event	=	False		Runs Continuously	

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During the parking lock standstill engagement routine, the parking lock components are tested by first attempting to drain the parking lock piston by setting the parking lock latching valve to drain. The parking lock hold solenoid is set to the electrical off position immediately.	Parking lock logical position (1) during forced low system pressure state, see Summary tabel attachments C_SID_ASV_CMP_VA_EN_PLK_STUCK_ON	= Locked		Application state is unequal to error state	=	True		
When the parking lock engagement by use of the parking lock latchting valve has succeeded or if parking lock engagement with parking lock latching valve attempt times out, the parking lock engagement valve is set to the hydraulic off position.	OR			Application state is unequal to bypass state	=	True		
If both the parking lock latching valve and the parking lock engagement valve are set hydraulic off and the parking lock position sensor does not read locked, the system pressure is forced low to attempt parking lock engagement.	Parking lock logical position (1) at the end of parking lock engagement valve and latching valve hydraulic off state, see Summary tabel attachments C_SID_ASV_CMP_VA_EN_PLK_STUCK_ON	= Open		Electrical fault detected for the parking lock hold solenoid	=	False		
If during the low system pressure phase, the parking lock position sensor reads locked, the parking lock engagement valve is diagnosed hydraulic stuck on. If after a timeout during the low system pressure	Parking lock logical position (1) at the end of forced low system pressure state, see Summary tabel attachments C_SID_ASV_CMP_VA_EN_PLK_STUCK_ON	= Between Hold and Locked		Electrical fault detected for the parking lock engagement valve	=	False		
phase the parking lock poiston reads between hold and locked, the parking lock engagement is				Electrical fault detected for the parking lock latching valve	=	False		
diagnosed hydraulic stuck on.				Electrical fault detected for the parking lock stepper motor	=	False		
				Electrical fault detected for the	=	False		
				Parking lock actuation strategy	=	Parking lock standstill engage strategy		
				Parking lock engagment valve logical	=	Hydraulic Off		
				position Parking lock latching valve logical position	=	Hydraulic Off		
				Measured system pressure System pressure sensor electrical	<	8	bar	
				fault detected	=	False		
				System pressure sensor electrical fault detected	=	False		
				System pressure low confirmation timer	>=	100	ms	
			Fault confirmation time	Parking lock engagement valve off state timer	>=	500	ms	
				Parking lock forced low system pressure timer	>=	600	ms	
This diagnostic detects a hydraulic stuck on	Darking lask laging position (1) at the							
parking low speed engagement routine. This	parking lock logical position (1) at the end of parking lock engagement valve and latching							
routine is used when parking lock engagement is	valve hydraulic off state, see Summary tabel	= Open	Enable Conditions:		=	False		
requested at low speed based on PRND and there are no electrical faults present for the	Attachments							
parking lock components.				Diagnostic reset event				Runs Continuously

During the parking lock low speed engagement									
routine, the parking lock components are tested	Parking lock logical position (1) during forced low								
by first attempting to drain the parking lock	system pressure state, see Summary tabel	Lesland.		Application state is unequal to error		Tours			
piston by setting the parking lock latching valve	attachments	= Locked		state	=	True			
to drain. The parking lock hold solenoid is kept in	C SID ASV CMP VA EN PLK STUCK ON								
the electrical on position untill the vehicle speed									
falls below the parking lock engagment speed.									
When the parking lock engagement by use of the									
parking lock latchting valve has succeeded or if									
parking lock engagement with parking lock				Application state is unequal to		-			
latching valve attempt times out, the parking				bypass state	=	True			
lock engagement valve is set to the hydraulic off									
position.									
If both the parting lock latching value and the									
If both the parking lock latching valve and the				Flantsian fronte de trata de la facette a					
parking lock engagement valve are set hydraulic				Electrical fault detected for the	=	False			
off and the parking lock position sensor does not				parking lock hold solehold					
read locked, the system pressure is forced low to									
If during the law system pressure phase, the									
n during the low system pressure phase, the				Floatrical fault datastad for the					
parking lock position sensor reads locked, the				Electrical fault detected for the	=	False			
parking lock engagement valve is diagnosed				parking lock engagement valve					
liyulaule stuck off.				Floatrical fault datastad for the					
				Electrical fault detected for the	=	False			
				parking lock latening valve					
				Electrical fault detected for the	=	False			
				parking lock stepper motor					
				Electrical fault detected for the	=	False			
				parking lock position sensor		Derking leek lew			
				Parking lock actuation strategy	-	Parking lock low			
				Parking lock actuation strategy	-	speed engage			
				Barking lock ongagment valve logical		strategy			
				Parking lock engagment valve logical	=	Hydraulic Off			
				position Parking lock latching valvo logical					
				Parking lock latening valve logical	=	Hydraulic Off			
			1	position Measured system pressure	,	0	har		
				System pressure sensor electrical	~	٥	Udl		
				fault detected	=	False			
				System pressure sensor electrical					
				fault detected	=	False			
				System pressure low confirmation					
				timer	>=	100	ms		
			Fault confirmation	Parking lock engagement valve off		200	ms		
			time	state timer	>=				
				Parking lock forced low system	>=	600			
			1	pressure timer			ms	1	1

Component/System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value		Secondary Parameters		Enable Conditions		Time Required	MIL illum.
Lube valve stuck	P2735	This diagnostic detects clutch lube valve stuck faults. This is done by time based and when driving conditons allow, triggering a current profile check for the clutch lube valve.	Current profile check for clutch lube valve consistenly indicates fail	= True	Enable Conditions:	Diagnostic reset event active	=	False		Runs continuously	C
		If the triggered current profile check consistently indicate fail, the clutch lube valve is diagnosed					>=	60	°C		
		stuck.				Transmission oil temperature Electrical fault present for the clutch lube valve	=	False			
						Synchronizer shift busy	=	False			
						Clutch state is closed Transmission clutch and gear	=	True			
						actuation stable (1), see Summary table attachments	=	True			
						Adaptation routine active	=	False			
						Zero clutch cooling flow is allowed for odd clutch	=	True			
						Zero clutch cooling flow is allowed for even clutch	=	True			
						Clutch cooling flow target	<	5.5	lpm		
						Application state is unequal to error	_	True			
						state Application state is upequal to	-	nue			
						bypass state	=	True			
						Microslip feature active on odd clutch	=	False			
						Microslip feature active on even clutch	=	False			
					Fault confirmation	Lube current profile check fail confirmation counter	>=	5	count		
						time in case of confirmed status	=	900000	ms		
						succes Lube current profile check repeat in case of confirmed status succes enabled	=	1			
						Lube current profile check repeat time in case of confirmed status fail	=	30000	ms		
						Lube current profile check repeat time in case of undebounced status succes	=	3000	ms		
						Lube current profile check repeat time in case of undebounced status fail	=	3000	ms		

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Component/System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Inreshold Value		Secondary Parameters		Conditions		Time Required	MIL IIIum.
Park lock latching valve stuck off	P187E	This diagnostic detects a hydraulic stuck off parking lock latching valve. If driver attempts to drive away and the parking lock position sensor indicate the parking remains	Parking lock logical position (1) , see Summary table attachments C_SID_ASV_CMP_VA_LTCH_PLK_STUCK_OFF	= Locked	Enable Conditions:	Absolute vehicle speed	<=	10	kph	Runs Continuously	В
		engaged, no output speed or vehicle speed is detected, the parking lock is considered stuck in park.	Currently profile check for the parking lock engagement valve consistently indicate pass	True =		Output speed	<=	100	rpm		
		Inis stuck in park behaviour is considered caused by either the parking lock engagement valve or the parking lock latching valve not pressurizing the parking lock piston which corresponds to parking lock engagement valve hydraulically stuck off or latching valve hydraulically stuck.				Clutch torque	>	75			
		To differentiate between the parking lock engagement valve and the parking lock latchinng valve hydraulically stuck off, the current profile check is used for the parking lock engagement valve. If the current profile check for the parking lock				Brake bressed	=	False			
		engagement valve consistenly passes, the parking lock latching valve is diagnosed hydraulically stuck off.				Parking lock position sensor electrical fault detected	=	False			
						Parking lock latching valve electrical fault detected	=	False			
						Parking lock latching valve logical position	=	Hydraulic On			
						Transmission oil temperature Diagnostic reset event	>= =	40 False	°C		
						Application state is unequal to error state	=	True			
						Application state is unequal to bypass state	=	True			
					Fault confirmation	Drive away fail confirmation time	>=	3000	ms		
						confirmation count	>=	3	count		

Component/System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value		Secondary Parameters		Enable Conditions		Time Required	MIL illum.
Park lock latching valve stuck on	P187D	This diagnostic detects a hydraulic stuck on parking lock latching valve by use of the parking lock diagnostic disengagement routine. This routine is used when parking lock disengagement is requested based on PRND and there are no electrical faults present for the parking lock components. During the parking lock diagnostic	Parking lock logical position (1) at the end of parking lock engagement valve hydraulic off test state, see Summary tabel attachments C_SID_ASV_CMP_VA_LTCH_PLK_STUCK_ON	= Open	Enable Conditions:	Absolute vehicle speed	<=	3		Runs Continuously	В
		disengagement routine, the parking lock components are tested by first disengaging the parking lock completely. This is done by setting both the parking lock latching valve and parking lock engagement valve to the hydraulic on position.				Transmission oil temperature	<=	120	°C		
		Once the parking position sensor shows parking lock disengagement, the parking hold solenoid is actuated to keep the parking lock disengaged even if hydraulic pressure to the parking lock piston is lost.				Battery voltage	>=	10000	mV		
		the parking lock hold solenoid is actuated, the parking lock engagement valve is tested by draining the parking lock piston with the parking lock engagement valve only				Parking lock latching valve logical position	=	Hydraulic Off			
		After the parking lock engagement hydraulic stuck on test, the parking lock engagement valve is set to the hydraulic on position. When the parking lock position sensor reads				Parking lock actuation strategy	=	Parking lock diagnostic disengage strategy			
		open after the parking engagement valve test, the parking lock latching valve is tested by drianing the parking lock pisiton with the parking lock latching valve only.				Parking lock engagement valve position target	=	Hydraulic On			
		open instead of hold when the parking lock latching valve is set to the hydraulic off after a time, the parking lock latching valve is diagnosed hydraulic stuck on.				Parking lock latching valve position target	=	Hydraulic Off			
						Parking lock hold solenoid position target Diagnostic reset event	=	Electrical On False			
						Application state is unequal to error state Application state is unequal to hypers state	=	True True			
						Electrical fault detected for the parking lock hold solenoid	=	False			
						parking lock engagement valve Electrical fault detected for the	=	False False			
						Electrical fault detected for the parking lock stepper motor	=	False			
						Electrical fault detected for the parking lock position sensor	=	False			
			<u> </u>	<u> </u>	Fault confirmation time	Parking lock engagement valve off test state timer	>	500	ms		

							-		
This diagnostic detects a hydraulic stuck on parking lock latching valve by use of the parking standstill engagement routine. This routine is used when parking lock engagement is requested at standstill based on PRND and there are no electrical faults present for the parking	Parking lock logical position (1) at the end of parking lock latching valve hydraulic off state, see Summary tabel attachments C_SID_ASV_CMP_VA_LTCH_PLK_STUCK_ON	=	Open	Enable Conditions:		=	False		
lock components.					Diagnostic reset event				Runs Continuously
During the parking lock standstill engagement									
routine, the parking lock components are tested	Parking lock logical position (1) during the								
by first attempting to drain the parking lock	parking lock engagement valve hydraulic off	=	Locked		Application state is unequal to error	=	True		
piston by setting the parking lock latching valve	state, see Summary table attachements				state				
the electrical off position immediately.									
When the parking lock engagement by use of the									
parking lock latchting valve has succeeded or if									
parking lock engagement with parking lock					Application state is unequal to	_	True		
latching valve attempt times out, the parking					bypass state	-	True		
lock engagement valve is set to the hydraulic off									
position.									
If the parking lock position sensor still reads									
bydraulic off position, the latching valve is					Electrical fault detected for the	=	False		
suspicious stuck on					parking lock hold solehold				
If the parking lock position sensor shows parking									
lock engagement occurs when the parking lock									
engagement valve is set to the hydraulic off					Electrical fault detected for the	=	False		
position the latching valve is diagnosed					parking lock engagement valve				
hydraulically stuck on.									
					Electrical fault detected for the	=	False		
					parking lock latching valve				
					parking lock stepper motor	=	False		
					Electrical fault detected for the				
					parking lock position sensor	=	False		
							Parking lock		
					Parking lock actuation strategy	=	standstill engage strategy		
					Parking lock engagment valve logical	_	Undraulia Off		
					position	-	Hydraulic Off		
					Parking lock latching valve logical				
					position at the end of the latching	=	Hydraulic Off		
					valve of state				
				Fault confirmation	Parking lock latching valve off state				
				time	timer	>=	300	ms	
This diagnostic detects a hydraulic stuck on									
parking lock latching valve by use of the parking	Parking lock logical position (1) at the end of								
standstill engagement routine. This routine is	parking lock engagement valve and latching		2						
used when parking lock engagement is	valve hydraulic off state, see Summary tabel	=	Open	Enable Conditions:		=	False		
are no electrical faults present for the parking									
lock components.					Diagnostic reset event				
During the parking lock standstill engagement					<u> </u>				
routine, the parking lock components are tested	Parking lock logical position (1) during forced low								
by first attempting to drain the parking lock	system pressure state, see Summary tabel	_	Locked		Application state is unequal to error	_	True		
piston by setting the parking lock latching valve	attachments	-	LUCKEU		state	-	nue		
to drain. The parking lock hold solenoid is set to	C_SID_ASV_CMP_VA_LTCH_PLK_STUCK_ON								
the electrical off position immediately.				1					

When the parking lock engagement by use of the parking lock latchting valve has succeeded or if parking lock engagement with parking lock latching valve attempt times out, the parking lock engagement valve is set to the hydraulic off position.	OR			Application state is unequal to bypass state	=	True		
If the parking lock position sensor still reads open when the latching valve was moved to the hydraulic off position, the latching valve is suspicious stuck on.	Parking lock logical position (1) at the end of parking lock engagement valve and latching valve hydraulic off state, see Summary tabel attachments C_SID_ASV_CMP_VA_LTCH_PLK_STUCK_ON	= Open		Electrical fault detected for the parking lock hold solenoid	=	False		
If both the parking lock latching valve and the parking lock engagement valve are set hydraulic off and the parking lock position sensor does not read locked, the system pressure is forced low to attempt parking lock engagement. If during the low system pressure phase, the	Parking lock logical position (1) at the end of forced low system pressure state, see Summary tabel attachments C_SID_ASV_CMP_VA_LTCH_PLK_STUCK_ON	= Between Hold and Locked		Electrical fault detected for the parking lock engagement valve	=	False		
parking lock position sensor reads locked, the parking lock latch valve is diagnosed hydraulic				Electrical fault detected for the parking lock latching valve	=	False		
STUCK ON.				Electrical fault detected for the parking lock stepper motor	=	False		
				Electrical fault detected for the	=	False		
				Parking lock actuation strategy	=	Parking lock standstill engage strategy		
				Parking lock engagment valve logical position	=	Hydraulic Off		
				Parking lock latching valve logical position	=	Hydraulic Off		
				Measured system pressure	<	8	bar	
				fault detected	=	False		
				fault detected	=	False		
				timer	>=	100	ms	
			Fault confirmation time	Parking lock engagement valve off state timer	>=	500	ms	
				Parking lock forced low system pressure timer	>=	600	ms	
This diagnostic detects a hydraulic stuck on parking lock latch valve by use of the parking low speed engagement routine. This routine is used when parking lock engagement is requested at low speed based on PRND and there are no	Parking lock logical position (1) at the end of parking lock latching valve hydraulic off state,	= Open	Enable Conditions:		=	False		
components.	C_SID_ASV_CMP_VA_LTCH_PLK_STUCK_ON			Diagnostic reset event				
During the parking lock low speed engagement routine, the parking lock components are tested by first attempting to drain the parking lock piston by setting the parking lock latching valve to drain. The parking lock hold solenoid is kept in the electrical on position untill the vehicle speed falls below the parking lock engagment speed.				Application state is unequal to error state	=	True		

When the parking lock engagement by use of the parking lock latching valve has succeeded or if parking lock engagement with parking lock latching valve attempt times out, the parking lock engagement valve is set to the hydraulic off position. If the parking lock position sensor still reads	Parking lock logical position (1) during the parking lock engagement valve hydraulic off state, see Summary table attachements C_SID_ASV_CMP_VA_LTCH_PLK_STUCK_ON	=	Hold		Application state is unequal to bypass state	=	True		
open when the latching valve was moved to the hydraulic off position, the latching valve is suspicious stuck on. If the parking lock position sensor shows parking	OR				Electrical fault detected for the parking lock hold solenoid	=	False		
lock engagement occurs when the parking lock engagement valve is set to the hydraulic off position the latching valve is diagnosed hydraulically stuck on.	Parking lock logical position (1) during the parking lock engagement valve hydraulic off state, see Summary table attachements C_SID_ASV_CMP_VA_LTCH_PLK_STUCK_ON	=	Between Locked and Hold		Electrical fault detected for the parking lock engagement valve	=	False		
	OR Parking lock logical position (1) during the				Electrical fault detected for the parking lock latching valve	=	False		
	parking lock engagement valve hydraulic off state, see Summary table attachements C SID ASV CMP VA LTCH PLK STUCK ON	=	Locked		Electrical fault detected for the parking lock stepper motor	=	False		
					Electrical fault detected for the parking lock position sensor	=	False Parking lock low		
					Parking lock actuation strategy	=	speed engage strategy		
					Parking lock latching valve logical	=	Hydraulic Off		
					valve of state	=	Hydraulic Off		
				Fault confirmation time	Parking lock latching valve off state timer	>=	200	ms	
This diagnostic detects a hydraulic stuck on parking lock latch valve by use of the parking low speed engagement routine. This routine is used when parking lock engagement is requested at low speed based on PRND and there are no	Parking lock logical position (1) at the end of parking lock engagement valve and latching valve hydraulic off state, see Summary tabel attachments	=	Open	Enable Conditions:		=	False		
electrical faults present for the parking lock components.	C_SID_ASV_CMP_VA_LTCH_PLK_STUCK_ON				Diagnostic reset event				Runs Continuously
During the parking lock low speed engagement routine, the parking lock components are tested by first attempting to drain the parking lock piston by setting the parking lock latching valve to drain. The parking lock hold solenoid is kept in the electrical on position untill the vehicle speed falls below the parking lock engagement speed.	Parking lock logical position (1) during forced low system pressure state, see Summary tabel attachments C_SID_ASV_CMP_VA_LTCH_PLK_STUCK_ON	=	Locked		Application state is unequal to error state	-	True		
parking lock latchting valve has succeeded or if parking lock engagement with parking lock latching valve attempt times out, the parking lock engagement valve is set to the hydraulic off position.					Application state is unequal to bypass state	=	True		
If both the parking lock latching valve and the parking lock engagement valve are set hydraulic off and the parking lock position sensor does not read locked, the system pressure is forced low to					Electrical fault detected for the parking lock hold solenoid	=	False		

If during the low system pressure phase, the													
parking lock position sensor reads locked, the			Electrical fault detected for the	_	Falco								
parking lock latch valve is diagnosed hydraulic			parking lock engagement valve	-	Faise								
stuck on.													
			Electrical fault detected for the	_	Falsa								
			parking lock latching valve	=	Faise								
			Electrical fault detected for the	_	Falsa								
			parking lock stepper motor	=	Faise								
			Electrical fault detected for the	_	Falsa								
			parking lock position sensor	=	rdiSe								
					Parking lock low								
			Parking lock actuation strategy	=	speed engage								
					strategy								
			Parking lock engagment valve logical	_	Hydraulic Off								
			position	-	riyuraulic Oli								
			Parking lock latching valve logical	_	Hydraulic Off								
			position	-	ingenaame on								
			Measured system pressure	<	8	bar							
			System pressure sensor electrical fault detected	=	False								
			System pressure sensor electrical	_	Falco								
			fault detected	-	raise								
			System pressure low confirmation	>-	100								
			timer	/-	100	ms							
		Fault confirmation	Parking lock engagement valve off		200	ms							
		time	state timer	>=	200								
			Parking lock forced low system	>=	600								
			pressure timer	/-	000	ms							
Component/Sustem	Foult Code	Monitor Stratom, Description	Malfunction Critoria	The	schold Value			Sacandany Daramatara		Enable		Time Required	
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component/system	Fault Code	This diagnostic detects a clutch pressure control		Thre				Secondary Parameters		Conditions		Time Required	IVIL IIIUM.
Clutch 1 proportional pressure valve stuck on	P0747	valve hydraulically stuck on fault. This is done by using the clutch recovery routine which is triggered by the setting of a clutch system or component diagnostic failure.	Current profile checks consistencly failed for the odd clutch pressure control valve	=	True		Enable Conditions:	Diagnostic reset event	=	False		Runs Continuously	A
		The clutch pressure control valve is verified for functionallity by use of the current profile check. If the clutch pressure control valve current profile check fails consistently, the valve is stuck in either the hydraulic on or hydraulic off position.	Odd clutch pressure measured during stuck check	>=	4	bar		Odd clutch pressure recovery routine is requested (1), see Summary table attachments C_SID_ASV_VA_VA_PRS_CLU	=	True			
		By setting the redundant shutdown position to the hydraulic on position while zero current is supplied to the pressure control valve, it can be determine dif the pressure control valve is hydraulically stuck on of hydraulically stuck off.						Odd clutch pressure recovery routine run conditions met (2), see Summary table attachments C_SID_ASV_VA_VA_PRS_CLU	=	True			
		If the pressure sensor measures a high pressure during this stage, the pressure control valve is diagnosed stuck on.						Odd clutch pressure sensor out-of- window drift fault detected during this instance of the odd clutch recovery routine	=	False			
								Odd clutch redundant shutdown valve stuck on fault detected druing this instance of the odd clutch recovery routine	=	False			
								Odd clutch redundant shutdown valve stuck off fault detected druing this instance of the odd clutch recovery routine	=	False			
								Time zero current is commanded for the odd clutch pressure control valve before triggering the current profile check	=	100	ms		
							Fault confirmation	Odd clutch current profile check consist fail confirmation count	=	3	count		
								Odd clutch pressure above stuck on detection level	>	500	ms		
Clutch 1 proportional		This diagnostic detects a clutch pressure control valve hydraulically stuck off fault. This is done by using the clutch recovery routine which is triggered by the setting of a clutch system or	Current profile checks consistencly failed for the odd clutch pressure control valve	=	True		Enable Conditions:	Diagnostic reset event	=	False			
pressure valve stuck off	P0746	component diagnostic failure. The clutch pressure control valve is verified for functionallity by use of the current profile check. If the clutch pressure control valve current profile check fails consistently, the valve is stuck in either the hydraulic on or hydraulic off position.	Odd clutch pressure measured during stuck check	<	4	bar		Odd clutch pressure recovery routine is requested (1), see Summary table attachments C_SID_ASV_VA_VA_PRS_CLU	=	True		Runs Continuously	A
		By setting the redundant shutdown position to the hydraulic on position while zero current is supplied to the pressure control valve, it can be determine dif the pressure control valve is hydraulically stuck on of hydraulically stuck off.						Odd clutch pressure recovery routine run conditions met (2), see Summary table attachments C_SID_ASV_VA_VA_PRS_CLU	=	True			
		If the pressure sensor measures a low pressure during this stage, the pressure control valve is diagnosed stuck off.						Odd clutch pressure sensor out-of- window drift fault detected during this instance of the odd clutch recovery routine	=	False			
								Odd clutch redundant shutdown valve stuck on fault detected druing this instance of the odd clutch recovery routine	=	False			

								Odd clutch redundant shutdown valve stuck off fault detected druing this instance of the odd clutch recovery routine Time zero current is commanded for the odd clutch pressure control valve before triggering the current profile check	=	False 100	ms			
							Fault confirmation	Odd clutch current profile check consist fail confirmation count Odd clutch pressure below stuck on	=	3 500	count ms			
Clutch 2 proportional pressure valve stuck on	P0777	This diagnostic detects a clutch pressure control valve hydraulically stuck on fault. This is done by using the clutch recovery routine which is triggered by the setting of a clutch system or component diagnostic failure. The clutch pressure control valve is verified for functionallity by use of the current profile check. If the clutch pressure control valve current profile check fails consistently, the valve is stuck	Current profile checks consistencly failed for the even clutch pressure control valve Even clutch pressure measured during stuck check	= T	rue 4 b	ar	Enable Conditions:	detection level Diagnostic reset event Even clutch pressure recovery routine is requested (1), see Summary table attachments	=	False		Runs Continuously	A	•
		in either the hydraulic on or hydraulic off position. By setting the redundant shutdown position to the hydraulic on position while zero current is supplied to the pressure control valve, it can be determine dif the pressure control valve is hydraulically stuck on of hydraulically stuck off.						C_SID_ASV_VA_VA_PRS_CLU Even clutch pressure recovery routine run conditions met (2), see Summary table attachments C_SID_ASV_VA_VA_PRS_CLU Even clutch pressure sensor out-of-	=	True				
		If the pressure sensor measures a high pressure during this stage, the pressure control valve is diagnosed stuck on.						window drift fault detected during this instance of the odd clutch recovery routine Even clutch redundant shutdown valve stuck on fault detected druing this instance of the odd clutch recovery routine	=	False False				
								Even clutch redundant shutdown valve stuck off fault detected druing this instance of the odd clutch recovery routine	=	False				
								Time zero current is commanded for the even clutch pressure control valve before triggering the current profile check	=	100	ms			
							Fault confirmation	Even clutch current profile check consist fail confirmation count Even clutch pressure above stuck on detection level	=	3 500	count ms			
Clutch 2 proportional pressure valve stuck off	P0776	This diagnostic detects a clutch pressure control valve hydraulically stuck off fault. This is done by using the clutch recovery routine which is triggered by the setting of a clutch system or component diagnostic failure.	Current profile checks consistencly failed for the even clutch pressure control valve	= T.	rue		Enable Conditions:	Diagnostic reset event	=	False		Runs Continuously	A	
		The clutch pressure control valve is verified for functionallity by use of the current profile check. If the clutch pressure control valve current profile check fails consistently, the valve is stuck in either the hydraulic on or hydraulic off position.	Odd clutch pressure measured during stuck check	<	4 b	ar		Even clutch pressure recovery routine is requested (1), see Summary table attachments C_SID_ASV_VA_VA_PRS_CLU	-	True				

By setting the redundant shutdown position to the hydraulic on position while zero current is supplied to the pressure control valve, it can be determine dif the pressure control valve is hydraulically stuck on of hydraulically stuck off.			Even clutch pressure recovery routine run conditions met (2), see Summary table attachments C_SID_ASV_VA_VA_PRS_CLU	=	True		
If the pressure sensor measures a low pressure during this stage, the pressure control valve is diagnosed stuck off.			Even clutch pressure sensor out-of- window drift fault detected during this instance of the odd clutch recovery routine	=	False		
			Even clutch redundant shutdown valve stuck on fault detected druing this instance of the odd clutch recovery routine	=	False		
			Even clutch redundant shutdown valve stuck off fault detected druing this instance of the odd clutch recovery routine	=	True		
			Time zero current is commanded for the even clutch pressure control valve before triggering the current profile check	=	100	ms	
		Fault confirmation	Even clutch current profile check consist fail confirmation count	=	3	count	
			detection level	>	500	ms	

Component/System	Fault Code	Monitor Strategy Description	Malfunction Criteria		Threshold Value			Secondary Parameters		Enable Conditions		Time Required	MIL illum.
LSD proportional pressure valve stuck on	P2809	This diagnostic detects a limited slip differential pressure control valve hydraulically stuck on fault. This is done by using the limited slip differential recovery routine which is triggered by the setting of a limited slip differential system or component diagnostic failure.	Current profile checks consistencly failed for the limited slip differential pressure control valve	=	True		Enable Conditions:	Diagnostic reset event	=	False		Runs Continuously	В
		The limited slip differential pressure control valve is verified for functionallity by use of the current profile check. If the limited slip differential pressure control valve current profile check fails consistently, the valve is stuck in either the hydraulic on or hydraulic off position.	Limited slip differential pressure measured during stuck check	>=	4	bar		Limited slip differential recovery routine is requested (1), see Summary table attachments C_SID_ASV_VA_VA_PRS_LSD	=	True			
		By setting the limited silp differential redundant shutdown valve to the hydraulic on position while zero current is supplied to the pressure control valve, it can be determined if the pressure control valve is hydraulically stuck on of hydraulically stuck off						Limited slip differential recovery routine run conditions met (2), see Summary table attachments C_SID_ASV_VA_VA_PRS_LSD	=	True			
		If the pressure sensor measures a high pressure during this stage, the pressure control valve is diagnosed stuck on.						Limited slip differential pressure sensor out-of-window drift fault detected during this instance of the odd clutch recovery routine Limited slip differential redundant	=	False			
								shutdown valve stuck on fault detected during this instance of the odd clutch recovery routine	=	False			
								Limited slip differential redundant shutdown valve stuck off fault detected during this instance of the odd clutch recovery routine	=	False			
								Time zero current is commanded for the limited slip differential pressure control valve before triggering the current profile check	=	100	ms		
							Fault confirmation	Limited slip differential current profile check consist fail confirmation count	=	3	count		
								Limited slip differential pressure above stuck on detection level	>	500	ms		
LSD proportional pressure valve stuck off	P2808	This diagnostic detects a limited slip differential pressure control valve hydraulically stuck off fault. This is done by using the limited slip differential recovery routine which is triggered by the setting of a limited slip differential system or component diagnostic failure.	Current profile checks consistencly failed for the limited slip differential pressure control valve	=	True	bar	Enable Conditions:	Diagnostic reset event	=	False		Runs Continuously	в
		The limited slip differential pressure control valve is verified for functionallity by use of the current profile check. If the limited slip differential pressure control valve current profile check fails consistently, the valve is stuck in either the hydraulic on or hydraulic off position.	Limited slip differential pressure measured during stuck check	<	4	bar		Limited slip differential recovery routine is requested (1), see Summary table attachments C_SID_ASV_VA_VA_PRS_LSD	=	True			

By setting the limited slip differential redundant						
shutdown valve to the hydraulic on position		Limited slip differential recovery				
while zero current is supplied to the pressure		routine run conditions met (2), see	_	True		
control valve, it can be determined if the		Summary table attachments	-	nue		
pressure control valve is hydraulically stuck on of		C_SID_ASV_VA_VA_PRS_LSD				
hydraulically stuck off.						
		Limited slip differential pressure				
If the pressure sensor measures a low pressure		sensor out-of-window drift fault				
during this stage, the pressure control valve is		detected during this instance of the	=	False		
diagnosed stuck on		odd clutch recovery routine				
		Limited slip differential redundant				
		shutdown valve stuck on fault				
		detected during this instance of the	=	False		
		add alutab receivers routing				
		but clutch recovery routine				
		Limited slip differential redundant				
		shutdown valve stuck off fault	=	False		
		detected during this instance of the				
		odd clutch recovery routine				
		Time zero current is commanded for				
		the limited slip differential pressure	=	100	ms	
		control valve before triggering the		100		
		current profile check				
		Limited slip differential current				
	Fault confirmation	profile check consist fail	=	3	count	
		confirmation count				
		Limited slip differential pressure		500		
		below stuck on detection level	~	500	ms	

Component/System	Fault Code	Monitor Strategy Description	Malfunction Criteria		Threshold Value			Secondary Parameters		Enable Conditions	Time Required	MIL illum.
Shift solenoid 1 is hydraulically stuck off	P08C4	This diagnostic detects a synchronizer pressure control valve hydraulically stuck off fault. This is done by use of the synchronizer recovery routine which is triggered by the setting of a synchronizer shift related system or component diagnostic failure or by the synchronizer integrity routine when a, engaged gear mismatch between what was stored in non-volatile memory and what the position and speed sensors indicate as currently engaged gears at controller startup.	 C_ROD_1 movement during C_ROD_1 move C_SY_DIR_B_TO_A test case (6), see Summary table attachments C_SID_ASV_CMP_VA_PRS_SY_STUCK_OFF (Synchronizer pressure control C_SPV_1 actuation with selector position target hydraulically S_OOSPOS_ON) 	<=	100	μm	Enable Conditions:	Synchronizer integrity intrusive routine triggered (1), see Summary table attachments C_SID_ASV_CMP_VA_PRS_SY_STUC K_OFF	=	True	Runs continuously	A
		The synchronizer recovery routine uses the synchronizer integrity routine as part of its functionallity.	C_NOD_A INVERIENT OUTING C_NOD_A INVE C_SY_DIR_B_TO_A test case (6), see Summary table attachments C_SID_ASV_CMP_VA_PRS_SY_STUCK_OFF (Synchronizer pressure control C_SPV_1 actuation with selector position target hydraulically S_OOSPOS_ON)	<=	100	μm		Synchronizer integrity routine running conditions (2), see Summary table attachments C_SID_ASV_CMP_VA_PRS_SY_STUC K_OFF	=	True		
		The synchronizer integrity routine performs small shift rod movements for all shift rods, synchronizer pressure control valves and synchronizer selector positions corresponding to the clutch shaft for which it is requested. The intent of the syncrhonizer integrity actuation is to perform small rod movement, not to engage or disengage gears.	C_ROD_2 movement during C_ROD_2 move C_SY_DIR_A_TO_B test case (6), see Summary table attachments C_SID_ASV_CMP_VA_PRS_SY_STUCK_OFF (Synchronizer pressure control C_SPV_1 actuation with selector position target hydraulically S_OOSPOS_OFF)	<=	100	μm		C_ROD_1 move C_SY_DIR_B_TO_A test case executed (3), see Summary table attachments C_SID_ASV_CMP_VA_PRS_SY_STUC K_OFF (Synchronizer pressure control C_SPV_1 actuation with selector position target hydraulically S_OOSPOS_ON)	=	True		
		If the synchronizer integrity routine was able to perform the test cases where the synchronizer pressure control valve would be used to move two separate rods corresponding to inverse selector position target, the synchronizer pressure control valve is suspicious hydraulically stuck off.	C_ROD_1 movement during C_ROD_2 move C_SY_DIR_A_TO_B test case (6), see Summary table attachments C_SID_ASV_CMP_VA_PRS_SY_STUCK_OFF (Synchronizer pressure control C_SPV_1 actuation with selector position target hydraulically S_OOSPOS_OFF)	<=	100	μm		C_ROD_2 move C_SY_DIR_A_TO_B test case executed (3), see Summary table attachments C_SID_ASV_CMP_VA_PRS_SY_STUC K_OFF (Synchronizer pressure control C_SPV_1 actuation with selector position target hydraulically S_OOSPOS_OFF)	=	True		
		If another test case, using a different pressure control valve, confirms operation of one of the shift rod position sensors from the test mentioned above, the synchronizer pressure control valve hydraulically stuck off result is confirmed and the synchronizer pressure control valve is diagnosed hydraulically stuck off.										
			C_ROD_1 movement during C_ROD_1 move C_SY_DIR_A_TO_B test case (6), see Summary table attachments C_SID_ASV_CMP_VA_PRS_SY_STUCK_OFF (Synchronizer pressure control C_SPV_2 actuation with selector position target hydraulically S_OOSPOS_ON) OR	>	100	μm		C_ROD_1 move C_SY_DIR_A_TO_B test case executed (3), see Summary table attachments C_SID_ASV_CMP_VA_PRS_SY_STUC K_OFF (Synchronizer pressure control C_SPV_2 actuation with selector position target hydraulically S_OOSPOS_ON) OR	=	True		

			C_ROD_2 movement during C_ROD_2 move C_SY_DIR_B_TO_A test case (6), see Summary table attachments C_SID_ASV_CMP_VA_PRS_SY_STUCK_OFF (Synchronizer pressure control C_SPV_2 actuation with selector position target hydraulically S_OOSPOS_OFF)	>	100	μm	Confirmation count	C_ROD_2 move C_SY_DIR_B_TO_A test case executed (3), see Summary table attachments C_SID_ASV_CMP_VA_PRS_SY_STUC K_OFF (Synchronizer pressure control C_SPV_2 actuation with selector position target hydraulically S_OOSPOS_OFF) Synchronizer integrity synchronizer pressure control valve stuck off fault test suite confirmation runs	=	True		
		This diagnostic detects a synchronizer pressure control valve hydraulically stuck off fault. This is done by use of the synchronizer recovery routine which is triggered by the setting of a synchronizer shift related system or component diagnostic failure or by the synchronizer integrity routine when a, engaged gear mismatch	C_ROD_1 movement during C_ROD_1 move C_SY_DIR_A_TO_B test case (6), see Summary table attachments C_SID_ASV_CMP_VA_PRS_SY_STUCK_OFF (Synchronizer pressure control C_SPV_2	<=	100	μm	Enable Conditions:	Synchronizer integrity intrusive		True		
Shift solenoid 2 is hydraulically stuck off	P27B9	between what was stored in non-volatile memory and what the position and speed sensors indicate as currently engaged gears at controller startup.	actuation with selector position target hydraulically S_OOSPOS_ON) C_ROD_2 movement during C_ROD_1 move C_SY_DIR_A_TO_B test case (6), see Summary					routine triggered (1), see Summary table attachments C_SID_ASV_CMP_VA_PRS_SY_STUC K_OFF	=		Runs continuously	A
		The synchronizer recovery routine uses the synchronizer integrity routine as part of its functionallity.	C_SID_ASV_CMP_VA_PRS_SY_STUCK_OFF (Synchronizer pressure control C_SPV_2 actuation with selector position target hydraulically S_OOSPOS_ON)	<=	100	μm		Synchronizer integrity routine running conditions (2), see Summary table attachments C_SID_ASV_CMP_VA_PRS_SY_STUC K_OFF	-	True		
		The synchronizer integrity routine performs small shift rod movements for all shift rods, synchronizer pressure control valves and synchronizer selector positions corresponding to the clutch shaft for which it is requested. The intent of the syncrhonizer integrity actuation is to perform small rod movement, not to engage or disengage gears.	C_ROD_2 movement during C_ROD_2 move C_SY_DIR_B_TO_A test case (6), see Summary table attachments C_SID_ASV_CMP_VA_PRS_SY_STUCK_OFF (Synchronizer pressure control C_SPV_2 actuation with selector position target hydraulically S_OOSPOS_OFF)	<=	100	μm		C_ROD_1 move C_SY_DIR_A_TO_B test case executed (3), see Summary table attachments C_SID_ASV_CMP_VA_PRS_SY_STUC K_OFF (Synchronizer pressure control C_SPV_2 actuation with selector position target hydraulically S_OOSPOS_ON)	=	True		
		If the synchronizer integrity routine was able to perform the test cases where the synchronizer pressure control valve would be used to move two separate rods corresponding to inverse selector position target, the synchronizer pressure control valve is suspicious hydraulically stuck off.	C_ROD_1 movement during C_ROD_2 move C_SY_DIR_B_TO_A test case (6), see Summary table attachments C_SID_ASV_CMP_VA_PRS_SY_STUCK_OFF (Synchronizer pressure control C_SPV_2 actuation with selector position target hydraulically S_OOSPOS_OFF)	<=	100	μm		C_ROD_2 move C_SY_DIR_B_TO_A test case executed (3), see Summary table attachments C_SID_ASV_CMP_VA_PRS_SY_STUC K_OFF (Synchronizer pressure control C_SPV_2 actuation with selector position target hydraulically S_OOSPOS_OFF)	=	True		
		If another test case, using a different pressure control valve, confirms operation of one of the shift rod position sensors from the test mentioned above, the synchronizer pressure control valve hydraulically stuck off result is confirmed and the synchronizer pressure control valve is diagnosed hydraulically stuck off.										

			C_ROD_1 movement during C_ROD_1 move C_SY_DIR_B_TO_A test case (6), see Summary table attachments C_SID_ASV_CMP_VA_PRS_SY_STUCK_OFF (Synchronizer pressure control C_SPV_1 actuation with selector position target hydraulically S_OOSPOS_ON) OR	>	100	μm		C_ROD_1 move C_SY_DIR_B_TO_A test case executed (3), see Summary table attachments C_SID_ASV_CMP_VA_PRS_SY_STUC K_OFF (Synchronizer pressure control C_SPV_1 actuation with selector position target hydraulically S_OOSPOS_ON) OR	=	True		
			C_ROD_2 movement during C_ROD_2 move C_SY_DIR_A_TO_B test case (6), see Summary table attachments C_SID_ASV_CMP_VA_PRS_SY_STUCK_OFF (Synchronizer pressure control C_SPV_1 actuation with selector position target hydraulically S_OOSPOS_OFF)	>	100	μm		C_ROD_2 move C_SY_DIR_A_TO_B test case executed (3), see Summary table attachments C_SID_ASV_CMP_VA_PRS_SY_STUC K_OFF (Synchronizer pressure control C_SPV_1 actuation with selector position target hydraulically S_OOSPOS_OFF)	-	True		
							Confirmation count	Synchronizer integrity synchronizer pressure control valve stuck off fault test quite confirmation runs	_	1		
Shift solenoid 3 is hydraulically stuck off	P27C1	This diagnostic detects a synchronizer pressure control valve hydraulically stuck off fault. This is done by use of the synchronizer recovery routine which is triggered by the setting of a synchronizer shift related system or component diagnostic failure or by the synchronizer integrity routine when a, engaged gear mismatch between what was stored in non-volatile memory and what the position and speed sensors indicate as currently engaged gears at controller startup.	C_ROD_3 movement during C_ROD_3 move C_SY_DIR_A_TO_B test case (6), see Summary table attachments C_SID_ASV_CMP_VA_PRS_SY_STUCK_OFF (Synchronizer pressure control C_SPV_3 actuation with selector position target hydraulically S_OOSPOS_ON)	<≈	100	μm	Enable Conditions:	Synchronizer integrity intrusive routine triggered (1), see Summary table attachments C_SID_ASV_CMP_VA_PRS_SY_STUC K_OFF	=	True	Runs continuously	А
		The synchronizer recovery routine uses the synchronizer integrity routine as part of its functionallity.	C_RCD_4 movement during C_ROD_3 move C_SY_DIR_A_TO_B test case (6), see Summary table attachments C_SID_ASV_CMP_VA_PRS_SY_STUCK_OFF (Synchronizer pressure control C_SPV_3 actuation with selector position target hydraulically S_OOSPOS_ON)	<=	100	μm		Synchronizer integrity routine running conditions (2), see Summary table attachments C_SID_ASV_CMP_VA_PRS_SY_STUC K_OFF	=	True		
		The synchronizer integrity routine performs small shift rod movements for all shift rods, synchronizer pressure control valves and synchronizer selector positions corresponding to the clutch shaft for which it is requested. The intent of the syncrhonizer integrity actuation is to perform small rod movement, not to engage or disengage gears.	C_ROD_4 movement during C_ROD_4 move C_SY_DIR_A_TO_B test case (6), see Summary table attachments C_SID_ASV_CMP_VA_PRS_SY_STUCK_OFF (Synchronizer pressure control C_SPV_3 actuation with selector position target hydraulically S_OOSPOS_OFF)	<=	100	μm		C_ROD_3 move C_SY_DIR_A_TO_B test case executed (3), see Summary table attachments C_SID_ASV_CMP_VA_PRS_SY_STUC K_OFF (Synchronizer pressure control C_SPV_3 actuation with selector position target hydraulically S_OOSPOS_ON)	=	True		
		If the synchronizer integrity routine was able to perform the test cases where the synchronizer pressure control valve would be used to move two separate rods corresponding to inverse selector position target, the synchronizer pressure control valve is suspicious hydraulically stuck off.	C_ROD_3 movement during C_ROD_4 move C_SY_DIR_A_TO_B test case (6), see Summary table attachments C_SID_ASV_CMP_VA_PRS_SY_STUCK_OFF (Synchronizer pressure control C_SPV_3 actuation with selector position target hydraulically S_OOSPOS_OFF)	<=	100	μm		C_ROD_4 move C_SY_DIR_A_TO_B test case executed (3), see Summary table attachments C_SID_ASV_CMP_VA_PRS_SY_STUC K_OFF (Synchronizer pressure control C_SPV_3 actuation with selector position target hydraulically S_OOSPOS_OFF)	=	True		

		If another test case, using a different pressure control valve, confirms operation of one of the shift rod position sensors from the test mentioned above, the synchronizer pressure control valve hydraulically stuck off result is confirmed and the synchronizer pressure control valve is diagnosed hydraulically stuck off.										
			C_ROD_3 movement during C_ROD_3 move C_SY_DIR_B_TO_A test case (6), see Summary table attachments C_SID_ASV_CMP_VA_PRS_SY_STUCK_OFF (Synchronizer pressure control C_SPV_4 actuation with selector position target hydraulically S_OOSPOS_ON) OR	>	100	μm		C_ROD_3 move C_SY_DIR_B_TO_A test case executed (3), see Summary table attachments C_SID_ASV_CMP_VA_PRS_SY_STUC K_OFF (Synchronizer pressure control C_SPV_4 actuation with selector position target hydraulically S_OOSPOS_ON) OR	-	True		
			C_ROD_4 movement during C_ROD_4 move C_SY_DIR_B_TO_A test case (6), see Summary table attachments C_SID_ASV_CMP_VA_PRS_SY_STUCK_OFF (Synchronizer pressure control C_SPV_4 actuation with selector position target hydraulically S_OOSPOS_OFF)	>	100	μm		C_ROD_4 move C_SY_DIR_B_TO_A test case executed (3), see Summary table attachments C_SID_ASV_CMP_VA_PRS_SY_STUC K_OFF (Synchronizer pressure control C_SPV_4 actuation with selector position target hydraulically S_OOSPOS_OFF)	-	True		
							Confirmation count	Synchronizer integrity synchronizer pressure control valve stuck off fault test suite confirmation runs	=	1		
Shift solenoid 4 is hydraulically stuck off	P27C9	This diagnostic detects a synchronizer pressure control valve hydraulically stuck off fault. This is done by use of the synchronizer recovery routine which is triggered by the setting of a synchronizer shift related system or component diagnostic failure or by the synchronizer integrity routine when a, engaged gear mismatch between what was stored in non-volatile memory and what the position and speed sensors indicate as currently engaged gears at controller startup.	C_ROD_3 movement during C_ROD_3 move C_SY_DIR_B_TO_A test case (6), see Summary table attachments C_SID_ASV_CMP_VA_PRS_SY_STUCK_OFF (Synchronizer pressure control C_SPV_4 actuation with selector position target hydraulically S_OOSPOS_ON)	<=	100	μm	Enable Conditions:	Synchronizer integrity intrusive routine triggered (1), see Summary table attachments C_SID_ASV_CMP_VA_PRS_SY_STUC K_OFF	-	True	Runs continuousiv	А
		The synchronizer recovery routine uses the synchronizer integrity routine as part of its functionallity.	C_ROD_4 movement during C_ROD_3 move C_SY_DIR_B_TO_A test case (6), see Summary table attachments C_SID_ASV_CMP_VA_PRS_SY_STUCK_OFF (Synchronizer pressure control C_SPV_4 actuation with selector position target hydraulically S_OOSPOS_ON)	<=	100	μm		– Synchronizer integrity routine running conditions (2), see Summary table attachments C_SID_ASV_CMP_VA_PRS_SY_STUC K_OFF	=	True		
		The synchronizer integrity routine performs small shift rod movements for all shift rods, synchronizer pressure control valves and synchronizer selector positions corresponding to the clutch shaft for which it is requested. The intent of the syncrhonizer integrity actuation is to perform small rod movement, not to engage or disengage gears.	C_ROD_4 movement during C_ROD_4 move C_SY_DIR_B_TO_A test case (6), see Summary table attachments C_SID_ASV_CMP_VA_PRS_SY_STUCK_OFF (Synchronizer pressure control C_SPV_4 actuation with selector position target hydraulically S_OOSPOS_OFF)	<=	100	μm		C_ROD_3 move C_SY_DIR_B_TO_A test case executed (3), see Summary table attachments C_SID_ASV_CMP_VA_PRS_SY_STUC K_OFF (Synchronizer pressure control C_SPV_4 actuation with selector position target hydraulically S_OOSPOS_ON)	=	True		

		If the synchronizer integrity routine was able to perform the test cases where the synchronizer pressure control valve would be used to move two separate rods corresponding to inverse selector position target, the synchronizer pressure control valve is suspicious hydraulically stuck off. If another test case, using a different pressure control valve, confirms operation of one of the shift rod position sensors from the test mentioned above, the synchronizer pressure control valve hydraulically stuck off result is confirmed and the synchronizer pressure control valve is diagnosed hydraulically stuck off.	C_ROD_3 movement during C_ROD_4 move C_SY_DIR_B_TO_A test case (6), see Summary table attachments C_SID_ASV_CMP_VA_PRS_SY_STUCK_OFF (Synchronizer pressure control C_SPV_4 actuation with selector position target hydraulically S_OOSPOS_OFF)	<=	100	μm		C_ROD_4 move C_SY_DIR_B_TO_A test case executed (3), see Summary table attachments C_SID_ASV_CMP_VA_PRS_SY_STUC K_OFF (Synchronizer pressure control C_SPV_4 actuation with selector position target hydraulically S_OOSPOS_OFF)	-	True		
			C_ROD_3 movement during C_ROD_3 move C_SY_DIR_A_TO_B test case (6), see Summary table attachments C_SID_ASV_CMP_VA_PRS_SY_STUCK_OFF (Synchronizer pressure control C_SPV_3 actuation with selector position target hydraulically S_OOSPOS_ON) OR	>	100	μm		C_ROD_3 move C_SY_DIR_A_TO_B test case executed (3), see Summary table attachments C_SID_ASV_CMP_VA_PRS_SY_STUC K_OFF (Synchronizer pressure control C_SPV_3 actuation with selector position target hydraulically S_OOSPOS_ON) OR	-	True		
			C_ROD_4 movement during C_ROD_4 move C_SY_DIR_A_TO_B test case (6), see Summary table attachments C_SID_ASV_CMP_VA_PRS_SY_STUCK_OFF (Synchronizer pressure control C_SPV_3 actuation with selector position target hydraulically S_OOSPOS_OFF)	>	100	μm		C_ROD_4 move C_SY_DIR_A_TO_B test case executed (3), see Summary table attachments C_SID_ASV_CMP_VA_PRS_SY_STUC K_OFF (Synchronizer pressure control C_SPV_3 actuation with selector position target hydraulically S_OOSPOS_OFF)	-	True		
							Confirmation count	Synchronizer integrity synchronizer pressure control valve stuck off fault test suite confirmation runs	=	1		
Shift solenoid 5 is hydraulically stuck off	P27D1	This diagnostic detects a synchronizer pressure control valve hydraulically stuck off fault. This is done by use of the synchronizer recovery routine which is triggered by the setting of a synchronizer shift related system or component diagnostic failure or by the synchronizer integrity routine when a, engaged gear mismatch between what was stored in non-volatile memory and what the position and speed sensors indicate as currently engaged gears at controller startup.	C_ROD_5 movement during C_ROD_5 move C_SY_DIR_A_TO_B test case (6), see Summary table attachments C_SID_ASV_CMP_VA_PRS_SY_STUCK_OFF (Synchronizer pressure control C_SPV_5 actuation with selector position target hydraulically S_OOSPOS_ON)	<=	100	μm	Enable Conditions:	Synchronizer integrity intrusive routine triggered (1), see Summary table attachments C_SID_ASV_CMP_VA_PRS_SY_STUC K_OFF	=	True	Runs continuously	A
		The synchronizer recovery routine uses the synchronizer integrity routine as part of its functionallity.	C_ROD_5 movement during C_ROD_5 move C_SY_DIR_A_TO_B test case (6), see Summary table attachments C_SID_ASV_CMP_VA_PRS_SY_STUCK_OFF (Synchronizer pressure control C_SPV_5 actuation with selector position target hydraulically S_OOSPOS_ON)	<=	100	μm		Synchronizer integrity routine running conditions (2), see Summary table attachments C_SID_ASV_CMP_VA_PRS_SY_STUC K_OFF	=	True		

The synchronizer integrity routine performs small shift rod movements for all shift rods, synchronizer pressure control valves and synchronizer selector positions corresponding to the clutch shaft for which it is requested. The intent of the syncrhonizer integrity actuation is to perform small rod movement, not to engage or disengage gears.	C_ROD_5 movement during C_ROD_5 move C_SY_DIR_B_TO_A test case (6), see Summary table attachments C_SID_ASV_CMP_VA_PRS_SY_STUCK_OFF (Synchronizer pressure control C_SPV_5 actuation with selector position target hydraulically S_OOSPOS_OFF)	<=	100	μm		C_ROD_5 move C_SY_DIR_A_TO_B test case executed (3), see Summary table attachments C_SID_ASV_CMP_VA_PRS_SY_STUC K_OFF (Synchronizer pressure control C_SPV_5 actuation with selector position target hydraulically S_OOSPOS_ON)	-	True		
If the synchronizer integrity routine was able to perform the test cases where the synchronizer pressure control valve would be used to move two separate rods corresponding to inverse selector position target, the synchronizer pressure control valve is suspicious hydraulically stuck off.	C_ROD_5 movement during C_ROD_5 move C_SY_DIR_B_TO_A test case (6), see Summary table attachments C_SID_ASV_CMP_VA_PRS_SY_STUCK_OFF (Synchronizer pressure control C_SPV_5 actuation with selector position target hydraulically S_OOSPOS_OFF)	<=	100	μm		C_ROD_5 move C_SY_DIR_B_TO_A test case executed (3), see Summary table attachments C_SID_ASV_CMP_VA_PRS_SY_STUC K_OFF (Synchronizer pressure control C_SPV_5 actuation with selector position target hydraulically S_OOSPOS_OFF)	=	True		
As there is no redundant path using another synchronizer pressure control valve and shift rod position sensor to verify the suspicious hydraulic stuck off result determined by the syncrhonizer interity routine, the current profile check is used to distinguish between the synchronizer pilot valve being hydraulically stuck off or the shift roc position sensor being stuck at value. If the synchronizer pressure control valve current profile check consistently indicates fail, the synchronizer pressure control valve is diagnosed hydraulically stuck off.	Synchronizer pressure control valve C_SPV_5 current profile check consistently indicates FAIL	=	True			Transmission oil temperature	>=	40	°C	
					Fault confirmation	Synchronizer pressure control valve C_SPV_5 current profile check fail confirmation count	=	3	count	

Component/System	Fault Code	Monitor Strategy Description	Malfunction Criteria		Threshold Value			Secondary Parameters		Enable		Time Required	MIL illum.
Shift solenoid 1 is		This diagnostic detects a syncrhonizer pressure	Selector target position	=	Hydraulic on		Enable Conditions:	Diagnostic reset event active	=	False			
hydraulically stuck on	P08C5	control valve hydraulic stuck on fault. This is done by analyzing rod movement during and shortly after a selector position change.	Difference between C_ROD_1 position at start of selector change and C_ROD_1 position measured (unintended rod movement detected)	>=	1000	μm		Time since start of selector pilot valve position target change	<	200	ms	Runs continuously	A
		If a synchronizer pressure control valve is hydraulically stuck on, there is a constant force being applied to a shift rod by the pressure from the synchronizer pressure control valve. When the selector nosition changes the	Difference between C_ROD_2 position at start of selector change and C_ROD_2 position measured (rod relaxation detected)	>=	125	μm		Electrical fault for C_ROD_1 position sensor active	=	False			
		pressure from the stuck on pressure control valve is routed differently which will lead to the relaxation of one rod and the unintentional movement of another. If the chaneing of the selector position is						Electrical fault for C_ROD_2 position sensor active	=	False			
		followed by a detected unintentional rod movement, the corresponding syncrhonizer pressure control valve is determined and considered suspicious hydraulically stuck on. If the other rod movement corresponding to this	or					Electrical fault for synchronizer pressure valve C_SPV_1 active	=	False			
		synchronizer pressure control valve shows relaxation, the synchronizer pressure control valve is diangosed hydraulically stuck on.						Electrical fault for synchronizer pressure valve C_SPV_2 active	=	False			
			Selector target position	=	Hydraulic off			C_ROD_1 force target	=	0	N		
			Difference between C_ROD_2 position at start of selector change and C_ROD_2 position measured (unintended rod movement detected)	>=	1000	μm		C_ROD_2 force target	=	0	Ν		
			Difference between C_ROD_1 position at start of selector change and C_ROD_1 position measured (rod relaxation detected)	>=	125	μm		Application state is equal to error state	=	False			
								Application state is equal to bypass state	=	False			
Shift solenoid 2 is hydraulically stuck on	P27BA	This diagnostic detects a syncrhonizer pressure control valve hydraulic stuck on fault.	Selector target position	=	Hydraulic on		Enable Conditions:	Diagnostic reset event active	=	False		Runs continuously	А
		This is done by analyzing rod movement during and shortly after a selector position change.	Difference between C_ROD_1 position at start of selector change and C_ROD_1 position measured (unintended rod movement detected)	>=	1000	μm		Time since start of selector pilot valve position target change	<	200	ms		
		If a synchronizer pressure control valve is hydraulically stuck on, there is a constant force being applied to a shift rod by the pressure from the synchronizer pressure control valve.	Difference between C_ROD_2 position at start of selector change and C_ROD_2 position measured (rod relaxation detected)	>=	125	μm		Electrical fault for C_ROD_1 position sensor active	=	False			
		when the selector position changes, the pressure from the stuck on pressure control valve is routed differently which will lead to the relaxation of one rod and the unintentional movement of another. If the changing of the selector position is						Electrical fault for C_ROD_2 position sensor active	=	False			
		followed by a detected unintentional rod movement, the corresponding syncrhonizer pressure control valve is determined and considered suspicious hydraulically stuck on. If the other rod movement corresponding to this	OR					Electrical fault for synchronizer pressure valve C_SPV_2 active	=	False			
		synchronizer pressure control valve shows relaxation, the synchronizer pressure control valve is diangosed hydraulically stuck on.	Soloctor target position	_	Hudraulie off			Electrical fault for synchronizer pressure valve C_SPV_1 active	=	False	Ν		
	I	I	selector target position	=	Hydraulic off		I	C_KOD_1 force target	=	U	IN	l	

			Difference between C_ROD_2 position at start of selector change and C_ROD_2 position measured (unintended rod movement detected)	>=	1000	μm		C_ROD_2 force target	=	0	N		
			Difference between C_ROD_1 position at start of selector change and C_ROD_1 position measured (rod relaxation detected)	>=	125	μm		Application state is equal to error state	=	False			
								Application state is equal to bypass state	=	False			
Shift solenoid 3 is hydraulically stuck on	P27C2	This diagnostic detects a syncrhonizer pressure control valve hydraulic stuck on fault.	Selector target position	=	Hydraulic on		Enable Conditions:	Diagnostic reset event active	=	False		Runs continuously	А
		This is done by analyzing rod movement during and shortly after a selector position change.	Difference between C_ROD_3 position at start of selector change and C_ROD_3 position measured (unintended rod movement detected)	>=	1000	μm		Time since start of selector pilot valve position target change	<	200	ms		
		If a synchronizer pressure control valve is hydraulically stuck on, there is a constant force being applied to a shift rod by the pressure from the synchronizer pressure control valve. When the selector notifing changes the	Difference between C_ROD_4 position at start of selector change and C_ROD_4 position measured (rod relaxation detected)	>=	125	μm		Electrical fault for C_ROD_3 position sensor active	=	False			
		pressure from the stuck on pressure control valve is routed differently which will lead to the relaxation of one rod and the unintentional movement of another.						Electrical fault for C_ROD_4 position sensor active	=	False			
		If the changing of the selector position is followed by a detected unintentional rod movement, the corresponding synchonizer pressure control valve is determined and considered suspicious hydraulically stuck on. If the other rod movement corresponding to this	OR					Electrical fault for synchronizer pressure valve C_SPV_3 active	=	False			
		synchronizer pressure control valve shows relaxation, the synchronizer pressure control valve is diangosed hydraulically stuck on.						Electrical fault for synchronizer pressure valve C_SPV_4 active	=	False			
			Selector target position	=	Hydraulic off			C_ROD_3 force target	=	0	Ν		
			Difference between C_ROD_4 position at start of selector change and C_ROD_4 position measured (unintended rod movement detected)	>=	1000	um		C_ROD_4 force target	=	0	N		
			Difference between C_ROD_3 position at start of selector change and C_ROD_3 position measured (rod relaxation detected)	>=	125	μm		Application state is equal to error state	=	False			
			,					Application state is equal to bypass state	=	False			
Shift solenoid 4 is hydraulically stuck on	P27CA	This diagnostic detects a syncrhonizer pressure control valve hydraulic stuck on fault.	Selector target position	=	Hydraulic on		Enable Conditions:	Diagnostic reset event active	-	False		Runs continuously	А
		This is done by analyzing rod movement during and shortly after a selector position change.	Difference between C_ROD_3 position at start of selector change and C_ROD_3 position measured (unintended rod movement detected)	>=	1000	μm		Time since start of selector pilot valve position target change	<	200	ms		
		If a synchronizer pressure control valve is hydraulically stuck on, there is a constant force being applied to a shift rod by the pressure from the synchronizer pressure control valve.	Difference between C_ROD_4 position at start of selector change and C_ROD_4 position measured (rod relaxation detected)	>=	125	μm		Electrical fault for C_ROD_3 position sensor active	=	False			
		when the selector position changes, the pressure from the stuck on pressure control valve is routed differently which will lead to the relaxation of one rod and the unintentional movement of another.						Electrical fault for C_ROD_4 position sensor active	=	False			
		If the changing of the selector position is followed by a detected unintentional rod movement, the corresponding syncrhonizer pressure control valve is determined and considered suspicious hydraulically stuck on.	OR					Electrical fault for synchronizer pressure valve C_SPV_4 active	=	False			

		If the other rod movement corresponding to this synchronizer pressure control valve shows relaxation, the synchronizer pressure control valve is diangosed hydraulically stuck on.	Selector target position Difference between C_ROD_4 position at start of selector change and C_ROD_4 position measured (unintended rod movement detected)	= >=	Hydraulic off 1000	μm		Electrical fault for synchronizer pressure valve C_SPV_3 active C_ROD_3 force target C_ROD_4 force target	= =	False 0 0	N N		
			Difference between C_ROD_3 position at start of selector change and C_ROD_3 position measured (rod relaxation detected)	>=	125	μm		Application state is equal to error state	=	False			
								Application state is equal to bypass state	=	False			
Shift solenoid 5 is hydraulically stuck on	P27D2	This diagnostic detects a syncrhonizer pressure control valve hydraulic stuck on fault.	Selector target position	=	Hydraulic on		Enable Conditions:	Diagnostic reset event active	=	False		Runs continuously	А
		This is done by analyzing rod movement during and shortly after a selector position change.	Difference between C_ROD_5 position at start of selector change and C_ROD_5 position measured (unintended rod movement detected)	>=	4000	μm		Time since start of selector pilot valve position target change	<	200	ms		
		hydraulically stuck on, there is a constant force being applied to a shift rod by the pressure from the synchronizer pressure control valve. When the selector position changes, the						Electrical fault for C_ROD_5 position sensor active	=	False			
		pressure from the stuck on pressure control valve is routed differently which will lead to the relaxation of one rod and the unintentional movement of another. If the changing of the selector position is	OR					Electrical fault for synchronizer pressure valve C_SPV_5 active	=	False			
		followed by a detected unintentional rod movement, the corresponding syncrhonizer pressure control valve is determined and considered suspicious hydraulically stuck on.						C_ROD_5 force target	=	0	N		
		synchronizer pressure control valve shows relaxation, the synchronizer pressure control valve is diangosed hydraulically stuck on.	Selector target position	=	Hydraulic off			Application state is equal to error state	=	False			
			Difference between C_ROD_5 position at start of selector change and C_ROD_5 position measured (unintended rod movement detected)	>=	4000	μm		Application state is equal to bypass state	=	False			

Component/System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value		Secondary Parameters		Enable Conditions		Time Required	MIL illum.
System pressure pilot valve stuck on	P2724	This diagnostic detects a system pressure pilot valve stuck on fault. This is done by use of the system pressure recovery routinte which is triggered by the setting of system pressure control system or component diangostic failure. The system pressure recovery routine first attempts to attain different pressure targets. If this fails, the faulted component is determined: system pressure sensor, system pressure pilot valve or the system pressure relief valve.	Current profile check consistently indicated fail for the system pressure pilot valve Pressure difference between the measured system pressure and the target reference value	= True < -3 bar	Enable Conditions:	Diagnostic reset event System pressure recovery routine is requested (1), see Summary table attachments C_SID_ASV_CMP_VA_PRS_SYS	=	False True		Runs Continuously	В
		If the system pressure target check has failed for one of the system pressure target, the system pressure sensor measurement is checked against a clutch pressure sensor by disengaging the gear on a clutch shaft when possible and ramping up the clutch pressure control valve current untilll the clutch is completely closed.				System pressure recovery routine run conditions met (2), see Summary table attachments C_SID_ASV_CMP_VA_PRS_SYS	=	True			
		When the clutch is completely closed, the system pressure and clutch pressure should be reading a similar value. If this is the the case, the system pressure sensor is operational and the failure to attain the system pressure targets is attributed to the system pressure actuation.				System pressure was unable to attain one of the system pressure steps during this instance of the system pressure recovery routine (3), see Summary table attachments C_SID_ASV_CMP_VA_PRS_SYS	=	True			
		To distinguish between system pressure pilot valve failure and system pressure relief valve failure, the current profile check is used for the system pressure pilot valve.				System pressure sensor check against clutch pressure sensor check passed during this instance of the system pressure recovery routine (4), see Summary table attachments C_SID_ASV_CMP_VA_PRS_SYS	=	True			
		If the system pressure pilot valve current profile check consistenly indicates fail, the system pressure pilot valve is diagnosed stuck.				Transmission oil temperature	>=	60	°C		
		To differentiate between the system pressure pilot valve being hydraulically stuck on or hydraulically stuck off, the system pressure is controlled open loop to an average system pressure target and the measured system pressure target and the measured system				Engine speed during forced zero current on the system pressure pilot valve	<=	2000	rpm		
		If the measured system pressure is lower than the system pressure target during this check, the system pressure pilot valve is diagnosed hydraulically stuck on.				Time zero current is commanded for the system pressure pilot valve before triggering the current profile check	>=	300	ms		
					Fault confirmation	System pressure pilot valve current profile check consist fail confirmation count System pressure below stuck on detection level	=	3 300	ms		
System pressure pilot	P2723	This diagnostic detects a system pressure pilot valve stuck on fault. This is done by use of the system pressure recovery routinte which is triggered by the setting of system pressure control system or component diagnostic failure.	Current profile check consistently indicated fail for the system pressure pilot valve	= True	Enable Conditions:	Diagnostic reset event	=	False		Runs Continuously	0
valve SLUCK OTT	F2123	control system of component diangostic failure.	1	1	1					Runs continuously	A

The system pressure recovery routine first attempts to attain different pressure targets. this fails, the faulted component is determine system pressure sensor, system pressure pilot valve or the system pressure relief valve.	f Pressure difference between the measured system pressure and the target reference value	> 3	bar		System pressure recovery routine is requested (1), see Summary table attachments C_SID_ASV_CMP_VA_PRS_SYS	=	True		
If the system pressure target check has failed one of the system pressure target, the system pressure sensor measurement is checked agai a clutch pressure sensor by disengaging the go on a clutch shaft when possible and ramping of the clutch pressure control valve current until the clutch is completely closed.	ior nst ar J				System pressure recovery routine run conditions met (2), see Summary table attachments C_SID_ASV_CMP_VA_PRS_SYS	=	True		
When the clutch is completely closed, the system pressure and clutch pressure should b reading a similar value. If this is the the case, t system pressure sensor is operational and the failure to attain the system pressure targets is attributed to the system pressure actuation.	e he				System pressure was unable to attain one of the system pressure steps during this instance of the system pressure recovery routine (3), see Summary table attachments C_SID_ASV_CMP_VA_PRS_SYS	Ξ	True		
To distinguish between system pressure pilot valve failure and system pressure relief valve failure, the current profile check is used for th system pressure pilot valve.	e				System pressure sensor check against clutch pressure sensor check passed during this instance of the system pressure recovery routine (4), see Summary table attachments C_SID_ASV_CMP_VA_PRS_SYS	=	True		
If the system pressure pilot valve current prof check consistenly indicates fail, the system pressure pilot valve is diagnosed stuck. To differentiate between the system pressure	le				Transmission oil temperature	>=	60	°C	
pilot valve being hydraulically stuck on or hydraulically stuck off, the system pressure is controlled open loop to an average system pressure target and the measured system pressure is analyzed.					Engine speed during forced zero current on the system pressure pilot valve	<=	2000	rpm	
If the measured system pressure is higher that the system pressure target during this check, system pressure pilot valve is diagnosed hydraulically stuck off.	n he				Time zero current is commanded for the system pressure pilot valve before triggering the current profile check	>=	300	ms	
				Fault confirmation	System pressure pilot valve current profile check consist fail confirmation count	=	3		
					System pressure below stuck on detection level	>	300	ms	

Component/System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value		Secondary Parameters		Enable		Time Required	MIL illum.
Clutch 1 Rsp stuck off	P0796	This diagnostic detects a clutch redundant shutdown valve hydraulically stuck off fault. This is done by using the clutch recovery routine which is triggered by the setting of a clutch system or component diagnostic failure.	Current profile check failed for the odd redundant shutdown valve (ORSV)	= True	Enable Conditions:	Diagnostic reset event	=	False		Runs Continuously	A
		To determine if the redundant shutdown valve is hydraulically stuck on, the redundant shutdown valve is set to the hydraulically on position and the clutch pressure control valve current is ramped up. If no clutch pressure is detected during this stage, the redundant pressure control valve is determined not to be stuck on.				Odd clutch pressure recovery routine is requested (1), see Summary table attachments C_SID_ASV_CMP_VA_RSP_CLU_STU CK_OFF	=	True			
		The clutch pressure redudant shutdown valve is further verified for functionality by use of the current profile check. If the clutch redundant shutdown valve current profile check fails consistently, the redundant shutdown shutdown valve is digenosed hydraulically stuck off.				Odd clutch pressure recovery routine run conditions met (2), see Summary table attachments C_SID_ASV_CMP_VA_RSP_CLU_STU CK_OFF	=	True			
						Odd clutch pressure sensor out-of- window drift fault detected during this instance of the odd clutch recovery routine	=	False			
						Odd clutch redundant shutdown valve stuck on fault detected druing this instance of the odd clutch recovery routine	=	False			
						Time zero current is commanded for the odd clutch redundant shutdown valve before triggering the current profile check	=	100	ms		
		This diagonatic detects a slutch sodundant			Fault confirmation	Odd clutch redundant shutdown valve current profile check consist fail confirmation count	=	3	count		
Clutch 2 Rsp stuck off	P2714	shutdown valve hydraulically stuck off fault. This is done by using the clutch recovery routine which is triggered by the setting of a clutch system or component diagnostic failure.	Current profile check failed for the even redundant shutdown valve (ERSV)	= True	Enable Conditions:	Diagnostic reset event	=	False		Runs Continuously	A
		To determine if the redundant shutdown valve is hydraulically stuck on, the redundant shutdown valve is set to the hydraulically on position and the clutch pressure control valve current is ramped up. If no clutch pressure is detected during this stage, the redundant pressure control valve is determined not to be stuck on.				Even clutch pressure recovery routine is requested (1), see Summary table attachments C_SID_ASV_CMP_VA_RSP_CLU_STU CK_OFF	=	True			
		The clutch pressure redudant shutdown valve is further verified for functionallity by use of the current profile check. If the clutch redundant shutdown valve current profile check fails consistently, the redundant shutdown shutdown valve is diagnosed hydraulically stuck off.				Even clutch pressure recovery routine run conditions met (2), see Summary table attachments C_SID_ASV_CMP_VA_RSP_CLU_STU CK_OFF	=	True			
						Even clutch pressure sensor out-of- window drift fault detected during this instance of the odd clutch recovery routine	=	False			

	Even clutch redundant shutdown valve stuck on fault detected druing this instance of the odd clutch recovery routine	=	False	
	Time zero current is commanded fo the even clutch redundant shutdown valve before triggering the current profile check	=	100 ms	
	Even clutch redundant shutdown Fault confirmation valve current profile check consist fail confirmation count	=	3 count	

Component/System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value			Secondary Parameters		Enable Conditions	Time Required	MIL illum.
Clutch 1 Rsp stuck on	P0797	This diagnostic detects a clutch redundant shutdown valve hydraulically stuck onn fault.	Current odd clutch pressure	> 1	bar	Enable Conditions:	Diagnostic reset event	=	False	Runs Continuously	А
		To determine if the redundant shutdown valve is hydraulically stuck on, the redundant shutdown valve is set to the hydraulically on position and the clutch pressure control valve current is ramped up. If no clutch pressure is detected during this stage, the redundant pressure control valve is determined diaenosed to be stuck on.					Odd clutch pressure recovery routine is requested (1), see Summary table attachments C_SID_ASV_CMP_VA_RSP_CLU_STU CK_ON	=	True		
		This check is performed time based and when allowed by running conditions as part of clutch pressure valve cleaning routine or as part of the clutch recovery routine which is triggered by the setting of a clutch system or component diagnostic failure.					Odd clutch pressure recovery routine run conditions met (2), see Summary table attachments C_SID_ASV_CMP_VA_RSP_CLU_STU CK_ON	=	True		
							Odd clutch pressure sensor out-of- window drift fault detected during this instance of the odd clutch recovery routine	=	False		
							OR Time based clutch pressure valve cleaning request (3), see Summary table attachments C_SID_ASV_CMP_VA_RSP_CLU_STU CK_ON	=	True		
							T Time based clutch pressure valve run conditions met (4), see Summary table attachments C_SID_ASV_CMP_VA_RSP_CLU_STU CK_ON	=	True		
Clutch 2 Rsp stuck on	P2715	This diagnostic detects a clutch redundant shutdown valve hydraulically stuck onn fault.	Current even clutch pressure	> 1	bar	Enable Conditions:	Diagnostic reset event	=	False	Runs Continuously	А
		To determine if the redundant shutdown valve is hydraulically stuck on, the redundant shutdown valve is set to the hydraulically on position and the clutch pressure control valve current is ramped up. If no clutch pressure is detected during this stage, the redundant pressure control valve is determined diagnosed to be stuck on.					Odd clutch pressure recovery routine is requested (1), see Summary table attachments C_SID_ASV_CMP_VA_RSP_CLU_STU CK_ON	-	True		
		This check is performed time based and when allowed by running conditions as part of clutch pressure valve cleaning routine or as part of the clutch recovery routine which is triggered by the setting of a clutch system or component diaenostic failure.					Odd clutch pressure recovery routine run conditions met (2), see Summary table attachments C_SID_ASV_CMP_VA_RSP_CLU_STU CK_ON	=	True		
							Odd clutch pressure sensor out-of- window drift fault detected during this instance of the odd clutch recovery routine	=	False		
							OR				
							Time based clutch pressure valve cleaning request (3), see Summary table attachments C_SID_ASV_CMP_VA_RSP_CLU_STU CK_ON	=	True		

	Time based clutch pressure valve run conditions met (4), see Summary table attachments C_SID_ASV_CMP_VA_RSP_CLU_STU	= True		
	CK_ON			

Component/System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	s	Secondary Parameters		Enable	Time Required	MIL illum.
ISD Rsn stuck off	P2817	This diagnostic detects a limited slip differential redundant shutdown valve hydraulically stuck off fault. This is done by using the limited slip differential recovery routine which is triggered by the setting of a limited slip differential system or component diagnostic failure.	Current profile check failed for the limited slip differential redundant shutdown valve (ERSV)	= True	Enable Conditions: [Diagnostic reset event	=	False	Runs Continuously	B
		To determine if the redundant shutdown valve is hydraulically stuck on, the redundant shutdown valve is set to the hydraulically on position and the limited slip differential pressure control valve current is ramped up. If no limited slip differential pressure is detected during this stage, the redundant pressure control valve is determined not to be stuck on.			L r S C C	Limited slip differential recovery routine is requested (1), see Summary table attachments C_SID_ASV_CMP_VA_RSP_LSD_STU CK_OFF	=	True	Kuns continuousiy	
		The limited slip differential pressure redudant shutdown valve is further verified for functionality by use of the current profile check. If the limited slip differential redundant shutdown valve current profile check fails consistently, the redundant shutdown valve is diagnosed hydraulically stuck off.			L r S C C	Limited slip differential recovery routine run conditions met (2), see Summary table attachments C_SID_ASV_CMP_VA_RSP_LSD_STU CK_OFF	-	True		
					L S C C	Limited slip differential pressure sensor out-of-window drift fault detected during this instance of the odd clutch recovery routine	=	False		
					L S C C	Limited slip differential redundant shutdown valve stuck on fault detected during this instance of the odd clutch recovery routine	=	False		
					Fault confirmation time		=	3 cour	t	

Component/System	Fault Code	Monitor Strategy Description	Malfunction Criteria		Threshold Value			Secondary Parameters		Enable Conditions	Time Required	MIL illum.
LSD Rsp stuck on	P2818	This diagnostic detects a limited slip differential redundant shutdown valve hydraulically stuck on fault.	Current limited slip differential pressure	>	1	bar	Enable Conditions:	Diagnostic reset event	=	False	Runs Continuously	В
		To determine if the redundant shutdown valve is hydraulically stuck on, the redundant shutdown valve is set to the hydraulically on position and the limited slip differential pressure control valve current is ramped up. If no limited slip differential pressure is detected during this stage, the redundant pressure control valve is determined diagnosed to be stuck on.						Limited slip differential recovery routine is requested (1), see Summary table attachments C_SID_ASV_CMP_VA_RSP_LSD_STU CK_OFF	=	True		
		This check is performed time based and when allowed by running conditions as part of limited slip differential pressure valve cleaning routine or as part of the limited slip differential recovery routine which is triggered by the setting of a limited slip differential system or component diagnostic failure						Limited slip differentail recovery routine run conditions met (2), see Summary table attachments C_SID_ASV_CMP_VA_RSP_LSD_STU CK_OFF	=	True		
								Limited slip differential sensor out- of-window drift fault detected during this instance of the limited slip differential recovery routine	=	False		
								OR				
								Time based limited slip differential pressure valve cleaning request (3), see Summary table attachments C_SID_ASV_CMP_VA_RSP_LSD_STU CK_OFF	=	True		
								Time based limited slip differential pressure valve run conditions met (4), see Summary table attachments C_SID_ASV_CMP_VA_RSP_LSD_STU CK_OFF	=	True		

Component/System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL illum.
Incorrect adaptation data	P287C	At controller initilization, the transmission learn data is verified. If a data check fails, the adaptation data is diagnosed faulted.	Odd clutch preload pressure end-of-line data invalid	= True			Runs at controller initialization	с
			Odd clutch preload pressure online learn data invalid	= True				
			Even clutch preload pressure end-of-line data	= True				
			Even clutch preload pressure online learn data	= True				
			Odd clutch kisspoint pressure end-of-line data	= True				
			Odd clutch kisspoint pressure online learn data invalid	= True				
			Even clutch kisspoint pressure end-of-line data invalid	= True				
			Even clutch kisspoint pressure online learn data invalid	= True				
			Odd clutch fill volume end-of-line data invalid	= True				
			Odd clutch fill volume online learn data invalid	- True				
			First shitch fill us have and of line data invalid	- True				
			Even clutch fill volume end-of-line data invalid	= Irue				
			Even clutch fill volume online learn data invalid	= True				
			Odd clutch fast fill factor end-of-line data invalid	= True				
			Odd clutch fast fill factor online learn data invalid	= True				
			Even clutch fast fill factor end-of-line data invalid	= True				
			invalid	= True				
			line data invalid	= True				
			of-line data invalid	= True				
			data invalid	= True				
			learn data invalid	= True				
			Even clutch torque kisspoint pressure end-of-line data invalid	= True				
			learn data invalid	= True				
			Odd clutch torque gain end-of-line data invalid	= Irue				
			Odd clutch torque gain online learn data invalid Even clutch torque gain end-of-line data invalid	= True = True				
			Even clutch torque gain online learn data invalid	= True				
			System pressure current correction end-of-line data invalid	= True				
			Odd clutch pressure sensor offset online learn data invalid	= True				
			Even clutch pressure sensor offset online learn data invalid	= True				
			System pressure offset sensor online learn data invalid	= True				
			Limited slip differential pressure sensor offset online learn data invalid	= True				
			Rod 1 synchronizer positions end-of-line data invalid	= True				
			Rod 1 synchronizer positions online learn data invalid	= True				

Rod 2 synchronizer positions end-of-line data invalid	=	True				
Rod 2 synchronizer positions online learn data invalid	=	True				
Rod 3 synchronizer positions end-of-line data invalid	=	True				
Rod 3 synchronizer positions online learn data	=	True				
Rod 4 synchronizer positions end-of-line data invalid	=	True				
Rod 4 synchronizer positions online learn data invalid	=	True				
Rod 5 synchronizer positions end-of-line data invalid	=	True				
Rod 5 synchronizer positions online learn data invalid	=	True				
Limited slip differential pressure to current correction end-of-line data invalid	=	True				
Odd clutch superfill time adaptation online learn data invalid	=	True				
Even clutch superfill time adaptation online learn data invalid	=	True				
Parking lock positions end-of-line data invalid	=	True				
Parking lock positions online learn data invalid	=	True				
Synchronizer pressure control valve 1 pressure	_	Taulo				
to current end-of-line data invalid	=	True				
Synchronizer pressure control valve 2 pressure to current end-of-line data invalid	=	True				
Synchronizer pressure control valve 3 pressure to current end-of-line data invalid	=	True				
Synchronizer pressure control valve 4 pressure to current end-of-line data invalid	=	True				
Synchronizer pressure control valve 5 pressure	=	True				
Lube solenoid flow to current correction end-of-	=	True				
Odd clutch speed sensor end-of-line data invalid	=	True				
Even clutch speed sensor end-of-line data invalid	_	Тгие				
Output speed sensor end-of-line data invalid	_	True				
Limited slip differential torque kisspoint end-of-	_	True				
line data invalid Limited slip differential torque gain end-of-line	_	True				
data invalid Limited slip differential kisspoint pressure end-of-	-	True				
line data invalid End-of-line data version loaded not compatable	=	Irue				
with current software	=	True				
Odd clutch preload pressure end-of-line learn routine not finished successfully	=	True	Odd clutch preload pressure end-of- line learn routine triggered by operator/mechanic	=	True	Runs continuously
Even clutch preload pressure end-of-line learn		Тгие	Even clutch preload pressure end-of- line learn routine triggered by	=	True	Rups continuously
routine not finished successfully			operator/mechanic	-		
Odd clutch kisspoint pressure end-of-line learn routine not finished successfully	=	True	Odd clutch kisspoint pressure end- of-line learn routine triggered by operator/mechanic	=	True	Runs continuously
			Even clutch kisspoint pressure end-			
Even clutch kisspoint pressure end-of-line learn	=	True	of-line learn routine triggered by	=	True	Runs continuously
routine not finished successfully			operator/mechanic			
k						4

Odd clutch fill volume and of line learn routine		Odd clutch fill volumen pressure			
not finished successfully	= True	end-of-line learn routine triggered	=	True	Runs continuously
not misrieu successiuny		by operator/mechanic			
Even clutch fill volume end-of-line learn routine		Even clutch fill volume pressure end-			
not finished successfully	= True	of-line learn routine triggered by	=	True	Runs continuously
not misned successfully		operator/mechanic			
Odd clutch fast fill factor end-of-line learn		Odd clutch fast fill factor end-of-line			
routine not finished successfully	= True	learn rotuine triggered by	=	True	Runs continuously
Successiony		operator/mechanic			
Even clutch fact fill factor and of line learn		Even clutch fast fill factor end-of-			
routing not finished successfully	= True	line learn rotuine triggered by	=	True	Runs continuously
Toutine not missieu successiuny		operator/mechanic			
		Odd clutch pressure to current			
Odd clutch pressure to current correction end-of-	= True	correction end-of-line learn routine	-	True	Runs continuously
line learn routine not finished successfully	- 1100	triggered by operator (mochanic	-	nue	Nuns continuousiy
		unggered by operator/mechanic			
		Even clutch pressure to current			
Even clutch pressure to current correction end-	= True	correction end-of-line learn routine	=	True	Runs continuously
of-line learn routine not finished successfully	- 1140	triggered by operator/mechanic	_	Hue	Kuns continuousiy
Rod 1 synchronizer positions end-of-line learn		Rod 1 synchronizer positions end-of-			1
routine not finished successfully	= True	line learn routine triggered by	=	True	Runs continuously
ioutine not missical succession,		operator/mechanic			
Rod 2 synchronizer positions end-of-line learn		Rod 2 synchronizer positions end-of-			
routine not finished successfully	= True	line learn routine triggered by	=	True	Runs continuously
		operator/mechanic			
Rod 3 synchronizer positions end-of-line learn		Rod 3 synchronizer positions end-of-			1
routine not finished successfully	= True	line learn routine triggered by	=	True	Runs continuously
,		operator/mechanic			
Rod 4 synchronizer positions end-of-line learn	_	Rod 4 synchronizer positions end-of-		_	
routine not finished successfully	= True	line learn routine triggered by	=	True	Runs continuously
·		operator/mechanic			
Rod 5 synchronizer positions end-of-line learn	_	Rod 5 synchronizer positions end-of-		_	
routine not finished successfully	= True	line learn routine triggered by	=	True	Runs continuously
·		operator/mechanic			
System pressure current correction end-of-line	_	System pressure current correction		-	
learn routine not finished successfully	= True	end-of-line learn routine triggered	=	True	Runs continuously
·		by operator/mechanic			
Limited slip differential pressure to current		Limited slip differential pressure to			
correction end-of-line learn routine not finished	= True	current correction end-of-line learn	=	True	Runs continuously
successfully		routine triggered by			
		operator/mechanic			
Parking lock positions end-of-lie learn routine	_	Parking lock positions end-of-lien		_	
not finished successfully	= True	learn routine triggered by	=	True	Runs continuously
		operator/mechanic			

		[Enable		
Component/System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Three	hold Value			Secondary Parameters	Co	nditions	Time Required	MIL illum.
			Engaged gear for the synchronizer corresponding to the driving gear based on speed sensor information indicates neutral (1), see Summary		True		Enable Conditions:			True		
lost	P277E	disengagement while driving on the odd clutch. This is detected by seeing synhronizer	table attachments C_SID_ASV_SYS_GEAR_ACT_LOST	=				Driving gear selected	=		Runs Continuously	А
		differential speed for the current driving gear while the clutch is not slipping.	Odd clutch slip	<	50	rpm		Synchronizer shift busy for an odd gear synchronizer	=	False		
		When syncrhonizer differential speed for the current driving gear is detected while the clutch is not slipping, the gear is diagnosed unintentionally mechanically disencessed						Driving gear corresponds to odd	_	True		
		unintendonany mechanicany disengageo.						priving gear equals logical engaged gear on odd clutch shaft	=	True		
							Fault confirmation time:			1000 ms		
Even clutch driving gear		This diagnostic detects unintentional gear	Engaged gear for the synchronizer corresponding to the driving gear based on speed sensor information indicates neutral (1), see Summary table attachments		True		Enable Conditions:			True		
lost	P277F	disengagement while driving on the odd clutch. This is detected by seeing synhronizer	C_SID_ASV_SYS_GEAR_ACT_LOST	=				Driving gear selected	=		Runs Continuously	А
		differential speed for the current driving gear while the clutch is not slipping. When syncrhonizer differential speed for the	Even clutch slip	<	50	rpm		Synchronizer shift busy for an even gear synchronizer	=	False		
		current driving gear is detected while the clutch is not slipping, the gear is diagnosed unintentionally mechanically disengaged.						Driving gear corresponds to even gear shaft	=	True		
								priving gear equals logical engaged gear on even clutch shaft	=	True		
							Fault confirmation time:			1000 ms		

										Enable			
Component/System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Th	reshold Value			Secondary Parameters		Conditions		Time Required	MIL illum.
Gear 1 performance	P1946	This diagnostic detects a failure to control the shift rod corresponding with a gear to neutral when a gear determination fault at controller initialization has been detected. If the engaged gears according to the rod position sensors don't match with engaged gear	Difference between measured C_ROD_1 positon and the learned rod neutral position	>=	600	μm	Enable Conditions:	Transmission engaged gear for the clutch shaft based on rod position sensor information not match with engaged gears stored in non-volatile memory at controller initialization	=	True		Runs Continuously	A
		data stored in non-volatile-memory at the end of the previous power cycle of the transmission controller, the intrusive synchronizer integrity routine is used to determine reliability of the rod position sensor.	OR					Synchronizer integrity routine running conditions (1), see Summary table attachments C_SID_ASV_SYS_GEAR_SY_BLOCKED	=	True			
		If the rod positon sensors are diagnosed ok by the synchronizer integrity routine, but the gear determination based on the rod position does not show an allowable gear engagement state, the rod drift correction routine is used to control the rods to their respective neutral positions.	Force target to control C_ROD_1 to neutral	>=	200	N		C_ROD_1 position sensor diagnosed ok by the syncrhonizer integrity routine OR the result could not be diagnosed due to a selector fault (3)/(4), see Summary table attachments C_SID_ASV_SYS_GEAR_SY_BLOCKED	=	True			
		If the rod drift correction routine fails to properly control the rods to neutral, the corresponding gears for this shift rod are diagnosed with a performance fault.						C_ROD_1 drift correction active (2), , see Summary table attachments C_SID_ASV_SYS_GEAR_SY_BLOCKED	=	True			
								System pressure	>	4.5	bar		
							Fault confirmation	Rod drift correction actuation to neutral active time	>=	2000	ms		
Gear 2 performance	P1947	This diagnostic detects a failure to control the shift rod corresponding with a gear to neutral when a gear determination fault at controller initialization has been detected. If the engaged gears according to the rod	Difference between measured C_ROD_4 positon and the learned rod neutral position	>=	600	μm	Enable Conditions:	Transmission engaged gear for the clutch shaft based on rod position sensor information not match with engaged gears stored in non-volatile memory at controller initialization	=	True		Runs Continuously	А
		position sensors don't match with engaged gear data stored in non-volatile-memory at the end of the previous power cycle of the transmission controller, the intrusive synchronizer integrity routine is used to determine reliability of the rod position sensor.	OR					Synchronizer integrity routine running conditions (1), see Summary table attachments C_SID_ASV_SYS_GEAR_SY_BLOCKED	=	True			
		If the rod positon sensors are diagnosed ok by the synchronizer integrity routine, but the gear determination based on the rod position does not show an allowable gear engagement state, the rod drift correction routine is used to control the rods to their respective neutral positions.	Force target to control C_ROD_4 to neutral	>=	200	N		C_ROD_4 position sensor diagnosed ok by the syncrhonizer integrity routine OR the result could not be diagnosed due to a selector fault (3)/(4), see Summary table attachments C_SID_ASV_SYS_GEAR_SY_BLOCKED	=	True			
		If the rod drift correction routine fails to properly control the rods to neutral, the corresponding gears for this shift rod are diagnosed with a performance fault.						C_ROD_4 drift correction active (2), , see Summary table attachments C_SID_ASV_SYS_GEAR_SY_BLOCKED	=	True			
								System pressure	>	4.5	bar		
							Fault confirmation	Rod drift correction actuation to neutral active time	>=	2000	ms		

Gear 3 performance	P1948	This diagnostic detects a failure to control the shift rod corresponding with a gear to neutral when a gear determination fault at controller initialization has been detected. If the engaged gears according to the rod position sensors don't match with engaged gear data stored in non-volatile-memory at the end of the previous power cycle of the transmission controller, the intrusive synchronizer integrity routine is used to determine reliability of the rod position concervent.	Difference between measured C_ROD_1 positon and the learned rod neutral position	>=	600	μm	Enable Conditions:	Transmission engaged gear for the clutch shaft based on rod position sensor information not match with engaged gears stored in non-volatile memory at controller initialization Synchronizer integrity routine running conditions (1), see Summary table attachments	-	True True		Runs Continuously	Α
		If the rod positon sensors are diagnosed ok by the synchronizer integrity routine, but the gear determination based on the rod position does not show an allowable gear engagement state, the rod drift correction routine is used to control the rods to their respective neutral positions. If the rod drift correction routine fails to properly control the rods to neutral, the corresponding gears for this shift rod are diagnosed with a neufromance fault	Force target to control C_ROD_1 to neutral	>=	200	Ν		C_NOD_1 position sensor diagnosed ok by the syncrhonizer integrity routine OR the result could not be diagnosed due to a selector fault (3)/(4), see Summary table attachments C_SID_ASV_SYS_GEAR_SY_BLOCKED C_ROD_1 drift correction active (2), , see Summary table attachments C_SID_ASV_SYS_GEAR_SY_BLOCKED	-	True			
								System pressure Rod drift correction actuation to	>	4.5	bar		
							Fault confirmation	neutral active time	>=	2000	ms		
Gear 4 performance	P1949	This diagnostic detects a failure to control the shift rod corresponding with a gear to neutral when a gear determination fault at controller initialization has been detected. If the engaged gears according to the rod position sensors don't match with engaged gear	Difference between measuredC_ROD_3 positon and the learned rod neutral position	>=	600	μm	Enable Conditions:	Transmission engaged gear for the clutch shaft based on rod position sensor information not match with engaged gears stored in non-volatile memory at controller initialization	=	True		Runs Continuously	A
		data stored in non-voiatile-memory at the end of the previous power cycle of the transmission controller, the intrusive synchronizer integrity routine is used to determine reliability of the rod position sensor.	OR					Synchronizer integrity routine running conditions (1), see Summary table attachments C_SID_ASV_SYS_GEAR_SY_BLOCKED	=	True			
		If the rod positon sensors are diagnosed ok by the synchronizer integrity routine, but the gear determination based on the rod position does not show an allowable gear engagement state, the rod drift correction routine is used to control the rods to their respective neutral positions.	Force target to control C_ROD_3 to neutral	>=	200	N		C_ROD_3 position sensor diagnosed ok by the syncrhonizer integrity routine OR the result could not be diagnosed due to a selector fault (3)/(4), see Summary table attachments C_SID_ASV_SYS_GEAR_SY_BLOCKED	Ξ	True			
		If the rod drift correction routine fails to properly control the rods to neutral, the corresponding gears for this shift rod are diagnosed with a performance fault.						C_ROD_3 drift correction active (2), , see Summary table attachments C_SID_ASV_SYS_GEAR_SY_BLOCKED	=	True			
								System pressure	>	4.5	bar		
							Fault confirmation	Rod drift correction actuation to neutral active time	>=	2000	ms		

Gear 5 performance	P194A	This diagnostic detects a failure to control the shift rod corresponding with a gear to neutral when a gear determination fault at controller initialization has been detected. If the engaged gears according to the rod position sensors don't match with engaged gear data stored in non-volatile-memory at the end of the previous power cycle of the transmission controller, the intrusive synchronizer integrity	Difference between measured C_ROD_2 positon and the learned rod neutral position	>=	600	μm	Enable Conditions:	Transmission engaged gear for the clutch shaft based on rod position sensor information not match with engaged gears stored in non-volatile memory at controller initialization Synchronizer integrity routine running conditions (1), see	=	True True		Runs Continuously	A
		routine is used to determine reliability of the rod position sensor. If the rod positon sensors are diagnosed ok by the synchronizer integrity routine, but the gear determination based on the rod position does not show an allowable gear engagement state, the rod drift correction routine is used to control the rods to their respective neutral positions.	OR Force target to control C_ROD_2 to neutral	>=	200	N		Summary table attachments C_SID_ASV_SYS_GEAR_SY_BLOCKED C_ROD_2 position sensor diagnosed ok by the syncrhonizer integrity routine OR the result could not be diagnosed due to a selector fault (3)/(4), see Summary table attachments C_SID_ASV_SYS_GEAR_SY_BLOCKED	=	True			
		If the rod drift correction routine fails to properly control the rods to neutral, the corresponding gears for this shift rod are diagnosed with a performance fault.	· · · · · · · · · · · · · · · · · · ·					C_ROD_2 drift correction active (2), , see Summary table attachments C_SID_ASV_SYS_GEAR_SY_BLOCKED System pressure	=	True	bar		
							Fault confirmation	Rod drift correction actuation to neutral active time	>=	2000	ms		
Gear 6 performance	P194B	This diagnostic detects a failure to control the shift rod corresponding with a gear to neutral when a gear determination fault at controller initialization has been detected. If the engaged gears according to the rod position sensors don't match with engaged gear	Difference between measured C_ROD_3 positon and the learned rod neutral position	>=	600	μm	Enable Conditions:	Transmission engaged gear for the clutch shaft based on rod position sensor information not match with engaged gears stored in non-volatile memory at controller initialization	Ξ	True		Runs Continuously	A
		data stored in non-volatile-memory at the end of the previous power cycle of the transmission controller, the intrusive synchronizer integrity routine is used to determine reliability of the rod position sensor.	OR					Synchronizer integrity routine running conditions (1), see Summary table attachments C_SID_ASV_SYS_GEAR_SY_BLOCKED	=	True			
		If the rod positon sensors are diagnosed ok by the synchronizer integrity routine, but the gear determination based on the rod position does not show an allowable gear engagement state, the rod drift correction routine is used to control the rods to their respective neutral positions.	Force target to control C_ROD_3 to neutral	>=	200	Ν		C_ROD_3 position sensor diagnosed ok by the syncrhonizer integrity routine OR the result could not be diagnosed due to a selector fault (3)/(4), see Summary table attachments C_SID_ASV_SYS_GEAR_SY_BLOCKED	=	True			
		If the rod drift correction routine fails to properly control the rods to neutral, the corresponding gears for this shift rod are diagnosed with a performance fault.						C_ROD_3 drift correction active (2), , see Summary table attachments C_SID_ASV_SYS_GEAR_SY_BLOCKED	=	True			
								System pressure	>	4.5	bar		
							Fault confirmation	Rod drift correction actuation to neutral active time	>=	2000	ms		

Gear 7 performance	P194C	This diagnostic detects a failure to control the shift rod corresponding with a gear to neutral when a gear determination fault at controller initialization has been detected. If the engaged gears according to the rod position sensors don't match with engaged gear data stored in non-volatile-memory at the end of the previous power cycle of the transmission controller, the intrusive synchronizer integrity routine is used to determine reliability of the rod	Difference between measured C_ROD_2 positon and the learned rod neutral position	>=	600	μm	Enable Conditions:	Transmission engaged gear for the clutch shaft based on rod position sensor information not match with engaged gears stored in non-volatile memory at controller initialization Synchronizer integrity routine running conditions (1), see Summary table attachments	-	True True		Runs Continuously	А
		If the rod positon sensors are diagnosed ok by the synchronizer integrity routine, but the gear determination based on the rod position does not show an allowable gear engagement state, the rod drift correction routine is used to control the rods to their respective neutral positions. If the rod drift correction routine fails to properly control the rods to neutral, the corresponding gears for this shift rod are diagnosed with a corformance furth	Force target to control C_ROD_2 to neutral	>=	200	Ν		C_NOD_2 position sensor diagnosed ok by the syncrhonizer integrity routine OR the result could not be diagnosed due to a selector fault (3)/(4), see Summary table attachments C_SID_ASV_SYS_GEAR_SY_BLOCKED C_ROD_2 drift correction active (2), , see Summary table attachments C_SID_ASV_SYS_GEAR_SY_BLOCKED	-	True			
								System pressure	>	4.5	bar		
							Fault confirmation	neutral active time	>=	2000	ms		
Gear 8 performance	P194D	This diagnostic detects a failure to control the shift rod corresponding with a gear to neutral when a gear determination fault at controller initialization has been detected. If the engaged gears according to the rod position sensors don't match with engaged gear	Difference between measured C_ROD_5 positon and the learned rod neutral position	>=	600	μm	Enable Conditions:	Transmission engaged gear for the clutch shaft based on rod position sensor information not match with engaged gears stored in non-volatile memory at controller initialization	=	True		Runs Continuously	A
		data stored in non-volatile-memory at the end of the previous power cycle of the transmission controller, the intrusive synchronizer integrity routine is used to determine reliability of the rod position sensor.	OR					Synchronizer integrity routine running conditions (1), see Summary table attachments C_SID_ASV_SYS_GEAR_SY_BLOCKED	=	True			
		If the rod positon sensors are diagnosed ok by the synchronizer integrity routine, but the gear determination based on the rod position does not show an allowable gear engagement state, the rod drift correction routine is used to control the rods to their respective neutral positions.	Force target to control C_ROD_5 to neutral	>=	200	N		C_ROD_5 position sensor diagnosed ok by the syncrhonizer integrity routine OR the result could not be diagnosed due to a selector fault (3)/(4), see Summary table attachments C_SID_ASV_SYS_GEAR_SY_BLOCKED	=	True			
		If the rod drift correction routine fails to properly control the rods to neutral, the corresponding gears for this shift rod are diagnosed with a performance fault.						C_ROD_5 drift correction active (2), , see Summary table attachments C_SID_ASV_SYS_GEAR_SY_BLOCKED	=	True			
								System pressure	>	4.5	bar		
							Fault confirmation	Rod drift correction actuation to neutral active time	>=	2000	ms		

Gear R performance	P194E	This diagnostic detects a failure to control the shift rod corresponding with a gear to neutral when a gear determination fault at controller initialization has been detected. If the engaged gears according to the rod position correct don't match with personal paper accessed accessed	Difference between measured C_ROD_4 positon and the learned rod neutral position	>=	600	μm	Enable Conditions:	Transmission engaged gear for the clutch shaft based on rod position sensor information not match with engaged gears stored in non-volatile memory at controller initialization	=	True		Runs Continuously	А
		data stored in non-volatile-memory at the end of the previous power cycle of the transmission controller, the intrusive synchronizer integrity routine is used to determine reliability of the rod position sensor.	OR					Synchronizer integrity routine running conditions (1), see Summary table attachments C_SID_ASV_SYS_GEAR_SY_BLOCKED	=	True			
		If the rod positon sensors are diagnosed ok by the synchronizer integrity routine, but the gear determination based on the rod position does not show an allowable gear engagement state, the rod drift correction routine is used to control the rods to their respective neutral positions.	Force target to control C_ROD_4 to neutral	>=	200	N		C_ROD_4 position sensor diagnosed ok by the syncrhonizer integrity routine OR the result could not be diagnosed due to a selector fault (3)/(4), see Summary table attachments C_SID_ASV_SYS_GEAR_SY_BLOCKED	=	True			
		If the rod drift correction routine fails to properly control the rods to neutral, the corresponding gears for this shift rod are diagnosed with a performance fault.						C_ROD_4 drift correction active (2), , see Summary table attachments C_SID_ASV_SYS_GEAR_SY_BLOCKED	=	True			
								System pressure	>	4.5	bar		
							Fault confirmation	Rod drift correction actuation to neutral active time	>=	2000	ms	1	

Common ant /Suntam		Manitas Stratage Description	Malfunction Criteria	Threshold Value		Casandan i Davamatara		Enable		Time Deguined	MIL Illuma
Component/System	Fault Code	This diagnotic detects a stuck gear by monitoring				Secondary Parameters		Conditions		Time Required	IVIIL IIIUM.
Stuck in Gear 1	P072C	gear disengagement attempts. The gear disengagement can fail when a rod	Synchronizer shift to neutral	= True	Enable Conditions:	Gear 1 disengagement requested	=	True		Runs Continuously	А
		position sensor faults occurs during the actuation and the corresponding shift rod position target is neutral. The gear disengagement can fail when the gear	Shift fork position sensor 1 electrical or consistency fault detected during the shift.	= True		Gear 1 disengagement active	=	True			
		disengagement actuation state times out because the transition condition to go the next gear disengagement stare are not met.	OR			System pressure	>	4.5	bar		
		If consecutive gear disengagement attempts fail, the gear is diagnosed stuck in gear.	Gear disengagement actuation state transition conditions met (1), see Summary table attachements C_SID_ASV_SYS_GEAR_SY_DISEN	= False		Application state is unequal to error state	=	True			
			Gear disengagement actuation state timer	Gear disengagement actuation state >= timeout (2), see Summary table attachements		Application state is unequal to bypass state	=	True			
					Fault confirmation	Gear 1 disengagement attempts	>=	4	count		
Stuck in Gear 2	P072D	This diagnotic detects a stuck gear by monitoring gear disengagement attempts.	Synchronizer shift to neutral	= True	Enable Conditions:	Gear 2 disengagement requested	=	True		Runs Continuously	А
		position sensor faults occurs during the actuation and the corresponding shift rod position target is neutral. The gear disengagement can fail when the gear	Shift fork position sensor 4 electrical or consistency fault detected during the shift.	= True		Gear 2 disengagement active	=	True			
		disengagement actuation state times out because the transition condition to go the next gear disengagement stare are not met.	OR			System pressure	>	4.5	bar		
		If consecutive gear disengagement attempts fail, the gear is diagnosed stuck in gear.	Gear disengagement actuation state transition conditions met (1), see Summary table attachements C SID ASV SYS GEAR SY DISEN	= False		Application state is unequal to error state	=	True			
			Gear disengagement actuation state timer	Gear disengagement actuation state >= timeout (2), see Summary table attachements		Application state is unequal to bypass state	=	True			
					Fault confirmation	Gear 2 disengagement attempts	>=	4	count		
Stuck in Gear 3	P072E	This diagnotic detects a stuck gear by monitoring gear disengagement attempts. The gear disengagement can fail when a rod	s Synchronizer shift to neutral	= True	Enable Conditions:	Gear 3 disengagement requested	=	True		Runs Continuously	А
		position sensor faults occurs during the actuation and the corresponding shift rod position target is neutral. The gear disengagement can fail when the gear	Shift fork position sensor 1 electrical or consistency fault detected during the shift.	= True		Gear 3 disengagement active	=	True			
		disengagement actuation state times out because the transition condition to go the next gear disengagement stare are not met.	OR			System pressure	>	4.5	bar		
		If consecutive gear disengagement attempts fail, the gear is diagnosed stuck in gear.	Gear disengagement actuation state transition conditions met (1), see Summary table attachements C SID ASV SYS GEAR SY DISEN	= False		Application state is unequal to error state	=	True			
			Gear disengagement actuation state timer	Gear disengagement actuation state >= timeout (2), see Summary table attachements		Application state is unequal to bypass state	=	True			
					Fault confirmation	Gear 3 disengagement attempts	>=	4	count		
Stuck in Gear 4	P072F	Inis diagnotic detects a stuck gear by monitoring gear disengagement attempts.	Synchronizer shift to neutral	= True	Enable Conditions:	Gear 4 disengagement requested	=	True	l	Runs Continuously	А

		The gear disengagement can fail when a rod position sensor faults occurs during the actuation and the corresponding shift rod position target is neutral. The gear disengagement can fail when the gear disengagement actuation state times out because the transition condition to go the next gear disengagement stare are not met.	Shift fork position sensor 3 electrical or consistency fault detected during the shift.	= True		Gear 4 disengagement active System pressure	=	True 4.5	bar		
		If consecutive gear disengagement attempts fail, the gear is diagnosed stuck in gear.	Gear disengagement actuation state transition conditions met (1), see Summary table attachements C_SID_ASV_SYS_GEAR_SY_DISEN	= False		Application state is unequal to error state	=	True			
			Gear disengagement actuation state timer	Gear disengagement actuation state >= timeout (2), see Summary table attachements		Application state is unequal to bypass state	=	True			
					Fault confirmation	Gear 4 disengagement attempts	>=	4	count		
Stuck in Gear 5	P073A	This diagnotic detects a stuck gear by monitoring gear disengagement attempts. The gear disengagement can fail when a rod	s Synchronizer shift to neutral	= True	Enable Conditions:	Gear 5 disengagement requested	=	True		Runs Continuously	A
		position sensor faults occurs during the actuation and the corresponding shift rod position target is neutral. The gear disengagement can fail when the gear	Shift fork position sensor 2 electrical or consistency fault detected during the shift.	= True		Gear 5 disengagement active	=	True			
		disengagement actuation state times out because the transition condition to go the next gear disengagement stare are not met.	OR			System pressure	>	4.5	bar		
		If consecutive gear disengagement attempts fail, the gear is diagnosed stuck in gear.	Gear disengagement actuation state transition conditions met (1), see Summary table attachements C SID ASV SYS GEAR SY DISEN	= False		Application state is unequal to error state	=	True			
			Gear disengagement actuation state timer	Gear disengagement actuation state >= timeout (2), see Summary table attachements		Application state is unequal to bypass state	=	True			
					Fault confirmation	Gear 5 disengagement attempts	>=	4	count		
Stuck in Gear 6	P073B	This diagnotic detects a stuck gear by monitoring gear disengagement attempts. The gear disengagement can fail when a rod	s Synchronizer shift to neutral	= True	Enable Conditions:	Gear 6 disengagement requested	=	True		Runs Continuously	А
		position sensor faults occurs during the actuation and the corresponding shift rod position target is neutral. The gear disengagement can fail when the gear	Shift fork position sensor 3 electrical or consistency fault detected during the shift.	= True		Gear 6 disengagement active	=	True			
		disengagement actuation state times out because the transition condition to go the next gear disengagement stare are not met.	OR			System pressure	>	4.5	bar		
		If consecutive gear disengagement attempts fail,	Gear disengagement actuation state transition conditions met (1), see Summary table attachements C_SID_ASV_SYS_GEAR_SY_DISEN	= False		Application state is unequal to error state	=	True			
			Gear disengagement actuation state timer	Gear disengagement actuation state >= timeout (2), see Summary table attachements		Application state is unequal to bypass state	=	True			
					Fault confirmation	Gear 6 disengagement attempts	>=	4	count		
Stuck in Gear 7	P073C	This diagnotic detects a stuck gear by monitoring gear disengagement attempts. The gear disengagement can fail when a rod	Synchronizer shift to neutral	= True	Enable Conditions:	Gear 7 disengagement requested	=	True		Runs Continuously	A
		position sensor faults occurs during the actuation and the corresponding shift rod position target is neutral.	Shift fork position sensor 2 electrical or consistency fault detected during the shift.	= True		Gear 7 disengagement active	=	True			

		The gear disengagement can fail when the gear disengagement actuation state times out because the transition condition to go the next gear disengagement stare are not met.	OR				System pressure	>	4.5	bar		
		If consecutive gear disengagement attempts fail, the gear is diagnosed stuck in gear.	Gear disengagement actuation state transition conditions met (1), see Summary table attachements C SID ASV SYS GEAR SY DISEN	=	False		Application state is unequal to error state	=	True			
			Gear disengagement actuation state timer	>=	Gear disengagement actuation state timeout (2), see Summary table attachements		Application state is unequal to bypass state	=	True			
						Fault confirmation	Gear 7 disengagement attempts	>=	4	count		
Stuck in Gear 8	P07D7	This diagnotic detects a stuck gear by monitoring gear disengagement attempts. The gear disengagement can fail when a rod	Synchronizer shift to neutral	=	True	Enable Conditions:	Gear 8 disengagement requested	=	True		Runs Continuously	А
		position sensor faults occurs during the actuation and the corresponding shift rod position target is neutral. The gear disengagement can fail when the gear	Shift fork position sensor 5 electrical or consistency fault detected during the shift.	=	True		Gear 8 disengagement active	=	True			
		disengagement actuation state times out because the transition condition to go the next gear disengagement stare are not met.	OR				System pressure	>	4.5	bar		
		If consecutive gear disengagement attempts fail, the gear is diagnosed stuck in gear.	Gear disengagement actuation state transition conditions met (1), see Summary table attachements C SID ASV SYS GEAR SY DISEN	=	False		Application state is unequal to error state	=	True			
			Gear disengagement actuation state timer	>=	Gear disengagement actuation state timeout (2), see Summary table attachements		Application state is unequal to bypass state	=	True			
						Fault confirmation	Gear 8 disengagement attempts	>=	4	count	ļ	
Stuck in Gear R	P072B	This diagnotic detects a stuck gear by monitoring gear disengagement attempts. The gear disengagement can fail when a rod	Synchronizer shift to neutral	=	True	Enable Conditions:	Gear R disengagement requested	=	True		Runs Continuously	A
		position sensor faults occurs during the actuation and the corresponding shift rod position target is neutral. The gear disengagement can fail when the gear	Shift fork position sensor 4 electrical or consistency fault detected during the shift.	=	True		Gear R disengagement active	=	True			
		disengagement actuation state times out						>	4 5		ļ	
		because the transition condition to go the next gear disengagement stare are not met.	OR				System pressure			bar		
		If consecutive gear disengagement attempts fail, the gear is diagnosed stuck in gear.	Gear disengagement actuation state transition conditions met (1), see Summary table attachements C SID ASV SYS GEAR SY DISEN	=	False		Application state is unequal to error state	=	True			
			Gear disengagement actuation state timer	>=	Gear disengagement actuation state timeout (2), see Summary table attachements		Application state is unequal to bypass state	=	True			
						Fault confirmation	Gear R disengagement attempts	>=	4	count		

Component/Sustem	Fault Code	Monitor Stratom Description	Malfunction Critoria		Throshold Value			Sacandany Daramatora		Enable		Time Required	MIL illum
component/ system	Fault Coue	Monitor Strategy Description			Maximum initial differential anord			Secondary Parameters		conditions		Time Required	IVITE III UITI.
Unable to Engage Gear		This diagnotic detects a stuck gear by monitoring	Absolute synchronizer differential speed for the	>	threshold for gear to engage (1) + 250, see Summary tabel attachments	rpm	Enable Conditions:		=	True			
1	P073F	gear engagement attempts.	gear to engage		C_SID_ASV_SYS_GEAR_SY_EN			Gear 1 engagement requested				Runs Continuously	В
		The gear engagement can fail when the differential speed is too high. The gear disengagement can fail when the gear	OR					Gear 1 engagement active	=	True			
		disengagement actuation state times out because the transition condition to go the next	Gear engagement actuation state transition conditions met (2), see Summary table	=	False				>	4.5			
		gear engagement state are not met.	attachements C_SID_ASV_SYS_GEAR_SY_EN		Gear engagement actuation state			System pressure			bar		
		If consecutive gear engagement attempts fail, the gear is diagnosed unable to engage gear.	Gear engagement actuation state timer	>=	timeout (3), see Summary table attachements			Application state is unequal to error state	=	True			
			OR					Application state is unequal to bypass state	=	True			
			Absolute synchronizer differential speed for the	>	Maximum differential speed threshold for the gear engagement actuation state (4), see Summary table attachments								
			gear to engage		C_SID_ASV_SYS_GEAR_SY_EN		Fault confirmation	Gear 1 engagement attempts	>=	4	count		
					Maximum initial differential speed								
Linable to Engage Gear		This diagnotic detects a stuck gear by monitoring	Absolute sunchronizer differential speed for the	>	threshold for gear to engage (1) + 250, see Summary tabel	rpm	Enable Conditions:		=	True			
2	P074A	gear engagement attempts. The gear engagement can fail when the	gear to engage		C_SID_ASV_SYS_GEAR_SY_EN			Gear 2 engagement requested		_		Runs Continuously	В
		differential speed is too high. The gear disengagement can fail when the gear	OR					Gear 2 engagement active	=	Irue			
		disengagement actuation state times out because the transition condition to go the next	Gear engagement actuation state transition conditions met (2), see Summary table	=	False			System prossure	>	4.5	bar		
		gear engagement state are not met.			Gear engagement actuation state			System pressure			Dai		
		If consecutive gear engagement attempts fail, the gear is diagnosed unable to engage gear.	Gear engagement actuation state timer	>=	timeout (3), see Summary table attachements			Application state is unequal to error state	=	True			
			OR		Mavimum differential anod			Application state is unequal to bypass state	=	True			
					threshold for the gear engagement								
				>	actuation state (4), see Summary								
			Absolute synchronizer differential speed for the		table attachments								
			gear to engage		C_SID_ASV_STS_GEAR_ST_EN		Fault confirmation	Gear 2 engagement attempts	>=	4	count		
					Maximum initial differential speed								
				>	250, see Summary tabel	rpm	Enable Conditions:		=	True			
Unable to Engage Gear 3	P074B	This diagnotic detects a stuck gear by monitoring gear engagement attempts.	Absolute synchronizer differential speed for the gear to engage		attachments C_SID_ASV_SYS_GEAR_SY_EN			Gear 3 engagement requested				Runs Continuously	В
		differential speed is too high. The gear disengagement can fail when the gear	OR					Gear 3 engagement active	=	True			
		disengagement actuation state times out because the transition condition to go the next	Gear engagement actuation state transition conditions met (2), see Summary table	=	False				>	4.5			
		gear engagement state are not met.	attachements C_SID_ASV_SYS_GEAR_SY_EN					System pressure			bar		
		If consecutive gear engagement attempts fail, the gear is diagnosed unable to engage gear	Gear engagement actuation state timer	>=	Gear engagement actuation state timeout (3), see Summary table attachements			Application state is unequal to error state	=	True			
			OR		attachements			Application state is unequal to bypass state	=	True			

Unable to Engage Gear 4	P074C	This diagnotic detects a stuck gear by monitoring gear engagement attempts. The gear engagement can fail when the differential speed is too high. The gear disengagement can fail when the gear disengagement actuation state times out because the transition condition to go the next gear engagement state are not met. If consecutive gear engagement attempts fail, the gear is diagnosed unable to engage gear.	Absolute synchronizer differential speed for the gear to engage Absolute synchronizer differential speed for the gear to engage OR Gear engagement actuation state transition conditions met (2), see Summary table attachements C_SID_ASV_SYS_GEAR_SY_EN Gear engagement actuation state timer OR	> = >=	Maximum differential speed threshold for the gear engagement actuation state (4), see Summary table attachments C_SID_ASV_SYS_GEAR_SY_EN Maximum initial differential speed threshold for gear to engage (1) + 250, see Summary table attachments C_SID_ASV_SYS_GEAR_SY_EN False Gear engagement actuation state timeout (3), see Summary table attachments Maximum differential speed threshold for the gear engagement	rpm	Fault confirmation	Gear 3 engagement attempts Gear 4 engagement requested Gear 4 engagement active System pressure Application state is unequal to error state Application state is unequal to bypass state	>= = > = =	4 True True 4.5 True True	count bar	Runs Continuously	в	
			Absolute synchronizer differential speed for the gear to engage	>	actuation state (4), see Summary table attachments C_SID_ASV_SYS_GEAR_SY_EN		Fault confirmation	Gear 4 engagement attempts	>=	4	count			
Unable to Engage Gear 5	P074D	This diagnotic detects a stuck gear by monitoring gear engagement attempts.	Absolute synchronizer differential speed for the gear to engage	>	Maximum initial differential speed threshold for gear to engage (1) + 250, see Summary tabel attachments C_SID_ASV_SYS_GEAR_SY_EN	rpm	Enable Conditions:	Gear 5 engagement requested	=	True		Runs Continuously	в	
		differential speed is too high. The gear disengagement can fail when the gear disengagement actuation state times out	OR Gear engagement actuation state transition	_	Falso			Gear 5 engagement active	=	True				
		because the transition condition to go the next gear engagement state are not met.	conditions met (2), see Summary table attachements C_SID_ASV_SYS_GEAR_SY_EN	_	Gear engagement actuation state			System pressure Application state is unequal to error	2	4.5	bar			
		If consecutive gear engagement attempts fail, the gear is diagnosed unable to engage gear.	Gear engagement actuation state timer	>=	timeout (3), see Summary table attachements			state Application state is unequal to bypass state	=	True				
			Absolute synchronizer differential speed for the gear to engage	>	Maximum differential speed threshold for the gear engagement actuation state (4), see Summary table attachments C_SID_ASV_SYS_GEAR_SY_EN		Fault confirmation	Gear 5 engagement attempts	>=	4	count			
-					Maximum initial differential speed threshold for gear to engage (1) +			Gear 5 engagement attempts	/-	4	count			
Unable to Engage Gear 6	P074E	This diagnotic detects a stuck gear by monitoring gear engagement attempts.	Absolute synchronizer differential speed for the gear to engage	>	250, see Summary tabel attachments C SID ASV SYS GEAR SY EN	rpm	Enable Conditions:	Gear 6 engagement requested	=	True		Runs Continuously	в	
		The gear engagement can fail when the differential speed is too high.	OR					Gear 6 engagement active	=	True				
		disengagement actuation state times out because the transition condition to go the next gear engagement state are not met.	Gear engagement actuation state transition conditions met (2), see Summary table attachements C_SID_ASV_SYS_GEAR_SY_EN	=	False			System pressure	>	4.5	bar			
		If consecutive gear engagement attempts fail, the gear is diagnosed unable to engage gear.	Gear engagement actuation state timer	>=	Gear engagement actuation state timeout (3), see Summary table attachements			Application state is unequal to error state	=	True				
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			OR		Maximum differential speed			Application state is unequal to bypass state	=	True				
			Absolute synchronizer differential speed for the gear to engage	>	threshold for the gear engagement actuation state (4), see Summary table attachments C_SID_ASV_SYS_GEAR_SY_EN		Fault confirmation	Gear 6 engagement attempts	>=	4	count			
					Maximum initial differential speed									
Unable to Engage Gear 7	P074F	This diagnotic detects a stuck gear by monitoring gear engagement attempts.	Absolute synchronizer differential speed for the	>	250, see Summary tabel attachments	rpm	Enable Conditions:	Gear 7 engagement requested	=	True		Runs Continuously	в	
		The gear engagement can fail when the differential speed is too high.	OR					Gear 7 engagement active	=	True				
		disengagement actuation state times out because the transition condition to go the next	Gear engagement actuation state transition conditions met (2), see Summary table	=	False				>	4.5				
		gear engagement state are not met.	attachements C_SID_ASV_SYS_GEAR_SY_EN					System pressure			bar			
		If consecutive gear engagement attempts fail, the gear is diagnosed unable to engage gear.	Gear engagement actuation state timer	>=	Gear engagement actuation state timeout (3), see Summary table attachements			Application state is unequal to error state	=	True				
			OR		Maximum differential speed			Application state is unequal to bypass state	=	True				
					threshold for the gear engagement									
			Absolute synchronizer differential speed for the	>	actuation state (4), see Summary table attachments									
			gear to engage		C_SID_ASV_SYS_GEAR_SY_EN		Fault confirmation	Gear 7 engagement attempts	>=	4	count			
					Maximum initial differential speed									
				>	250, see Summary tabel	rpm	Enable Conditions:		=	True				
Unable to Engage Gear 8	P07D8	I his diagnotic detects a stuck gear by monitoring gear engagement attempts.	absolute synchronizer differential speed for the gear to engage		attachments C_SID_ASV_SYS_GEAR_SY_EN			Gear 8 engagement requested				Runs Continuously	В	
		differential speed is too high.	OR					Gear 8 engagement active	=	True				
		disengagement actuation state times out	Gear engagement actuation state transition	=	False				>	4.5				
		gear engagement state are not met.	attachements C_SID_ASV_SYS_GEAR_SY_EN					System pressure			bar			
		If consecutive gear engagement attempts fail, the gear is diagnosed unable to engage gear.	Gear engagement actuation state timer	>=	Gear engagement actuation state timeout (3), see Summary table attachements			Application state is unequal to error state	=	True				
			OR		Maximum differential croad			Application state is unequal to bypass state	=	True				
			Absolute synchronizer differential speed for the	>	threshold for the gear engagement actuation state (4), see Summary table attachments									
			gear to engage		C_SID_ASV_SYS_GEAR_SY_EN		Fault confirmation	Gear 8 engagement attempts	>=	4	count			
	L				Maximum initial differential speed			consecution and the second sec	-		count			1
		This discussion detectors in the termination of	Alexalization of the state of the state of the state	>	250, see Summary tabel	rpm	Enable Conditions:		=	True				
Unable to Engage Gear R	P073E	i his diagnotic detects a stuck gear by monitoring gear engagement attempts.	Absolute synchronizer differential speed for the gear to engage		attachments C_SID_ASV_SYS_GEAR_SY_EN			Gear R engagement requested				Runs Continuously	В	
		The gear engagement can fail when the differential speed is too high.	OR					Gear R engagement active	=	True				

The gear disengagement can fail when the gear disengagement actuation state times out because the transition condition to go the next gear engagement state are not met.	Gear engagement actuation state transition conditions met (2), see Summary table attachements C_SID_ASV_SYS_GEAR_SY_EN	= False		System pressure	>	4.5	bar	
If consecutive gear engagement attempts fail, the gear is diagnosed unable to engage gear.	Gear engagement actuation state timer	Gear engagement actuation state >= timeout (3), see Summary table attachements		Application state is unequal to error state Application state is unequal to bypacs state	=	True True		
	Absolute synchronizer differential speed for the gear to engage	Maximum differential speed threshold for the gear engagement > actuation state (4), see Summary table attachments C_SID_ASV_SYS_GEAR_SY_EN	Fault confirmation	Gear R engagement attempts	>=	4	count	

								Enable			
Component/System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value			Secondary Parameters	Conditions		Time Required	MIL illum.
		This diagnostic detect rod drift by detected a rod		Bod drift fault high limit (1) see			No rod 1 force present condition (3)				
		position measured which is outside wide	Rod 1 position measurement	Summary table attachments	um	Enable Conditions:	confirmation time, see Summary	100			
		tolerances compared to the current logically		C SID ASV SYS MECH ROD CLU	μ		table attachments	100			
Rod 1 drift fault	P284D	engaged gear.		>			C_SID_ASV_SYS_MECH_ROD_CLU	>=	ms	Runs Continuously	A
		The logically engaged gear is verified by seeing					Flandwised fourth for an el 4 an está a e				
		there is a match with the engaged gear based on	OR				Electrical fault for rod 1 position	False			
		the clutch and output speed sensors.		Rod drift fault low limit (2) soo			sensor	-			
				< Summary table attachments			Consistency fault rod 1 position	False			
			Rod 1 position measurement	C SID ASV SYS MECH ROD CLU	um		sensor	=			
				e_oib_/iov_oib_incon_iob_eco	P		Synchronizer shift busy on				
							corresponding clutch shaft	= False			
							No electrical odd clutch speed				
							sensor OR output speed sensor fault	100			
							time	>=	ms		
							Logically engaged gear matches rod				
							1 speed gear (4), see Summary table	True			
							attachments	The			
							C_SID_ASV_SYS_MECH_ROD_CLU	=			
							Output speed available from sensor	True			
							OR substituted by CAN info	=			
							Odd clutch speed available from	True			
							sensor	=			
							End-of-line rod 1 position learn	False			
							routine busy	=			
							End-of-line rod 2 position learn	False			
							routine busy	=			
							End-of-line rod 3 position learn	False			
							Fout of line and Ameritian leave	=			
							End-of-line rod 4 position learn	_ False			
							Fod of line red E position learn	=			
							routine busy	_ False			
							Application state is upequal to error	_			
							state	= True			
							Application state is upequal to				
							bypass state	= True			
							-,,				
						Fault confirmation		500			
						time:		500	ms		
							Rod drift correction for rod 1 has				
		This diagnostic detects rod drift by determining		>= 10		Enable Conditions:	been triggered (10), see Summary	True			
		too many active occurences of the rod drift		10		Enable conditions.	table attachments	inde			
		correction.	Rod 1 drift correction active counter		count		C_SID_ASV_SYS_MECH_ROD_CLU	=		Runs Continuously	
							Rod drift correction for rod 1				
		The rod drift correction is triggered when the					transition to active (13), see				
		rod position measured is outside narrow					Summary table attachments	True			
		tolerances compared to the current logically					C_SID_ASV_SYS_MECH_ROD_CLU				
		engaged gear.					(increments active counter)	=			-
		This diagnastic detects and drift by determining					Rod drift correction for rod 1 has				
		This diagnostic detects rod drift by determining		> 5000		Enable Conditions:	table attachments	True			
	1	correction	Rod 1 drift correction active timer		mc			_		Runs Continuously	
		correction.	Nou I unit correction active timer		1115		C_SID_ASV_STS_IVIECT_ROD_CLU	-		Runs Continuously	
	1	The rod drift correction is triggered when the					(13) see Summary table				
		rod position measured is outside parrow				1	attachments	True			
		tolerances compared to the current logically					C SID ASV SYS MECH ROD CUI	nue			
		engaged gear				1	(increments active timer)	-			
1	1	chooped pear.	_1	I		ļ.	(increased by betwee timer)	I	l		I

		This diagnostic detect rod drift by detected a rod			Dad drift fault high limit (1) and			No rod 2 force present condition (3)					
		position measured which is outside wide			Rod drift fault fight limit (1), see			confirmation time, see Summary					
		tolerances compared to the current logically	Rod 2 position measurement		Summary table attachments	μm	Enable Conditions:	table attachments		100			
Ded 2 drift fault	02045	engaged ages			C_SID_ASV_SYS_MECH_ROD_CLU				×-			Dune Continuously	
Rou 2 drift fault	P284E	engageu gear.		^				C_SID_ASV_STS_WECH_ROD_CLU	>=		ms	Runs Continuously	A
		The logically engaged gear is verified by seeing											
		there is a match with the engaged gear based on	OR					Electrical fault for rod 2 position		False			
		the clutch and output speed sensors	-					sensor	-				
		the clutch and output speed sensors.						3611301	-				
					Rod drift fault low limit (2), see								
				<	Summary table attachments			Consistency fault rod 2 position		False			
			Rod 2 position measurement		C SID ASV SYS MECH POD CITI	um		sensor	-				
			Nou z position measurement		C_SID_ASV_STS_WECH_KOD_CLU	μιιι		361301	-				
								Synchronizer shift busy on		Falco			
								corresponding clutch shaft	=	1 4130			
								No electrical odd clutch speed					
								No electrical oud clutteri specu					
								sensor OR output speed sensor fault		100			
								time	>=		ms		
								Logically engaged gear matches rod					
								2 speed gear (4), see Summary table		True			
								attachments		nuc			
								C SID ASV SYS MECH ROD CLU	=				
								Output speed available from sensor					
								Output speed available from sensor		True			
								OR substituted by CAN info	=				
								Odd clutch speed available from					
								sensor	-	True			
								301301	-				
								End-of-line rod 1 position learn		Falco			
								routine busy	=	Faise			
								End-of-line rod 2 position learn					
								End of line rou 2 position learn		False			
								routine busy	=				
								End-of-line rod 3 position learn					
								routine busy	=	False			
								End of line red 4 position learn					
								End-of-line rod 4 position learn		False			
								routine busy	=	T disc			
								End-of-line rod 5 position learn					
								routing busy	-	False			
								Toutille busy	-				
								Application state is unequal to error	_	True			
								state	=	True			
								Application state is upequal to					
								Application state is unequal to	=	True			
								bypass state					
							Eault confirmation						
										500			
							time:				ms	l	
								Rod drift correction for rod 2 has					
		This diagnostic detects rod drift by determining						been triggered (10), see Summary					
				>=	10		Enable Conditions:			True			
		too many active occurences of the rod unit						Lable attachments					
		correction.	Rod 2 drift correction active counter			count		C_SID_ASV_SYS_MECH_ROD_CLU	=			Runs Continuously	
								Rod drift correction for rod 2					
		The red drift correction is triggered when the						transition to active (12) coo					
		The fou unit conection is triggered when the						transition to active (15), see					
		rod position measured is outside narrow						Summary table attachments		True			
		tolerances compared to the current logically						C SID ASV SYS MECH ROD CLU					
		engaged gear						(increments active counter)	=				
		cillagea Searr						Ded drift consetien for and 2 hos				{	
				1			1	KOU DRITE COFFECTION FOR FOD 2 has	1				
		This diagnostic detects rod drift by determining		L	5000		Frahla Caralistana	been triggered (10), see Summary	1	T			
		too long active occurence of the rod drift		>	5000		Enable Conditions:	table attachments	1	True			
		correction	Rod 2 drift correction active timer			mc	1	C SID ASV SVS MECH BOD CUL	-			Runs Continuously	
		correction.	Nou 2 unit correction active timer	1		1115	1	C_SID_ASV_STS_IVIECT_KOD_CLU	1-			Nuns continuously	
				1				Rod drift correction for rod 2 active	1				
		The rod drift correction is triggered when the		1				(13) , see Summary table	1				
		rod position measured is outside parrow		1				attachments	1	True			
		i ou position measureu is outside fiarrow					1		1	True			
		tolerances compared to the current logically					1	C_SID_ASV_SYS_MECH_ROD_CLU	1				
		engaged gear.		1			1	(increments active timer)	=				
		This diagnostic detect rod drift by detected a rod						No rod 3 force present condition (3)	1 I			İ	
		nesition measured which is subside with			Rod drift fault high limit (1), see		1	application time Control (5)	1				
		position measured which is outside wide	Rod 3 position measurement		Summary table attachments	um	Enable Conditions	confirmation time, see Summary	1	100			
		tolerances compared to the current logically		1		P		table attachments	1	200			
Rod 3 drift fault	P284F	engaged gear.		>				C SID ASV SYS MECH ROD CLU	>=		ms	Runs Continuously	А
	-		1				1		1		-		1

		The logically engaged gear is verified by seeing there is a match with the engaged gear based on the clutch and output speed sensors.	OR					Electrical fault for rod 3 position sensor	Fal	lse		
				<	Rod drift fault low limit (2), see Summary table attachments			Consistency fault rod 3 position	Fal	lse		
			Rod 3 position measurement		C_SID_ASV_SYS_MECH_ROD_CLU	μm		sensor Synchronizer shift busy on corresponding clutch shaft	= Fal	lse		
								No electrical even clutch speed sensor OR output speed sensor fault	10	00		
								Logically engaged gear matches rod 3 speed gear (4), see Summary table attachments	z- Tri	ue		
								C_SID_ASV_SYS_MECH_ROD_CLU Output speed available from sensor	= Tri	II.e		
								OR substituted by CAN info Even clutch speed available from sensor	= _ Tri	ue		
								End-of-line rod 1 position learn routine busy	= Fal	lse		
								End-of-line rod 2 position learn routine busy	= Fal	lse		
								routine busy End-of-line rod 4 position learn	= Fal	lse		
								routine busy End-of-line rod 5 position learn	= Fal	lse		
								routine busy Application state is unequal to error state	= Tri	ue		
								Application state is unequal to bypass state	= Tri	ue		
							Fault confirmation time:		50	00 ms		
		This diagnostic detects rod drift by determining too many active occurences of the rod drift		>=	10		Enable Conditions:	Rod drift correction for rod 3 has been triggered (10), see Summary table attachments	Tri	ue		
		correction. The rod drift correction is triggered when the	Rod 3 drift correction active counter			count		C_SID_ASV_SYS_MECH_ROD_CLU Rod drift correction for rod 3 transition to active (13) , see	=		Runs Continuously	
		rod position measured is outside narrow tolerances compared to the current logically engaged gear.						Summary table attachments C_SID_ASV_SYS_MECH_ROD_CLU (increments active counter)	Tri	ue		
		This diagnostic detects rod drift by determining too long active occurence of the rod drift		>	5000		Enable Conditions:	Rod drift correction for rod 3 has been triggered (10), see Summary table attachments	Tri	ue		
		correction. The rod drift correction is triggered when the rod position measured is outside narrow	Rod 3 drift correction active timer			ms		C_SID_ASV_SYS_MECH_ROD_CLU	=		Runs Continuously	
		tolerances compared to the current logically engaged gear.						Rod drift correction for rod 3 active (13) (increments active timer)	=	ue		
	89959	position measured which is outside wide tolerances compared to the current logically	Rod 4 position measurement		Rod drift fault high limit (1)	μm	Enable Conditions:	No rod 4 force present condition (3) confirmation time, see Summary table attachments	10	00		
KOO 4 drift fault	P2850	engaged gear. The logically engaged gear is verified by seeing there is a match with the engaged gear based on	OR	>				L_SID_ASV_SYS_MECH_KOD_CLU	>= Fal	ms	Kuns Continuously	A
		the clutch and output speed sensors.	Rod 4 position measurement	<	Rod drift fault low limit (2)	μm		sensor Consistency fault rod 4 position sensor	= Fal	lse		

							Synchronizer shift busy on corresponding clutch shaft No electrical even clutch speed sensor OR output speed sensor fault time Logically engaged gear matches rod 4 speed gear (4), see Summary table attachments	=	False 100 ms True		
							C_SID_ASV_SYS_MECH_ROD_CLU Output speed available from sensor OR substituted by CAN info Even clutch speed available from	=	True		
							sensor End-of-line rod 1 position learn routine busy End-of-line rod 2 position learn	=	True False		
							routine busy End-of-line rod 3 position learn routine busy	=	False False		
							routine busy End-of-line rod 5 position learn routine busy	=	False False		
							Application state is unequal to error state Application state is unequal to bypass state	=	True True		
						Fault confirmation			500 ms		
		This diagnostic detects rod drift by determining too many active occurences of the rod drift correction.	Rod 4 drift correction active counter	>= 10	count	Enable Conditions:	Rod drift correction for rod 4 has been triggered (10), see Summary table attachments C_SID_ASV_SYS_MECH_ROD_CLU	=	True	Runs Continuously	
		The rod drift correction is triggered when the rod position measured is outside narrow tolerances compared to the current logically engaged gear.					Rod drift correction for rod 4 transition to active (13), see Summary table attachments C_SID_ASV_SYS_MECH_ROD_CLU (increments active counter)	=	True		
		This diagnostic detects rod drift by determining too long active occurence of the rod drift correction.	Rod 4 drift correction active timer	> 5000	ms	Enable Conditions:	Rod drift correction for rod 4 has been triggered (10), see Summary table attachments C_SID_ASV_SYS_MECH_ROD_CLU	=	True	Runs Continuously	
		The rod drift correction is triggered when the rod position measured is outside narrow tolerances compared to the current logically engaged gear.					(13), see Summary table attachments C_SID_ASV_SYS_MECH_ROD_CLU (increments active timer)	=	True		
Rod 5 drift fault	P286A	This diagnostic detect rod drift by detected a rod position measured which is outside wide tolerances compared to the current logically engaged gear.	Rod 5 position measurement	Rod drift fault high limit (1), s Summary table attachment > C_SID_ASV_SYS_MECH_ROD_	see :s μm CLU	Enable Conditions:	No rod 5 force present condition (3) confirmation time, see Summary table attachments C_SID_ASV_SYS_MECH_ROD_CLU	>=	100 ms	Runs Continuously	A
		The logically engaged gear is verified by seeing there is a match with the engaged gear based on the clutch and output speed sensors.	OR				Electrical fault for rod 5 position sensor	=	False		
			Rod 5 position measurement	Rod drift fault low limit (2), s Summary table attachment C_SID_ASV_SYS_MECH_ROD_	ee s CLU μm		Consistency fault rod 5 position sensor	=	False		
							Synchronizer shift busy on corresponding clutch shaft No electrical even clutch speed sensor OB output speed sensor fault	=	False		
							time	>=	ms		

					Logically engaged gear matches rod 5 speed gear (4), see Summary table attachments C_SID_ASV_SYS_MECH_ROD_CLU Output speed available from sensor	=	True	
					OR substituted by CAN info Even clutch speed available from	-	True	
					End-of-line rod 1 position learn routine busy	=	False	
					End-of-line rod 2 position learn routine busy	=	False	
					End-of-line rod 3 position learn routine busy	=	False	
					routine busy End-of-line rod 5 position learn	=	False	
					routine busy Application state is unequal to error	-	False	
					state Application state is unequal to	=	True	
					bypass state			
				time:			500 ms	
This diagnostic detects rod drift by determining too many active occurences of the rod drift correction.	Rod 5 drift correction active counter	>= 10	count	Enable Conditions:	Rod drift correction for rod 5 has been triggered (10), see Summary table attachments C_SID_ASV_SYS_MECH_ROD_CLU	=	True	Runs Continuously
The rod drift correction is triggered when the rod position measured is outside narrow tolerances compared to the current logically engaged gear.					Rod drift correction for rod 5 transition to active (13), see Summary table attachments C_SID_ASV_SYS_MECH_ROD_CLU (increments active counter)	=	True	
This diagnostic detects rod drift by determining too long active occurence of the rod drift correction	Rod 5 drift correction active timer	> 5000	me	Enable Conditions:	Rod drift correction for rod 5 has been triggered (10), see Summary table attachments	-	True	Runs Continuously
The rod drift correction is triggered when the rod position measured is outside narrow tolerances compared to the current logically engaged gear.			1115		Rod drift correction for rod 5 active (13), see Summary table attachments C_SID_ASV_SYS_MECH_ROD_CLU (increments active timer)	=	True	Kuns Concinuousiy

Component/System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value			Secondary Parameters		Enable Conditions		Time Required	MIL illum.
Park lock disengage retry fault	P07E6	This diagnostic detects a failure to disengage the parking lock.	The difference between the adapted parklock hold position and the measured parklock position	> 500	um	Enable Conditions:	Parklock engage park request	=	False		Runs Continuously	А
		(presence of hydraulic power in the system) and the parking lock disengagement is requested, the time for parking lock disengagement is monitored.	The difference between the measured parklock position and the adapted parklock open position	> 500	um		Parklock disengagement possible (1), Summary table attachments C_SID_ASV_SYS_PLK_DISEN	=	True			
		If the parking lock disengagement takes too long, a parking lock disengagement retry counter is incremented. When the parking lock disengagement retry					Parking lock state is Disengaging (4), Summary table attachments C_SID_ASV_SYS_PLK_DISEN	=	True			
		counter reaches the maximum retry count, the parking lock is diagnosed stuck in park.					System pressure	>=	15	bar		
							Parking lock position sensor electrical or consistency fault detected	=	False			
							Diagnostic reset event Application state is unequal to error	=	False			
							state Application state is unequal to bypass state	=	True			
						Fault confirmation	Disengage active timer		Disengage timeout (2), Summary table attachments C_SID_ASV_SYS_ PLK_DISEN	ms		
							Parking lock disengaging retry counter	=	3	count		
		This diagnostic detects an unintended parking lock egangement.	The difference between the adapted parklock hold position and the measured parklock position	> 500	um	Enable Conditions:	Parklock engage park request	=	False		Runs Continuously	
		When the parking lock was disengaged and the parking lock position sensor reads parking lock engagement for a confirmation time, the parking lock open fault retry counter is incremented.	The difference between the measured parklock position and the adapted parklock open position	> 500	um		Parking lock state is Open (4), Summary table attachments C_SID_ASV_SYS_PLK_DISEN	=	True			
		When the parking lock open fault retry counter reaches the maximum fault count, the parking lock is diagnosed stuck in park.					Diagnostic reset event	=	False			
							Application state is unequal to error state	=	True			
							Application state is unequal to bypass state	=	True			
						Fault confirmation	Open fault timer	=	250	ms		
							Parking lock open fault retry counter	=	3	count		

Component/System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value			Secondary Parameters		Enable Conditions		Time Required	MIL illum.
Park lock engage retry fault	P07E4	This diagnostic detecs a failure to engage the parking lock. If the parking lock engagement takes too long, the parking lock engage retry counter is incremented.	Absolute difference between the parklock locked position and the measured parklock position	> 500	um	Enable Conditions:	Parklock state transition to engaging allowed (1), see Summary table attachments C_SID_ASV_SYS_PLK_EN	=	True		Runs Continuously	В
		If the parking lock retry counter reaches the maximum parking lock engagement retry count, the parking lock is diagnosed unable to engage.					Vehicle speed acceptable for engaging parklock (2), see Summary table attachments C SID ASV SYS PLK EN	=	True			
							Parklock engage park request	=	True			
							Parking lock state is Disengaging Parking lock piston sensor (PLPS)	=	True			
							fault detected	=	False			
							Application state is unequal to error	-	Faise			
							state Application state is unequal to bypass state	=	True			
						Fault confirmation			Engage timeout (3), see Summary table attachments	ms		
							Parking lock engagement timer Engaging retry counter	=	C_SID_ASV_SYS_ PLK_EN 3	count		
		This diagnostic detects unintentional parking lock disengagement by measuring a parking lock position outside the parking lock locked position tolerances or a too higher vehcile or output speed. If the parking lock shows unintended parking	Absolute difference between the parklock locked position and the measured parklock position	> 500	um	Enable Conditions:	Parking lock state is Locked (4), see Summary table attachments C_SID_ASV_SYS_PLK_EN	=	True		Runs Continuously	
		lock disengagement, the parking lock locked fault counter is incremented. If the parking lock locked fault counter reaches	t OR				Parklock engage park request	=	True			
		the maximum parking lock locked fault count, the parking lock is diagnosed unable to engage.	Absolute vehicle speed	> 3	kph		Diagnostic reset event	=	False			
			OR				Application state is unequal to error state	=	True			
			Absolute speed of the output shaft	> 30	rpm		Application state is unequal to bypass state	=	True			
						Fault confirmation	Parking lock locked fault timer Locked retry counter	=	50 1	ms count		

Component/System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value			Secondary Parameters		Enable		Time Required	MII illum
component, system	Tuure couc						Secondary Furameters				Time Required	
Transmission Clutch 1 Pressure Control Too		This diagnostic detects a clutch pressure that is	Difference between clutch 1 pressure sensor	 Pressure difference fault threshold (1), see Summary table attachments 	bar	Enable Conditions:			False			
High	P2855	above the modeled pressure at the sensor.	reading and modeled pressure	C_SID_ASV_SYS_PRS_CLU			Diagnostic clear event	=			Runs Continuously	В
		pressure for too long, the clutch pressure control		= 2					False			
		is diagnosed faulted with a pressure charge	Hysteresis	- 2	har		Electrical fault for clutch 1 pressure sensor	-	Tuise			
					bui		Electrical fault for clutch 1 pressure control valve	=	False			
							Electrical fault for clutch 1	-	False			
							Clutch 1 redundant shutdown valve	= H	Hydraulic On			
							Clutch 1 recovery request	=	False			
							1 clutch pressure control valve	_	False			
							Adaptive routine overrule for clutch	-	False			
							Adaptive routine overrule for clutch	=				
							calculations	=	False			
							Last superfill on clutch 1 end	= >	Faise 80	ms		
							Application state is unequal to error	=	True			
							Application state is unequal to	=	True			
							bypass state					
								h	Pressure difference too			
								hig	th confirmation			
						Fault confirmation		t Si	time (2), see			
						time.		é	attachments			
								C_:	SID_ASV_SYS_ PRS_CLU			
				Absolute pressure difference fault			Pressure too high fault timer	>=		ms		
		This diagnostic detects an absolute difference		threshold (3), see Summary table		Fundal Constitutions						
		between the measured pressure and the	Absolute difference between clutch 1 pressure	> attachments		Enable Conditions:						
		modeled pressure at the sensor. If absolute pressure difference is too high for too	sensor reading and modeled pressure	C_SID_ASV_SYS_PRS_CLU	bar		Diagnostic clear event	=	False		Runs Continuously	
		the modeled pressure, the clutch pressure		= 0.5			Electrical fault fax alutab 1 concerns					
		charge fault.	Hysteresis		bar		sensor	=	False			
			Difference between clutch 1 pressure sensor	> 0			Electrical fault for clutch 1 pressure		E .l.			
			reading and modeled pressure		bar		control valve Electrical fault for clutch 1	=	False			
							redundant shutdown valve	=	False			
							ciuton 1 redundant shutdown valve position	= +	Hydraulic On			
							Clutch 1 recovery request	=	False			
							Adaptive routine overrule for clutch					
							current Adaptive routine overrule for clutch	=	False			
							1 fast filling	=	False			

							Fault confirmation time:	Adaptive routine overrule for clutch 1 pressure control flow influence calculations Clutch 1 superfill active Last superfill on clutch 1 end Application state is unequal to error state Application state is unequal to bypass state		False False 80 True True Absolute pressure difference confirmation time (4), see Summary table attachments C_SID_ASV_SYS_ PBSS CIU	ms		
		This diagnostic detects a fault to control the clutch pressure around the hold pressure.	Absolute difference between clutch 1 target pressure and hold pressure	<	0.05078125	bar	Enable Conditions:	Diagnostic clear event	=	False		Runs Continuously	
		controlled around hold pressure which is a region where no torque will be transmitted through the clutch. If the clutch is being controlled around hold pressure and the measured pressure is above the	Difference between clutch 1 pressure sensor reading and modeled pressure	>	1.19921875	bar		Electrical fault for clutch 1 pressure sensor	=	False			
		hold pressure too much for too long, the clutch pressure control is diagnosed faulted with a pressure charge fault.	Hysteresis	=	0.5	bar		Electrical fault for clutch 1 pressure control valve	=	False			
								redundant shutdown valve Clutch 1 redundant shutdown valve	=	False Hydraulic On			
								position Clutch 1 recovery request Adaptive routine overrule for clutch	=	False			
								Adaptive routine overrule for clutch	=	False			
								Adaptive routine overrule for clutch 1 pressure control flow influence	=	Faise			
								calculations Clutch 1 superfill active Last superfill on clutch 1 end	= = >	False False 80	ms		
								Application state is unequal to error state	=	True			
								Application state is unequal to bypass state	=	True			
							Fault confirmation time:	Pressure above hold pressure fault timer	>=	300	ms		
Transmission Clutch 1 Pressure Control Too Low	P2853	This diagnostic detects a fault to control the clutch pressure above zero pressure.	Clutch 1 modeled pressure	>	1	bar	Enable Conditions:	Diagnostic clear event	=	False		Runs Continuously	В
		If the model pressure at the sensor is bigger than a threshold and the clutch pressure sensor is measuring below a low the pressure detection level for too long, the clutch pressure control is		<	0.5			Electrical fault for clutch 1 pressure					
		diangosed with a pressure discharge fault.	Clutch 1 pressure sensor reading			bar		sensor Electrical fault for clutch 1 pressure control valve	=	False False			

		1				Electrical fault for clutch 1				
						redundant shutdown valve	=	False		
						Clutch 1 redundant shutdown valve				
						position	=	Hydraulic On		
						Clutch 1 recovery request	=	False		
						Adaptive routine overrule for clutch				
						1 clutch pressure control valve				
						current	=	False		
						Adaptive routine overrule for clutch				
						1 fast filling	-	False		
						Adaptive routine overrule for clutch	-	T disc		
						1 prossure control flow influence				
						a pressure control now initiaence	_	Falco		
						Clutch 4 and affill a stine	-	False		
						Clutch I superin active	=	Faise		
						Last superfill on clutch 1 end	>	80	ms	
						Application state is unequal to error	=	True		
						state				
						Application state is unequal to	-	True		
		1				bypass state	-	nue		
		1								
					Fault confirmation			5000		
					time:	No pressure detected fault timer	>=	5000	ms	
		1	Absolute pressure difference fault							
This diagnostic detects an absolute difference			threshold (3), see Summary table							
between the measured pressure and the	Absolute difference between clutch 1 pressure	>	attachments		Enable Conditions:					
modeled pressure at the sensor.	sensor reading and modeled pressure		C SID ASV SYS PRS CLU	bar		Diagnostic clear event	=	False		Runs Continuously
If absolute pressure difference is too high for too			0_00_000_000_000_000_000							,
long and the measured pressure is lower than										
the modeled pressure, the clutch pressure		_	0.5							
control is diagnosod faulted with a prossure		-	0.5			Electrical fault for clutch 1 process				
discharge foult	Lhusteresia			har		Electrical fault for clutch 1 pressure	_	Falsa		
discharge fault.	Hysteresis			bar		sensor	=	Faise		
	Difference between clutch 1 pressure sensor	<	0			Electrical fault for clutch 1 pressure				
	reading and modeled pressure			bar		control valve	=	False		
						Electrical fault for clutch 1				
						redundant shutdown valve	=	False		
						Clutch 1 redundant shutdown valve		Hydraulic On		
						position	=	Hyuraulic Off		
						Clutch 1 recovery request	=	False		
						Adaptive routine overrule for clutch				
						1 clutch pressure control valve				
						current	=	False		
						Adaptive routine overrule for clutch				
						1 fast filling	=	False		
						Adaptive routine overrule for clutch				
						1 pressure control flow influence				
						calculations	_	Falco		
						Clutch 4 and affill a stine	-	False		
		1				Couton 1 Superini active	=	raise		
		1				Last superfill on clutch 1 end	>	80	ms	
						Application state is unequal to error	=	True		
						state				
						Application state is unequal to	=	True		
						bypass state	-	nuc		
								Absolute		
								pressure		
								difference		
		1						confirmation		
					Fault confirmation			time (4) see		
					time:			Summary table		
1								attachmonte		
		1				Abaaluta areasura taa biab				
		1				Absolute pressure too high		C_SID_ASV_SYS_		
1		1			1	difference timer	>=	PRS_CLU	ms	

Transmission Clutch 1 2 Pressure Control Too High	P2856	This diagnostic detects a clutch pressure that is above the modeled pressure at the sensor. If the measured pressure is above the modeled pressure for too long, the clutch pressure control is diagnosed faulted with a pressure charge performance fault.	Difference between clutch 2 pressure sensor reading and modeled pressure Hysteresis	=	Pressure difference fault threshold (1), see Summary table attachments C_SID_ASV_SYS_PRS_CLU 2	bar bar	Enable Conditions:	Diagnostic clear event Electrical fault for clutch 2 pressure sensor Electrical fault for clutch 2 pressure control valve Electrical fault for clutch 2 redundant shutdown valve Clutch 2 redundant shutdown valve position Clutch 2 recovery request Adaptive routine overrule for clutch 2 clutch pressure control valve current Adaptive routine overrule for clutch 2 fast filing Adaptive routine overrule for clutch 2 pressure control flow influence calculations Clutch 2 superfill active Last superfill on clutch 2 end Application state is unequal to error state Application state is unequal to bypass state		False False False False Hydraulic On False False False False 80 True True Pressure	ms	Runs Continuously	В
							Fault confirmation time:	Pressure too high fault timer	>=	difference too high confirmation time (2), see Summary table attachments C_SID_ASV_SYS_ PRS_CLU	ms		
		This diagnostic detects an absolute difference between the measured pressure and the modeled pressure at the sensor. If absolute pressure difference is too high for too long and the measured pressure is higher than the modeled pressure, the clutch pressure control is diagnosed faulted with a pressure charge fault.	Absolute difference between clutch 2 pressure sensor reading and modeled pressure Hysteresis Difference between clutch 2 pressure sensor reading and modeled pressure	>	Absolute pressure difference fault threshold (3), see Summary table attachments C_SID_ASV_SYS_PRS_CLU 0.5 0	bar bar bar	Enable Conditions:	Diagnostic clear event Electrical fault for clutch 2 pressure sensor Electrical fault for clutch 2 pressure control valve Electrical fault for clutch 2 redundant shutdown valve Dosition Clutch 2 redundant shutdown valve position Clutch 2 recovery request Adaptive routine overrule for clutch 2 clutch pressure control valve current Adaptive routine overrule for clutch 2 fast filling Adaptive routine overrule for clutch 2 pressure control flow influence calculations		False False False False Hydraulic On False False False False		Runs Continuously	

							Fault confirmation time:	Clutch 2 superfill active Last superfill on clutch 2 end Application state is unequal to error state Application state is unequal to bypass state	= = =	False 80 True True Absolute pressure difference confirmation time (4), see Summary table attachments C_SID_ASV_SYS_	ms		
		This diagnostic detecs a fault to control the clutch pressure around the hold pressure. When the clutch is currently not in used, it is controlled around hold pressure which is a region where no torque will be transmitted through the clutch.	Absolute difference between clutch 2 target pressure and hold pressure Difference between clutch 2 pressure sensor reading and modeled pressure	<	0.05078125	bar bar	Enable Conditions:	difference timer Diagnostic clear event Electrical fault for clutch 2 pressure sensor	=	PRS_CLU False False	ms	Runs Continuously	
		If the clutch is being controlled around hol d pressure and the measured pressure is above the hold pressure too much for too long, the clutch pressure control is diagnosed faulted with a pressure charge fault.	Hysteresis	-	0.5	bar	Fault confirmation	Electrical fault for clutch 2 pressure control valve Electrical fault for clutch 2 redundant shutdown valve Clutch 2 redundant shutdown valve position Clutch 2 recovery request Adaptive routine overrule for clutch 2 clutch pressure control valve current Adaptive routine overrule for clutch 2 fast filling Adaptive routine overrule for clutch 2 pressure control flow influence calculations Clutch 2 superfill active Last superfill on clutch 2 end Application state is unequal to error state Application state is unequal to bypass state Pressure above hold pressure fault		False False Hydraulic On False False False False False False True True	ms		
Transmission Clutch 2 Pressure Control Too Low	P2854	This diagnostic detects a fault to control the clutch pressure above zero pressure. If the model pressure at the sensor is bigger than a threshold and the clutch pressure sensor is	Clutch 2 modeled pressure	>	1	bar	time: Enable Conditions:	timer Diagnostic clear event	=	False	ms	Runs Continuously	В
		measuring below a low the pressure detection level for too long, the clutch pressure control is diangosed with a pressure discharge fault.	Clutch 2 pressure sensor reading	<	0.5	bar		Electrical fault for clutch 2 pressure sensor Electrical fault for clutch 2 pressure control valve Electrical fault for clutch 2 redundant shutdown valve	= = =	False False False			

						Clutch 2 redundant shutdown valve position Clutch 2 recovery request Adaptive routine overrule for clutch 2 clutch pressure control valve current Adaptive routine overrule for clutch 2 fast filling Adaptive routine overrule for clutch 2 pressure control flow influence calculations Clutch 2 superfill active Last superfill on clutch 2 end Application state is unequal to error state Application state is unequal to bypass state		Hydraulic On False False False False 80 True True	ms	
					Fault confirmation			5000		
					time:	No pressure detected fault timer	>=	5000	ms	
This diagnostic detects an absolute difference between the measured pressure and the modeled pressure at the sensor. If absolute pressure difference is too high for too long and the measured pressure is lower than	Absolute difference between clutch 2 pressure sensor reading and modeled pressure	>	Absolute pressure difference fault threshold (3), see Summary table attachments C_SID_ASV_SYS_PRS_CLU	bar	Enable Conditions:	Diagnostic clear event	=	False		Runs Continuously
the modeled pressure, the clutch pressure		=	0.5							
control is diagnosed faulted with a pressure						Electrical fault for clutch 2 pressure				
discharge fault.	Hysteresis			bar		sensor	=	False		
	Difference between clutch 2 pressure sensor	<	0			Electrical fault for clutch 2 pressure				
	reading and modeled pressure		Ũ	bar		control valve	=	False		
						Electrical fault for clutch 2	_	Falco		
						Clutch 2 redundant shutdown valve	-	Faise		
						position	=	Hydraulic On		
						Clutch 2 recovery request Adaptive routine overrule for clutch	=	False		
						2 clutch pressure control valve current	=	False		
						Adaptive routine overrule for clutch 2 fast filling	=	False		
						Adaptive routine overrule for clutch				
						calculations	=	False		
						Clutch 2 superfill active	=	False		
						Last superfill on clutch 2 end	>	80	ms	
						Application state is unequal to error	=	True		
						Application state is unequal to	=	True		
						bypass state				
								Absolute		
								pressure		
								difference		
					Fault confirmation			time (4) see		
					time:			Summary table		
								attachments		
						Absolute pressure too high		C_SID_ASV_SYS_		
						difference timer	>=	PRS_CLU	ms	

Component/System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Thresh	old Value			Secondary Parameters		Enable Conditions		Time Required	MIL illum.
Limited Slip Differential Clutch Pressure Control Too High	C2A18	This diagnostic detects an absolute difference between the measured pressure and the modeled pressure at the sensor. If absolute pressure difference is too high for too long and the measured pressure is higher than	Absolute difference between limited slip differential pressure sensor reading and target pressure	>	2 ba	ar	Enable Conditions:	Electrical fault for limited slip differential pressure sensor	=	False		Runs Continuously	В
		the modeled pressure on trol is diagnosed faulted differential pressure control is diagnosed faulted with a too high pressure fault	Hustarosis	=	0.5	ar		Electrical fault for limited slip	_	False			
		with a too high pressure fault.	Difference between limited slip differential	>	0 ba	ar		Electrical fault for limited slip differential redundant shutdown valve	-	False			
			P					Limited slip differential redundant shutdown valve position Limited slip differential recovery	=	Hydraulic On			
								request Adaptive routine overrule for limited slip differential pressure	=	False False			
								control valve current Application state is unequal to error state	=	True			
								Application state is unequal to bypass state	=	True			
							Fault confirmation time:			1500	ms		
Limited Slip Differential Clutch Pressure Control Too Low	C2A19	This diagnostic detects an absolute difference between the measured pressure and the modeled pressure at the sensor. If absolute pressure difference is too high for too long and the measured noressure is lower than	Absolute difference between limited slip differential pressure sensor reading and target pressure	>	2 ba	ar	Enable Conditions:	Electrical fault for limited slip differential pressure sensor	=	False		Runs Continuously	В
		the modeled pressure, the limited slip differential pressure control is diagnosed faulted with a too low pressure fault	Hysteresis	=	0.5	ar		Electrical fault for limited slip	=	False			
			Difference between limited slip differential pressure sensor reading and target pressure	<	0 ba	ar		Electrical fault for limited slip differential redundant shutdown valve	=	False			
			,					Limited slip differential redundant shutdown valve position Limited slip differential recovery	=	Hydraulic On			
								request Adaptive routine overrule for limited slip differential pressure	=	False False			
								control valve current Application state is unequal to error state	=	True			
							Fault confirmation	Application state is unequal to bypass state	=	True			
		This diagnostic detects a lack of pressure build					time:			1500	ms		
		up in the eLSD clutch when pressure is requested. If the measured pressure is too low for too long	Limited slip differential pressure sensor reading	< (J.25 ba	ar	Enable Conditions:	Electrical fault for limited slip differential pressure sensor	=	False		Runs Continuously	
		while the target pressure is above a minimum threshold, the limited slip differential presure control is diagnosed faulted with a too low pressure fault.						Electrical fault for limited slip differential pressure control valve	=	False			

			Electrical fault for limited slip differential redundant shutdown valve	=	False		
			Limited slip differential redundant shutdown valve position	=	Hydraulic On		
			Limited slip differential recovery request	=	False		
			Adaptive routine overrule for limited slip differential pressure	=	False		
			Application state is unequal to error state	=	True		
			Application state is unequal to bypass state	=	True		
			eLSD target pressure	>	0.5	bar	
		Fault confirmation time:			3000	ms	

										Enable			
Component/System	Fault Code	Monitor Strategy Description	Malfunction Criteria		Threshold Value			Secondary Parameters		Conditions		Time Required	MIL illum.
System Pressure Control Too High	P0869	This diagnostic detects a system pressure above the target pressure fault.	Difference between Measured system pressure and System pressure target	>	5	bar	Enable Conditions:	Electrical fault for system pressure sensor	=	False		Runs Continuously	В
		If the measured system pressure is above the	,									,	
		target system pressure for too long, the system	Hystorosis low limit		2					Falco			
		pressure control is diagnosed with a pressure too	hysteresis low limit		5			Electrical fault for sytem pressure		Faise			
		high fault.		=		bar		pilot valve	=				
								Hydraulic power available from		_			
								main pump or a target speed is		True			
								Adaptive routine overrule for	-				
								system pressure pilot valve current	-	False			
								System pressure forced low waiting					
								on steady flow	=	False			
								No system pressure fault fail		E a la a			
								conditions	=	False			
								System pressure recovery request	=	False			
								System pressure recovery after					
								system pressure drop check active		False			
								(2), see Summary table attachments					
								C_SID_ASV_SYS_PRS_SYS	=				
								Application state is unequal to error state	=	True			
								Application state is unequal to		True			
								bypass state	-	nue			
								Diagnostic is disabled during priming					
								mode of the aux pump (3), see	=	False			
								C_SID_A5_STS_PRS_STS					
							Fault confirmation			4500			
							time:			1500	ms		
			Difference between System pressure target and		System pressure fault low limit (1),								
System Pressure		This diagnostic detects a system pressure below	Measured system pressure		see Summary table attachments	bar	Enable Conditions:	Electrical fault for system pressure		False			_
Control Too Low	P0868	the target pressure fault.		>	C_SID_ASV_SYS_PRS_SYS			sensor	=			Runs Continuously	В
		If the measured system pressure is below the											
		pressure control is diagnosed with a pressure too	Hysteresis low limit		2			Electrical fault for sytem pressure		False			
		low fault.		=		bar		pilot valve	=				
								Hydraulic power available from					
								main pump or a target speed is		True			
								requested to the auxiliary pump	=				
								Adaptive routine overrule for		False			
								system pressure pilot valve current	=	1 disc			
								System pressure forced low waiting		False			
								on steady flow	=				
								conditions	-	False			
								System pressure recovery request	=	False			
								Custom processor recovery often					
								system pressure drop check active		Falco			
								(2), see Summary table attachments		FdISe			
								C SID ASV SYS PRS SYS	=				
								Application state is unequal to error	_	True			
								state	=	rrue			
								Application state is unequal to bypass state	=	True			

									Diagnostic is disabled during priming mode of the aux pump (3), see Summary table attachments C_SID_AS_SYS_PRS_SYS	=	False			
								Fault confirmation time:			1500	ms		
No System Pressure Fault	P0867	This diagnostic detetcs a fault where there is no system pressure buildup as it is expected. If the transmission pump(s) are running, minimal	Measured system pressure	<	4	I	oar	Enable Conditions:	Electrical fault for system pressure sensor	=	False		Runs Continuously	A
		system pressure buildup is expected. If this does not occur a system pressure performance fault is							Hydraulic power available from main pump or a target speed is		True			
		diagnosed.							requested to the auxiliary pump Application state is unequal to bypass state	=	True			
									Diagnostic is disabled during priming mode of the aux pump (3), see Summary table attachments C_SID_AS_SYS_PRS_SYS	=	False			
								Fault confirmation time:			2000	ms		

C	Fault Carls	Manitan Charles an Description	Adulfum Alian Orthantia		Thursday I d Malue			Considerer Doministerer		Enable		Time Demoined	N 411 111
Component/System	Fault Code	Monitor Strategy Description			Infeshold value			Secondary Parameters		Conditions		Time Required	IVIL IIIum.
Complement rod move caused by selector		This diagnostic detects a selectory hydraulic	The difference between the actual rod sensor measurement and the actual rod start position	<=	1100	um	Enable Conditions:						
routing hydraulically off	P194F	stuck off fault. During a gear engagement or a gear disengagement, the corresponding rod positon	The difference between the complement rod sensor	>	1100			Diagnostic reset event Speed sensors have no electrical fault (1), see Summary table	=	False		Runs Continuously	В
		sensor and the complement rod position sensor are analyzed. If no rod movement is detected for the rod corresponding to the intended year	measurement			um		attachments C_SID_ASV_SYS_SEL_SY	=				
		engagement/disengagement and rod movement is detected for the complement rod and the intended selector position is hydraulically on, the											
		stuck off.						Synchronizer shift started	=	True	Inm		
								Application state is unequal to error	=	4.5 True	ipin		
								Application state is unequal to	=	True			
								Fault active of active rod sensor	=	False			
								actuation selector pilot valve Actual rod force target	= >	Hydraulic On 0	N		
								Complement rod movement direction for shift solenoid in use	=	B to A			
							Fault confirmation		=	40	ms		
		This diagnostic detects a selectory hydraulic	The difference between the actual rod start	<=	1100		Enable Conditions:						
		stuck off fault. During a gear engagement or a gear	position and the actual rod sensor measurement	-	1100	um		Diagnostic reset event Speed sensors have no electrical	=	False		Runs Continuously	
		disengagement, the corresponding rod positon sensor and the complement rod position sensor	The difference between the complement rod sensor measurement and the complement rod	>	1100			fault (1), see Summary table attachments		False			
		are analyzed. If no rod movement is detected for the rod	start position			um		C_SID_ASV_SYS_SEL_SY	=				
		corresponding to the intended gear engagement/disengagement and rod movement											
		is detected for the complement rod and the intended selector position is hydraulically on, the											
		stuck off.						Synchronizer shift started	=	True	Inne		
								Application state is unequal to error	=	4.5 True	ipin		
								Application state is unequal to	=	True			
								Fault active of active rod sensor	=	False			
								actuation selector pilot valve	=	Hydraulic On	N		
								Complement rod movement direction for shift solenoid in use	=	A to B	in in		
							Fault confirmation		-				
		This diagnostic detects a selectory hydraulic	The difference between the actual rod sensor				time		=	40	ms		
		stuck off fault.	measurement and the actual rod start position	<=	1100	um	Enable Conditions:	Diagnostic reset event	=	False		Runs Continuously	

During a gear engagement or a gear disengagement, the corresponding rod positon sensor and the complement rod position sensor are analyzed. If no rod movement is detected for the rod corresponding to the intended gear engagement/disengagement and rod movement is detected for the complement rod and the	The difference between the complement rod sensor measurement and the complement rod start position	>	1100	um		Speed sensors have no electrical fault (1), see Summary table attachments C_SID_ASV_SYS_SEL_SY	=	False		
intended selector position is hydraulically on, the										
selector mechanism is diagnosed hydraulically stuck off.						Synchronizer shift started	=	True		
						Flow of main pump	>	4.5	lpm	
						Application state is unequal to error state	=	True		
						Application state is unequal to bypass state	=	True		
						Fault active of active rod sensor	=	False		
						Expected position of synchronizer actuation selector pilot valve	=	Hydraulic On		
						Actual rod force target	>	0	Ν	
						Complement rod movement direction for shift solenoid in use	=	A to B		
					Fault confirmation			40		
					time		=	40	ms	
This diagnostic detects a selectory hydraulic	The difference between the actual rod start	<=	1100		Enable Conditions:					
stuck off fault.	position and the actual rod sensor measurement			um		Diagnostic reset event	=	False		Runs Continuously
During a gear engagement or a gear disengagement, the corresponding rod positon	The difference between the complement rod					Speed sensors have no electrical fault (1), see Summary table				
sensor and the complement rod position sensor	start position and the complement rod sensor	>	1100			attachments		False		
are analyzed.	incusurement			um		C_SID_ASV_SYS_SEL_SY	=			
corresponding to the intended gear										
engagement/disengagement and rod movement										
is detected for the complement rod and the intended selector position is hydraulically on the										
selector mechanism is diagnosed hydraulically										
stuck off.						Synchronizer shift started	=	True		
						Flow of main pump Application state is unequal to error	>	4.5	ipm	
						state	=	True		
						Application state is unequal to bypass state	=	True		
						Fault active of active rod sensor	=	False		
						actuation selector pilot valve	=	Hydraulic On		
						Actual rod force target	<=	0	Ν	
						direction for shift solenoid in use	=	B to A		
					Fault confirmation					
					time		=	40	ms	

		This diagnostic detects a hydraulically stuck off selector mechanism. This is by use of the synchronizer integrity routine which can be triggered by the setting by a gear system or component diagnostic failure or by a mismatch between the engaged gears stored in non- volatile memory and the engaged gears according to position and speed sensors. The synchronizer integrity routine performs small rod movement actuations and evaluates the actual rod movements caused by this.	Rod movement in intended move direction during a synchronizer integrity test case (7), see Summary table attachments C_SID_ASV_SYS_SEL_SY	<=	100	μm	Enable Conditions:	Synchronizer integrity intrusive routine triggered (2), see Summary table attachments C_SID_ASV_SYS_SEL_SY	=	True		Runs Continuously	
		corresponding to the acuated rod but its complement rod showed rod movement when the selector target position is hydraulically on, the selector stuck off confirmation counter is incremented. If the selector stuck off confirmation counter	Complement rod movement for actuated shift solenoid during a syncrhonizer integrity test case (7), see Summary table attachments C_SID_ASV_SYS_SEL_SY	>	100	μm		Synchronizer integrity routine running conditions (3), see Summary table attachments C_SID_ASV_SYS_SEL_SY	=	True			
		reaches the selector hydraulically stuck off fault confirmation count, the selector mechansim is diagnosed hydraulically stuck off.						Expected position of synchronizer actuation selector pilot valve Synchronizer test case conditions met (4), see Summary table attachments	=	Hydraulic On True			
							Fault confirmation count	C_SID_ASV_SYS_SEL_SY Selector stuck off fault detection during synchronizer test suite confirmation count	=	2			
								Synchronizer integrity selector stuck off fault test suite confirmation runs	=	3			
Complement rod move caused by selector routing hydraulically on	P1950	This diagnostic detects a selectory hydraulic stuck on fault. During a gear engagement or a gear	The difference between the actual rod sensor measurement and the actual rod start position	<=	1100	um	Enable Conditions:	Diagnostic reset event Speed sensors have no electrical	=	False		Runs Continuously	В
		disengagement, the corresponding rod positon sensor and the complement rod position sensor are analyzed. If no rod movement is detected for the rod	The difference between the complement rod start position and the complement rod sensor measurement	>	1100	um		fault (1), see Summary table attachments C_SID_ASV_SYS_SEL_SY	=	False			
		corresponding to the intended gear engagement/disengagement and rod movement is detected for the complement rod and the intended selector position is hydraulically off, the selector mechanism is diagnosed											
		hydraulically stuck on.						Synchronizer shift started Flow of main pump Application state is unequal to error state	= >	True 4.5 True	lpm		
								Application state is unequal to bypass state Fault active of active rod sensor Expected position of synchronizer	=	True False			
								actuation selector pilot valve Actual rod force target Complement rod movement direction for shift solenoid in use	= >	Hydraulic Off 0 B to A	N		
							Fault confirmation time		=	40	ms		

This diagnostic detects a selectory hydraulic	The difference between the actual rod start	<= 1100	Enable Conditions:					
stuck on fault.	position and the actual rod sensor measurement		um	Diagnostic reset event	= F	alse	Runs Continuously	
During a gear engagement or a gear	The difference between the complement rod			Speed sensors have no electrical				
sensor and the complement rod position sensor	sensor measurement and the complement rod	> 1100		attachments	F	alse		
are analyzed.	start position		um	C SID ASV SYS SEL SY	=			
If no rod movement is detected for the rod								
corresponding to the intended gear								
engagement/disengagement and rod movement								
is detected for the complement rod and the								
the selector mechanism is diagnosed								
hydraulically stuck on.				Synchronizer shift started	= 1	True		
				Flow of main pump	>	4.5 lpm		
				Application state is unequal to error	- 1	True		
				state	-	inde		
				Application state is unequal to	= 1	True		
				Eault active of active rod sensor	= 6	alco		
				Expected position of synchronizer				
				actuation selector pilot valve	= Hydr	aulic Off		
				Actual rod force target	<=	0 N		
				Complement rod movement	А	to B		
				direction for shift solehold in use	=			
			Fault confirmation					
			time		=	40 ms		
This diagnostic detects a selectory hydraulic	The difference between the actual rod sensor	<= 1100	Enable Conditions:					
stuck on fault.	measurement and the actual rod start position		m	Diagnostic reset event	= +	-alse	Runs Continuously	
disengagement the corresponding rod positon	The difference between the complement rod			fault (1) see Summary table				
sensor and the complement rod position sensor	sensor measurement and the complement rod	> 1100		attachments	F	alse		
are analyzed.	start position		um	C_SID_ASV_SYS_SEL_SY	=			
If no rod movement is detected for the rod								
corresponding to the intended gear								
engagement/disengagement and rod movement								
intended selector position is hydraulically off,								
the selector mechanism is diagnosed								
hydraulically stuck on.				Synchronizer shift started	= 1	True		
				Flow of main pump	>	4.5 lpm		
				Application state is unequal to error	= 1	True		
				state				
				bypass state	= 1	True		
				Fault active of active rod sensor	= F	alse		
				Expected position of synchronizer	= Hydr	aulic Off		
				actuation selector pilot valve	- Hyur			
				Actual rod force target	>	0 N		
				direction for shift solenoid in use	_ A	to B		
			Fault confirmation			40		
			time		=	ms	l	
This diagnostic detects a selectory hydraulic	The difference between the actual rod start	<= 1100	Enable Conditions:					
stuck on fault.	position and the actual rod sensor measurement	- 1100	chasie conultions:	Diagnostic reset event	= F	alse	Runs Continuously	
During a gear engagement or a gear				Speed sensors have no electrical			,	
disengagement, the corresponding rod positon	i ne anterence between the complement rod	> 1100		fault (1), see Summary table		alse		
sensor and the complement rod position sensor	measurement	1100		attachments	r	uise		
are analyzed.				C_SID_ASV_SYS_SEL_SY	=		1 1	

If no rod movement is detected for the rod corresponding to the intended gear engagement/disengagement and rod movement is detected for the complement rod and the intended selector position is hydraulically off, the selector mechanism is diagnosed hydraulically stuck on.		Synchronizer shift started Flow of main pump Application state is unequal to error state Application state is unequal to bypass state Fault active of active rod sensor Expected position of synchronizer actuation selector pilot valve Actual rod force target Complement rod movement direction for shift solenoid in use	= True > 4.5 lpm = True = True = False = Hydraulic Off <= 0 N = B to A	
		time	= 40 ms	
This diagnostic detects a hydraulically stuck on selector mechanism. This is by use of the synchronizer integrity routine which can be triggered by the setting by a gear system or component diagnostic failure or by a mismatch between the engaged gears stored in non- volatile memory and the engaged gears according to position and speed sensors. The synchronizer integrity routine performs small rod movement actuations and evaluates the actual rod movements caused by this. When no rod movement is detected corresponding to the acuated rod but its complement rod showed rod movement when the selector stuck on confirmation counter incremented. If the selector stuck on confirmation counter	100 <= μm 100 > μm	Enable Conditions: Synchronizer integrity intrusive routine triggered (2), see Summary table attachments C_SID_ASV_SYS_SEL_SY Synchronizer integrity routine running conditions (3), see Summary table attachments C_SID_ASV_SYS_SEL_SY	True = True	Runs Continuously
reaches the selector hydraulically stuck off fault confirmation count, the selector mechansim is diagnosed hydraulically stuck on.		Expected position of synchronizer actuation selector pilot valve Synchronizer test case conditions	Hydraulic Off =	
		met (4), see Summary table attachments C_SID_ASV_SYS_SEL_SY	True =	
		Fault confirmation count confirmation count	2 =	
		Synchronizer integrity selector fault stuck on test suite confirmation runs	3	

Component/System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value		Secondary Parameters	C	Enable onditions	Time Required	MIL illum.
Serial Data Message Safety Performance 1	P1967	The safety software partition A detects incorrect values for safety relevant CAN signals.	Values determined by application software which are always deemed unacceptable by safety software A side		Enable conditions:	Application software reports transmission actual range as invalid	=	False	Runs continuously	В
		On the one hand, the safety software A side considers certain values for the transmission actual range signal determined by application software which are always unacceptable.	Transmission actual range reported by application software	Park Position or Reverse Position != or Neutral Position or First Drive Position						
		On the other hand, the safety software A side considers values for the transmission actual range signal determined by application software which are acceptable according to the working conditions/states.	Situations which are deemed acceptable by safety software A side							
		The DTC is set when transmission actual range signal reported by application software reports an illegal value or when none of the acceptable situations are detected.	Transmission actual range reported by application software	Transmission actual range = determined by safety software A partition						
			Transmission actual range determined by safety software A partition	= Park						
			Transmission actual range reported by application software	= or Beverse						
			Transmission actual range determined by safety software A partition	= Neutral	Fault confirmation time	Fault confirmation time before safety software intervention	>=	450 ms		
		The safety software partition A detects incorrect values for safety relevant CAN signals.	Values determined by application software which are always deemed unacceptable by safety software A side		Enable conditions:	Application software reports shift lever position as invalid	=	False	Runs continuously	
		On the one hand, the safety software A side considers certain values for the shift lever position signal determined by application software which are always unacceptable.	Shift lever position reported by application software	< Park Range						
		On the other hand, the safety software A side considers values for the shift lever position signal determined by application software which are acceptable according to the working conditions/states.	Shift lever position reported by application software	> Forward Range B						
		The DTC is set when the shift lever position determined by application software reports an illegal value or when none of the acceptable situations are detected.	Situations which are deemed acceptable by safety software A side							
			software A partition Shift lever position reported by application	= Park						
			software Transmission actual range determined by safety software A partition	= Neutral						
			Shift lever position reported by application	Forward Range A = or						
			Transmission actual range determined by safety	Forward Range B = Drive						
			Shift lever position reported by application software	= Reverse Range						
			Transmission actual range determined by safety software A partition	= Reverse	Fault confirmation time	Fault confirmation time before safety software intervention	>=	450 ms		
		The safety software partition A detects incorrect values for safety relevant CAN signals.	Values determined by application software which are always deemed unacceptable by safety software A side		Enable conditions:	Application software reports engaged power flow as invalid	=	False	Runs continuously	

On the one hand, the safety software A side considers certain values for the engaged power flow signal determined by application software which are always unacceptable.	Engaged power flow reported by application software	<	No Powerflow							
On the other hand, the safety software A side considers values for the engaged power flow signal determined by application software which are acceptable according to the working conditions/states.	Engaged power flow reported by application software	>	Reverse Engaged							
The DTC is set when the engaged power flow reported by application software reports an illegal value or when none of the acceptable situations are detected.	Situations which are deemed acceptable by safety software A side									
	Transmission actual range determined by safety software A partition	=	Park							
	Transmission actual range determined by safety software A partition	=	Neutral							
	Engaged power flow reported by application software	=	Drive Engaged							
	Transmission actual range determined by safety software A partition	=	Drive							
	Engaged power flow reported by application software	=	Reverse Engaged							
	Transmission actual range determined by safety software A partition	=	Reverse		Fault confirmation time	Fault confirmation time before safety software intervention	>=	450	ms	
The safety software partition A detects incorrect values for safety relevant CAN signals.	Values determined by application software which are always deemed unacceptable by safety software A side				Enable conditions:	Application software reports engaged transmission output speed as invalid	=	True		Runs continuously
On the one hand, the safety software A side considers certain values for the transmission output speed signal determined by application software which are always unacceptable.	Transmission output speed reported by application software	>	16383.75	rpm						
On the other hand, the safety software A side considers values for the transmission output speed signal determined by application software which are acceptable according to the working conditions/states.	Situations which are deemed acceptable by safety software A side									
The DTC is set when the transmission output speed reported by application software reports an illegal value or when none of the acceptable situations are detected.	Absolute difference between transmission output speed reported by application software with applied delay and absolute transmission output speed determined by safety software A partition	<=	Transmission output speed tolerance (1), see summary table attachments C_SID_SSWA_CAN	rpm						
	Delay applied for transmission output speed reported by application software	=	50	ms	Fault confirmation time	Fault confirmation time before safety software intervention	>=	450	ms	
The safety software partition A detects incorrect values for safety relevant CAN signals.	Values determined by application software which are always deemed unacceptable by safety software A side				Enable conditions:	Application software reports transmission active gear as invalid	=	False		Runs continuously
On the one hand, the safety software A side considers certain values for the transmsission active gear signal determined by application software which are always unacceptable.	Transmission active gear reported by application software	>	Park Gear							
On the other hand, the safety software A side considers values for the transmission active gear signal determined by application software which are acceptable according to the working conditions/states.	Transmission active gear reported by application software	<	First Gear							
The DTC is set when the transmission active gear reported by application software reports an illegal value or when none of the acceptable situations are detected.	Transmission active gear reported by application software	>	Eight Gear							
	Transmission active gear reported by application software	<	Neutral Gear							

The safety software partition A detects incorrect values for safety relevant CAN signals. On the one hand, the safety software A side considers certain values for the transmission active gear ratio signal determined by application software which are always unacceptable. On the other hand, the safety software A side considers values for the transmission active gear ratio signal determined by application software which are acceptable according to the working conditions/states. The DTC is set when the transmission active gear ratio reported by application software reports an illegal value or when none of the acceptable situations are detected.	Values determined by application software which are always deemed unacceptable by safety software A side Transmission active gear determined by safety software A partition Transmission active gear determined by safety software A partition Transmission active gear reported by application software Transmission active gear determined by safety software A partition Transmission active gear reported by application software Transmission active gear determined by safety software A partition Transmission active gear determined by safety software A partition Transmission active gear determined by safety software A partition Transmission active gear reported by application software Transmission active gear reported by application software Transmission active gear reported by application software Transmission active gear determined by safety software A partition Transmission active gear determined by safety software A partition Time since last clutch shift was busy Situation allowed enable Transmission active gear determined by safety software A partition Time since last clutch shift was busy Situation allowed enable Values determined by application software which are always deemed unacceptable by safety software A side Transmission active gear reported by application software Values determined by application software which are always deemed unacceptable by safety software A side Absolute difference between transmission gear ratio reported by application software and transmission gear ratio determined by safety software A partition Transmission active gear reported by application software <th>= Park = Neutral I= Park = Reverse = Reverse > Gear 1 <= Gear 8 >= Gear 1 <= Gear 3 < 2500 = C_SE_TRUE = Reverse < 2500 = C_SE_TRUE > 7.99609375 > 7.99609375 Transmission active gear ratio <= tolerance (2), see summarty table attachments C_SID_SSWA_CAN >= Transmission gear ratio determined by safety software A partition >= Transmission active gear ratio - - - - Transmission active gear ratio<th>ms</th><th>Fault confirmation time Enable conditions:</th><th>Fault confirmation time before safety software intervention Application software reports transmission active gear ratio as invalid</th><th>>=</th><th>450 False</th><th>ms</th><th>Runs continuously</th></th>	= Park = Neutral I= Park = Reverse = Reverse > Gear 1 <= Gear 8 >= Gear 1 <= Gear 3 < 2500 = C_SE_TRUE = Reverse < 2500 = C_SE_TRUE > 7.99609375 > 7.99609375 Transmission active gear ratio <= tolerance (2), see summarty table attachments C_SID_SSWA_CAN >= Transmission gear ratio determined by safety software A partition >= Transmission active gear ratio - - - - Transmission active gear ratio <th>ms</th> <th>Fault confirmation time Enable conditions:</th> <th>Fault confirmation time before safety software intervention Application software reports transmission active gear ratio as invalid</th> <th>>=</th> <th>450 False</th> <th>ms</th> <th>Runs continuously</th>	ms	Fault confirmation time Enable conditions:	Fault confirmation time before safety software intervention Application software reports transmission active gear ratio as invalid	>=	450 False	ms	Runs continuously
	Situation allowed enable Time since last clutch shift was busy	attachments C_SID_SSWA_CAN = C_SE_TRUE < 0	ms						

				Maximum of transmission active							1 1	
				gear ratio calculated from odd and							1	
		Transmission active gear reported by application		even clutch shaft engaged gears							1	
		software	<=	+							1	
		sortware		Transmission ctive gear ratio							1	
				tolerance (2), see Summary table							1	
				attachments C_SID_SSW_CAN							1	
				Minimum of transmission active							1	
				gear ratio calculated from odd and							1	
		Transmission active gear reported by application		even clutch shaft engaged gears							1	
		software	>=	-							1	
				Transmission ctive gear ratio							1	
				tolerance (2), see Summary table							1	
				attachments C_SID_SSW_CAN							1	
		Situation allowed enable	=	C_SE_TRUE							1	
		Time since last clutch shift was busy	<	0	ms						1	
				Minimum of transmission active							1	
				gear ratio calculated from odd and							1	
		Transmission active gear reported by application		even clutch shaft engaged gears							1	
		software	>=	-							1	
				I ransmission ctive gear ratio							1	
				tolerance (2), see Summary table							1	
				attachments C_SID_SSW_CAN							1	
1		Situation allowed enable 1	=	C_SE_IRUE		F	Fourth and firms attack times to a form				1	
		Situation allowed enable 2	=	C_SE_TRUE		rault confirmation	Fault confirmation time before	>=	450	ms	1	
						time	satety software intervention				, ,	

Component/System	Fault Code	Monitor Strategy Description	Malfunction Criteria		Threshold Value			Secondary Parameters		Enable Conditions		Time Required	MIL illum.
Odd Gear Clutch Safety Performance 1	P1960	The safety software partition A prevents unintended acceleration. If the odd clutch torque is too high while the odd clutch is slipping and a gear is engaged on the odd clutch shaft, the safety software partition A	Difference between actual torque on odd clutch and driver demanded engine torque Odd clutch slip speed	>=	Clutch acceleration torque limit (1), see Summary tabel attachements C_SID_SSWA_SG_CLU 1000	Nm rpm		Range request	=	Drive or Reverse		Runs Continuously	A
		can detect a safety goal violation.						Odd gear shaft is in neutral	=	False			
		If this safety goal violation is detected for too long, the application software will attempt intervention. If the safety goal violation persists, the safety software partition A will intervene.					Fault confirmation for L1 intervention	Fault confirmation time before application software intervention	>=	350	ms		
		When the safety software partition A intervention or the application software intervention which consist of the corresponding clutch shaft disablement persists too long, the						Application software intervention limit before latching	>=	2			
		odd gear clutch safety performance 1 DTC is set.					Fault confirmation for	Fault confirmation time before		400	count		
				ļ			L2 intervention	safety software intervention	>=	420	ms		
		The safety software partition A prevents unintended acceleration. If the actual clutch torque is too high and the torque request towards the engine is too high	Difference between actual torque on odd clutch and driver demanded engine torque	>=	Clutch acceleration torque limit (1), see Summary tabel attachements C_SID_SSWA_SG_CLU	Nm		Odd gear shaft is in neutral	=	False		Runs Continuously	
		while the odd clutch is not slipping and a gear is engaged on the odd clutch shaft, the safety software partition A can detect a safety goal violation.	Odd clutch slip speed	<=	250	rpm		Slow engine torque request active	=	True			
		If this safety goal violation is detected for too long, the application software will attempt intervention. If the safety goal violation persists, the safety software partition A will intervene.	Odd clutch slip speed	>=	-250	rpm		or					
		When the safety software partition A intervention or the application software intervention which consist of the corresponding clutch shaft disablement persists too long, the	Difference between slow torque request towards the engine and driver demanded engine torque	>=	Clutch acceleration torque limit (1), see Summary tabel attachements C_SID_SSWA_SG_CLU	Nm				-			
		odd gear clutch safety performance 1 DTC is set.						Fast engine torque request active	=	Irue			
			Difference between fast torque request towards the engine and driver demanded engine torque	>=	Clutch acceleration torque limit (1), see Summary tabel attachements C_SID_SSWA_SG_CLU	Nm	Fault confirmation for L1 intervention	Fault confirmation time before application software intervention	>=	350	ms		
								Application software intervention limit before latching	>=	2	count		
							Fault confirmation for	Fault confirmation time before safety software intervention	>=	420	ms		
		The safety software partition A prevents unintended change in driving direction. If the unintendend change in driving direction condition is detected for the odd clutch shaft	Absolute vehicle speed	<=	18	kph		Range request	=	Reverse		Runs Continuously	
		defined by acceleration in forward direction while request is reverse, the safety software can detect a safety goal violation.	Absolute vehicle speed hysteresis	>	19	kph		Vehicle speed	>=	0	kph		

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If this safety goal violation is detected for too long, the application software will attempt intervention. If the safety goal violation persists, the safety software partition A will intervene.	Total transmission output torque	>=	394	Nm		Odd clutch shaft has forward gear engaged	=	True		
When the safety software partition A intervention or the application software intervention which consist of the corresponding clutch shaft disablement persists too long, the odd gear clutch safety uperformance 1 DTC is set.	Transmission output torque contribution from odd clutch shaft	>	394	Nm	Fault confirmation for L1 intervention	Fault confirmation time before application software intervention	>=	350	ms	
	or					Application software intervention limit before latching	>=	2	count	
	Transmission output torque contribution from odd clutch shaft	>=	Transmission output torque contribution from even clutch shaft		Fault confirmation for L2 intervention	Fault confirmation time before safety software intervention	>=	420	ms	
The safety software partition A prevents unintended propulsion engagement,	Total transmission output torque	>	394	Nm		Range request	=	Park or Neutral		Runs Continuously
condition is detected defined by acceleration in drive or reverse while request is park or neutral, the safety software can detect a safety goal violation.	Transmission output torque contribution from odd clutch shaft	>	394	Nm		Odd clutch shaft has forward gear engaged	=	True		
If this safety goal violation is detected for too long, the application software will attempt intervention. If the safety goal violation persists, the safety software partition A will intervene.	or				Fault confirmation for L1 intervention	Fault confirmation time before application software intervention	>=	350	ms	
When the safety software partition A intervention or the application software intervention which consist of the corresponding clutch shaft disablement persists too long, the	Transmission output torque contribution from odd clutch shaft	>=	Transmission output torque contribution from even clutch shaft			Application software intervention limit before latching	>=	2		
odd gear clutch safety performance 1 DTC is set.					Fault confirmation for L2 intervention	Fault confirmation time before safety software intervention	>=	420	ms	
The safety software partition A prevents unintended deceleration caused by clutch tie up.	Odd clutch torque	>=	Clutch tie up torque limit (2), see Summary table attachements C_SID_SSWA_SG_CLU	Nm		Odd clutch shaft has forward gear engaged	=	True		Runs Continuously
If both clutch shafts have a gear engaged and both clutches show torque at the same time, a clutch tie up condition is detected.	Odd clutch torque hysteresis	<	Clutch tie up torque recovery limit (3), see Summary table attachements C_SID_SSWA_SG_CLU	Nm		Even clutch shaft has reverse gear engaged	=	True		
Clutch tie up can be caused by clutch torque being applied on both clutches while one clutch shaft has a forward gear engaged and the other cltuch shaft or has a forward gera engaged.	Even clutch torque	>=	Clutch tie up torque limit (2), see Summary table attachements C_SID_SSWA_SG_CLU	Nm		Vehicle speed '	<=	-18	kph	
	Even clutch torque hysteresis	s <	Clutch tie up torque recovery limit (3), see Summary table attachements C_SID_SSWA_SG_CLU	Nm		Vehicle speed reset threshold	>	-17	kph	
Clutch tie up can be caused by clutch torque	Total transmission output torque	>	820 Clutch tie up torque limit (2), see	Nm						
being applied on both clutch with at least one of the clutches showing high negative slip.	Odd clutch torque	>=	Summary table attachements C_SID_SSWA_SG_CLU	Nm		Odd clutch shaft has gear engaged	=	True		
chosen based on whether both clutches show high negative slip in which case the clutch with the highest clutch torque is chosed.	Odd clutch torque hysteresis	<	Clutch tie up torque recovery limit (3), see Summary table attachements C_SID_SSWA_SG_CLU	Nm		Even clutch shaft has gear engaged	=	True		

l	In case only a single clutch is showing high negative slip, this clutch shaft is targeted.	Even clutch torque	>=	Clutch tie up torque limit (2), see Summary table attachements C_SID_SSWA_SG_CLU	Nm		Absolute vehicle speed	>	18	kph	
		Even clutch torque hysteresis	<	Clutch tie up torque recovery limit (3), see Summary table attachements C_SID_SSWA_SG_CLU	Nm		Vehicle speed reset threshold	<=	17	kph	
		Absolute total transmission output torque	>	820	Nm						l
		Odd clutch slip speed	<	Clutch tie up slip threshold (4), see Summary table attachments C_SID_SSWA_SG_CLU	rpm						
		or	l	Clutch tie up slip threshold (4), see							l
		Even clutch slip speed	<	Summary table attachments	rpm						l
		Determination of odd clutch targeted for	l	C_SID_SSWA_SG_CLO							I
		reaction		Clutch tie up slip threshold (4), see							l
		Odd clutch slip speed	<	Summary table attachments C_SID_SSWA_SG_CLU	rpm						
		Even clutch slip speed	>=	Clutch tie up slip threshold (4), see Summary table attachments	rpm						l
			l	C_SID_SSWA_SG_CLU	ľ						l
		or		Clutch tie up slip threshold (4), see							l
		Odd clutch slip speed	<	Summary table attachments	rpm						l
				C_SID_SSWA_SG_CLU Clutch tie up slip threshold (4), see							l
		Even clutch slip speed	<	Summary table attachments	rpm						l
		Odd clutch torque	>	Even clutch torque							1
1	If this safety goal violation is detected for too		l			Foult confirmation for	Fault confirmation time hofers				I
1	long, the application software will attempt		l			L1 intervention	application software intervention	>=	350		l
1	the safety software partition A will intervene.									ms	
1	When the safety software partition A		l								l
1	intervention or the application software	1	1				Application software intervention		2		1
	intervention which consist of the corresponding		ļ				limit before latching	>=			4
	clutch shaft disablement persists too long, the		ļ				limit before latching	>=		count	
	clutch shaft disablement persists too long, the odd gear clutch safety performance 1 DTC is set.					Fault confirmation for	Fault confirmation time before	>=	420	count	
, ,	lutch shaft disablement persists too long, the odd gear clutch safety performance 1 DTC is set.			Clutch actuation with too low gear		Fault confirmation for L2 intervention	Fault confirmation time before safety software intervention	>= >=	420	count ms	
•	Littch shaft disablement persists too long, the odd gear clutch safety performance 1 DTC is set.	Odd clutch torque		Clutch actuation with too low gear engaged clutch torque limit (5), see	Nm	Fault confirmation for L2 intervention	Fault confirmation time before safety software intervention	>=	420	count ms	
	Littch shaft disablement persists too long, the odd gear clutch safety performance 1 DTC is set.	Odd clutch torque	>=	Clutch actuation with too low gear engaged clutch torque limit (5), see Summary table attachements	Nm	Fault confirmation for L2 intervention	Fault confirmation time before safety software intervention Clutch tie up safety goal violation detected	>= >= =	420 False	count ms	Runs Continuously
	Clutch shaft disablement persists too long, the odd gear clutch safety performance 1 DTC is set. The safety software partition A prevents unintended deceleration caused by clutch apply with a too low gear engaged.	Odd clutch torque	>=	Clutch actuation with too low gear engaged clutch torque limit (5), see Summary table attachements C_SID_SSWA_SG_CLU	Nm	Fault confirmation for L2 intervention	Fault confirmation time before safety software intervention Clutch tie up safety goal violation detected	>=	420 False	count ms	Runs Continuously
	Interferential minimum construction and conceptioning clutch shaft disablement persists too long, the odd gear clutch safety performance 1 DTC is set. The safety software partition A prevents unintended deceleration caused by clutch apply with a too low gear engaged.	Odd clutch torque	>=	Clutch actuation with too low gear engaged clutch torque limit (5), see Summary table attachements C_SID_SSWA_SG_CLU Clutch actuation with too low gear engaged clutch torque recovery	Nm	Fault confirmation for L2 intervention	Fault confirmation time before safety software intervention Clutch tie up safety goal violation detected	>=	420 False	count	Runs Continuously
	Interference in the contraction of the contractioning clutch shaft disablement persists too long, the odd gear clutch safety performance 1 DTC is set. The safety software partition A prevents unintended deceleration caused by clutch apply with a too low gear engaged. If clutch torque is applied with high negative slip a clutch actuation with too low gear engaged	Odd clutch torque Clutch torque hysteris	>=	Clutch actuation with too low gear engaged clutch torque limit (5), see Summary table attachements C_SID_SSWA_SG_CLU Clutch actuation with too low gear engaged clutch torque recovery limit (6), see Summary table attachement C_SID_SSWA_SG_CLU	Nm	Fault confirmation for L2 intervention	Iimit before latching Fault confirmation time before safety software intervention Clutch tie up safety goal violation detected Odd clutch shaft has gear engaged	>=	420 False True	count ms	Runs Continuously
	Interferential with experience of the corresponding clutch shaft disablement persists too long, the odd gear clutch safety performance 1 DTC is set. The safety software partition A prevents unintended deceleration caused by clutch apply with a too low gear engaged. If clutch torque is applied with high negative slip a clutch actuation with too low gear engaged condition is detected.	Odd clutch torque Clutch torque hysteris	>=	Clutch actuation with too low gear engaged clutch torque limit (5), see Summary table attachements C_SID_SSWA_SG_CLU Clutch actuation with too low gear engaged clutch torque recovery limit (6), see Summary table attachements C_SID_SSWA_SG_CLU Clutch actuation with too low gear	Nm Nm	Fault confirmation for L2 intervention	limit before latching Fault confirmation time before safety software intervention Clutch tie up safety goal violation detected Odd clutch shaft has gear engaged	>=	420 False True	count ms	Runs Continuously
	Interferential minimum contractor in contraportioning clutch shaft disablement persists too long, the bodd gear clutch safety performance 1 DTC is set. The safety software partition A prevents unintended deceleration caused by clutch apply with a too low gear engaged. If clutch torque is applied with high negative slip a clutch actuation with too low gear engaged condition is detected.	Odd clutch torque Clutch torque hysteris Odd clutch slip	>= <	Clutch actuation with too low gear engaged clutch torque limit (5), see Summary table attachements C_SID_SSWA_SG_CLU Clutch actuation with too low gear engaged clutch torque recovery limit (6), see Summary table attachements C_SID_SSWA_SG_CLU Clutch actuation with too low gear engaged clutch slip limit (7), see	Nm Nm	Fault confirmation for L2 intervention	Imit before latching Fault confirmation time before safety software intervention Clutch tie up safety goal violation detected Odd clutch shaft has gear engaged Absolute vehicle speed	>=	420 False True	count ms	Runs Continuously
- - - - - - - - - - - - - - - - - - -	Interference in the contraction of the contraction	Odd clutch torque Clutch torque hysteris Odd clutch slip	>= <	Clutch actuation with too low gear engaged clutch torque limit (5), see Summary table attachements C_SID_SSWA_SG_CLU Clutch actuation with too low gear engaged clutch torque recovery limit (6), see Summary table attachements C_SID_SSWA_SG_CLU Clutch actuation with too low gear engaged clutch Slip limit (7), see Summary table attachements C_SID_SSW_SG_CLU	Nm Nm rpm	Fault confirmation for L2 intervention	Imit before latching Fault confirmation time before safety software intervention Clutch tie up safety goal violation detected Odd clutch shaft has gear engaged Absolute vehicle speed	>= = >= >=	420 False True 18	count ms kph	Runs Continuously
	Interference multiple construction and conceptioning clutch shaft disablement persists too long, the bodd gear clutch safety performance 1 DTC is set. The safety software partition A prevents unintended deceleration caused by clutch apply with a too low gear engaged. If clutch torque is applied with high negative slip a clutch actuation with too low gear engaged condition is detected.	Odd clutch torque Clutch torque hysteris Odd clutch slip Engine speed gradient	>= < <	Clutch actuation with too low gear engaged clutch torque limit (5), see Summary table attachements C_SID_SSWA_SG_CLU Clutch actuation with too low gear engaged clutch torque recovery limit (6), see Summary table attachements C_SID_SSWA_SG_CLU Clutch actuation with too low gear engaged clutch slip limit (7), see Summary table attachements C_SID_SSW_SG_CLU 1	Nm Nm rpm <u>rpm/10ms</u>	Fault confirmation for L2 intervention	Iimit before latching Fault confirmation time before safety software intervention Clutch tie up safety goal violation detected Odd clutch shaft has gear engaged Absolute vehicle speed Absolute vehicle speed hysteresis	>= = >= >=	420 False True 18 17	count ms kph kph	Runs Continuously
	The safety software partition A prevents clutch software partition A prevents unintended deceleration caused by clutch apply with a too low gear engaged.	Odd clutch torque Clutch torque hysteris Odd clutch slip Engine speed gradient	~ ~ ~	Clutch actuation with too low gear engaged clutch torque limit (5), see Summary table attachements C_SID_SSWA_SG_CLU Clutch actuation with too low gear engaged clutch torque recovery limit (6), see Summary table attachements C_SID_SSWA_SG_CLU Clutch actuation with too low gear engaged clutch slip limit (7), see Summary table attachements C_SID_SSW_SG_CLU 1 Clutch actuation with too low gear engaged clutch torque limit (5) see	Nm Nm rpm _ <u>rpm/10ms</u>	Fault confirmation for L2 intervention	I limit before latching Fault confirmation time before safety software intervention Clutch tie up safety goal violation detected Odd clutch shaft has gear engaged Absolute vehicle speed Absolute vehicle speed yeard speed Absolute vehicle speed hysteresis Odd clutch shaft has a forward gear	>=	420 False True 18 17	count ms kph kph	Runs Continuously
	Interference in the contexponent persists too long, texponent persists too long, texponent persists to	Odd clutch torque Clutch torque hysteris Odd clutch slip Engine speed gradient Odd clutch torque	>= < <	Clutch actuation with too low gear engaged clutch torque limit (5), see Summary table attachements C_SID_SSWA_SG_CLU Clutch actuation with too low gear engaged clutch torque recovery limit (6), see Summary table attachements C_SID_SSWA_SG_CLU Clutch actuation with too low gear engaged clutch slip limit (7), see Summary table attachements C_SID_SSW_SG_CLU 1 Clutch actuation with too low gear engaged clutch torque limit (5), see Summary table attachements	Nm Nm rpm <u>rpm/10ms</u> Nm	Fault confirmation for L2 intervention	Iimit before latching Fault confirmation time before safety software intervention Clutch tie up safety goal violation detected Odd clutch shaft has gear engaged Absolute vehicle speed Absolute vehicle speed hysteresis Odd clutch shaft has a forward gear engaged	>= = >= >= <	420 False True 18 17 True	count ms kph kph	Runs Continuously

		If too much clutch torque is applied with a forwards gear enaged while vehicle is moving in backwards direction, the safety software partition A can detect a safety goal violation.	Clutch torque hysteris	; <	Clutch actuation with too low gear engaged clutch torque recovery limit (6), see Summary table attachements C_SID_SSWA_SG_CLU	Nm		Vehicle speed Vehicle speed hysteresis	<=	-18 -17	kph kph		
		If this safety goal violation is detected for too long, the application software will attempt intervention. If the safety goal violation persists, the safety software partition A will intervene.					Fault confirmation for L1 intervention	Fault confirmation time before application software intervention	>=	350	ms		
		When the safety software partition A intervention or the application software intervention which consist of the corresponding clutch shaft disablement persists too long, the odd gear clutch safety performance 1 DTC is set.						Application software intervention limit before latching	>=	2	count		
							Fault confirmation for	Fault confirmation time before	>=	420			
					Clutch torque high acceleration limit		L2 intervention	safety software intervention	-	120	ms		
Even Gear Clutch Safety Performance 1	P1961	The safety software partition A prevents unintended acceleration. If the even clutch torque is too high while the even clutch is slipping and a gear is engaged on	Difference between actual torque on even clutch and driver demanded engine torque Even clutch slip speed	>=	depending on gear (1), see Summary tabel attachements C_SID_SSWA_SG_CLU 1000	Nm		Range request	=	Drive or Reverse		Runs Continuously	A
		the even clutch shaft, the safety software partition A can detect a safety goal violation.				r.		Even gear shaft is in neutral	=	False			
		If this safety goal violation is detected for too long, the application software will attempt intervention. If the safety goal violation persists, the safety software partition A will intervene.					Fault confirmation for L1 intervention	Fault confirmation time before application software intervention	>=	350	ms		
		When the safety software partition A intervention or the application software intervention which consist of the corresponding clutch shaft disablement persists too long, the even gear clutch safety performance 1 DTC is set.						Application software intervention limit before latching	>=	2	count		
		5 7.					Fault confirmation for	Fault confirmation time before	>=	420			
		The safety software partition A prevents unintended acceleration. If the actual clutch torque is too high and the	Difference between actual torque on odd clutch and driver demanded engine torque	>=	Clutch torque high acceleration limit depending on gear (1), see Summary tabel attachements C_SID_SSWA_SG_CLU	Nm		Even gear shaft is in neutral	=	False	1115	Runs Continuously	
		torque request towards the engine is too high while the even clutch is not slipping and a gear is engaged on the even clutch shaft, the safety software partition A can detect a safety goal violation.	Even clutch slip speed	<=	250	rpm		Slow engine torque request active	=	True			
		If this safety goal violation is detected for too long, the application software will attempt intervention. If the safety goal violation persists, the safety software partition A will intervene.	Even clutch slip speed	>=	-250	rpm		or					
		When the safety software partition A intervention or the application software intervention which consist of the corresponding clutch shaft disablement persists too long, the even gear clutch safety performance 1 DTC is set.	Difference between slow torque request towards the engine and driver demanded engine torque	>=	Clutch torque high acceleration limit depending on gear (1), see Summary tabel attachements C_SID_SSWA_SG_CLU	Nm		Fast engine torque request active	=	True			

	Difference between fast torque request towards the engine and driver demanded engine torque	>=	Clutch torque high acceleration limit depending on gear (1), see Summary tabel attachements C_SID_SSWA_SG_CLU	Nm	Fault confirmation for L1 intervention Fault confirmation for	Fault confirmation time before application software intervention Application software intervention limit before latching Fault confirmation time before	>= >=	350	ms count	
					L2 intervention	safety software intervention	>=	420	ms	
The safety software partition A prevents unintended change in driving direction, If the unintendend change in driving direction condition is detected for the even clutch shaft	Absolute vehicle speed	<=	18	kph		Range request	=	Drive		Runs Continuously
defined by acceleration in forward direction while request is reverse or acceleration in reverse direction while request is forward, the safety software partition A can detect a safety goal violation.	Absolute vehicle speed hysteresis	>	19	kph		Vehicle speed	<=	0	kph	
If this safety goal violation is detected for too long, the application software will attempt intervention. If the safety goal violation persists, the safety software partition A will intervene.	Total transmission output torque	<	-394	Nm		Even clutch shaft has reverse gear engaged	=	True		
When the safety software partition A intervention or the application software intervention which consist of the corresponding clutch shaft disablement persists too long, the even gear clutch safety performance 1 DTC is set.	Absolute vehicle speed	<=	18	kph		Range request	=	Reverse		
	Absolute vehicle speed hysteresis	>	19	kph		Vehicle speed	>=	0	kph	
	Total transmission output torque	>=	394	Nm		Even clutch shaft has forward gear engaged	=	True		
	Transmission output torque contribution from even clutch shaft or	>	394	Nm						
	Transmission output torque contribution from even clutch shaft	>=	Transmission output torque contribution from odd clutch shaft							
					Fault confirmation for L1 intervention	Fault confirmation time before application software intervention	>=	350	ms	
						Application software intervention limit before latching	>=	2	count	
					Fault confirmation for L2 intervention	Fault confirmation time before safety software intervention	>=	420	ms	
The safety software partition A prevents unintended propulsion engagement. If the unintendend propulsion engagement	Total transmission output torque	<	-394	Nm		Range request	=	Park or Neutral		Runs Continuously
condition is detected defined by acceleration in drive or reverse while request is park or neutral, the safety software partition A can detect a safety goal violation.	Transmission output torque contribution from even clutch shaft	<	-394	Nm		Even clutch shaft has forward gear engaged	=	True		
If this safety goal violation is detected for too long, the application software will attempt intervention. If the safety goal violation persists, the safety software partition A will intervene.	or									
When the safety software partition A intervention or the application software intervention which consist of the corresponding clutch shaft disablement persists too long, the even gear clutch safety performance 1 DTC is set.	Transmission output torque from even clutch shaft	<	Transmission output torque from odd clutch shaft							
	Total transmission output torque	>	394	Nm	1					

Transmission output torque contribution from even clutch shaft or	>	394	Nm	Fault confirmation for L1 intervention	Fault confirmation time before application software intervention Application software intervention	>=	350	ms	
Transmission output torque contribution from even clutch shaft	>=	Transmission output torque contribution from odd clutch shaft		Fault confirmation for L2 intervention	limit before latching Fault confirmation time before safety software intervention	>=	420	count ms	
Odd clutch torque	>=	Clutch tie up torque limit (2), see Summary table attachements C_SID_SSWA_SG_CLU	Nm		Odd clutch shaft has forward gear engaged	=	True		Runs Continuously
Odd clutch torque hysteresis	<	Clutch tie up torque recovery limit (3), see Summary table attachements C_SID_SSWA_SG_CLU	Nm		Even clutch shaft has reverse gear engaged	=	True		
Even clutch torque	>=	Clutch tie up torque limit (2), see Summary table attachements C_SID_SSWA_SG_CLU	Nm		Vehicle speed '	>=	18	kph	
Even clutch torque hysteresis	<	Clutch tie up torque recovery limit (3), see Summary table attachements C_SID_SSWA_SG_CLU	Nm		Vehicle speed reset threshold	<	17	kph	
Total transmission output torque	<	-820	Nm						
Odd clutch torque	>=	Clutch tie up torque limit (2), see Summary table attachements C_SID_SSWA_SG_CLU	Nm		Odd clutch shaft has gear engaged	=	True		
Odd clutch torque hysteresis	<	Clutch tie up torque recovery limit (3), see Summary table attachements C_SID_SSWA_SG_CLU	Nm		Even clutch shaft has gear engaged	=	True		
Even clutch torque	>=	Clutch tie up torque limit (2), see Summary table attachements C_SID_SSWA_SG_CLU	Nm		Absolute vehicle speed	>	18	kph	
Even clutch torque hysteresis	<	Clutch tie up torque recovery limit (3), see Summary table attachements C_SID_SSWA_SG_CLU	Nm		Vehicle speed reset threshold	<=	17	kph	
Absolute total transmission output torque	>	820	Nm						
Odd clutch slip speed	<	Clutch tie up slip threshold (4), see Summary table attachments C_SID_SSWA_SG_CLU	rpm						
or									
Even clutch slip speed	<	Clutch tie up slip threshold (4), see Summary table attachments C_SID_SSWA_SG_CLU	rpm						
Determination of even clutch targeted for									
reaction Odd clutch slip speed	>=	Clutch tie up slip threshold (4), see Summary table attachments	rpm						
Even clutch slip speed	<	C_SID_SSWA_SG_CLU Clutch tie up slip threshold (4), see Summary table attachments	rpm						
		C_SID_SSWA_SG_CLU							
or		Clutch tie up slip threshold (4) coo							
Odd clutch slip speed	<	Summary table attachments C_SID_SSWA_SG_CLU Clutch tie up slip threshold (4), see	rpm						
Even clutch slip speed Even clutch torque	< >=	Summary table attachments C_SID_SSWA_SG_CLU Odd clutch torque	rpm						
	rransmission output torque contribution from even clutch shaft or rransmission output torque contribution from even clutch shaft Ddd clutch torque Odd clutch torque hysteresis Even clutch torque hysteresis Fotal transmission output torque Odd clutch torque hysteresis Codd clutch torque hysteresis Even clutch torque Odd clutch torque hysteresis Even clutch torque hysteresis Absolute total transmission output torque Odd clutch slip speed or Even clutch slip speed Even clutch slip speed	ransmission output torque contribution from > yr > fransmission output torque contribution from > wen clutch shaft > Odd clutch torque > Odd clutch torque hysteresis <	Iransmission output torque contribution from yeen clutch shaft > 394 r Iransmission output torque contribution from yeen clutch shaft > Transmission output torque contribution from odd clutch shaft. Ddd clutch torque >= Summary table attachements Ddd clutch torque hysterests < (3), see Summary table attachements	transmission output torque contribution from wen clutch shaft > 394 Nm rr irransmission output torque contribution from wen clutch shaft > 394 Nm 2dd dutch shaft : Transmission output torque contribution from odd clutch shaft . 2dd dutch torque > : Clutch tie up torque limit (2), see Nm 2dd dutch torque : (3), see Summary table attachements Nm 2ven clutch torque : : Summary table attachements Nm 2ven clutch torque : : : : : Even clutch torque hysteresis : : : : : : 2dd dutch torque : : : : : : : : Even clutch torque :<	frammission output torque contribution from reen dutch shaft r frammission output torque contribution from reen dutch shaft r frammission output torque contribution from reen dutch shaft r frammission output torque contribution from reen dutch shaft CSUD_SKM_SG_CLU Cluck tie quorque limit (2), see Summary table attachments CSUD_SKM_SG_CLU Sven clutch torque hysteresis CSUD_SKM_SG_CLU Cluck tie quorque recovery limit (3), see Summary table attachments CSUD_SKM_SG_CLU Sven clutch torque hysteresis CSUD_SKM_SG_CLU Cluck tie quo torque recovery limit CSUD_SKM_SG_CLU Cluck tie quo torque recovery limit	riansmission output torque contribution from reach duch shaft r resch duch resch r resch duch shaft r resch duch r r r r r r r r r r r r r r r r r r r	transmission subput transe contribution for rear out that haft is not subpat to reque contribution for rear manual output to reque contribution for rear manual output to reque contribution for rear contribution output to reque rear contrear contrear contre	insertional part trage contribution from	$ \begin{array}{cccccccccccccccccccccccccccccccccccc$

If this safety goal violation is detected for too long, the application software will attempt intervention. If the safety goal violation persists, the safety software partition A will intervene.						Fault confirmation for L1 intervention	Fault confirmation time before application software intervention	>=	350	ms	
When the safety software partition A intervention or the application software intervention which consist of the corresponding clutch shaft disablement persists too long, the even gear clutch safety performance 1 DTC is set.							Application software intervention limit before latching	>=	2	count	
						Fault confirmation for L2 intervention	Fault confirmation time before safety software intervention	>=	420	ms	
The safety software partition A prevents unintended deceleration caused by clutch apply with a too low gear engaged.	Even clutch torque		>=	Clutch actuation with too low gear engaged clutch torque limit (5), see Summary table attachements C_SID_SSWA_SG_CLU	Nm		Clutch tie up safety goal violation detected	=	False		Runs Continuously
If clutch torque is applied with high negative slip a clutch actuation with too low gear engaged condition is detected.		Clutch torque hysteris	<	Clutch actuation with too low gear engaged clutch torque recovery limit (6), see Summary table attachements C_SID_SSWA_SG_CLU	Nm		Odd clutch shaft has gear engaged	=	True		
	Even clutch slip		<	Clutch actuation with too low gear engaged clutch slip limit (7), see Summary table attachements C_SID_SSW_SG_CLU	rpm		Absolute vehicle speed	>=	18	kph	
	Engine speed gradient		>=	1	rpm/10ms		Absolute vehicle speed hysteresis	<	17	kph	
The safety software partition A prevents unintended deceleration caused by clutch apply in forwards direction while moving in the backwards direction.	Even clutch torque		>=	Clutch actuation with too low gear engaged clutch torque limit (5), see Summary table attachements C_SID_SSWA_SG_CLU	Nm		Even clutch shaft has a forward gear engaged	=	True		
If too much clutch torque is applied with a forwards gear enaged while vehicle is moving in backwards direction, the safety software partition A can detect a safety goal violation.		Clutch torque hysteris	<	Clutch actuation with too low gear engaged clutch torque recovery limit (6), see Summary table attachements C_SID_SSWA_SG_CLU	Nm		Vehicle speed	<=	-18	kph	
							Vehicle speed hysteresis	>	-17	kph	
The safety software partition A prevents unintended deceleration caused by clutch apply in reverse direction while moving in the forward direction.	Even clutch torque		>=	Clutch actuation with too low gear engaged clutch torque limit (5), see Summary table attachements C_SID_SSWA_SG_CLU	Nm		Even clutch shaft has a reverse gear engaged	=	True		
If too much clutch torque is applied with a reverse gear enaged while vehicle is moving in foward direction, the safety software partition A can detect a safety goal violation.		Clutch torque hysteris	<	Clutch actuation with too low gear engaged clutch torque recovery limit (6), see Summary table attachements C_SID_SSWA_SG_CLU	Nm		Vehicle speed	>=	18	kph	
							Vehicle speed hysteresis	<	17	kph	
If this safety goal violation is detected for too long, the application software will attempt intervention. If the safety goal violation persists, the safety software partition A will intervene.						Fault confirmation for L1 intervention	Fault confirmation time before application software intervention	>=	350	ms	
When the safety software partition A intervention or the application software intervention which consist of the corresponding clutch shaft disablement persists too long, the							Application software intervention limit before latching	>=	2		
even gear clutch safety performance 1 DTC is set.						Fault confirmation for L2 intervention	Fault confirmation time before safety software intervention	>=	420	count ms	

Component/System	Fault Code	Monitor Strategy Description	Malfunction Criteria		Threshold Value			Secondary Parameters		Enable Conditions		Time Required	MIL illum.
Park System Safety Performance 1	P1964	The safety software partition A detects unintended parking lock disengagement.	Absolute difference between parking lock position measured and learned parking lock engaged position	>	500	μm	Enable Conditions:	Parking lock was previously confirmed engaged (1), see Summary table attachements C_SID_SSWA_SG_PLK	=	True		Runs Continuously	В
								Range request	=	Park			
							Fault confirmation time	Fault confirmation time before safety software intervention	>=	450	ms		
		The safety software partition A detects failure to	Absolute difference between parking lock position measured and learned parking lock	>	500	um	Enable Conditions:	Driver range request	=	Park		Runs Continuously	
						μm		Absolute Vehicle speed	<	0.25	kph	Runs continuously	
								Parking lock was previously confirmed engaged during park request (2), see Summary table attachements C_SID_SSWB_SG_PLK	=	False			
							Fault confirmation	Fault confirmation time before	>=	450	ms		
Component/System	Fault Code	Monitor Strategy Description	Malfunction Criteria		Threshold Value			Secondary Parameters		Enable Conditions		Time Required	MIL illum.
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Serial Data Message Safety Performance 1	P1968	The safety software partition B detects incorrect values for safety relevant CAN signals.	Values determined by application software which are always deemed unacceptable by safety software B side		Park Position		Enable conditions:	Application software reports transmission actual range as invalid	=	False		Runs continuously	В
		On the one hand, the safety software B side considers certain values for the transmission actual range signal determined by application software which are always unacceptable.	Transmission actual range reported by application software	!=	or Reverse Position or Neutral Position or First Drive Position								
		On the other hand, the safety software B side considers values for the transmission actual range signal determined by application software which are acceptable according to the working conditions/states.	Situations which are deemed acceptable by safety software B side										
		The DTC is set when transmission actual range signal reported by application software reports an illegal value or when none of the acceptable situations are detected.	Transmission actual range determined by safety software B partition	=	Park								
			Absolute transmission output speed Transmission actual range reported by application software	>	50 Transmission actual range determined by safety software B partition	rpm							
			Absolute transmission output speed Transmission actual range reported by application software	> =	50 Drive or Reverse	rpm							
			Transmission actual range determined by safety software B partition	=	Neutral								
			Absolute transmission output speed	<=	50	rpm							
			application software	!=	Park								
			Transmission actual range determined by safety software B partition	=	Neutral or Drive or Reverse		Fault confirmation time	Fault confirmation time before safety software intervention	>=	450	ms		
		The safety software partition B detects incorrect values for safety relevant CAN signals.	Values determined by application software which are always deemed unacceptable by safety software B side				Enable conditions:	Application software reports shift lever position as invalid	=	False		Runs continuously	
		On the one hand, the safety software B side considers certain values for the shift lever position signal determined by application software which are always unacceptable.	Shift lever position reported by application software	<	Park Range								
		On the other hand, the safety software B side considers values for the shift lever position signal determined by application software which are acceptable according to the working conditions/states.	Shift lever position reported by application software	>	Forward Range B								
		The DTC is set when the shift lever position determined by application software reports an illegal value or when none of the acceptable situations are detected.	Situations which are deemed acceptable by safety software B side										
			Transmission actual range determined by safety software B partition	=	Park								
			Absolute transmission output speed	>	50	rpm	1						
			Iransmission actual range determined by safety software B partition	=	Neutral								
			Shift lever position reported by application software	!=	Park Range]						

	Absolute transmission output speed Transmission actual range determined by safety software B partition Shift lever position reported by application software Absolute transmission output speed Transmission actual range determined by safety software B partition Shift lever position reported by application software	> = = = =	50 Drive Forward Range A or Forward Range B 50 Reverse Reverse Range	rpm						
	Transmission actual range determined by safety software B partition	=	Neutral or Drive or Reverse	1 pm	Fault confirmation	Eault confirmation time before				
	software	!=	Park Range		time	safety software intervention	>=	450	ms	
The safety software partition B detects incorrect values for safety relevant CAN signals.	Values determined by application software which are always deemed unacceptable by safety software B side				Enable conditions:	Application software reports engaged power flow as invalid	=	False		Runs continuously
considers certain values for the engaged power flow signal determined by application software which are always unacceptable.	Engaged power flow reported by application software	<	No Powerflow							
On the other hand, the safety software B side considers values for the engaged power flow signal determined by application software which are acceptable according to the working conditions/states.	Engaged power flow reported by application software	>	Reverse Engaged							
The DTC is set when the engaged power flow reported by application software reports an illegal value or when none of the acceptable situations are detected.	Situations which are deemed acceptable by safety software B side									
	Absolute transmission output speed	<=	50	rpm	-					
	Transmission actual range determined by safety software B partition	=	Park or Neutral	Tpin						
	Absolute transmission output speed Engaged power flow reported by application software	> =	50 Drive Engaged	rpm						
	software B partition	=	Drive							
	Absolute transmission output speed Engaged power flow reported by application	>	50 Boyorco Engagod	rpm						
	software Transmission actual range determined by safety software B partition	=	Reverse		Fault confirmation time	Fault confirmation time before safety software intervention	>=	450	ms	
The safety software partition B detects incorrect values for safety relevant CAN signals. On the one hand, the safety software B side considers certain values for the transmission output speed signal determined by application software which are always unacceptable. On the other hand, the safety software B side	Values determined by application software. which are always deemed unacceptable by safety software B side Transmission output speed reported by application software	>	16383.75	rpm	Enable conditions:	Application software reports engaged transmission output speed as invalid	-	True		Runs continuously
considers values for the transmission output speed signal determined by application software which are acceptable according to the working conditions/states.	Situations which are deemed acceptable by safety software B side									

The DTC is set when the transmission output speed reported by application software reports an illegal value or when none of the acceptable situations are detected.	Absolute difference between transmission output speed reported by application software and absolute transmission output speed determined by safety software B partition	<=	Transmission output speed tolerance (1), see summary table attachments C_SID_SSWB_CAN	rpm	Fault confirmation time	Fault confirmation time before safety software intervention	>=	450	ms	
The safety software partition B detects incorrect values for safety relevant CAN signals.	Values determined by application software which are always deemed unacceptable by safety software B side				Enable conditions:	Application software reports transmission active gear ratio as invalid	=	False		Runs continuously
On the one hand, the safety software B side considers certain values for the transmission active gear ratio signal determined by application software which are always unacceptable.	Transmission active gear reported by application software	>	7.99609375							
On the other hand, the safety software B side considers values for the transmission active gear ratio signal determined by application software which are acceptable according to the working conditions/states. The DTC is set when the transmission active gear	Values determined by application software which are always deemed unacceptable by safety software B side									
ratio reported by application software reports an illegal value or when none of the acceptable situations are detected.	Absolute transmission output speed	<=	50	rpm						
	Absolute difference between transmission gear ratio reported by application software and transmission gear ratio determined by safety software B partition	<=	Transmission active gear ratio tolerance (2), see summarty table attachments C_SID_SSWB_CAN							
	Transmission active gear reported by application software	>=	Transmission gear ratio determined by safety software B partition - Transmission active gear ratio tolerance (2), see summarty table attachments C_SID_SSWB_CAN							
	Situation allowed enable	=	C SE TRUE							
	Time since last clutch shift was busy	<	2000 Maximum of transmission active gear ratio calculated from odd and	ms	•					
	Transmission active gear reported by application software	<=	even clutch shaft engaged gears + Transmission active gear ratio tolerance (2), see Summary table attachments C_SID_SSW_CAN							
	Transmission active gear reported by application software	>=	vinimum of transmission active gear ratio calculated from odd and even clutch shaft engaged gears - Transmission active gear ratio tolerance (2), see Summary table attachments C_SID_SSW_CAN							
	Situation allowed enable Time since last clutch shift was busy	= <	C SE TRUE 2000 Minimum of transmission active gear ratio calculated from odd and	ms						
	Transmission active gear reported by application software	>=	even clutch shaft engaged gears - Transmission active gear ratio tolerance (2), see Summary table attachments C_SID_SSWB_CAN							
	Situation allowed enable 1	=	C_SE_TRUE							
	Situation allowed enable 2	=	C_SE_TRUE		Fault confirmation time	Fault confirmation time before safety software intervention	>=	450	ms	

Component/System	Fault Code	Monitor Strategy Description	Malfunction Criteria		Threshold Value			Secondary Parameters		Enable Conditions		Time Required	MIL illum.
Odd Gear Clutch Safety Performance 2	P1962	The safety software partition B prevents unintended acceleration. If the odd clutch torque is too high while the odd clutch is slipping and a gear is engaged on the odd clutch both the ochev coftware partition B.	Difference between actual torque on odd clutch and driver demanded engine torque Odd clutch slip speed	>=	Clutch acceleration torque limit (1), see Summary tabel attachements C_SID_SSWB_SG_CLU 1000	Nm rpm		Range request	=	Drive or Reverse		Runs Continuously	A
		can detect a safety goal violation.						Odd gear shaft is in neutral	=	False			
		If this safety goal violation is detected for too long, the application software will attempt intervention. If the safety goal violation persists, the safety software partition B will intervene.					Fault confirmation for L1 intervention	Fault confirmation time before application software intervention	>=	390	ms		
		When the safety software partition B intervention or the application software intervention which consist of the corresponding clutch shaft disablement persists too long, the						Application software intervention limit before latching	>=	2			
		odd gear clutch safety performance 2 DTC is set.					Fault confirmation for	Fault confirmation time before	>=	440	count		
		The safety software partition B prevents unintended acceleration. If the actual clutch torque is too high and the torque request towards the engine is too high while the odd clutch is not slipping and a gear is	Difference between actual torque on odd clutch and driver demanded engine torque	>=	Clutch acceleration torque limit (1), see Summary tabel attachements C_SID_SSWB_SG_CLU	Nm		Odd gear shaft is in neutral	=	False		Runs Continuously	
		engaged on the odd clutch shaft, the safety software partition B can detect a safety goal violation. If this safety goal violation is detected for too	oud clutch shp speed	<=	250	rpm		Slow engine torque request active	=	True			
		long, the application software will attempt intervention. If the safety goal violation persists, the safety software partition B will intervene.	Odd clutch slip speed	>=	-250	rpm		or					
		When the safety software partition B intervention or the application software intervention which consist of the corresponding clutch shaft disablement persists too long, the other software software software software software other software sof	Difference between slow torque request towards the engine and driver demanded engine torque	>=	Clutch acceleration torque limit (1), see Summary tabel attachements C_SID_SSWB_SG_CLU	Nm				Taua			
		odu gear ciutor salety performance z DTC is set.	Difference between fast torque request towards the engine and driver demanded engine torque	>=	Clutch acceleration torque limit (1), see Summary tabel attachements C_SID_SSWB_SG_CLU	Nm	Fault confirmation for L1 intervention	Fault confirmation time before application software intervention	>=	390	ms		
								Application software intervention limit before latching	>=	2	count		
							Fault confirmation for L2 intervention	Fault confirmation time before safety software intervention	>=	440	ms		
		Ine sarety software partition B prevents unintended change in driving direction. If the unintendend change in driving direction condition is detected for the odd clutch shaft	Absolute vehicle speed	<=	18	kph		Range request	=	Reverse		Runs Continuously	
		defined by acceleration in forward direction while request is reverse, the safety software can detect a safety goal violation.	Absolute vehicle speed hysteresis	>	19	kph		Vehicle speed	>=	0	kph		

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If this safety goal violation is detected for too long, the application software will attempt intervention. If the safety goal violation persists, the safety software partition B will intervene.	Total transmission output torque	>=	394	Nm		Odd clutch shaft has forward gear engaged	=	True		
When the safety software partition B intervention or the application software intervention which consist of the corresponding clutch shaft disablement persists too long, the odd gear clutch safety performance 2 DTC is set.	Transmission output torque contribution from odd clutch shaft	>	394	Nm	Fault confirmation for L1 intervention	Fault confirmation time before application software intervention	>=	390	ms	
	or					Application software intervention limit before latching	>=	2	count	
	Transmission output torque contribution from odd clutch shaft	>=	Transmission output torque contribution from even clutch shaft		Fault confirmation for L2 intervention	Fault confirmation time before safety software intervention	>=	440	ms	
The safety software partition B prevents unintended propulsion engagement,	Total transmission output torque	>	394	Nm		Range request	=	Park or Neutral		Runs Continuously
If the unintendend propulsion engagement condition is detected defined by acceleration in drive or reverse while request is park or neutral, the safety software can detect a safety goal violation.	Transmission output torque contribution from odd clutch shaft	>	394	Nm		Odd clutch shaft has forward gear engaged	=	True		
If this safety goal violation is detected for too long, the application software will attempt intervention. If the safety goal violation persists, the safety software partition B will intervene.	or				Fault confirmation for L1 intervention	Fault confirmation time before application software intervention	>=	390	ms	
When the safety software partition B intervention or the application software intervention which consist of the corresponding clutch shaft disablement persists too long, the	Transmission output torque contribution from odd clutch shaft	>=	Transmission output torque contribution from even clutch shaft			Application software intervention limit before latching	>=	2		
odd gear clutch safety performance 2 DTC is set.					Fault confirmation for L2 intervention	Fault confirmation time before safety software intervention	>=	440	count ms	
The safety software partition B prevents unintended deceleration caused by clutch tie up.	Odd clutch torque	>=	Clutch tie up torque limit (2), see Summary table attachements C_SID_SSWB_SG_CLU	Nm		Odd clutch shaft has forward gear engaged	=	True		Runs Continuously
If both clutch shafts have a gear engaged and both clutches show torque at the same time, a clutch tie up condition is detected.	Odd clutch torque hysteresis	<	Clutch tie up torque recovery limit (3), see Summary table attachements C_SID_SSWB_SG_CLU	Nm		Even clutch shaft has reverse gear engaged	=	True		
Clutch tie up can be caused by clutch torque being applied on both clutches while one clutch shaft has a forward gear engaged and the other cltuch shaft or has a forward gera engaged.	Even clutch torque	>=	Clutch tie up torque limit (2), see Summary table attachements C_SID_SSWB_SG_CLU	Nm		Vehicle speed '	<=	-18	kph	
	Even clutch torque hysteresis	<	Clutch tie up torque recovery limit (3), see Summary table attachements C_SID_SSWB_SG_CLU	Nm		Vehicle speed reset threshold	>	-17	kph	
Clutch tie up can be caused by clutch torque	Total transmission output torque	>	820 Clutch tie up torque limit (2), see	Nm						
being applied on both clutch with at least one of the clutches showing high negative slip.	Odd clutch torque	>=	Summary table attachements C_SID_SSWB_SG_CLU	Nm		Odd clutch shaft has gear engaged	=	True		
high negative slip in which case the clutch with the highest clutch torque is chosed.	Odd clutch torque hysteresis	<	Clutch tie up torque recovery limit (3), see Summary table attachements C_SID_SSWB_SG_CLU	Nm		Even clutch shaft has gear engaged	=	True		

In case only a single clutch is showing high negative slip, this clutch shaft is targeted.	Even clutch torque	>=	Clutch tie up torque limit (2), see Summary table attachements C_SID_SSWB_SG_CLU	Nm		Absolute vehicle speed	>	18	kph	
	Even clutch torque hysteresis	s <	Clutch tie up torque recovery limit (3), see Summary table attachements C_SID_SSWB_SG_CLU	Nm		Vehicle speed reset threshold	<=	17	kph	
	Absolute total transmission output torque	>	820	Nm						
	Odd clutch slip speed	<	Clutch tie up slip threshold (4), see Summary table attachments C_SID_SSWB_SG_CLU	rpm						
	or		Clutch tig up clip throshold (4), soo							
	Even clutch slip speed	<	Summary table attachments C SID SSWB SG CLU	rpm						
	Determination of odd clutch targeted for									
	reaction		Clutch tie up slip threshold (4), see							
	Odd clutch slip speed	<	Summary table attachments C_SID_SSWB_SG_CLU	rpm						
	Even clutch slip speed	>=	Clutch tie up slip threshold (4), see Summary table attachments C SID SSWB SG CLU	rpm						
	or									
	Odd clutch slip speed	<	Clutch tie up slip threshold (4), see Summary table attachments C SID SSWB SG CLU	rpm						
	Even clutch slip speed	<	Clutch tie up slip threshold (4), see Summary table attachments	rpm						
	Odd clutch torque	>	Even clutch torque							
If this safety goal violation is detected for too long, the application software will attempt intervention. If the safety goal violation persists, the safety software partition B will intervene.					Fault confirmation for L1 intervention	Fault confirmation time before application software intervention	>=	390	ms	
When the safety software partition B intervention or the application software intervention which consist of the corresponding clutch chief displayment parcific to logge the						Application software intervention limit before latching	>=	2		
odd gear clutch safety performance 2 DTC is set.									count	
					Fault confirmation for	Fault confirmation time before	>=	440		
			Clutch actuation with too low gear		L2 intervention	safety software intervention			ms	
The safety software partition B prevents unintended deceleration caused by clutch apply with a too low gear engaged.	Odd clutch torque	>=	engaged clutch torque limit (5), see Summary table attachements C_SID_SSWB_SG_CLU	Nm		Clutch tie up safety goal violation detected	=	False		Runs Continuously
If clutch torque is applied with high negative slip a clutch actuation with too low gear engaged condition is detected.	Clutch torque hysteris	s <	Clutch actuation with too low gear engaged clutch torque recovery limit (6), see Summary table attachements C_SID_SSWB_SG_CLU	Nm		Odd clutch shaft has gear engaged	=	True		
	Odd clutch slip	<	Clutch actuation with too low gear engaged clutch slip limit (7), see Summary table attachements C_SID_SSWB_SG_CLU	rpm		Absolute vehicle speed	>=	18	kph	
The cafety coffusion partition P provents	Engine speed gradient	>=	1	rpm/10ms		Absolute vehicle speed hysteresis	<	17	kph	
unintended deceleration caused by clutch apply in forwards direction while moving in the backwards direction.	Odd clutch torque	>=	clutch actuation with too low gear engaged clutch torque limit (5), see Summary table attachements C_SID_SSWB_SG_CLU	Nm		Odd clutch shaft has a forward gear engaged	=	True		

		If too much clutch torque is applied with a forwards gear enaged while vehicle is moving in backwards direction, the safety software partition B can detect a safety goal violation.	Clutch torque hysteris	<	Clutch actuation with too low gear engaged clutch torque recovery limit (6), see Summary table attachements C_SID_SSWB_SG_CLU	Nm		Vehicle speed Vehicle speed hysteresis	<=	-18 -17	kph kph	
		If this safety goal violation is detected for too long, the application software will attempt intervention. If the safety goal violation persists, the safety software partition B will intervene.					Fault confirmation for L1 intervention	Fault confirmation time before application software intervention	>=	390	ms	
		When the safety software partition B intervention or the application software intervention which consist of the corresponding clutch shaft disablement persists too long, the order and clutch coffst underformance DTC is reference on DTC is ref						Application software intervention limit before latching	>=	2	count	
		odd gear clutch safety performance 2 DTC is set.					Fault confirmation for	Fault confirmation time before	>=	440	ms	
Even Gear Clutch Safety Performance 2	P1963	The safety software partition B prevents unintended acceleration. If the even clutch torque is too high while the even clutch is slipping and a gear is engaged on	Difference between actual torque on even clutch and driver demanded engine torque	>=	Clutch torque high acceleration limit depending on gear (1), see Summary tabel attachements C_SID_SSWB_SG_CLU	Nm		Range request	=	Drive or Reverse		
		the even clutch shaft, the safety software partition B can detect a safety goal violation.	Even clutch slip speed	>=	1000	rpm		Even gear shaft is in neutral	=	False		
		If this safety goal violation is detected for too long, the application software will attempt intervention. If the safety goal violation persists, the safety software partition B will intervene.					Fault confirmation for L1 intervention	Fault confirmation time before application software intervention	>=	390	ms	
		When the safety software partition B intervention or the application software intervention which consist of the corresponding clutch shaft disablement persists too long, the even gear clutch safety neerformance 2 DTC is set						Application software intervention limit before latching	>=	2	count	
							Fault confirmation for L2 intervention	Fault confirmation time before safety software intervention	>=	440	ms	
		The safety software partition B prevents unintended acceleration. If the actual clutch torque is too high and the	Difference between actual torque on odd clutch and driver demanded engine torque	>=	Clutch torque high acceleration limit depending on gear (1), see Summary tabel attachements C_SID_SSWB_SG_CLU	Nm		Even gear shaft is in neutral	=	False		
		torque request towards the engine is too high while the even clutch is not slipping and a gear is engaged on the even clutch shaft, the safety software partition B can detect a safety goal violation.	Even clutch slip speed	<=	250	rpm		Slow engine torque request active	=	True		
		If this safety goal violation is detected for too long, the application software will attempt intervention. If the safety goal violation persists, the safety software partition B will intervene.	Even clutch slip speed	>=	-250	rpm		or				
		When the safety software partition B intervention or the application software intervention which consist of the corresponding clutch shaft disablement persists too long, the even gear clutch safety performance 2 DTC is set.	Difference between slow torque request towards the engine and driver demanded engine torque	>=	Clutch torque high acceleration limit depending on gear (1), see Summary tabel attachements C_SID_SSWB_SG_CLU	Nm		Fast engine torque request active	=	True		
		1 - <i>1</i> - <i>1</i>					1		L			I

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	Difference between fast torque request towards the engine and driver demanded engine torque	>=	Clutch torque high acceleration limit depending on gear (1), see Summary tabel attachements C_SID_SSWB_SG_CLU	Nm	Fault confirmation for L1 intervention	Fault confirmation time before application software intervention	>=	390	ms
					Fault confirmation for	limit before latching	>=	2	count
					L2 intervention	safety software intervention	>=	440	ms
The safety software partition B prevents unintended change in driving direction, If the unintendend change in driving direction condition is detected for the even clutch shaft	Absolute vehicle speed	<=	18	kph		Range request	=	Drive	
while request is reverse or acceleration in reverse direction while request is forward, the safety software partition B can detect a safety goal violation.	Absolute vehicle speed hysteresis	>	19	kph		Vehicle speed	<=	0	kph
If this safety goal violation is detected for too long, the application software will attempt intervention. If the safety goal violation persists, the safety software partition B will intervene.	Total transmission output torque	<	-394	Nm		Even clutch shaft has reverse gear engaged	=	True	
When the safety software partition B intervention or the application software intervention which consist of the corresponding clutch shaft disablement persists too long, the even gear clutch safety performance 2 DTC is set.	Absolute vehicle speed	<=	18	kph		Range request	=	Reverse	
	Absolute vehicle speed hysteresis	>	19	kph		Vehicle speed	>=	0	kph
	Total transmission output torque	>=	394	Nm		engaged	=	True	
	Transmission output torque contribution from even clutch shaft or	>	394	Nm					
	Transmission output torque contribution from even clutch shaft	>=	Transmission output torque contribution from odd clutch shaft						
					Fault confirmation for L1 intervention	Fault confirmation time before application software intervention	>=	390	ms
						limit before latching	>=	2	count
					Fault confirmation for L2 intervention	Fault confirmation time before safety software intervention	>=	440	ms
The safety software partition B prevents unintended propulsion engagement. If the unintendend propulsion engagement	Total transmission output torque	<	-394	Nm		Range request	=	Park or Neutral	
condition is detected defined by acceleration in drive or reverse while request is park or neutral, the safety software partition B can detect a safety goal violation.	Transmission output torque contribution from even clutch shaft	<	-394	Nm		Even clutch shaft has forward gear engaged	=	True	
If this safety goal violation is detected for too long, the application software will attempt intervention. If the safety goal violation persists, the safety software partition B will intervene.	or								
When the safety software partition B intervention or the application software intervention which consist of the corresponding clutch shaft disablement persists too long, the even gear clutch safety performance 2 DTC is set.	Transmission output torque from even clutch shaft	<	Transmission output torque from odd clutch shaft						
	Total transmission output torque	>	394	Nm	1				

	Transmission output torque contribution from even clutch shaft	>	394	Nm	Fault confirmation for L1 intervention	Fault confirmation time before application software intervention	>=	390	ms	
	or Transmission output torque contribution from	>=	Transmission output torque		Fault confirmation for	Application software intervention limit before latching Fault confirmation time before	>= >=	2	count	
The safety software partition B prevents unintended deceleration caused by clutch tie up.	even clutch shaft Odd clutch torque	>=	contribution from odd clutch shaft Clutch tie up torque limit (2), see Summary table attachements	Nm	L2 intervention	safety software intervention Odd clutch shaft has forward gear engaged	=	True	ms	
If both clutch shafts have a gear engaged and both clutches show torque at the same time, a clutch tie up condition is detected.	Odd clutch torque hysteresis	<	Clutch tie up torque recovery limit (3), see Summary table attachements C_SID_SSWB_SG_CLU	Nm		Even clutch shaft has reverse gear engaged	=	True		I
Clutch tie up can be caused by clutch torque being applied on both clutches while one clutch shaft has a forward gear engaged and the other cltuch shaft or has a forward gera engaged.	Even clutch torque	>=	Clutch tie up torque limit (2), see Summary table attachements C_SID_SSWB_SG_CLU	Nm		Vehicle speed '	>=	18	kph	
	Even clutch torque hysteresis	<	Clutch tie up torque recovery limit (3), see Summary table attachements C_SID_SSWB_SG_CLU	Nm		Vehicle speed reset threshold	<	17	kph	
	Total transmission output torque	<	-820	Nm						
Clutch tie up can be caused by clutch torque being applied on both clutch with at least one of the clutches showing high negative slip.	Odd clutch torque	>=	Clutch tie up torque limit (2), see Summary table attachements C_SID_SSWB_SG_CLU	Nm		Odd clutch shaft has gear engaged	=	True		
The clutch shaft being targeted for reaction is chosen based on whether both clutches show high negative slip in which case the clutch with the highest clutch torque is chosed.	Odd clutch torque hysteresis	<	Clutch tie up torque recovery limit (3), see Summary table attachements C_SID_SSWB_SG_CLU	Nm		Even clutch shaft has gear engaged	=	True		
In case only a single clutch is showing high negative slip, this clutch shaft is targeted.	Even clutch torque	>=	Clutch tie up torque limit (2), see Summary table attachements C_SID_SSWB_SG_CLU	Nm		Absolute vehicle speed	>	18	kph	
	Even clutch torque hysteresis	<	Clutch tie up torque recovery limit (3), see Summary table attachements C_SID_SSWB_SG_CLU	Nm		Vehicle speed reset threshold	<=	17	kph	
	Absolute total transmission output torque	>	820	Nm						
	Odd clutch slip speed	<	Clutch tie up slip threshold (4), see Summary table attachments C SID SSWB SG CLU	rpm						
	or									
	Even clutch slip speed	<	Clutch tie up slip threshold (4), see Summary table attachments C SID SSWB SG CLU	rpm						
	Determination of even clutch targeted for reaction		Clutch tie un slin threshold (4) see							
	Odd clutch slip speed	>=	Summary table attachments C_SID_SSWB_SG_CLU	rpm						
	Even clutch slip speed	<	Clutch tie up slip threshold (4), see Summary table attachments C_SID_SSWB_SG_CLU	rpm						
	or									
	Odd clutch slip speed	<	Clutch tie up slip threshold (4), see Summary table attachments C_SID_SSWB_SG_CLU Clutch tie up slip threshold (4), see	rpm						
	Even clutch slip speed	<	Summary table attachments C_SID_SSWB_SG_CLU	rpm						
1	Even clutch torque	>=	Udd clutch torque						l	

If this safety goal violation is detected for too long, the application software will attempt intervention. If the safety goal violation persists, the safety software partition B will intervene.						Fault confirmation for L1 intervention	Fault confirmation time before application software intervention	>=	390	ms	
When the safety software partition B intervention or the application software intervention which consist of the corresponding clutch shaft disablement persists too long, the even gear clutch safety performance 2 DTC is set.							Application software intervention limit before latching	>=	2	count	
						Fault confirmation for L2 intervention	Fault confirmation time before safety software intervention	>=	440	ms	
The safety software partition B prevents unintended deceleration caused by clutch apply with a too low gear engaged.	Even clutch torque		>=	Clutch actuation with too low gear engaged clutch torque limit (5), see Summary table attachements C_SID_SSWB_SG_CLU	Nm		Clutch tie up safety goal violation detected	=	False		Runs Continuously
If clutch torque is applied with high negative slip a clutch actuation with too low gear engaged condition is detected.		Clutch torque hysteris	<	Clutch actuation with too low gear engaged clutch torque recovery limit (6), see Summary table attachements C_SID_SSWB_SG_CLU	Nm		Odd clutch shaft has gear engaged	=	True		
	Even clutch slip		<	Clutch actuation with too low gear engaged clutch slip limit (7), see Summary table attachements C_SID_SSW_SG_CLU	rpm		Absolute vehicle speed	>=	18	kph	
	Engine speed gradient		>=	<u>1 r</u>	pm/10ms		Absolute vehicle speed hysteresis	<	17	kph	
The safety software partition B prevents unintended deceleration caused by clutch apply in forwards direction while moving in the backwards direction.	Even clutch torque		>=	Clutch actuation with too low gear engaged clutch torque limit (5), see Summary table attachements C_SID_SSWB_SG_CLU	Nm		Even clutch shaft has a forward gear engaged	=	True		
If too much clutch torque is applied with a forwards gear enaged while vehicle is moving in backwards direction, the safety software partition B can detect a safety goal violation.		Clutch torque hysteris	<	Clutch actuation with too low gear engaged clutch torque recovery limit (6), see Summary table attachements C_SID_SSWB_SG_CLU	Nm		Vehicle speed	<=	-18	kph	
							Vehicle speed hysteresis	>	-17	kph	
The safety software partition B prevents unintended deceleration caused by clutch apply in reverse direction while moving in the forward direction.	Even clutch torque		>=	Clutch actuation with too low gear engaged clutch torque limit (5), see Summary table attachements C_SID_SSWB_SG_CLU	Nm		Even clutch shaft has a reverse gear engaged	=	True		
If too much clutch torque is applied with a reverse gear enaged while vehicle is moving in foward direction, the safety software partition B can detect a safety goal violation.		Clutch torque hysteris	<	Clutch actuation with too low gear engaged clutch torque recovery limit (6), see Summary table attachements C_SID_SSWB_SG_CLU	Nm		Vehicle speed	>=	18	kph	
,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,							Vehicle speed hysteresis	<	17	kph	
If this safety goal violation is detected for too long, the application software will attempt intervention. If the safety goal violation persists, the safety software partition B will intervene.						Fault confirmation for L1 intervention	Fault confirmation time before application software intervention	>=	390	ms	
When the safety software partition B intervention or the application software intervention which consist of the corresponding clutch shaft disablement persists too long, the							Application software intervention limit before latching	>=	2		
even gear clutch safety performance 2 DTC is set.						Fault confirmation for L2 intervention	Fault confirmation time before safety software intervention	>=	440	count ms	

										Enable			
Component/System	Fault Code	Monitor Strategy Description	Malfunction Criteria		Threshold Value			Secondary Parameters		Conditions		Time Required	MIL illum.
Electronic Limited Slip Differential Safety		The safety software partition B detects unintended unintended lateral vehicle	Limited slip differential torque	>=	Limited slip differential torque threshold (1), see summary table		Enable Conditions:	Absolute vehicle speed	>=	3			
Performance	P1966	movement by wrong eLSD torque application.	···· • • • • • • • • • •		attachments C_SID_SSWB_SG_LSD	Nm					kph	Runs Continuously	В
		If this safety goal violation is detected for too long, the application software will attempt											
		intervention by eLSD disable. If the safety goal						Absolute vehicle speed hysteresis	<	2			
		will intervene.									kph		
		When the safety software partition B intervention or the application software											
		intervention persists too long, the Electronic						eLSD drain active based on actuator currents	=	False			
		Limited Slip Differential Safety Performance DTC is set.						currents					
								ABS active	=	True			
							Fault confirmation for	Fault confirmation time before	~-	120			
							L1 intervention	application software intervention	>=	120	ms		
								Application software intervention limit before latching	>=	2	count		
							Fault confirmation for	Fault confirmation time before	~-	150			
							L2 intervention	safety software intervention	/-	130	ms		

Component/System	Fault Code	Monitor Strategy Description	Malfunction Criteria		Threshold Value			Secondary Parameters		Enable Conditions		Time Required	MIL illum.
Park System Safety Performance 2	P1965	The safety software partition B detects unintended park state disengagement.	Estimated parking lock stepper motor position	>=	1000	μm	Enable Conditions:	Parking lock was previously engaged (1), see Summary table attachements C_SID_SSWB_SG_PLK	=	True		Runs Continuously	В
		If this safety goal violation is detected for too long, the application software will attempt intervention. If the safety goal violation persists, the safety software partition B will intervene. When the cofter coftware partitions	Parking lock stepper motor speed	>=	0	mm/s		Range request	=	Park			
		intervention or the application software intervention persists too long, the park system		<=	200	mA							
		safety performance 2 DTC is set.	Parking lock engagement valve current System pressure	>	12	bar	Fault confirmation	Fault confirmation time before	N -	450			
		The safety software partition B detects	Engine speed Estimated parking lock stepper motor position	>=	1000		time	safety software intervention Range request	=	Park	ms	Rups Continuously	
		If this safety goal violation is detected for too long, the application software will attempt intervention. If the safety goal violation persists,	Parking lock stepper motor speed	>=	0			Absolute vehicle speed	<	0.300000011920 929	lunk	nono continuotosi y	
		When the safety software partition B intervention or the application software intervention persists too long, the park system safety performance 2 DTC is set.	Parking lock engagement valve current	<=	200	mA		Parking lock was previously engaged during park request (2), see Summary table attachments C_SID_SSWB_SG_PLK	=	False	крп		
			Engine speed	>	12 70	bar rpm		OK Range request Vehicle speed low during park	=	Park			
								attachments C_SID_SSWB_SG_PLK Parking lock was previously engaged	=	True			
								during park request (2), see Summary table attachments C_SID_SSWB_SG_PLK	=	False			
							Fault confirmation time	Fault confirmation time before safety software intervention	>=	450	ms		

Component/System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Secondary Parameters		Enable Conditions			Enable Conditions			Time Required	MIL illum.
Transmission Control Module (TCM)	U0073	Controller Area Network bus Communication Error	CAN Hardware Circuitry Detects a bus-off condition	= True						>=	5 occurences	A			
(1011)										in	5 sec				
					Enable Conditions: Stabiliz Ignit Ignit Part OTA Program	ition delay on Voltage on Voltage al network State Flag	<pre>>= >= </pre>	5 8.75 18 ACTIVE for at least 2sec INACTIVE	sec Volt Volt						
Transmission Control Module (TCM)	U1960	Key Provisioning	Empty Key Slot found at power up initialization	= True						>=	1 fail count	A			
()					Enable Conditions: Stabiliz Ignit Ignit Part OTA Program	ition delay on Voltage on Voltage al network State Flag	/ >= >= < < =	5 8.75 18 ACTIVE for at least 5sec INACTIVE	sec Volt Volt						
Transmission Control Module (TCM)	U1960	Key Provisioning	Authoritative counter overflow	= True						>=	1 fail count	А			
(((()))					Enable Conditions: Stabiliz Ignit Ignit Part OTA Program	ition delay on Voltage on Voltage al network State Flag	<pre>>= >= <</pre>	5 8.75 18 ACTIVE for at least 5sec INACTIVE	sec Volt Volt						
Transmission Control Module (TCM)	U196192	Security Peripheral Monitor	Security periperal related fault during MAC generation or Security periperal related fault during MAC verification	= True						>=	1 fail count	A			
					Enable Conditions: Stabiliz Ignit Ignit Part OTA Program	ition delay on Voltage on Voltage al network State Flag	<pre>>= >= <</pre>	5 8.75 18 ACTIVE for at least 5sec INACTIVE	sec Volt Volt						
Transmission Control Module (TCM)	U1962	Message authentication Monitor	Message Authentication failed	= True						>=	250 fail counts per key slot	А			
()					Enable Conditions: Stabiliz Ignit Ignit Part	tion delay on Voltage on Voltage al network	<pre> >= >= <</pre>	5 8.75 18 ACTIVE for at least 2sec	sec Volt Volt						
					Disable Conditions: MIL Illui	inated for	DTC	U1960							
Transmission Control Module (TCM)	U1611	Lost Communications with ECM CAN	CAN messages from ECM are not received by the TCM	= True						>=	1 sec	А			

					Enable Conditions: Disable Conditions:	Stabilization delay Ignition Voltage Ignition Voltage Partial network OTA Program State Flag MIL Illuminated for	>= >= = = DTC	5 8.75 18 ACTIVE for at least 5sec INACTIVE U0073	sec Volt Volt			
Transmission Control Module	U1619	Lost Communications with ECM LIN	LIN messages from ECM are not received by the TCM	= True						>=	1 sec	В
(TCM)					Enable Conditions:	Stabilization delay Ignition Voltage Ignition Voltage Power Mode Partial network OTA Program State Flag	>= >= < = =	5 8.75 18 RUN or PROPULSION ACTIVE for at least 5sec INACTIVE	sec Volt Volt			
					Disable Conditions:	MIL Illuminated for	DTC	U0073				
Transmission Control Module (TCM)	U0131	Lost Communications with EPS	CAN messages from EPS are not received by the TCM	= True						>=	1 sec	с
					Enable Conditions:	Stabilization delay Ignition Voltage Ignition Voltage Partial network OTA Program State Flag	>= >= < = =	5 8.75 18 ACTIVE for at least 5sec INACTIVE	sec Volt Volt			
					Disable Conditions:	MIL Illuminated for	DTC	U0073				
Transmission Control Module (TCM)	U0151	Lost Communications with SDM	CAN messages from SDM are not received by the TCM	= True						>=	1 sec	В
					Enable Conditions: Disable Conditions:	Stabilization delay Ignition Voltage Ignition Voltage Partial network OTA Program State Flag MIL Illuminated for	>= >= < = DTC	5 8.75 18 ACTIVE for at least 5sec INACTIVE U0073	sec Volt Volt			
Transmission Control Module	U0140	Lost Communications with BCM	CAN messages from BCM are not received by the TCM	= True						>=	1 sec	В
(TCM)					Enable Conditions:	Stabilization delay Ignition Voltage Ignition Voltage Partial network OTA Program State Flag	>= >= < = =	5 8.75 18 ACTIVE for at least 5sec INACTIVE	sec Volt Volt			
					Disable Conditions:	MIL Illuminated for	DTC	U0073				
Transmission Control Module (TCM)	U1608	Lost Communications with CGM	CAN messages from CGM are not received by the TCM	= True						>=	1 sec	В
()					Enable Conditions:	Stabilization delay Ignition Voltage	>= >=	5 8.75	sec Volt	+		-

					Disable Conditions:	Ignition Voltage Partial network OTA Program State Flag MIL Illuminated for	< = = DTC	18 ACTIVE for at least 5sec INACTIVE U0073	Volt			
Transmission Control Module	U1610	Lost Communications with EBCM	CAN messages from EBCM are not received by the TCM	= True						>=	1 sec	А
					Enable Conditions: Disable Conditions:	Stabilization delay Ignition Voltage Ignition Voltage Partial network OTA Program State Flag MIL Illuminated for	>= >= = = DTC	5 8.75 18 ACTIVE for at least 5sec INACTIVE U0073	sec Volt Volt			
Transmission Control Module (TCM)	U0401	Invalid data received from ECM	CAN message from ECM signal integrity fault detected	= True						>= out of	40 80	А
					Enable Conditions: Disable Conditions:	Stabilization delay Ignition Voltage Ignition Voltage Partial network OTA Program State Flag MIL Illuminated for	>= >= = DTC	5 8.75 18 ACTIVE for at least 5sec INACTIVE U0073	sec Volt Volt			
		Invalid Data Received from ECM/PCM A over LIN	LIN message from ECM signal integrity fault detected	= True						>= out of	25 50	
					Enable Conditions: Disable Conditions:	Stabilization delay Ignition Voltage Ignition Voltage Partial network OTA Program State Flag MIL Illuminated for	>= >= = DTC	5 8.75 18 ACTIVE for at least 5sec INACTIVE 'U0073	sec Volt Volt			
Transmission Control Module (TCM)	U0420	Invalid data received from EPS	CAN message from EPS signal integrity fault detected	= True						>= out of	40 80	с
					Enable Conditions: Disable Conditions:	Stabilization delay Igrition Voltage Ignition Voltage Partial network OTA Program State Flag MIL Illuminated for	>= < = DTC	5 8.75 18 ACTIVE for at least 5sec INACTIVE U0073	sec Volt Volt			
Transmission Control Module (TCM)	U0452	Invalid data received from SDM	CAN message from SDM signal integrity fault detected	= True						>= out of	40 80	В

					Enable Conditions:	Stabilization delay Ignition Voltage Ignition Voltage Partial network OTA Program State Flag MIL Illuminated for	>= >= = =	5 8.75 18 ACTIVE for at least 5sec INACTIVE U0073	sec Volt Volt			
Transmission Control Module (TCM)	U0422	Invalid data received from BCM	CAN message from BCM signal integrity fault detected	= True						>= out of	40 80	В
					Enable Conditions:	Stabilization delay Ignition Voltage Ignition Voltage Partial network OTA Program State Flag	>= >= = =	5 8.75 18 ACTIVE for at least 5sec INACTIVE	sec Volt Volt			
					Disable Conditions:	MIL Illuminated for	DTC	U0073				
Transmission Control Module (TCM)	U0447	Invalid data received from CGM	CAN message from CGM signal integrity fault detected	= True						>= out of	40 80	В
					Enable Conditions:	Stabilization delay Ignition Voltage Ignition Voltage Partial network OTA Program State Flag	>= >= < = =	5 8.75 18 ACTIVE for at least 5sec INACTIVE	sec Volt Volt			
					Disable Conditions:	MIL Illuminated for	DTC	U0073				
Transmission Control Module (TCM)	U0418	Invalid data received from EBCM	CAN message from EBCM signal integrity fault detected	= True						>= out of	40 80	А
					Enable Conditions:	Stabilization delay Ignition Voltage Ignition Voltage Partial network OTA Program State Flag	>= >= < = =	5 8.75 18 ACTIVE for at least 5sec INACTIVE	sec Volt Volt			
					Disable Conditions:	MIL Illuminated for	DTC	U0073				
Transmission Control Module (TCM)	P06AF	Invalid data received from ECM/LIN	ECM diagnostic pattern check failed	= True						>= out of or	5 50 no fault free sample window during	A
					Enable Conditions:	Power Mode	=	not 'OFF' at least 5 sec	sec			
					Disable Conditions:	MIL Illuminated for	DTC	U0073				
1	1	1			1					1		1

Transmission Control Module	U00BB	Lost Communications with EPUMP	CAN messages from EPUMP are not received by the TCM	= True						>=	1 sec	с
(TCM)					Enable Conditions:	Stabilization delay Ignition Voltage	>= >=	5 8.75 18	sec Volt Volt			
						PT CAN/CAN3 communication active	>=	5	sec			
						Vehicle Power Modes(External Battery Power supplied to Pump)	>=	5	sec			
					Disable Conditions:	MIL Illuminated for	DTC	U0073				
Transmission Control	U03BC	Invalid data received from EPUMP	CAN message from EPUMP signal integrity fault	= True						>=	40	с
(TCM)			ueletteu							out of	80	
					Enable Conditions:	Stabilization delay	>=	5	sec			
						Ignition Voltage Ignition Voltage	>= <	8.75 18	Volt Volt			
						PT CAN/CAN3 communication active	>=	5	sec			
						Vehicle Power Modes(External Battery Power supplied to Pump)	>=	5	sec			
					Disable Conditions:	MIL Illuminated for	DTC	U0073				
Transmission Control Module (TCM)	U1639	Lost Communications with EBCM gatewayed from CAN 3 over CGM	CAN messages from EBCM are not received by the TCM	= True						>=	1 sec	А
(TCM)					Enable Conditions:	Stabilization delay	>=	5	sec			
						Ignition Voltage	<	18	Volt			
						Partial network	=	ACTIVE for at least 5sec				
						OTA Program State Flag	=	INACTIVE				
					Disable Conditions:	MIL Illuminated for	DTC	U0073				
Transmission Control Module (TCM)	U1647	Lost Communications with ICCM gatewayed from CAN 3 over CGM	CAN messages from ICCM are not received by the TCM	= True						>=	1 sec	А
(,					Enable Conditions:	Stabilization delay	>=	5	Sec			
						Ignition Voltage	<	18	Volt			
						Partial network	=	least 5sec				
						OTA Program State Flag	=	INACTIVE				
					Disable Conditions:	MIL Illuminated for	DTC	U0073				
Transmission Control Module (TCM)	U1659	Lost Communications with VICM gatewayed over CAN 3	CAN messages from VICM are not received by the TCM	= True						>=	1 sec	A
-					Enable Conditions:	Stabilization delay	>= >=	5 8.75	sec Volt			
						Ignition Voltage	<	18 ACTIVE for at	Volt			
						Partial network	=	least 5sec				
					Disable Conditions	OTA Program State Flag	=	INACTIVE				
					Disable Conditions:	WIL IIIUMINATED for	DIC	00073				
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Transmission Control Module (TCM)	U042B	Invalid data received from ICCM	CAN message from ICCM signal integrity fault detected	= True						>= out of	40 80	А
					Enable Conditions: Disable Conditions:	Stabilization delay Ignition Voltage Ignition Voltage Partial network OTA Program State Flag MIL Illuminated for	>= >= = = DTC	5 8.75 18 ACTIVE for at least 5sec INACTIVE U0073	sec Volt Volt			
Transmission Control Module (TCM)	U0412	Invalid data received from VICM	CAN message from VICM signal integrity fault detected	= True						>= out of	40 80	A
					Enable Conditions: Disable Conditions:	Stabilization delay Ignition Voltage Ignition Voltage Partial network OTA Program State Flag MIL Illuminated for	>= >= = = DTC	5 8.75 18 ACTIVE for at least 5sec INACTIVE U0073	sec Volt Volt			