Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
Crankshaft Position (CKP)-Camshaft Position (CMP) Correlation Bank 1 Sensor A	P0016	Detects cam to crank misalignment by monitoring if cam sensor pulse for bank 1 sensor A occurs during the incorrect crank position	4 cam sensor pulses less than or greater than nominal position in one cam revolution.	-10.0 Crank Degrees 10.0 Crank Degrees	Crankshaft and camshaft position signals are synchronized Engine is Spinning No Active DTCs: Time since last execution of diagnostic	 CrankSensor_FA P0340, P0341 < 1.0 seconds	2 failures out of 3 tests. A failed test is 4 failures out of 5 samples. One sample per cam rotation	Type B, 2 Trips

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
Outside Air Temperature (OAT) Sensor Circuit Performance (OAT wired to ECM)	P0071	Detects an OAT sensor that has stuck in range by comparing to IAT when conditions are appropriate	OAT-to-IAT engine off equilibrium counter (see below for description of this counter) If IAT >= OAT: IAT - OAT If IAT < OAT: OAT - IAT The "OAT-to-IAT engine off equilibrium counter" is a counter that is incremented or decremented based on vehicle speed when the engine is off. When this counter is high enough, the vehicle has reached an equilibrium where IAT and OAT can be compared. The value that is added or subtracted to the counter every 100 msec is contained in table **P0071: OAT Performance Drive Equilibrium Engine Off**	>= 300.0 counts > 15.0 deg C > 15.0 deg C	Time between current ignition cycle and the last time the engine was running Engine is not running Vehicle Speed Coolant Temperature - IAT IAT - Coolant Temperature No Active DTCs:	>= 28,800.0 seconds >= 12.4 MPH < 15.0 deg C < 15.0 deg C VehicleSpeedSensor_FA IAT_SensorFA ECT_Sensor_DefaultDetected MAF_SensorFA EngineModeNotRunTimerError	Executed every 100 msec	Type B, 2 Trips
			OAT-to-IAT engine running equilibrium counter (see below for description of this counter) If IAT >= OAT: IAT - OAT If IAT < OAT:	>= 300.0 counts > 15.0 deg C	Engine is running Vehicle Speed Engine air flow No Active DTCs:	>= 12.4 MPH >= 10.0 grams/second VehicleSpeedSensor_FA IAT_SensorFA ECT_Sensor_DefaultDetected MAF_SensorFA	Executed every 100 msec	

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
			OAT - IAT The "OAT-to-IAT engine running equilibrium counter" is a counter that is incremented or decremented based on vehicle speed and engine air flow when the engine is running. When this counter is high enough, the vehicle has reached an equilibrium where IAT and OAT can be compared. The value that is added or subtracted to the counter every 100 msec is contained in table **P0071: OAT Performance Drive Equilibrium Engine Running**	> 15.0 deg C		EngineModeNotRunTimer Error		

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
Outside Air Temperature (OAT) Sensor Circuit Low	P0072	Detects a continuous short to ground in the OAT signal circuit or the OAT sensor	Raw OAT Input	<= 52 Ohms (~150 deg C)	Continuous		40 failures out of 50 samples 1 sample every 100 msec	Type B, 2 Trips

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
Outside Air Temperature (OAT) Sensor Circuit High	P0073	Detects a continuous open circuit in the OAT signal circuit or the OAT sensor	Raw OAT Input	>= 403,672 Ohms (~-60 deg C)	Continuous		40 failures out of 50 samples 1 sample every 100 msec	Type B, 2 Trips

16 OBDG04 ECM Summary Tables (Initial DTCs)

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
Outside Air Temperature (OAT) Sensor Intermittent In-Range	P0074	Detects a noisy or erratic OAT signal circuit or OAT sensor	String Length Where: "String Length" = sum of "Diff" calculated over And where: "Diff" = ABS(current OAT reading - OAT reading from 100 milliseconds previous)	> 100 deg C 10 consecutive OAT samples		Continuous	4 failures out of 5 samples Each sample takes 1.0 seconds	Type B, 2 Trips

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
Fuel Rail Pressure (FRP) Too Low	P0087	Determine if rail pressure is below an absolute value.	Rail pressure	< 0 to 13 MPa (see table **P0087 Minimum rail pressure**)	Run crank voltage Engine running, cranking excluded No IFT running (refer to FUL_IFT_St)	≥ 11.0 V	320 failures out of 457 samples 6.25 ms/sample	Type A, 1 Trips

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
Fuel Pressure Regulator 1 Performance	P0089	Determine when rail pressure is above maximum threshold when pressure is governed by Metering Unit valve.	Rail pressure	> 67 to 217 MPa (see table **P0089 Maximum rail pressure with MU**)	Run crank voltage Rail pressure is governed by Metering Unit	≥ 11.0 V	160 failures out of 229 samples OR 160 continuous failures out of 229 samples 6.25 ms/sample	Type A, 1 Trips

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
Fuel Pressure Regulator Solenoid 1 Control Circuit	P0090	Determine when an open circuit affects Fuel Pressure Regulator 1 (Metering Unit Valve) control circuit.	Impedence between signal and controller ground	≥ 200 kΩ	Powertrain relay voltage Rail pressure is governed by Metering Unit No active DTC since key is on:	≥ 11.0 V FHP_MU_DrvrCloseTFTKO FHP_MU_DrvrOpenTFTKO	44 failures out of 88 samples 6.25 ms/sample	Type A, 1 Trips

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
Fuel Pressure Regulator Solenoid 1 Control Circuit Low Voltage	P0091	Determine when short circuit to ground affects Fuel Pressure Regulator 1 (Metering Unit Valve) control circuit.	Impedence between signal and controller ground	≤ 0.5 Ω	Powertrain relay voltage Rail pressure is governed by Metering Unit No active DTC since key is on:	≥ 11.0 V FHP_MU_DrvrCloseTFTKO FHP_MU_DrvrOpenTFTKO	44 failures out of 88 samples 6.25 ms/sample	Type A, 1 Trips

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
Fuel Pressure Regulator Solenoid 1 Control Circuit High Voltage	P0092	Determine when short circuit to power affects Fuel Pressure Regulator 1 (Metering Unit Valve) control circuit.	Impedence between signal and controller power	≤ 0.5 Ω	Powertrain relay voltage Rail pressure is governed by Metering Unit No DTC active since key is on:	≥ 11.0 V FHP_MU_DrvrCloseTFTKO FHP_MU_DrvrOpenTFTKO	44 failures out of 88 samples 6.25 ms/sample	Type A, 1 Trips

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
Intake Air Temperature Sensor 2 Circuit Performance (applications with IAT, IAT2 and IAT3)	P0096	Detects an IAT2 sensor that has stuck in range by comparing to IAT and IAT3 at startup	ABS(Power Up IAT - Power Up IAT2) AND ABS(Power Up IAT - Power Up IAT3) AND ABS(Power Up IAT2 - Power Up IAT3)	> 25 deg C <= 25 deg C > 25 deg C	Time between current ignition cycle and the last time the engine was running Powertrain Relay Voltage for a time No Active DTCs:	> 28,800 seconds >= 11.0 Volts >= 0.9 seconds PowertrainRelayFault ECT_Sensor_Ckt_FA IAT_SensorCircuitFA MnfdTempSensorCktFA HumTempSnsrCktFA	Executes once at the beginning of each ignition cycle if enable conditions are met	Type B, 2 Trips
			Power Up IAT is between Power Up IAT2 and Power Up IAT3 AND ABS(Power Up IAT2 - Power Up IAT3) AND ABS(Power Up IAT - Power Up IAT2) > ABS(Power Up IAT - Power Up IAT3)	> 25 deg C	Time between current ignition cycle and the last time the engine was running Powertrain Relay Voltage for a time No Active DTCs:	> 28,800 seconds >= 11.0 Volts >= 0.9 seconds PowertrainRelayFault ECT_Sensor_Ckt_FA IAT_SensorCircuitFA MnfdTempSensorCktFA HumTempSnsrCktFA	Executes once at the beginning of each ignition cycle if enable conditions are met	
			Power Up IAT3 is between Power Up IAT and Power Up IAT2 AND ABS(Power Up IAT - Power Up IAT2) AND ABS(Power Up IAT3 -	> 25 deg C	Time between current ignition cycle and the last time the engine was running Powertrain Relay Voltage for a time No Active DTCs:	> 28,800 seconds >= 11.0 Volts >= 0.9 seconds PowertrainRelayFault ECT_Sensor_Ckt_FA IAT_SensorCircuitFA MnfdTempSensorCktFA	Executes once at the beginning of each ignition cycle if enable conditions are met	

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
			Power Up IAT2) > ABS(Power Up IAT3 - Power Up IAT)			HumTempSnsrCktFA		

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
Intake Air Temperature Sensor Circuit 2 Low	P0097	Detects a continuous short to ground or open in the IAT 2 signal circuit	Raw IAT 2 Input	< 13 Hertz (~-60 deg C)	Powertrain Relay Voltage for a time No Active DTCs:	>= 11.0 Volts >= 0.9 seconds PowertrainRelayFault	40 failures out of 50 samples 1 sample every 100 msec	Type B, 2 Trips

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
Intake Air Temperature Sensor Circuit 2 High	P0098	Detects a continuous high frequency in the IAT 2 signal circuit	Raw IAT 2 Input	> 390 Hertz (~150 deg C)	Powertrain Relay Voltage for a time No Active DTCs:	>= 11.0 Volts >= 0.9 seconds PowertrainRelayFault	40 failures out of 50 samples 1 sample every 100 msec	Type B, 2 Trips

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
Intake Air Temperature Sensor 2 Intermittent In-Range	P0099	Detects a noisy or erratic IAT 2 signal circuit or IAT 2 sensor	String Length Where: "String Length" = sum of "Diff" calculated over And where: "Diff" = ABS(current IAT 2 reading - IAT 2 reading from 100 milliseconds previous)	> 100.00 deg C 10 consecutive IAT 2 samples	Powertrain Relay Voltage for a time No Active DTCs:	>= 11.0 Volts >= 0.9 seconds PowertrainRelayFault	4 failures out of 5 samples Each sample takes 1.0 seconds	Type B, 2 Trips

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
Intake Air Pressure Measurement System - Multiple Sensor Correlation	P00C7	This monitor is used to identify an ECU input logic fault. The plausibility monitor compares the BARO, MAP and TCIAP pressures when the Throttle valve is open, the engine speed and the fuel injected quantity are below a threshold (engine idle condition) and the engine coolant temperature is higher than a threshold: in that condition the three sensors are expected to measure the same pressure. The monitor is able to handle the situation in which the three sensors are not in agreement: in that case a DTC sets indicating that there is a generic fault that impacts two or three sensors. In this case the monitor is not able to pinpoint the sensors that are not working correctly.	Difference (absolute value) in measured pressure between BARO sensor and TCIAP sensor AND Difference (absolute value) in measured pressure between BARO sensor and MAP sensor AND Difference (absolute value) in measured pressure between TCIAP sensor and MAP sensor	> **P0106, P2227, P227B, P00C7: Maximum pressure difference** [kPa] > **P0106, P2227, P227B, P00C7: Maximum pressure difference** [kPa] > **P0106, P2227, P227B, P00C7: Maximum pressure difference** [kPa]	Correlation diagnostic enabled by calibration Engine is running Cranking ignition in range Engine speed Requested fuel Throttle measured position Engine Coolant Temperature OR OBD Coolant Enable Criteria No faults are present	1.00 ==TRUE ==TRUE Battery voltage > 11.00 [V] < 1,100.00 [rpm] < 50.00 [mm^3] > 90.00 [%] > 70.00 [°C] ==TRUE CrankSensor_FA ==FALSE FUL_GenericInjSysFA ==FALSE TPS_PstnSnsrFA ==FALSE MAP_SensorCircuitFA ==FALSE AAP2_SnsrCktFA ==FALSE AAP_AAP5_SnsrCktFA ==FALSE	320.00 fail counters over 400.00 sample counters sampling time is 12.5 ms	Type A, 1 Trips

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
						AAP_AAP2_SnsrStabFA ==FALSE AAP_AAP5_SnsrStabFA ==FALSE ECT_Sensor_FA ==FALSE MAF_MAF_SnsrFA ==FALSE		
			Difference (absolute value) in measured pressure between BARO sensor and TCIAP sensor AND Difference (absolute value) in measured pressure between BARO sensor and TCIAP sensor AND Difference (absolute value) in measured pressure between BARO sensor and TCIAP sensor OR Difference (absolute value) in measured pressure between BARO sensor and TCIAP sensor AND Difference (absolute value) in measured pressure between BARO sensor and TCIAP sensor AND Difference (absolute value) in measured pressure between BARO sensor and TCIAP sensor OR	> 10.0 kPa <= 10.0 kPa <= 10.0 kPa <= 10.0 kPa > 10.0 kPa <= 10.0 kPa	Time between current ignition cycle and the last time the engine was running Engine is not rotating Manifold Pressure Manifold Pressure Baro Pressure Baro Pressure TCIAP Pressure TCIAP Pressure No Active DTCs: No Pending DTCs:	> 5.0 seconds >= 50.0 kPa <= 115.0 kPa >= 50.0 kPa <= 115.0 kPa >= 50.0 kPa <= 115.0 kPa EngineModeNotRunTimer Error MAP_SensorFA AAP_SnsrFA AAP2_SnsrFA MAP_SensorCircuitFP AAP_SnsrCktFP AAP2_SnsrCktFP	4 failures out of 5 samples 1 sample every 12.5 msec	

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
			Difference (absolute value) in measured pressure between BARO sensor and TCIAP sensor AND Difference (absolute value) in measured pressure between BARO sensor and TCIAP sensor AND Difference (absolute value) in measured pressure between BARO sensor and TCIAP sensor OR Difference (absolute value) in measured pressure between BARO sensor and TCIAP sensor AND Difference (absolute value) in measured pressure between BARO sensor and TCIAP sensor AND Difference (absolute value) in measured pressure between BARO sensor and TCIAP sensor	<= 10.0 kPa <= 10.0 kPa > 10.0 kPa > 10.0 kPa > 10.0 kPa > 10.0 kPa				

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
Intake Air Temperature Sensor 3 Circuit Performance	P00E9	Detects an IAT3 sensor that has stuck in range by comparing to IAT and IAT2 at startup	ABS(Power Up IAT - Power Up IAT2) AND ABS(Power Up IAT - Power Up IAT3) AND ABS(Power Up IAT2 - Power Up IAT3)	<= 25 deg C > 25 deg C > 25 deg C	Time between current ignition cycle and the last time the engine was running Powertrain Relay Voltage for a time No Active DTCs:	> 28,800 seconds >= 11.0 Volts >= 0.9 seconds PowertrainRelayFault ECT_Sensor_Ckt_FA IAT_SensorCircuitFA MnfdTempSensorCktFA HumTempSnsrCktFA	Executes once at the beginning of each ignition cycle if enable conditions are met	Type B, 2 Trips
			Power Up IAT is between Power Up IAT2 and Power Up IAT3 AND ABS(Power Up IAT2 - Power Up IAT3) AND ABS(Power Up IAT - Power Up IAT3) > ABS(Power Up IAT - Power Up IAT2)	> 25 deg C	Time between current ignition cycle and the last time the engine was running Powertrain Relay Voltage for a time No Active DTCs:	> 28,800 seconds >= 11.0 Volts >= 0.9 seconds PowertrainRelayFault ECT_Sensor_Ckt_FA IAT_SensorCircuitFA MnfdTempSensorCktFA HumTempSnsrCktFA	Executes once at the beginning of each ignition cycle if enable conditions are met	
			Power Up IAT2 is between Power Up IAT and Power Up IAT3 AND ABS(Power Up IAT - Power Up IAT3) AND ABS(Power Up IAT2 -	> 25 deg C	Time between current ignition cycle and the last time the engine was running Powertrain Relay Voltage for a time No Active DTCs:	> 28,800 seconds >= 11.0 Volts >= 0.9 seconds PowertrainRelayFault ECT_Sensor_Ckt_FA IAT_SensorCircuitFA MnfdTempSensorCktFA	Executes once at the beginning of each ignition cycle if enable conditions are met	

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
			Power Up IAT3) > ABS(Power Up IAT2 - Power Up IAT)			HumTempSnsrCktFA		

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
Intake Air Temperature Sensor Circuit 3 Low	P00EA	Detects a continuous short to ground in the IAT 3 signal circuit or the IAT 3 sensor	Raw IAT 3 Input	< 56 Ohms (~150 deg C)	Engine Run Time	> 0.00 seconds	40 failures out of 50 samples 1 sample every 100 msec	Type B, 2 Trips

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
Intake Air Temperature Sensor Circuit 3 High	P00EB	Detects a continuous open circuit in the IAT 3 signal circuit or the IAT 3 sensor	Raw IAT 3 Input	> 151,542 Ohms (~-60 deg C)	Engine Run Time	> 0.00 seconds	40 failures out of 50 samples 1 sample every 100 msec	Type B, 2 Trips

16 OBDG04 ECM Summary Tables (Initial DTCs)

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
Intake Air Temperature Sensor 3 Intermittent In-Range	P00EC	Detects a noisy or erratic IAT 3 signal circuit or IAT 3 sensor	String Length Where: "String Length" = sum of "Diff" calculated over And where: "Diff" = ABS(current IAT 3 reading - IAT 3 reading from 100 milliseconds previous)	> 80.00 deg C 10 consecutive IAT 3 samples	Continuous		4 failures out of 5 samples Each sample takes 1.0 seconds	Type B, 2 Trips

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
Humidity Sensor Circuit Low	P00F4	Detects a continuous short to power in the Humidity Sensor circuit	Humidity Duty Cycle	<= 5.0 %	Powertrain Relay Voltage for a time No Active DTCs:	>= 11.0 Volts >= 0.9 seconds PowertrainRelayFault	40 failures out of 50 samples 1 sample every 100 msec	Type B, 2 Trips

16 OBDG04 ECM Summary Tables (Initial DTCs)

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
Humidity Sensor Circuit High	P00F5	Detects a continuous open or short to low in the Humidity Sensor circuit	Humidity Duty Cycle	>= 95.0 %	Powertrain Relay Voltage for a time No Active DTCs:	>= 11.0 Volts >= 0.9 seconds PowertrainRelayFault	40 failures out of 50 samples 1 sample every 100 msec	Type B, 2 Trips

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
Humidity Sensor Circuit Intermittent	P00F6	Detects a noisy or erratic humidity sensor input	String Length Where: "String Length" = sum of "Diff" calculated over And where: "Diff" = ABS(current Humidity reading - Humidity reading from 100 milliseconds previous)	> 80 % 10 consecutive Humidity samples	Powertrain Relay Voltage for a time No Active DTCs:	>= 11.0 Volts >= 0.9 seconds PowertrainRelayFault	4 failures out of 5 samples Each sample takes 1.0 seconds	Type B, 2 Trips

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
Manifold Absolute Pressure (MAP) Sensor Performance	P0106	This monitor is used to identify MAP sensor internal faults (measurement with an offset or a drift). The plausibility monitor compares the BARO, MAP and TCIAP pressures when the Throttle valve is open, the engine speed and the fuel injected quantity are below a threshold (engine idle condition) and the engine coolant temperature is higher than a threshold: in that condition the three sensors are expected to measure the same pressure. If MAP sensor drifts from the other two a specific DTC sets.	Difference (absolute value) in measured pressure between MAP sensor and TCIAP sensor AND Difference (absolute value) in measured pressure between MAP sensor and BARO sensor AND Difference (absolute value) in measured pressure between BARO sensor and TCIAP sensor	> **P0106, P2227, P227B, P00C7: Maximum pressure difference** [kPa] > **P0106, P2227, P227B, P00C7: Maximum pressure difference** [kPa] < **P0106, P2227, P227B, P00C7: Maximum pressure difference** [kPa]	Correlation diagnostic enabled by calibration Engine is running Cranking ignition in range Engine speed Requested fuel Throttle measured position Engine Coolant Temperature OR OBD Coolant Enable Criteria No faults are present	1.00 ==TRUE ==TRUE Battery voltage > 11.00 [V] < 1,100.00 [rpm] < 50.00 [mm^3] > 90.00 [%] > 70.00 [°C] ==TRUE CrankSensor_FA ==FALSE FUL_GenericInjSysFA ==FALSE TPS_PstnSnsrFA ==FALSE MAP_SensorCircuitFA ==FALSE AAP2_SnsrCktFA ==FALSE AAP_AAP5_SnsrCktFA ==FALSE	320.00 fail counters over 400.00 sample counters sampling time is 12.5 ms	Type A, 1 Trips

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
						AAP_AAP2_SnsrStabFA ==FALSE AAP_AAP5_SnsrStabFA ==FALSE ECT_Sensor_FA ==FALSE MAF_MAF_SnsrFA ==FALSE		
			MAP sensor OR MAP sensor	< 50.0 kPa > 115.0 kPa	Time between current ignition cycle and the last time the engine was running Engine is not rotating No Active DTCs: No Pending DTCs:	> 5.0 seconds EngineModeNotRunTimer Error MAP_SensorCircuitFA AAP_SnsrCktFA MAP_SensorCircuitFP AAP_SnsrCktFP	4 failures out of 5 samples 1 sample every 12.5 msec	

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
Manifold Absolute Pressure Sensor Circuit Low (with pull-up)	P0107	Detects a continuous short to low in either the signal circuit or the MAP sensor.	MAP Voltage	< 3.0 % of 5 Volt Range (This is equal to 0.15 Volts or 3.5 kPa)	Continuous		320 failures out of 400 samples 1 sample every 12.5 msec	Type B, 2 Trips

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
Manifold Absolute Pressure Sensor Circuit High (with pull-up)	P0108	Detects an open sensor ground, continuous short to high, or open in either the signal circuit or the MAP sensor.	MAP Voltage	> 97.0 % of 5 Volt Range (This is equal to 4.85 Volts, or 313.2 kPa)	Continuous		320 failures out of 400 samples 1 sample every 12.5 msec	Type B, 2 Trips

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
Intake Air Temperature Sensor Circuit Performance (applications with IAT, IAT2 and IAT3)	P0111	Detects an IAT sensor that has stuck in range by comparing to IAT2 and IAT3 at startup	ABS(Power Up IAT - Power Up IAT2) AND ABS(Power Up IAT - Power Up IAT3) AND ABS(Power Up IAT2 - Power Up IAT3)	> 25 deg C > 25 deg C <= 25 deg C	Time between current ignition cycle and the last time the engine was running Powertrain Relay Voltage for a time No Active DTCs:	> 28,800 seconds >= 11.0 Volts >= 0.9 seconds PowertrainRelayFault ECT_Sensor_Ckt_FA IAT_SensorCircuitFA MnfdTempSensorCktFA HumTempSnsrCktFA	Executes once at the beginning of each ignition cycle if enable conditions are met	Type B, 2 Trips
			Power Up IAT2 is between Power Up IAT and Power Up IAT3 AND ABS(Power Up IAT - Power Up IAT3) AND ABS(Power Up IAT2 - Power Up IAT) > ABS(Power Up IAT2 - Power Up IAT3)	> 25 deg C	Time between current ignition cycle and the last time the engine was running Powertrain Relay Voltage for a time No Active DTCs:	> 28,800 seconds >= 11.0 Volts >= 0.9 seconds PowertrainRelayFault ECT_Sensor_Ckt_FA IAT_SensorCircuitFA MnfdTempSensorCktFA HumTempSnsrCktFA	Executes once at the beginning of each ignition cycle if enable conditions are met	
			Power Up IAT3 is between Power Up IAT and Power Up IAT2 AND ABS(Power Up IAT - Power Up IAT2) AND ABS(Power Up IAT3 -	> 25 deg C	Time between current ignition cycle and the last time the engine was running Powertrain Relay Voltage for a time No Active DTCs:	> 28,800 seconds >= 11.0 Volts >= 0.9 seconds PowertrainRelayFault ECT_Sensor_Ckt_FA IAT_SensorCircuitFA MnfdTempSensorCktFA	Executes once at the beginning of each ignition cycle if enable conditions are met	

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
			Power Up IAT) > ABS(Power Up IAT3 - Power Up IAT2)			HumTempSnsrCktFA		

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
Intake Air Temperature Sensor Circuit Low	P0112	Detects a continuous short to ground in the IAT signal circuit or the IAT sensor	Raw IAT Input	< 58 Ohms (~150 deg C)	Engine Run Time	> 0.00 seconds	40 failures out of 50 samples 1 sample every 100 msec	Type B, 2 Trips

16 OBDG04 ECM Summary Tables (Initial DTCs)

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
Intake Air Temperature Sensor Circuit High	P0113	Detects a continuous open circuit in the IAT signal circuit or the IAT sensor	Raw IAT Input	> 142,438 Ohms (~-60 deg C)	Engine Run Time	> 0.00 seconds	40 failures out of 50 samples 1 sample every 100 msec	Type B, 2 Trips

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
Intake Air Temperature Sensor Intermittent In-Range	P0114	Detects a noisy or erratic IAT signal circuit or IAT sensor	String Length Where: "String Length" = sum of "Diff" calculated over And where: "Diff" = ABS(current IAT reading - IAT reading from 100 milliseconds previous)	> 80.00 deg C 10 consecutive IAT samples	Continuous		4 failures out of 5 samples Each sample takes 1.0 seconds	Type B, 2 Trips

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
Engine Coolant Temp Sensor Circuit Low	P0117	Circuit Continuity This DTC detects a short to ground in the ECT signal circuit or the ECT sensor.	ECT Resistance (@ 150ºC)	< 57 Ohms			5 failures out of 6 samples 1 sec/ sample Continuous	Type B, 2 Trips

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
Engine Coolant Temp Sensor Circuit High	P0118	Circuit Continuity This DTC detects a short to high or open in the ECT signal circuit or the ECT sensor.	ECT Resistance (@ -60ºC)	> 118,862 Ohms	Engine run time OR IAT min	> 10.0 seconds ≥ -7.0 °C	5 failures out of 6 samples 1 sec/ sample Continuous	Type B, 2 Trips

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
Engine Coolant Temperature (ECT) Sensor Circuit Intermittent	P0119	Circuit Continuity This DTC detects large step changes in the ECT signal circuit or the ECT sensor. Allowable high and low limits are calculated for the next sample based on the previous sample.	ECT temperature step change: 1) postive step change is greater than calculated high limit OR 2) negitive step change is lower than calculated low limit. The calculated high and low limits for the next reading use the following calibrations: 1) Sensor time constant 2) Sensor low limit 3) Sensor high limit *****Generic Example***** If the last ECT reading was 90 Deg C, the Time constant was calibrated at 10 seconds, the low limit was calibrated to -80 Deg C and the high limit was calibrated to 200 Deg C the caluculated limits are 101 Deg C and 73 Deg C. The next reading (after the 90 Deg C reading) must be between 73 Deg C and 101 Deg C to be valid.	15.0 seconds -80.0 Deg C 200.0 Deg C	No Active DTC's	ECT_Sensor_Ckt_FP	3 failures out of 4 samples 1 sec/ sample Continuous	Type B, 2 Trips

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
Engine Coolant Temperature Below Stat Regulating Temperature) (energy based "Deluxe" method	P0128	This DTC detects if the engine coolant temperature rises too slowly due to an ECT or Cooling system fault	Energy is accumulated after the first conbustion event using Range #1 or #2 below: Thermostat type is divided into normal (non-heated) and electrically heated. For this application the "type" cal (KeTHMG_b_TMS_ElecThstEquipped) = 0 If the type cal is equal to one, the application has an electrically heated t-stat, if equal to zero the the application has an non heated t-stat. See appropiate section below. ***************************** Type cal above = 1 (Electrically heated t-stat) == == == == Range #1 (Primary) ECT reaches Commanded temperature minus 19 °C when Ambient min is ≤ 52 °C and > 10 °C. Note: Warm up target for range #1 will be at least 69 °C == == == == Range #2 (Alternate) ECT reaches Commanded temperature minus 50 °C when Ambient min is ≤ 10 °C and > -7 °C. Note: Warm up target for range #2 will be at least	See the two tables named: **P0128_Maximum Accumulated Energy for Start-up ECT conditions - Primary** and **P0128_Maximum Accumulated Energy for Start-up ECT conditions - Alternate** in the Supporting tables section. This diagnostic models the net energy into and out of the cooling	No Active DTC's Engine not run time (soaking time before current trip) Engine run time Fuel Condition Distance traveled *************************** If Engine RPM is continuously greater than for this time period The diagnostic test for this key cycle will abort *************************** *************************** If T-Stat Heater commanded duty cycle for this time period	ECT_Sensor_Ckt_FA ECT_Sensor_Perf_FA VehicleSpeedSensor_FA OAT_PtEstFiltFA IAT_SensorCircuitFA MAF_SensorFA THMR_AWP_AuxPumpFA THMR_AHV_FA THMR_SWP_Control_FA THMR_SWP_NoFlow_FA THMR_SWP_FlowStuckOn_FA EngineTorqueEstInaccurate ≥ 1,800 seconds 20 ≤ Eng Run Tme ≤ 1,450 seconds Ethanol ≤ 87 % ≥ 0.50 miles *************************** 9,999 rpm 5.0 seconds *************************** *************************** > 20.0 % duty cycle > 5.0 seconds	1 failure to set DTC 1 sec/ sample Once per ignition key cycle	Type B, 2 Trips

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
			55 °C **************************** Type cal above = 0 (non - heated t-stat) == == == == Range #1 (Primary) ECT reaches 69 °C when Ambient min is ≤ 52 °C and > 10 °C. == == == == Range #2 (Alternate) ECT reaches 55 °C when Ambient min is ≤ 10 °C and > -7 °C. ****************************	system during the warm-up process. The five energy terms are: heat from combustion (with AFM correction), heat from after-run, heat loss to enviroment, heat loss to cabin and heat loss to DFCO.	The diagnostic test for this key cycle will abort *************************** ECT at start run	*************************** -40 ≤ ECT ≤ 64 °C		

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
Fuel Temperature Sensor A Performance	P0181	Determine when fuel temperature sensor is not plausible, due to offset or drift.	Absolute difference between fuel temperature and reference temperature (see **P0181 Fuel Temperature Sensor Reference**)	> 20.0 °C to 20.0 °C (see table **P0181 Fuel Temperature Plausibility**)	Run crank voltage Run crank voltage Engine not cranking A time and is passed since engine movement is detected Engine soak time No error for Engine Not Running timer (refer to EngineModeNotRunTimer Error No DTC active: (Engine coolant temperature OR ECT_OBD_GlobalCoolTmpEnbl (refer to "OBD Coolant Enable Criteria" section))	> 6.0 V ≥ 11.0 V > 8 s < 13 s > 28,799 s = FALSE) FTS_FTS_CktFA FTS_PlausRefSnsrFlt > -40 °C = TRUE	1 sample 100 ms/sample	Type B, 2 Trips

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
Fuel Temperature Sensor A Circuit Low	P0182	Determine when a short circuit to ground affects fuel temperature sensor.	Fuel temperature sensor output resistance	< 50 Ω	Run crank voltage Run crank voltage Engine not cranking	> 6.0 V ≥ 11.0 V	10 failures out of 20 samples 100 ms/samples	Type B, 2 Trips

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
Fuel Temperature Sensor A Circuit High	P0183	Determine when a short circuit to ground affects fuel temperature sensor.	Fuel temperature sensor output resistance	> 121,865 Ω	Run crank voltage Run crank voltage Engine not cranking	> 6.0 V ≥ 11.0 V	10 failures out of 20 samples 100 ms/samples	Type B, 2 Trips

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
Fuel Temperature Sensor A Circuit Intermittent	P0184	Determine when fuel temperature sensor changes quicker than expected, likely due to an intermittent fault.	Fuel temperature	> (1 - α) * 156 °C + (Last good sample * α) with α = e^[- (amount of consecutive bad samples * 0.01)]	Run crank voltage Run crank voltage No active DTC:	> 6.0 V ≥ 11.0 V FTS_FTS_CktFA	10 failures out of 15 samples 100 ms/samples	Type B, 2 Trips
			Fuel temperature	< (1 - α) * -56 °C + (Last good sample * α) with α = e^[- (amount of consecutive bad samples * 0.01)]	Run crank voltage Run crank voltage No active DTC:	> 6.0 V ≥ 11.0 V FTS_FTS_CktFA	10 failures out of 15 samples 100 ms/samples	

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
Fuel Rail Pressure (FRP) Sensor A Performance	P0191	Determine when fuel rail pressure sensor is not plausible, due to offset or drift.	Rail pressure sensor output (as percentage of supply voltage) OR Rail pressure sensor output (as percentage of supply voltage)	> 14.0 % < 6.5 %	Engine off time No error for Engine Not Running timer (refer to EngineModeNotRunTimer Error No engine movement detected since begin of driving cycle (Engine coolant temperature OR ECT_OBD_GlobalCoolTmpEnbl (refer to "OBD Coolant Enable Criteria" section)) Run crank voltage Run crank voltage No active DTC:	≥ 35 s = FALSE) ≥ -40 °C = TRUE > 6.0 V ≥ 11.0 V ECT_Sensor_FA FHP_RPS_CktFA	42 failures out of 60 samples 6.25 ms/sample	Type A, 1 Trips
			Absolute difference between rail pressure #1 (first trace) and rail pressure #2 (second trace)	> 21.0 MPa	**P0191 Rail Pressure Sensor Configuration** Run crank voltage Run crank voltage No active DTC:	= CeFHPG_e_RPS_DoubleTrack > 6.0 V ≥ 11.0 V FHP_RPS_CktFA P0194	33 failures out of 55 samples 6.25 ms/sample	

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
Fuel Rail Pressure (FRP) Sensor A Circuit Low Voltage	P0192	Determine when a short circuit to ground affects fuel rail pressure sensor.	Fuel rail pressure sensor output (as percentage of supply voltage)	< 4.3 %	Starter motor is not engaged OR Starter motor has been engaged for a time OR Run crank voltageRun crank voltage	 ≥ 15 s > 8.4 V	38 failures out of 76 samples OR 22 continuous failures out of 76 samples 6.25 ms/samples	Type A, 1 Trips

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
Fuel Rail Pressure (FRP) Sensor A Circuit High Voltage	P0193	Determine when a short circuit to voltage affects fuel rail pressure sensor.	Fuel rail pressure sensor output (as percentage of supply voltage)	< 94.8 %	Starter motor is not engaged OR Starter motor has been engaged for a time OR Run crank voltageRun crank voltage	≥ 15 s > 8.4 V	38 failures out of 76 samples OR 22 continuous failures out of 76 samples 6.25 ms/samples	Type A, 1 Trips

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
Fuel Rail Pressure (FRP) Sensor A Circuit Intermittent	P0194	Determine when rail pressure sensor changes quicker than expected, likely due to an intermittent fault.	Absolute difference two consecutive rail pressure samples	> 15.0 MPa	Run crank voltage Run crank voltage Engine not cranking No DTC active since key is on:	> 6.0 V ≥ 11.0 V FHP_RPS_CktTFTKO FHP_RPS_OfstTFTKO	80 failures out of 115 samples 6.25 ms/sample	Type X, No MIL

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
Coolant Temperature Dropped Below Diagnostic Monitoring Temperature	P01F0	This DTC detects an unexplained system cool down below the OBD monitoring threshold during normal operating conditions	For this application the "type" cal (KeTHMG_b_TMS_ElecThstEquipped) = 0 If the type cal is equal to one, the application has an electrically heated t-stat, if equal to zero the the application has an non heated t-stat. See appropiate section below.		No Active DTC's	ECT_Sensor_Ckt_FA VehicleSpeedSensor_FA OAT_PtEstFiltFA THMR_AWP_AuxPumpFA THMR_AHV_FA THMR_SWP_Control_FA EngineTorqueEstInaccurate ECT_Sensor_Perf_FA THMR_SWP_NoFlow_FA THMR_SWP_FlowStuckOn_FA	30 failures out of 60 samples 1 sample / second Continuous	Type B, 2 Trips
			**************************** Type cal above = 0 (non - heated t-stat) == == == ==		Engine Runtime	≥ 30.0 seconds		
					Distance traveled this key cycle	≥ 1.2 km		
			Engine coolant temperature ****************************	≤ 68.0 Deg C	Ambient air pressure	≥ 55.0 kPa		
					Ambient air temperature	≥ -7.0 Deg C		
			Type cal above = 1 (Electrically heated t-stat) == == == ==		************************** Engine coolant temperature			
			Engine coolant temperature	≤ 70.5 Deg C	At least once during the key cycle			
					Type 0 (non-heated t-stat)	≥ 69 Deg C		
					Type 1 (Electrically heated T-stat)	≥ 71.5 to 86.5 Deg C		
					************************** Heat to coolant	≥ 20.0 kW		
					DFCO time	≤ 2.0 seconds		
					Thermostat duty cycle	≤ 20.0 %		

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
Turbocharger/ Supercharger "A" Overboost Condition	P0234	This monitor detects failures in the charging air system such to not fulfil the request of boost pressure in the intake manifold. It works only in steady state closed loop pressure control zone. The DTC checks a permanent negative control deviation of the boost pressure indicating an overboost condition. This monitor is used to detect any malfunction in the boost pressure system causing the vehicle's emissions to exceed the limits. The aim of the boost overboost pressure monitor is to detect obstructions in the exhaust pipe. The boost pressure is usually controlled by the VGT vanes. The intake manifold pressure is also affected by the throttle valve and the EGR valve position changes. The aim of this procedure is to identify a limitation of the VGT vanes (equal to an obstruction) that leads to exceed the emission limits.	Boost pressure tracking error (difference between the desired boost pressure and the measured pressure at intake manifold by MAP sensor) lower than a threshold. The setpoint used for closed loop control is the intake manifold pressure: in this situation the diagnostic monitors the boost pressure closed loop control tracking error.	< (**P0234: Negative boost deviation threshold (throttle control not active)** [kPa] x **P0234, P2263: Overboost barometric correction**)	Calibration on diagnostic enabling Engine Running Cranking ignition in range Relay voltage in range Difficult launch NOT detected Boost Pressure Control Closed Loop active No active transition from one combustion mode to another Outside Air Temperature Desired Boost Pressure steady state: BstDes-BstDes_Old Engine speed	**P0234, P0299: Boost pressure control deviation enabling** ==TRUE ==TRUE Battery voltage > 11.00 [V] Powertrain relay voltage > 11.00 [V] Refer to "LDT_DifficultLaunchActive" Free Form AIC_BstCntrlCL==TRUE ==TRUE > -7.00 [°C] AND < 55.00 [°C] > -18 [kPa/s] AND < 24 [kPa/s] > 1,800.00 [rpm]	320 fail counters over 400 sample counters sampling time is 25ms	Type B, 2 Trips

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
						AND < 2,550.00 [rpm]		
					Desired intake Boost pressure	> **P0234: Minimum boost pressure for overboost monitor enabling** [kPa] AND **P0234: Maximum boost pressure for overboost** <**monitor enabling** [kPa]		
					Engine Coolant Temperature OR OBD Coolant Enable Criteria, AND Engine Coolant Temperature	> 70 [°C] ==TRUE < 117 [°C]		
					Ambient Air Pressure	> 70 [kPa] AND < 110 [kPa]		
					Throttle Valve position	>= 75.00 [%]		
					No active DTCs	AIC_BstSysDiagDenomDsbl ==FALSE		
					Timer delay once all above conditions are	> **P0234: Overboost monitor delay timer**		

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
					fulfilled	[s]		
			Boost pressure tracking error(difference between the desired boost pressure and the measured pressure at intake manifold by MAP sensor) lower than a threshold. The setpoint used for closed loop control is the conversion of the desired upstream throttle boost pressure (target) in desired intake boost pressure. The conversion of the setpoint is done calculating the pressure drop over the throttle valve that is strictly dependent on the valve position.	< (**P0234: Negative boost deviation threshold (throttle control active)** [kPa] x **P0234, P2263: Overboost barometric correction**)	Calibration on diagnostic enabling Engine Running Cranking ignition in range Relay voltage in range Difficult launch NOT detected Boost Pressure Control Closed Loop active No active transition from one combustion mode to another Outside Air Temperature Desired Boost Pressure steady state:	**P0234, P0299: Boost pressure control deviation enabling** ==TRUE ==TRUE Battery voltage > 11.00 [V] Powertrain relay voltage > 11.00 [V] Refer to "LDT_DifficultLaunchActive" Free Form AIC_BstCntrlCL==TRUE ==TRUE > -7.00 [°C] AND < 55.00 [°C] > -18 [kPa/s] AND	320 fail counters over 400 sample counters sampling time is 25ms	

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
					BstDes-BstDes_Old	< 24 [kPa/s]		
					Engine speed	> 1,800.00 [rpm] AND < 2,550.00 [rpm]		
					Desired intake Boost pressure	> **P0234: Minimum boost pressure for overboost monitor enabling** [kPa] AND **P0234: Maximum boost pressure for overboost** <**monitor enabling** [kPa]		
					Engine Coolant Temperature OR OBD Coolant Enable Criteria, AND Engine Coolant Temperature	> 70 [°C] ==TRUE < 117 [°C]		
					Ambient Air Pressure	> 70 [kPa] AND < 110 [kPa]		
					Throttle Valve position	>= 100.00 [%]		
					No active DTCs	AIC_BstSysDiagDenomDsbl ==FALSE		

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
					Timer delay once all above conditions are fulfilled	> **P0234: Overboost monitor delay timer** [s]		

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
Turbocharger/ Supercharger "A" Underboost Condition	P0299		Boost pressure tracking error(difference between the desired boost pressure and the measured pressure at intake manifold by MAP sensor) higher than a threshold. The setpoint used for closed loop control is the intake manifold pressure: in this situation the diagnostic monitors the boost pressure closed loop control tracking error.	> (**P0299: Positive boost deviation threshold (throttle control not active)** [kPa] x **P0299, P2263: Underboost barometric correction**)	Calibration on diagnostic enabling	**P0234, P0299: Boost pressure control deviation enabling** ==TRUE	320.00 fail counters over 400.00 sample counters sampling time is 25ms	Type B, 2 Trips
					Engine Running	==TRUE		
					Cranking ignition in range	Battery voltage > 11.00 [V]		
					Relay voltage in range	Powertrain relay voltage > 11.00 [V]		
					Difficult launch NOT detected	Refer to "LDT_DifficultLaunchActive" Free Form		
					Boost Pressure Control Closed Loop active	AIC_BstCntrlCL==TRUE		
					No active transition from one combustion mode to another	==TRUE		
					Outside Air Temperature	> -7.00 [°C] AND < 55.00 [°C]		
					Desired Boost Pressure steady state: BstDes-BstDes_Old	> -18 [kPa/s] AND < 24 [kPa/s]		
					Engine speed	> 1,250.00 [rpm]		

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
		This monitor detects failures in the charging air system such to not fulfil the request of boost pressure in the intake manifold. It works only in steady state closed loop pressure control zone. The DTC checks a permanent positive control deviation of the boost pressure indicating an underboost condition. This monitor is used to detect any malfunction in the boost pressure system causing the vehicle's emissions to exceed the limits. The aim of the underboost pressure monitor is to detect leakages in the pipe after the compressor or in the intake/exhaust manifold. The boost pressure is usually controlled by the VGT vanes. The intake manifold pressure is also affected by the throttle valve and the EGR valve position changes. The aim of this procedure is to identify a limitation of the VGT vanes (equal to a leakage) that leads to exceed the emission			 Desired intake Boost pressure Engine Coolant Temperature OR OBD Coolant Enable Criteria, AND Engine Coolant Temperature Ambient Air Pressure Throttle Valve position No active DTCs Timer delay once all above conditions are	AND < 2,000.00 [rpm] > **P0299: Minimum boost pressure for underboost monitor enabling** [kPa] AND < **P0299: Maximum boost pressure for underboost monitor enabling** [kPa] > 70 [°C] ==TRUE < 117 [°C] > 70 [kPa] AND < 110 [kPa] >= 75.00 [%] AIC_BstSysDiagDenomDsbl ==FALSE > **P0299: Underboost monitor delay timer**		

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
		limits.			fulfilled	[s]		
			Boost pressure tracking error(difference between the desired boost pressure and the measured pressure at intake manifold by MAP sensor) higher than a threshold. The setpoint used for closed loop control is the conversion of the desired upstream throttle boost pressure (target) in desired intake boost pressure. The conversion of the setpoint is done calculating the pressure drop over the throttle valve that is strictly dependent on the valve position.	> (**P0299: Positive boost deviation threshold (throttle control active)** [kPa] x **P0299, P2263: Underboost barometric correction**)	Calibration on diagnostic enabling	**P0234, P0299: Boost pressure control deviation enabling** ==TRUE	320.00 fail counters over 400.00 sample counters sampling time is 25ms	
					Engine Running	==TRUE		
					Cranking ignition in range	Battery voltage > 11.00 [V]		
					Relay voltage in range	Powertrain relay voltage > 11.00 [V]		
					Difficult launch NOT detected	Refer to "LDT_DifficultLaunchActive" Free Form		
					Boost Pressure Control Closed Loop active	AIC_BstCntrlCL==TRUE		
					No active transition from one combustion mode to another	==TRUE		
					Outside Air Temperature	> -7.00 [°C] AND < 55.00 [°C]		
					Desired Boost Pressure steady state: BstDes-BstDes_Old	> -18 [kPa/s] AND < 24 [kPa/s]		

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
					Engine speed	> 1,250.00 [rpm] AND < 2,000.00 [rpm]		
					Desired intake Boost pressure	> **P0299: Minimum boost pressure for underboost monitor enabling** [kPa] AND < **P0299: Maximum boost pressure for underboost monitor enabling** [kPa]		
					Engine Coolant Temperature OR OBD Coolant Enable Criteria, AND Engine Coolant Temperature	> 70 [°C] ==TRUE < 117 [°C]		
					Ambient Air Pressure	> 70 [kPa] AND < 110 [kPa]		
					Throttle Valve position	>= 100.00 [%]		
					No active DTCs	AIC_BstSysDiagDenomDsbl ==FALSE		

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
					Timer delay once all above conditions are fulfilled	> **P0299: Underboost monitor delay timer** [s]		

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
Random Misfire Detected Cylinder 1 Misfire Detected Cylinder 2 Misfire Detected Cylinder 3 Misfire Detected Cylinder 4 Misfire Detected	P0300 P0301 P0302 P0303 P0304	These DTC's will determine if a random or a cylinder specific misfire is occurring by monitoring various terms derived from crankshaft velocity. The rate of misfire over an interval is compared to both emissions and catalyst damaging thresholds. The pattern of crankshaft acceleration after the misfire is checked to differentiate between real misfire and other sources of crank shaft noise.	Crankshaft Deceleration Value(s) vs. Engine Speed and Engine load The equation used to calculate deceleration value is tailored to specific vehicle operating conditions. The selection of the equation used is based on the 1st single cylinder continuous misfire threshold tables encountered that are not max of range. If all tables are max of range at a given speed/load, that speed load region is an ***Undetectable region*** see Algorithm Description Document for additional details. SINGLE CYLINDER CONTINUOUS MISFIRE((Medres_Decel Medres_Jerk OR (Medres_Decel Medres_Jerk OR (Lores_Decel Lores_Jerk OR (Lores_Decel Lores_Jerk OR RevBalanceTime)	- see details of thresholds on Supporting Tables Tab > **IdleSCD_Decel** AND > **IdleSCD_Jerk)** > **SCD_Decel** AND > **SCD_Jerk)** > **IdleCyl_Decel** AND > **IdleCyl_Jerk)** > **CylModeDecel** AND > **CylModeJerk)** >**RevMode_Decel**	Engine Run Time Engine Coolant Temp Or If ECT at startup Then ECT System Voltage + Throttle delta - Throttle delta Early Termination option: (used on plug ins that may not have enough engine run time at end of trip for normal interval to complete.)	> 2 crankshaft revolution -7 ºC < ECT < 125 ºC < -7 ºC 21 ºC < ECT < 125 ºC 9.00 < volts < 32.00 < 100.00 % per 25 ms < 100.00 % per 25 ms Not Enabled	Emission Exceedence = any (5) failed 200 rev blocks out of (16) 200 rev block tests Failure reported for (1) Exceedence in 1st (16) 200 rev block tests, or (4) Exceedences thereafter. OR when Early Termination Reporting = Enabled and engine rev > 1,000 revs and < 3,200 revs at end of trip any Catalyst Exceedence = (1) 200 rev block as data supports for catalyst damage.	Type B, 2 Trips (Mil Flashes with Catalyst damage level of Misfire)

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
			***************************** *Feature only used on Diesel engines Combustion Modes that force selection of Idle Tables *****************************	************************* *Feature only used on Diesel engines **CombustModeIdleTbl** in Supporting Tables *************************			Catalyst Failure reported with (1 or 3) Exceedences in FTP, or (1) Exceedence outside FTP. Continuous	
			Other patterns of misfire use adjustments to the single cylinder continuous misfire threshold tables: RANDOM MISFIRE Use random misfire thresholds If no misfire for	> 3 Engine Cycles				
			(Medres_Decel AND Medres_Jerk)	> **IdleSCD_Decel** * **Random_SCD_Decel** > **IdleSCD_Jerk** * **Random_SCD_Jerk**				
			OR (Medres_Decel AND Medres_Jerk)	> **SCD_Decel** * **Random_SCD_Decel** > **SCD_Jerk** * **Random_SCD_Jerk**				
			OR (Lores_Decel AND Lores_Jerk)	> **IdleCyl_Decel** * **RandomCylModDecel** > **IdleCyl_Jerk** * **RandomCylModJerk**				
			OR (Lores_Decel	> **CylModeDecel** *				

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
			AND Lores_Jerk) OR RevBalanceTime PAIRED CYLINDER MISFIRE If a cylinder & it's pair are above PAIR thresholds (Medres_Decel AND Medres_Jerk) OR (Medres_Decel AND Medres_Jerk) OR (Lores_Decel AND Lores_Jerk) OR (Lores_Decel AND Lores_Jerk) OR (Revmode Active AND	**RandomCylModDecel** > **CylModeJerk** * **RandomCylModJerk** > **RevMode_Decel** * **RandomRevModDecl** > **IdleSCD_Decel** * **Pair_SCD_Decel** > **IdleSCD_Jerk** * **Pair_SCD_Jerk** > **SCD_Decel** * **Pair_SCD_Decel** > **SCD_Jerk** * **Pair_SCD_Jerk** > **IdleCyl_Decel** * **PairCylModeDecel** > **IdleCyl_Jerk** * **PairCylModeJerk** > **CylModeDecel** * **PairCylModeDecel** > **CylModeJerk** * **PairCylModeJerk**				

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
			(within one engine cycle: 2nd largest Lores_Decel)	> **CylModeDecel * PairCylModeDecel**				
			AND Above TRUE for))	> 35 engine cycles out of 100 engine cycles				
			BANK MISFIRE Cylinders above Bank Thresholds	>= 3 cylinders				
			(Medres_Decel	> **IdleSCD_Decel** * **Bank_SCD_Decel**				
			AND Medres_Jerk)	> **IdleSCD_Jerk** * **Bank_SCD_Jerk**				
			OR (Medres_Decel	> **SCD_Decel** * **Bank_SCD_Decel**				
			AND Medres_Jerk)	> **SCD_Jerk** * **Bank_SCD_Jerk**				
			OR (Lores_Decel	> **IdleCyl_Decel** * **BankCylModeDecel**				
			AND Lores_Jerk)	>**IdleCyl_Jerk** * **BankCylModeJerk**				
			OR (Lores_Decel	> **CylModeDecel** * **BankCylModeDecel**				
			AND Lores_Jerk)	> **CylModeJerk** * **BankCylModeJerk**				

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
			CONSECUTIVE CYLINDER MISFIRE 1st cylinder uses single cyl continuous misfire thresholds; 2nd Cylinder uses: (Medres_Decel AND Medres_Jerk) OR (Medres_Decel AND Medres_Jerk) OR (Lores_Decel AND Lores_Jerk) OR (Lores_Decel AND Lores_Jerk) CYLINDER DEACTIVATION MODE (Active Fuel Managment) AFM: SINGLE CYLINDER	> **IdleSCD_Decel** * **ConsecSCD_Decel** > **IdleSCD_Jerk** * **ConsecSCD_Jerk** > **SCD_Decel** * **ConsecSCD_Decel** > **SCD_Jerk** * **ConsecSCD_Jerk** > **IdleCyl_Decel** * **ConsecCylModDecel** > **IdleSCD_Jerk** * **ConsecCylModeJerk** > **CylModeDecel** * **ConsecCylModDecel** > **CylModeJerk** * **ConsecCylModeJerk**				

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
			CONTINUOUS MISFIRE (CylAfterDeacCyl_Decel AND CylAfterDeacCyl_Jerk) OR (CylBeforeDeacCylDecel AND CylBeforeDeacCyl_Jerk) AFM: RANDOM MISFIRE Use random misfire thresholds If no misfire for (CylAfterDeacCyl_Decel AND CylAfterDeacCyl_Jerk) (CylBeforeDeacCylDecel AND CylBeforeDeacCyl_Jerk)	> **CylModeDecel** * **ClyAfterAFM_Decel** > **CylModeJerk** * **CylAfterAFM_Jerk** > **CylModeDecel** * **CylBeforeAFM_Decel** > **CylModeJerk** * **ClyBeforeAFM_Jerk** > 3 Engine Cycles > **CylModeDecel** * **ClyAfterAFM_Decel** * **RandomAFM_Decl** > **CylModeJerk** * **CylAfterAFM_Jerk** * **RandomAFM_Jerk** > **CylModeDecel** * **CylBeforeAFM_Decel** * **RandomAFM_Decl** > **CylModeJerk** * **ClyBeforeAFM_Jerk** * **RandomAFM_Jerk** - see details on Supporting Tables Tab				

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
			Misfire Percent Emission Failure Threshold	≥ 5.00 % P0300				
			Misfire Percent Catalyst Damage When engine speed and load are less than the FTP cals (3) catalyst damage exceedences are allowed.	> **Catalyst_Damage_Misfire_Percentage** in Supporting Tables whenever secondary conditions are met. ≤ 0 FTP rpm AND ≤ 10 FTP % load	(at low speed/loads, one cylinder may not cause cat damage) Engine Speed Engine Load Misfire counts	> 1,000 rpm AND > 20 % load AND < 180 counts on one cylinder		
				disable conditions:	Engine Speed	580 < rpm < ((Engine Over Speed Limit) - 400) OR 8,191) Engine speed limit is a function of inputs like Gear and temperature see **EngineOverSpeedLimit** in supporting tables	4 cycle delay	
					No active DTCs:	TPS_FA EnginePowerLimited	4 cycle delay	

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
						MAF_SensorTFTKO MAP_SensorTFTKO IAT_SensorTFTKO ECT_Sensor_Ckt_TFTKO 5VoltReferenceB_FA CrankSensor_TFTKO CrankSensor_FA CamLctnIntFA CamLctnExhFA CamSensorAnyLctnTFTKO AnyCamPhaser_FA AnyCamPhaser_TFTKO AmbPresDfltdStatus		
					P0315 & engine speed	> 1,000 rpm	4 cycle delay	
					Fuel Level Low	LowFuelConditionDiagnostic	500 cycle delay	
					Cam and Crank Sensors	in sync with each other	4 cycle delay	
					Misfire requests TCC unlock	Not honored because Transmission in hot mode or POPD intrusive diagnostic running	4 cycle delay	
					Fuel System Status	≠ Fuel Cut	4 cycle delay	
					Active FuelManagement	Transition in progress	0 cycle delay	
					Undetectable engine speed and engine load region	***Undetectable region*** from Malfunction Criteria	4 cycle delay	
					Abusive Engine Over Speed	> 8,192 rpm	0 cycle delay	
					Below zero torque (except CARB approved 3000 rpm to redline triangle.)	< **ZeroTorqueEngLoad** or <**ZeroTorqueAFM** if AFM is active	4 cycle delay	

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
						in Supporting Tables		
					Below zero torque: TPS Vehicle Speed	≤ 100.0 % (≤ 2.0 % in AFM) > 19 mph (> 19 mph AFM)	4 cycle delay	
					NEGATIVE TORQ AFM If deactivated cylinders appear to make power, torque is negative: DeactivatedCyl_Decel AND DeactivatedCyl_Jerk AND # of Deact Cyls Inverted	<**DeacCylInversionDecel** <**DeacCylInversionJerk** > 0 cylinders	0 cycle delay	
					EGR Intrusive test	Active	12 cycle delay	
					Manual Trans	Clutch shift	4 cycle delay	
					Accel Pedal Position AND Automatic transmission shift	> 1.00 %	0 cycle delay	
					After Fuel resumes on Automatic shift containing Fuel Cut		2 Cylinder delay	
					Delay if PTO engaged	Enabled	4 cycle delay	
					****************************** *Feature only used on Diesel engines	******************************	******************	
					Combustion Mode		4 cycle delay	

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
						= **InfrequentRegen** value in Supporting Tables		
					Driver cranks before Wait to Start lamp extinguishes	IF TRUE	**WaitToStart** cycle delay	
					Brake Torque ******************************	> 199.99 % Max Torque ******************************	4 cycle delay ******************	
					DRIVELINE RING FILTER After a low level misfire, another misfire may not be detectable until driveline ringing ceases. If no ringing seen, stop filter early.			
					Filter Driveline ring:	> "**Ring Filter**" # of engine cycles after misfire in Supporting Tables		
					Stop filter early:	> "**Number of Normals**" # of engine cycles after misfire in Supporting Tables tab		
					ABNORMAL ENGINE SPEED OSCILLATION: (checks each "misfire" candidate in 100 engine Cycle test to see if it looks like some disturbance like rough road (abnormal).)			
					Used Off Idle, and while not shifting, TPS Engine Speed Veh Speed Auto Transmission	 > 200 % > 1,000 rpm > 3 mph not shifting		
					indivdual candidate deemed abnormal if			

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
					number of consecutive decelerating cylinders after "misfire": (Number of decels can vary with misfire detection equation) Consecutive decels while in SCD Mode Cyl Mode Rev Mode	 > **Abnormal SCD Mode** > **Abnormal Cyl Mode** > **Abnormal Rev Mode** in Supporting Tables		
					At the end of 100 engine cycle test, the ratio of abnormal/candidate is checked to confirm if real misfire is present within the 100 engine cycles. abnormal candidates/ total candidates	 > 0.50 ratio	discard 100 engine cycle test	
					MISFIRE CRANKSHAFT PATTERN RECOGNITION checks each "misfire" candidate in 100 engine Cycle test to see if overall crankshaft pattern looks like real misfire (recognized), or some disturbance like rough road (unrecognized). At the end of 100 engine cycle test, the ratio of unrecog/recognized is checked to confirm if real			

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
					misfire is present within the 100 engine cycles. Typically used for checking a single misfire per engine cycle but can support some other patterns on some packages			
					Pattern Recog Enabled:	Enabled		
					Pattern Recog Enabled during Cylinder Deac	Not Enabled		
					Pattern Recog Enabled consecutive cyl pattrn	Enabled		
					Engine Speed	700 < rpm < 6,800		
					Veh Speed	> 0.6 mph		
					The 1st check for "recognized" is the 1st fired cylinder after the misfire candidate should both accelerate and jerk an amount based acceleration and jerk of Single Cylinder Misfire thresholds in effect at that speed and load.			
					(CylAfter_Accel AND CylAfter_Jerk)	> Misfire_ decel ***** **1st_FireAftrMisfr_Acel** > Misfire_Jerk ***** **1st_FireAftrMisfr_Jerk** Or if AFM mode is active: > Misfire_ decel * **1stFireAftrMisAcelAFM** > Misfire_Jerk * **1stFireAfterMisJerkAFM**		

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
					Addtionally, the crankhaft is checked again a small calibratible number of cylinders later to see if the distrubance is still large like rough road, or has calmed down like real misfire. The size of disturbance is compared to a multiplier times the ddt_jerk value used to detect misfire at that speed and load. If there is repetitive misfire on consecutive engine cycles, the expected snap is adjusted due to the higher expected disturbance. Num of Cylinders after misfire to start check of crankshaft snap "misfire" recognized if: Crankshaft snap after: isolated "misfire" repetative "misfire" At the end of 100 engine cycle test, the ratio of unrecog/recognized is checked to confirm if real misfire is present. Ratio of Unrecog/Recog	2 Cylinders < Misfire_Jerk *** SnapDecayAfterMisfire** < Misfire_Jerk * **SnapDecayAfterMisfire * RepetSnapDecayAdjst** in Supporting Tables > 1.00	discard 100 engine cycle test	

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
					: NON-CRANKSHAFT BASED ROUGH ROAD: Rough Road Source IF Rough Road Source = WheelSpeedInECM ABS/TCS Wheel speed noise VSES IF Rough Road Source = "FromABS" ABS/TCS RoughRoad VSES IF Rough Road Source = "TOSS" TOSS dispersion AND No Active DTCs	Disabled CeRRDR_e_None active > **WSSRoughRoadThres** active active detected active >**TOSSRoughRoadThres** in supporting tables Transmission Output Shaft Angular Velocity Validity TransmissionEngagedState_FA (Auto Trans only) ClutchPstnSnsr FA (Manual Trans only)	discard 100 engine cycle test discard 100 engine cycle test discard 100 engine cycle test 4 cycle delay	

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
Crankshaft Position System Variation Not Learned	P0315	Monitor for valid crankshaft tooth values	Differance between 360 degrees and the sum of the reluctor wheel's teeth	> 0.001 degrees	OBD Manufacturer Enable Counter	MEC = 0	0.50 seconds Frequency Continuous100 msec	Type A, 1 Trips

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
Crankshaft Position (CKP) Sensor A Circuit	P0335	Determines if a fault exists with the crank position sensor signal	Time since last crankshaft position sensor pulse received	>= 4.0 seconds	Starter engaged AND (cam pulses being received OR (MAF_SensorFA AND Engine Air Flow	 = FALSE > 2.0 grams/second))	Continuous every 100 msec	Type A, 1 Trips
			No crankshaft pulses received	>= 0.3 seconds	Engine is Running Starter is not engaged		Continuous every 12.5 msec	
			No crankshaft pulses received		Engine is Running OR Starter is engaged No DTC Active:	 P0340 P0341	2 failures out of 10 samples One sample per engine revolution	

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
Crankshaft Position (CKP) Sensor A Performance	P0336	Determines if a performance fault exists with the crank position sensor signal	Time in which 10 or more crank re-synchronizations occur	< 10.0 seconds	Engine Air Flow Cam-based engine speed No DTC Active:	>= 2.0 grams/second > 450 RPM P0335	Continuous every 250 msec	Type A, 1 Trips
			No crankshaft synchronization gap found	>= 0.4 seconds	Engine is Running Starter is not engaged		Continuous every 12.5 msec	
			Time since starter engaged without detecting crankshaft synchronization gap	>= 1.5 seconds	Starter engaged AND (cam pulses being received OR (MAF_SensorFA AND Engine Air Flow	= FALSE > 2.0 grams/second))	Continuous every 100 msec	
			Crank pulses received in one engine revolution OR Crank pulses received in one engine revolution	< 51 > 65	Engine is Running OR Starter is engaged No DTC Active:	P0340 P0341	8 failures out of 10 samples One sample per engine revolution	

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
Camshaft Position (CMP) Sensor Circuit Bank 1 Sensor A	P0340	Determines if a fault exists with the cam position bank 1 sensor A signal	Time since last camshaft position sensor pulse received OR Time that starter has been engaged without a camshaft sensor pulse	>= 5.5 seconds >= 4.0 seconds	Starter engaged AND (crank pulses being received OR (MAF_SensorFA AND Engine Air Flow	= FALSE > 2.0 grams/second))	Continuous every 100 msec	Type A, 1 Trips
			Fewer than 4 camshaft pulses received in a time	> 3.0 seconds	Engine is running Starter is not engaged		Continuous every 100 msec	
			No camshaft pulses received during first 12 MEDRES events (There are 12 MEDRES events per engine cycle		Crankshaft is synchronized Starter must be engaged to enable the diagnostic, but the diagnostic will not disable when the starter is disengaged No DTC Active:	CrankSensor_FA	Continuous every MEDRES event	
			The number of camshaft pulses received during 100 engine cycles	= 0	Crankshaft is synchronized No DTC Active:	CrankSensor_FA	8 failures out of 10 samples Continuous every engine cycle	

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
Camshaft Position (CMP) Sensor Performance Bank 1 Sensor A	P0341	Determines if a performance fault exists with the cam position bank 1 sensor A signal	The number of camshaft pulses received during first 12 MEDRES events is OR (There are 12 MEDRES events per engine cycle)	< 4 > 6	Crankshaft is synchronized Starter must be engaged to enable the diagnostic, but the diagnostic will not disable when the starter is disengaged No DTC Active:	CrankSensor_FA	Continuous every MEDRES event	Type A, 1 Trips
			The number of camshaft pulses received during 100 engine cycles OR	< 398 > 402	Crankshaft is synchronized No DTC Active:	CrankSensor_FA	8 failures out of 10 samples Continuous every engine cycle	

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
Exhaust Gas Recirculation (EGR) System Performance	P0400	This monitor detects failures in the air system such to lead to an excessive EGR flow rate through the intake manifold that could lead to clog the DPF or jerk the engine. It works both when EGR flow is managed with a mass air flow request or with an O2 concentration request (the mass air flow error is always calculated). This monitor is used to detect any malfunction in the air system that lead to very high EGR rate that could lead to damage the intake manifold or the EGR cooler outlet pipe. The monitor shall not overlap with the Excessive EGR flow emission correlated monitor.	Air mass tracking error: difference between the fresh air requested (set point) and the fresh air measured by MAF sensor.	> **P0400: EGR flow performance threshold (air mass tracking error)** [mg]	System performance diagnostic enabled by calibration	1.00 ==TRUE	179.00 fail counters over 360.00 sample counters	Type B, 2 Trips
					Engine Running	==TRUE	sampling time is 25 ms	
					Cranking ignition in range	Battery voltage > 11.00 [V]		
					Relay voltage in range	Powertrain relay voltage > 11.00 [V]		
					Air Control is Active (air control in closed loop)	AIC_AirCntrlShtOffAction ==Ce_AICR_e_CntrlActv		
					Desired EGR rate	> 0 [%]		
					A transition between different combustion modes is ended	==TRUE		
					Engine speed is steady state: |RPM-RPM_old|	> 6 [rpm] AND < 21 [rpm]		
					for a minimum number of samples	> 50 [counts]		
					Fuel request is steady state: |FUEL-FUEL_old|	> 0.10 [mm^3]] AND < 1.00 [mm^3]		
					for a minimum number of samples	> 50 [counts]		

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
					Flow deviation diagnostic enabled	1.00 ==TRUE		
			Air mass tracking error: difference between the fresh air requested (set point) and the fresh air measured by MAF sensor.	> **P0400: EGR flow performance threshold (air flow tracking error)** [mg]	System performance diagnostic enabled by calibration	1.00 ==TRUE	179.00 fail counters over 360.00 sample counters sampling time is 25 ms	
					Engine Running	==TRUE		
					Cranking ignition in range	Battery voltage > 11.00 [V]		
					Relay voltage in range	Powertrain relay voltage > 11.00 [V]		
					Air Control is Active (air control in closed loop)	AIC_AirCntrlShtOffAction ==Ce_AICR_e_CntrlActv		
					Desired EGR rate	> 0 [%]		
					A transition between different combustion modes is ended	==TRUE		
					Engine speed is steady state: |RPM-RPM_old|	> 6 [rpm] AND < 21 [rpm]		
					for a minimum number of samples	> 50 [counts]		
					Fuel request is steady	> 0.10 [mm^3]		

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
					state: |FUEL-FUEL_old|	AND < 1.00 [mm^3]		
					for a minimum number of samples	> 50 [counts]		
					Flow deviation diagnostic enabled	1.00 ==TRUE		

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
Exhaust Gas Recirculation (EGR) Flow insufficient (for OBDII market)	P0401	This monitor detects failures in the air system such to not fulfil the request of mass air flow through the intake circuit. It works both when EGR flow is managed with a mass air flow request or with an O2 concentration request (the mass air flow error is always calculated). This monitor is used to detect any malfunction in the air system that lead to higher/lower EGR rate causing the vehicle's emissions to exceed the emission limits. The aim of the EGR flow monitor is to detect HP EGR obstructions (insufficient EGR flow). The EGR flow depends on several variables like the HP EGR valve position, intake manifold pressure, exhaust pressure, EGR cooler outlet temperature. The aim of this procedure is to identify a limitation of the HP EGR (equal to an obstruction) that leads to exceed the OBDII limits.	Air mass tracking error: difference between the fresh air requested (set point) and the fresh air measured by MAF sensor.	< (SeaBaro Constant x **P0401: Insufficient EGR flow barometric table B (sea level)** [mg]) + (MidBaro Constant x **P0401: Insufficient EGR flow barometric table B (mid level)** [mg]) + (LoBaro Constant x **P0401: Insufficient EGR flow barometric table B (low level)** [mg]) + (SeaBaro Constant x	Calibration on diagnostic enabling Flow deviation diagnostic enabled by calibration Engine Running Cranking ignition in range Relay voltage in range Air Control is Active (air control in closed loop) Engine speed is steady state: |RPM-RPM_old| for a minimum number of samples Fuel request is steady state: |FUEL-FUEL_old| for a minimum number of samples Desired EGR rate	**P0401, P0402: EGR flow monitor enabling** ==TRUE 1.00 ==TRUE ==TRUE Battery voltage > 11.00 [V] Powertrain relay voltage > 11.00 [V] AIC_AirCntrlShtOffAction ==Ce_AICR_e_CntrlActv > 6 [rpm] AND < 21 [rpm] > 50 [counts] > 0.10 [mm^3] AND < 1.00 [mm^3] > 50 [counts] > 0 [%]	320.00 fail counters over 400.00 sample counters sampling time is 25 ms	Type B, 2 Trips

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
				P0401: Insufficient EGR flow barometric table A (sea level) [mg] x **P0401: Insufficient EGR flow barometric correction (sea level)**) + (MidBaro Constant x **P0401: Insufficient EGR flow barometric table A (mid level)** [mg] x **P0401: Insufficient EGR flow barometric correction (mid level)**) + (LoBaro Constant x **P0401: Insufficient EGR flow barometric table A (low level)** [mg] x **P0401: Insufficient EGR flow barometric correction (low level)**)	A transition between different combustion modes is ended OR Disabled by calibration	==TRUE OR 1.00 ==TRUE		
					A combustion mode transition is NOT active	==TRUE		
					Throttle measured position	> 90.00 [%]		
					Desired EGR flow	> **P0401: Minimum desired EGR flow**[mg]		
					Desired fuel quantity	> 10.00 [mm^3] AND < 25.00 [mm^3]		
					Engine speed	> 1,600.00 [rpm] AND < 1,900.00 [rpm]		
					Outside air temperature	> -7.00 [°C]		
					Ambient air pressure	> 69.60 [kPa]		
					OBD Coolant Enable Criteria	==TRUE		
					No faults on proper			

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
					temperature sensor All Enabling conditions last for a time	AIC_EGR_FlowDiagAirTe mpFA ==FALSE > 1.00 [s]		

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
Exhaust Gas Recirculation (EGR) Flow excessive (for OBDII market)	P0402	It detects excessive EGR flow. Actual MAF readings are compared to desired fresh air mass values as an indication of how much EGR is flowing.This monitor detects failures in the air system such to not fulfil the request of mass air flow through the intake circuit. It works both when EGR flow is managed with a mass air flow request or with an O2 concentration request (the mass air flow error is always calculated). This monitor is used to detect any malfunction in the air system that lead to higher/lower EGR rate causing the vehicle's emissions to exceed the emission limits. The aim of the EGR flow monitor is to detect HP EGR valve leakages (excessive EGR flow). The EGR flow depends on several variables like the HP EGR valve position, intake manifold pressure, exhaust pressure, EGR cooler outlet temperature. The aim	Air mass tracking error: difference between the fresh air requested (set point) and the fresh air measured by MAF sensor.	> (SeaBaro Constant x **P0402: Excessive EGR flow barometric table B (sea level)** [mg]) + (MidBaro Constant x **P0402: Excessive EGR flow barometric table B (mid level)** [mg]) + (LoBaro Constant x **P0402: Excessive EGR flow barometric table B (low level)** [mg]) + (SeaBaro Constant x	Calibration on diagnostic enabling	**P0401, P0402: EGR flow monitor enabling** ==TRUE	375.00 fail counters over 500.00 sample counters	Type B, 2 Trips
					Flow deviation diagnostic enabled by calibration	1.00 ==TRUE	sampling time is 25 ms	
					Engine Running	==TRUE		
					Cranking ignition in range	Battery voltage > 11.00 [V]		
					Relay voltage in range	Powertrain relay voltage > 11.00 [V]		
					Air Control is Active (air control in closed loop)	AIC_AirCntrlShtOffAction ==Ce_AICR_e_CntrlActv		
					Engine speed is steady state: |RPM-RPM_old|	> 6 [rpm] AND < 21 [rpm]		
					for a minimum number of samples	> 50 [counts]		
					Fuel request is steady state: |FUEL-FUEL_old|	> 0.10 [mm^3] AND < 1.00 [mm^3]		
					for a minimum number of samples	> 50 [counts]		
					Desired EGR rate	> 0 [%]		

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
		of this procedure is to identify a limitation of the HP EGR (equal to a leakage) that leads to exceed the OBDII limits.		**P0402: Excessive EGR flow barometric table A (sea level)** [mg] x **P0402: Excessive EGR flow barometric correction (sea level)**) + (MidBaro Constant x **P0402: Excessive EGR flow barometric table A (mid level)** [mg] x **P0402: Excessive EGR flow barometric correction (mid level)**) + (LoBaro Constant x **P0402: Excessive EGR flow barometric table A (low level)** [mg] x **P0402: Excessive EGR flow barometric correction (low level)**)	A transition between different combustion modes is ended OR Disabled by calibration A combustion mode transition is not active Throttle measured position Desired EGR flow Desired fuel quantity Engine speed Outside air temperature Ambient air pressure OBD Coolant Enable Criteria	==TRUE OR 1.00 ==TRUE ==TRUE > 90.00 [%] < **P0402: Maximum desired EGR flow**[mg] > 45.00 [mm^3] AND < 65.00 [mm^3] > 1,550.00 [rpm] AND < 1,950.00 [rpm] > -7.00 [°C] > 69.60 [kPa] ==TRUE		

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
					No faults on proper temperature sensor	AIC_EGR_FlowDiagAirTempFA ==FALSE		
					All Enabling conditions last for a time	> 1.00 [s]		

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
Warm Up Catalyst Efficiency Below Threshold Bank 1	P0421	The Catalyst (CC DOC) monitor only runs during DPF regeneration and compares the CC DOC released oxidation heat and the post-injected fuel quantity both evaluated inside a determined portion of the DPF regeneration itself. This comparison (ratio) produces an Aging Index that shall be greater than the efficiency threshold, in case of fresh (efficient) Catalyst. If, instead, the so calculated Aging Index is below the efficiency threshold, the diagnosis reports fail cause the Catalyst is too much damaged to play well its role (conversion inefficiency detected) and shall be replaced. It is needed that post-injection is enabled during CC DOC monitor in order to produce enough exothermic heat across the Catalyst to evaluate the component conversion efficiency in a reliable way. EWMA Filtering functionality (including	Catalyst Aging Index < Threshold If - Catalyst EWMA filter enabling calibration = TRUE AND - Catalyst conversion inefficiency previously detected (Catalyst Fault Active = TRUE) Then: Catalyst Aging Index < Threshold	Aging Index < **CatCrtdEffThrsh** [Curve] If EWMA Enbl Cal = 0.00 [Boolean] AND Catalyst FA = CAT_CatSysEffLoB1_FA Then: Aging Index < **CatCrtdEffRepEWMA** [Curve]	- Catalyst monitor enabling calibration = TRUE AND No active DTCs: - Catalyst up temperature sensor not in fault (Fault Flag = FALSE) AND - Catalyst down temperature sensor not in fault (Fault Flag = FALSE); Temperature Learning concluded: - Number of elapsed samples (task time = 100 [ms]) equal to calibration; Catalyst monitor status is DISABLED if: - DPF regeneration disabled OR - Injection system in fault (Fault Flag = TRUE) OR - Ambient temperature information in fault (Fault Active = TRUE) OR - Catalyst up exhaust flow estimation in fault (Fault Flag = TRUE)	Monitor Enbl Cal = 1.00 [Boolean] AND Cat Up Temp Snsr Flt = NOT (EGT_SnsrCatUpFlt) AND Cat Dwn Temp Snsr Flt = NOT (EGT_SnsrCatDwnFlt); Samples nr. = 10.00 [Counter]; VeCATD_e_CatSt = TeCATR_e_CatMontrSt.CeCATD_e_MontrDsbld [Enumerative] DPF_DPF_St = TeDPFR_e_DPF_St.CeDPFR_e_SootLoading [Enumerative] OR Injection System Flt = FUL_GenericInjSysFlt OR Amb Temp FA = CAT_OutsideTempFA OR Cat Up Exh Flow Flt = EXF_TotExhCatUpFlt	Task Time = 100 [ms] If - Catalyst EWMA filter enabling cailibration = FALSE (EWMA Enbl Cal = 0.00 [Boolean]) Then: 2 trips (with malfunction) to set DTC (Type B) If - Catalyst EWMA filter enabling cailibration = TRUE (EWMA Enbl Cal = 0.00 [Boolean]) AND - EWMA status = EWMA Standard (NeCATD_e_EWMA_CalcStatCatEff = TeCATR_e_Status_EWMA.CeCATR_e_EWMA_Standard) Then: 1 trip (with malfunction) to set DTC (Type A)	Type B, 2 Trips

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
		Fast Initial Response (FIR), Rapid Response (RR) and EWMA Standard) is supported by the Catalyst (CC DOC) monitor. In MY16 sw the mentioned monitor only runs in the following below exhaust configuration (NA XLDE): - C_UI_SCR_HCI_C_DPF: Close Coupled DOC (Catalyst) --> Urea Injector --> Selective Catalyst Reduction --> Hydro Carbon Injector --> Under Floor DOC (Second Catalyst) --> Diesel Particulate FIlter			OR - Ambient pressure lower than calibration OR - Ambient temperature lower than calibration OR - Catalyst monitor already performed successfully in current driving cycle (Catalyst monitor shall run only once per driving cycle) OR HC unloading enabled; Catalyst monitor status can move from DISABLED to TRIGGERED if: - DPF regeneration enabled AND - Injection system not in fault (Fault Flag = FALSE) AND - Ambient temperature information not in fault (Fault Active = FALSE) AND - Catalyst up exhaust flow estimation not in fault (Fault Flag = FALSE) AND - Ambient pressure higher than calibration AND	OR Amb Press < 70.00 [KPa] OR Amb Temp < 266.00 [K] OR Catalyst monitor already performed successfully in current driving cycle (Catalyst monitor shall run only once per driving cycle) [Boolean] OR HCI_DeHC_ExhInjDsbl = TRUE [Boolean]; VeCATD_e_CatSt = TeCATR_e_CatMontrSt.CeCATD_e_MontrTrg [Enumerative] DPF_DPF_St ≠ TeDPFR_e_DPF_St.CeDPFR_e_SootLoading [Enumerative] AND Injection System Flt = NOT (FUL_GenericInjSysFlt) AND Amb Temp FA = NOT (CAT_OutsideTempFA) AND Cat Up Exh Flow Flt = NOT (EXF_TotExhCatUpFlt) AND Amb Press > 70.00 [KPa] AND	If - Catalyst EWMA filter enabling cailibration = TRUE (EWMA Enbl Cal = 0.00 [Boolean]) AND - EWMA status = Fast Initial Response (FIR) (NeCATD_e_EWMA_CalcStatCatEff = TeCATR_e_Status_EWMA.CeCATR_e_EWMA_FIR) Then: - 1 trip (with malfunction) to set DTC (Type A) and return to EWMA status = EWMA Standard (NeCATD_e_EWMA_CalcStatCatEff = TeCATR_e_Status_EWMA.CeCATR_e_EWMA_Standard) - 0.00 [Counter] elapsed trips (with no mulfunction) to report pass and return to EWMA status = EWMA Standard (NeCATD_e_EWMA_CalcStatCat	

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
					- Ambient temperature higher than calibration AND - Catalyst monitor not yet performed successfully in current driving cycle (Catalyst monitor shall run only once per driving cycle) AND - If DPF regeneration has been interrupted in previous driving cycle or in current driving cycle Then: Engine coolant temperature lower than calibration AND - Catalyst up exhaust temperature (by sensor) lower than calibration; Catalyst monitor status can move from TRIGGERED to ENABLED (oxidation heat release integrator and post injected fuel integrator are both enabled) if: - DPF regeneration enabled AND - Injection system not in fault (Fault Flag = FALSE) AND	Amb Temp > 266.00 [K] AND Catalyst monitor not yet performed successfully in current driving cycle (Catalyst monitor shall run only once per driving cycle) [Boolean] AND If Interrupted DPF regeneration counter > 0 [Counter] Then: Eng Cool Temp < 255.99 [°C] AND Cat Up Temp Snsr < 1,500.00 [K]; VeCATD_e_CatSt = TeCATR_e_CatMontrSt.CeCATD_e_MontrEnbl [Enumerative] DPF_DPF_St ≠ TeDPFR_e_DPF_St.CeDPFR_e_SootLoading [Enumerative] AND Injection System Flt = NOT (FUL_GenericInjSysFlt) AND	Eff = TeCATR_e_Status_EWMA.CeCATR_e_EWMA_Standard) If - Catalyst EWMA filter enabling cailibration = TRUE (EWMA Enbl Cal = 0.00 [Boolean]) AND - EWMA status = Rapid Response (RR) (NeCATD_e_EWMA_CalcStatCatEff = TeCATR_e_Status_EWMA.CeCATR_e_EWMA_RR) Then: - 1 trip (with malfunction) to set DTC (Type A) and return to EWMA status = EWMA Standard (NeCATD_e_EWMA_CalcStatCatEff = TeCATR_e_Status_EWMA.CeCATR_e_EWMA_Standard) - 1 trip (with no mulfunction) to report pass	

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
					- Ambient temperature information not in fault (Fault Active = FALSE) AND - Catalyst up exhaust flow estimation not in fault (Fault Flag = FALSE) AND - Ambient pressure higher than calibration AND - Ambient temperature higher than calibration AND - Catalyst monitor not yet performed successfully in current driving cycle (Catalyst monitor shall run only once per driving cycle) AND - Catalyst up exhaust temperature (by sensor) higher than calibration AND - Post injection enabled AND - Catalyst up exhaust flow estimation higher than calibration AND - Post injection fuel rate higher than calibration; Oxidation heat release integrator and post injected fuel integrator are both frozen if: - Engine not running OR - Catalyst up exhaust flow	Amb Temp FA = NOT (CAT_OutsideTempFA) AND Cat Up Exh Flow Flt = NOT (EXF_TotExhCatUpFlt) AND Amb Press > 70.00 [KPa] AND Amb Temp > 266.00 [K] AND Catalyst monitor not yet performed successfully in current driving cycle (Catalyst monitor shall run only once per driving cycle) [Boolean] AND Cat Up Temp Snsr > 0.00 [K] AND FUL_PostEnbl = TRUE [Boolean] AND Cat Up Exh Flow > 10.00 [g/s] AND Post Inj Fuel Qnty > 0.00 [g/s]; OR Cat Up Exh Flow < 10.00	- 0.00 [Counter] elapsed trips (with no mulfunction) to report pass and return to EWMA status = EWMA Standard (NeCATD_e_EWMA_CalcStatCatEff = TeCATR_e_Status_EWMA.CeCATR_e_EWMA_Standard)	

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
					estimation lower than calibration OR - Post injection fuel rate lower than calibration; Catalyst monitor status can move from ENABLED (oxidation heat release integrator and post injected fuel integrator are both enabled) to DONE (integrators are stopped and the ratio between the total integrated oxidation heat and the total integrated injected fuel is performed with the consequent creation of the Catalyst Aging Index to be compared with the Fault Threshold --> Diagnostic test evaluation trigger) if: - DPF regeneration enabled AND - Injection system not in fault (Fault Flag = FALSE) AND - Ambient temperature information not in fault (Fault Active = FALSE) AND - Catalyst up exhaust flow estimation not in fault (Fault Flag = FALSE) AND	[g/s] OR Post Inj Fuel Qnty < 0.00 [g/s]; VeCATD_e_CatSt = TeCATR_e_CatMontrSt.CeCATD_e_MontrDone [Enumerative] DPF_DPF_St ≠ TeDPFR_e_DPF_St.CeDPFR_e_SootLoading [Enumerative] AND Injection System Flt = NOT (FUL_GenericInjSysFlt) AND Amb Temp FA = NOT (CAT_OutsideTempFA) AND Cat Up Exh Flow Flt = NOT (EXF_TotExhCatUpFlt) AND		

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
					- Ambient pressure higher than calibration AND - Ambient temperature higher than calibration AND - Catalyst monitor not yet performed successfully in current driving cycle (Catalyst monitor shall run only once per driving cycle) AND - Integrated post injected fuel quantity higher than curve.	Amb Press > 70.00 [KPa] AND Amb Temp > 266.00 [K] AND Catalyst monitor not yet performed successfully in current driving cycle (Catalyst monitor shall run only once per driving cycle) [Boolean] AND Intgr Post Inj Fuel Qnty > **CatCrtdMaxFuel** [g].		

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
Main Catalyst Efficiency Below Threshold Bank 1	P0422	The Second Catalyst (UF DOC) monitor only runs during DPF regeneration and compares the UF DOC released oxidation heat and the exhaust-injected fuel quantity (by HCI) both evaluated inside a determined portion of the DPF regeneration itself. This comparison (ratio) produces an Aging Index that shall be greater than the efficiency threshold, in case of fresh (efficient) Second Catalyst. If, instead, the so calculated Aging Index is below the efficiency threshold, the diagnosis reports fail cause the Second Catalyst is too much damaged to play well its role (conversion inefficiency detected) and shall be replaced. It is needed that exhaust-injection (by HCI) is enabled during UF DOC monitor in order to produce enough exothermic heat across the Second Catalyst to evaluate the component conversion efficiency in a reliable way.	Second Catalyst Aging Index < Threshold If - Second Catalyst EWMA filter enabling calibration = TRUE AND - Second Catalyst conversion inefficiency previously detected (Second Catalyst Fault Active = TRUE) Then: Second Catalyst Aging Index < Threshold	Aging Index < **Cat2_CrtdEffThrsh** [Curve] If EWMA Enbl Cal = 0.00 [Boolean] AND Second Catalyst FA = CAT_Cat2_SysEffLoB1_FA Then: Aging Index < **Cat2CrtdEffRepEWMA** [Curve]	- Second Catalyst monitor enabling calibration = TRUE AND No active DTCs: - Second Catalyst up temperature estimation not in fault (Fault Flag = FALSE) AND - Second Catalyst down temperature sensor not in fault (Fault Flag = FALSE); Temperature Learning concluded: - Number of elapsed samples (task time = 100 [ms]) equal to calibration; Second Catalyst monitor status is DISABLED if: - DPF regeneration disabled OR - HCI system in fault (Fault Flag = TRUE) OR - Ambient temperature information in fault (Fault Active = TRUE) OR - Second Catalyst up exhaust flow estimation in	Monitor Enbl Cal = 1.00 [Boolean] AND Cat2 Up Temp Estim Flt = NOT (EGT_TempCat2_UpFlt) AND Cat2 Dwn Temp Snsr Flt = NOT (EGT_SnsrCat2_DwnFlt); Samples nr. = 10.00 [Counter]; VeCATD_e_Cat2_St = TeCATR_e_CatMontrSt.CeCATD_e_MontrDsbld [Enumerative] DPF_DPF_St = TeDPFR_e_DPF_St.CeDPFR_e_SootLoading [Enumerative] OR HCI System Flt = HCI_GenericShtOffReq OR Amb Temp FA = CAT_OutsideTempFA OR Cat2 Up Exh Flow Flt = EXF_TotExhCat2_UpFlt	Task Time = 100 [ms] If - Second Catalyst EWMA filter enabling cailibration = FALSE (EWMA Enbl Cal = 0.00 [Boolean]) Then: 2 trips (with malfunction) to set DTC (Type B) If - Second Catalyst EWMA filter enabling cailibration = TRUE (EWMA Enbl Cal = 0.00 [Boolean]) AND - EWMA status = EWMA Standard (NeCATD_e_EWMA_CalcStatCat2_Eff = TeCATR_e_Status_EWMA.CeCATR_e_EWMA_Standard) Then: 1 trip (with malfunction) to set DTC (Type A)	Type A, 1 Trips

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
		EWMA Filtering functionality (including Fast Initial Response (FIR), Rapid Response (RR) and EWMA Standard) is supported by the Second Catalyst (UF DOC) monitor. In MY16 sw the mentioned monitor only runs in the following below exhaust configuration (NA XLDE): - C_UI_SCR_HCI_C_DPF: Close Coupled DOC (Catalyst) --> Urea Injector --> Selective Catalyst Reduction --> Hydro Carbon Injector --> Under Floor DOC (Second Catalyst) --> Diesel Particulate FIlter			fault (Fault Flag = TRUE) OR - Ambient pressure lower than calibration OR - Ambient temperature lower than calibration OR - Second Catalyst monitor already performed successfully in current driving cycle (Second Catalyst monitor shall run only once per driving cycle) OR HC unloading enabled; Second Catalyst monitor status can move from DISABLED to TRIGGERED if: - DPF regeneration enabled AND - HCI system not in fault (Fault Flag = FALSE) AND - Ambient temperature information not in fault (Fault Active = FALSE) AND - Second Catalyst up exhaust flow estimation not in fault (Fault Flag = FALSE) AND - Ambient pressure higher	OR Amb Press < 70.00 [KPa] OR Amb Temp < 266.00 [K] OR Second Catalyst monitor already performed successfully in current driving cycle (Second Catalyst monitor shall run only once per driving cycle) [Boolean] OR HCI_DeHC_ExhInjDsbl = TRUE [Boolean]; VeCATD_e_Cat2_St = TeCATR_e_CatMontrSt.CeCATD_e_MontrTrg [Enumerative] DPF_DPF_St ≠ TeDPFR_e_DPF_St.CeDPFR_e_SootLoading [Enumerative] AND HCI System Flt = NOT (HCI_GenericShtOffReq) AND Amb Temp FA = NOT (CAT_OutsideTempFA) AND Cat2 Up Exh Flow Flt = NOT (EXF_TotExhCat2_UpFlt) AND Amb Press > 70.00 [KPa]	If - Second Catalyst EWMA filter enabling cailibration = TRUE (EWMA Enbl Cal = 0.00 [Boolean]) AND - EWMA status = Fast Initial Response (FIR) (NeCATD_e_EWMA_CalcStatCat2_Eff = TeCATR_e_Status_EWMA.CeCATR_e_EWMA_FIR) Then: - 1 trip (with malfunction) to set DTC (Type A) and return to EWMA status = EWMA Standard (NeCATD_e_EWMA_CalcStatCat2_Eff = TeCATR_e_Status_EWMA.CeCATR_e_EWMA_Standard) - 0.00 [Counter] elapsed trips (with no mulfunction) to report pass and return to EWMA status = EWMA	

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
					than calibration AND - Ambient temperature higher than calibration AND - Second Catalyst monitor not yet performed successfully in current driving cycle (Second Catalyst monitor shall run only once per driving cycle) AND - If DPF regeneration has been interrupted in previous driving cycle or in current driving cycle Then: Engine coolant temperature lower than calibration AND - Second Catalyst up exhaust temperature (by estimation) lower than calibration; Second Catalyst monitor status can move from TRIGGERED to ENABLED (oxidation heat release integrator and exhaust injected fuel (by HCI) integrator are both enabled) if: - DPF regeneration enabled AND	AND Amb Temp > 266.00 [K] AND Second Catalyst monitor not yet performed successfully in current driving cycle (Second Catalyst monitor shall run only once per driving cycle) [Boolean] AND If Interrupted DPF regeneration counter > 0 [Counter] Then: Eng Cool Temp < 255.99 [°C] AND Cat2 Up Temp Estim < 1,500.00 [K]; VeCATD_e_Cat2_St = TeCATR_e_CatMontrSt.CeCATD_e_MontrEnbl [Enumerative] DPF_DPF_St ≠ TeDPFR_e_DPF_St.CeDPFR_e_SootLoading [Enumerative] AND	Standard (NeCATD_e_EWMA_CalcStatCat2_Eff = TeCATR_e_Status_EWMA.CeCATR_e_EWMA_Standard) If - Second Catalyst EWMA filter enabling cailibration = TRUE (EWMA Enbl Cal = 0.00 [Boolean]) AND - EWMA status = Rapid Response (RR) (NeCATD_e_EWMA_CalcStatCat2_Eff = TeCATR_e_Status_EWMA.CeCATR_e_EWMA_RR) Then: - 1 trip (with malfunction) to set DTC (Type A) and return to EWMA status = EWMA Standard (NeCATD_e_EWMA_CalcStatCat2_Eff = TeCATR_e_Status_EWMA.CeCATR_e_EWMA_Sta	

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
					- HCI system not in fault (Fault Flag = FALSE) AND - Ambient temperature information not in fault (Fault Active = FALSE) AND - Second Catalyst up exhaust flow estimation not in fault (Fault Flag = FALSE) AND - Ambient pressure higher than calibration AND - Ambient temperature higher than calibration AND - Second Catalyst monitor not yet performed successfully in current driving cycle (Second Catalyst monitor shall run only once per driving cycle) AND - Second Catalyst up exhaust temperature (by estimation) higher than calibration AND - Exhaust injection (by HCI) enabled AND - Second Catalyst up exhaust flow estimation higher than calibration AND - Exhaust injection fuel quantity (by HCI) higher than calibration;	HCI System Flt = NOT (HCI_GenericShtOffReq) AND Amb Temp FA = NOT (CAT_OutsideTempFA) AND Cat2 Up Exh Flow Flt = NOT (EXF_TotExhCat2_UpFlt) AND Amb Press > 70.00 [KPa] AND Amb Temp > 266.00 [K] AND Second Catalyst monitor not yet performed successfully in current driving cycle (Second Catalyst monitor shall run only once per driving cycle) [Boolean] AND Cat2 Up Temp Estim > 0.00 [K] AND HCI_InjReleaseSt = TRUE [Boolean] AND Cat2 Up Exh Flow > 0.00 [g/s] AND Exh Inj Fuel Qnty (by HCI) > 0.00 [g];	ndard) - 1 trip (with no mulfunction) to report pass - 0.00 [Counter] elapsed trips (with no mulfunction) to report pass and return to EWMA status = EWMA Standard (NeCATD_e_EWMA_CalcStatCat2_Eff = TeCATR_e_Status_EWMA.CeCATR_e_EWMA_Standard)	

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
					Oxidation heat release integrator and exhaust injected fuel (by HCI) integrator are both frozen if: - Engine not running OR - Second Catalyst up exhaust flow estimation lower than calibration OR - Exhaust injection fuel quantity (by HCI) lower than calibration; Second Catalyst monitor status can move from ENABLED (oxidation heat release integrator and exhaust injected fuel (by HCI) integrator are both enabled) to DONE (integrators are stopped and the ratio between the total integrated oxidation heat and the total integrated injected fuel is performed with the consequent creation of the Second Catalyst Aging Index to be compared with the Fault Threshold --> Diagnostic test evaluation trigger) if: - DPF regeneration enabled AND - HCI system not in fault (Fault Flag = FALSE)	OR Cat2 Up Exh Flow < 0.00 [g/s] OR Exh Inj Fuel Qnty (by HCI) < 0.00 [g]; VeCATD_e_Cat2_St = TeCATR_e_CatMontrSt.CeCATD_e_MontrDone [Enumerative] DPF_DPF_St ≠ TeDPFR_e_DPF_St.CeDPFR_e_SootLoading [Enumerative] AND HCI System Flt = NOT (HCI_GenericShtOffReq)		

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
					AND - Ambient temperature information not in fault (Fault Active = FALSE) AND - Second Catalyst up exhaust flow estimation not in fault (Fault Flag = FALSE) AND - Ambient pressure higher than calibration AND - Ambient temperature higher than calibration AND - Second Catalyst monitor not yet performed successfully in current driving cycle (Second Catalyst monitor shall run only once per driving cycle) AND - Integrated exhaust injected fuel quantity (by HCI) higher than curve.	AND Amb Temp FA = NOT (CAT_OutsideTempFA) AND Cat2 Up Exh Flow Flt = NOT (EXF_TotExhCat2_UpFlt) AND Amb Press > 70.00 [KPa] AND Amb Temp > 266.00 [K] AND Second Catalyst monitor not yet performed successfully in current driving cycle (Second Catalyst monitor shall run only once per driving cycle) [Boolean] AND Intgr Exh Inj Fuel Qnty (by HCI) > **Cat2_CrtdMaxFuel** [g].		

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
Fuel Level Sensor 1 Performance (For use on vehicles with a single fuel tank)	P0461	This DTC will detect a fuel sender stuck in range in the primary fuel tank.	Delta fuel volume change over 38.2 liters of fuel consumed by the engine.	< 3 liters	Engine Running No active DTCs:	 VehicleSpeedSensor_FA	250 ms / sample	Type B, 2 Trips

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
Fuel Level Sensor 1 Circuit Low Voltage	P0462	This DTC will detect a fuel sender stuck out of range low in the primary fuel tank.	Fuel level Sender % of 5V range	< 10 %			100 failures out of 125 samples 100 ms / sample	Type B, 2 Trips

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
Fuel Level Sensor 1 Circuit High Voltage	P0463	This DTC will detect a fuel sender stuck out of range high in the primary fuel tank.	Fuel level Sender % of 5V range	> 60 %			100 failures out of 125 samples 100 ms / sample	Type B, 2 Trips

16 OBDG04 ECM Summary Tables (Initial DTCs)

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
Cooling Fan 1 Relay Control Circuit Open (ODM) (Not used on EREV)	P0480	Diagnoses the cooling fan 1 relay control low side driver circuit for circuit faults	Voltage low during driver off state (indicates open circuit)	Open Circuit: ≥ 200 K Ω impedance between signal and controller ground	Powertrain Relay Voltage	Voltage ≥ 11.00 volts	50 failures out of 63 samples 100 ms / sample	Type B, 2 Trips Note: In certain controllers P0691 may also set (Fan 1 Short to Ground).

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
Cooling Fan System Performance	P0483	Detects inability to control fan speed to desired RPM	1. Weighted filtered difference between actual fan speed and commanded fan speed [Min] OR 2. Weighted filtered difference between actual fan speed and commanded fan speed [Max]	1. <= -500.00 RPM OR 2. >= 500.00 RPM	1. System Performance test AND 2. Intake Air Temp AND 3. System Voltage AND 4. Commanded Fan Spd AND 5. Fan Drive Spd [Min] AND 6. Fan Drive Spd [Max] AND 7. Engine Coolant Temp AND 8. Fan Drive Spd Rate of Change AND 9. Outside Air Temp AND 10. Barometric Pressure AND 11. Fan Spd Weight Factor calculation Calculated product of [FactorA]*[FactorB]*[FactorC]*[FactorD] where FactorA: Input speed stability basis [See Supporting Table A] FactorB: Input Speed basis [See Supporting Table B] FactorC: Engine Coolant Temp basis [See Supporting Table C] FactorD: Intake Air Temp basis [See Supporting Table D]	1. = 1.00 AND 2. ≥ -7.00 degC AND 3. >= 11.00 Volts AND 4. >= 15.00 % AND 5. >= 200.00 RPM AND 6. <= 5,320.00 RPM AND 7. 69.00 degC AND 8. < 2,000.00 RPM/sec AND 9. >= -7.00 degC AND 10. > 74.00 kPa AND 11. > 0.60	Fail condtion present >= 600.00 ; 100 ms / sample	Type B, 2 Trips

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
Cooling Fan Speed High	P0495	Diagnoses the engine driven cooling fan during OFF state	Fan speed is too high when fan command to the off state	Fan speed > 1,500 RPM	Test enabled Fluid in fan clutch is pumped out	= 1.00	800 failures out of 1,000 samples 100 ms / sample	Type B, 2 Trips

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
Low Engine Speed Idle System	P0506	This DTC will determine if a low idle exists	Filtered Engine Speed Error	> 75.00 rpm	Baro	> 70 kPa	Diagnostic runs in every 12.5 ms loop	Type B, 2 Trips
			filter coefficient	0.00175	Coolant Temp	> KeSPDD_T_EnblECT_Min (60 °C) and < KfECTI_T_EngCoolHotHiThresh (120 °C) Must verify KfECTI_T_EngCoolHotLoThresh (118) is less than KfECTI_T_EngCoolHotHiThresh (120)	Diagnostic reports pass or fail in 10 seconds once all enable conditions are met	
					Engine run time	≥ 60 sec		
					Ignition voltage	32 ≥ volts ≥ 11		
					Time since gear change	≥ 3 sec		
					Time since a TCC mode change	> 3 sec		
					IAT	> -20 °C		
					Vehicle speed	≤ 1.24 mph		
					Commanded RPM delta	≤ 25 rpm		
					Idle time	> 5 sec		
					For manual transmissions: Clutch Pedal Position or Clutch Pedal Position	> 12.00 pct < 75.00 pct		

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
					  No active DTCs	PTO not active Transfer Case not in 4WD LowState Off-vehicle device control (service bay control) must not be active. following conditions not TRUE: (VeTESR_e_EngSpdReqIntvType = CeTESR_e_EngSpdMinLimit AND VeTESR_e_EngSpdReqRespType = CeTESR_e_NoSuggestion) Clutch is not depressed TC_BoostPresSnsrFA ECT_Sensor_FA EnginePowerLimited EGRValveCircuit_FA EGRValvePerformance_FA IAT_SensorCircuitFA EvapFlowDuringNonPurge_FA FuelTrimSystemB1_FA FuelTrimSystemB2_FA FuelInjectorCircuit_FA MAF_SensorFA EngineMisfireDetected_FA IgnitionOutputDriver_FA		

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
						TPS_FA TPS_Performance_FA VehicleSpeedSensor_FA FuelLevelDataFault LowFuelConditionDiagnostic Clutch Sensor FA AmbPresDfltdStatus P2771		
					All of the above met for Idle time	> 5 sec		
						The diagnostic does not run during autostop as engine is shutdown during that time (occurs in a hybrid or 12v start stop vehicle)		

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
High Engine Speed Idle System	P0507	This DTC will determine if a high idle exists	Filtered Engine Speed Error	< -150.00 rpm	Baro	> 70 kPa	Diagnostic runs in every 12.5 ms loop	Type B, 2 Trips
			filter coefficient	0.00175	Coolant Temp	> KeSPDD_T_EnblECT_Min (60 °C) and < KfECTI_T_EngCoolHotHiThresh (120 °C) Must verify KfECTI_T_EngCoolHotLoThresh (118) is less than KfECTI_T_EngCoolHotHiThresh (120)	Diagnostic reports pass or fail in 10 seconds once all enable conditions are met	
					Engine run time	≥ 60 sec		
					Ignition voltage	32 ≥ volts ≥ 11		
					Time since gear change	≥ 3 sec		
					Time since a TCC mode change	> 3 sec		
					IAT	> -20 °C		
					Vehicle speed	≤ 1.24 mph		
					Commanded RPM delta	≤ 25 rpm		
					For manual transmissions: Clutch Pedal Position or Clutch Pedal Position	> 12.00 pct < 75.00 pct		

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
						PTO not active Transfer Case not in 4WD LowState Off-vehicle device control (service bay control) must not be active. following conditions not TRUE: (VeTESR_e_EngSpdReqIntvType = CeTESR_e_EngSpdMinLimit AND VeTESR_e_EngSpdReqRespType = CeTESR_e_NoSuggestion) Clutch is not depressed		
					No active DTCs	TC_BoostPresSnsrFA ECT_Sensor_FA EnginePowerLimited EGRValveCircuit_FA EGRValvePerformance_FA IAT_SensorCircuitFA EvapFlowDuringNonPurge_FA FuelTrimSystemB1_FA FuelTrimSystemB2_FA FuelInjectorCircuit_FA MAF_SensorFA EngineMisfireDetected_FA IgnitionOutputDriver_FA TPS_FA TPS_Performance_FA VehicleSpeedSensor_FA		

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
						FuelLevelDataFaultLow FuelConditionDiagnostic Clutch SensorFA AmbPresDfltdStatus P2771		
					All of the above met for Idle time	> 5 sec The diagnostic does not run during autostop as engine is shutdown during that time (occurs in a hybrid or 12v start stop vehicle)		

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
Engine Oil Pressure (EOP) Sensor Circuit Low Voltage	P0522	Determines if the Engine Oil Pressure (EOP) Sensor circuit voltage is too low	(Engine Oil Pressure Sensor Circuit Voltage) ÷ 5 Volts) *100	< 5.00 percent	Engine Speed Enable Engine Speed Disable Oil Pressure Sensor In Use Diagnostic Status	> 400 rpm < 350 rpm Yes Enabled	800 failures out of 1,000 samples Performed every 6.25 msec	Type C, No SVS

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
Engine Oil Pressure (EOP) Sensor Circuit High Voltage	P0523	Determines if the Engine Oil Pressure (EOP) Sensor circuit voltage is too high	(Engine Oil Pressure Sensor Circuit Voltage) ÷ 5 Volts) *100	> 95.00 percent	Oil Pressure Sensor In Use Diagnostic Status	Yes Enabled	800 failures out of 1,000 samples Performed every 6.25 msec	Type C, No SVS

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
Cooling Fan Speed Sensor Circuit	P0526	Diagnoses the engine driven cooling fan speed sensor	Measured fan speed is less than a RPM threshold	Measured fan speed <= 4.00 RPM	Run/Crank Voltage Fan duty cycle	Voltage ≥ 11.00 volts ≥ 36.00 % for time ≥ 2.00 seconds	900 failures out of 1,200 samples 100 ms / sample	Type B, 2 Trips

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
Air Conditioning High Side Pressure Sensor (HSPS) Sensor Performance	P0531	Determines if the Air Conditioning High Side Pressure Sensor circuit voltage is stuck or biased in range	**Engaged Test** Primary Enable Conditons:		Compressor Type = Electric Driven Diagnostic Status Engaged Test Status Enable with Key Off No active DTC's	Electronic Varaible Disabled Disabled Disabled Fault bundles: ACHighSidePressSnsrCkt FA ACFailedOnSD ACThrmlRefrigSpdVld ACCMLostComm		Type X, No MIL
			To fail a currently passing Engaged test: The filtered, weighted ratio between measured Delta and predicted delta (a function of ambient temp, coolant temp, vehicle speed, and fan speed.):	Measured Test Delta Pressure ÷ Predicted Engaged Test Filtered Weighted Pressure) * first order filter coefficient < 0.0996 Predicted Engaged Test Filtered Weighted Pressure = (**P0531_Coolant_Weighting_Factor** * **P0531_FanSpeed_Weighting_Factor** * **P0531_Delta_Predicted_ Pressure** * **P0531_Delta_Predicted_Quality_Factor**) with a 1st order filter coefficient =	Use First Order Filter = FALSE Quality or weighting factor values less than "1" indicate that we don't have 4sigma/2sigma robustness in that region. The quality of the data is determined via statistical analysis of Variance data. Regions where diagnosis is possible have a quality or weighting factor values: 0.10	Compressor Speed > 150 RPM **P0531_Delta_Predicted_Quality_Factor** > 0.0 and **P0531_Coolant_Weighting_Factor** > - 0.0 AND < 4.0 and **P0531_FanSpeed_Weighting_Factor** > - 0.0 AND < 4.0	Performed every 100 msec	

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
				(P0531 Engage Test Details on Supporting Tables Tab: **P0531_Coolant_Weighting_Factor** **P0531_FanSpeed_Weighting_Factor** **P0531_Delta_Predicted_ Pressure** **P0531_Delta_Predicted_Quality_Factor**)	Fast Initial Response (FIR): FIR will trigger when an NVM reset or code clear occurs. Once triggered, the filtered ratio is reset to Initial response test ratio: FIR Test Ratio = 1.00 with an initial response first order filter: FIR Test Filter = 0.00 Rapid Step Response (RSR): RSR will trigger if the ratio result from the last test is < 0.40 AND the delta from the last filtered ratio by > 0.05 Once triggered, the RSR filtered ratio is reset to: RSR Test Ratio = 1.00 with an rapid step response first order filter: RSR Test Filter = 0.00		0 FIR tests must complete before the diagnostic can report. 0 RSR tests must complete before the diagnostic can report.	
			<u>To pass a currently failing Engaged test:</u> The filtered, weighted ratio between measured delta and predicted delta (a function of ambient temp, coolant temp,	Measured Test Delta Pressure / Predicted Engaged Test: Filtered Weighted Pressure) * first order	Use First Order Filter = FALSE Quality or weighting factor values less than "1" indicate that we don't	Compressor Speed > 150 RPM **P0531_Delta_Predicted_Quality_Factor** > 0.0	Performed every 100 msec # of Test Samples = 100	

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
			vehicle speed and fan speed.):	filter coefficient => 0.0996 Predicted Engaged Test Filtered Weighted Pressure = (**P0531_Coolant_Weighting_Factor** * **P0531_FanSpeed_Weighting_Factor** * **P0531_Delta_Predicted_ Pressure** * **P0531_Delta_Predicted_Quality_Factor**) with a first order filter coefficient = (P0531 Engage Test Details on Supporting Tables Tab: **P0531_Coolant_Weighting_Factor** **P0531_FanSpeed_Weighting_Factor** **P0531_Delta_Predicted_ Pressure** **P0531_Delta_Predicted_Quality_Factor**)	have 4sigma/2sigma robustness in that region. The quality of the data is determined via statistical analysis of Variance data. Regions where diagnosis is possible have a quality or weighting factor values: 0.10 Fast Initial Response (FIR): FIR will trigger when an NVM reset or code clear occurs. Once triggered, the filtered ratio is reset to Initial response test ratio: FIR Test Ratio = 1.00 with an initial response first order filter: FIR Test Filter = 0.00 Rapid Step Response (RSR): RSR will trigger if the ratio result from the last test is < 0.40 AND	and **P0531_Coolant_Weighting_Factor** > - 0.0 AND < 4.0 and **P0531_FanSpeed_Weighting_Factor** > - 0.0 AND < 4.0	0 FIR tests must complete before the diagnostic can report. 0 RSR tests must complete before the diagnostic can report.	

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
					the delta from the last filtered ratio by > 0.05 Once triggered, the RSR filtered ratio is reset to: RSR Test Ratio = 1.00 with an rapid step response first order filter: RSR Test Filter = 0.00			

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
Air Conditioning High Side Pressure Sensor (HSPS) Circuit Low Voltage	P0532	Determines if the Air Conditioning High Side Pressure Sensor circuit voltage is too low	(AC High Side Pressure Sensor Circuit Voltage) ÷ 5 Volts) *100	< 2 percent	AC HSP Sensor Present Diagnostic Status	Yes Enabled	80 failures out of 100 samples Performed every 25 msec	Type C, No SVS

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
Air Conditioning High Side Pressure Sensor (HSPS) Circuit High Voltage	P0533	Determines if the Air Conditioning High Side Pressure Sensor circuit voltage is too high	(AC High Side Pressure Sensor Circuit Voltage) ÷ 5 Volts) *100	> 98 percent	AC HSP Sensor Present Diagnostic Status	Yes Enabled	80 failures out of 100 samples Performed every 25 msec	Type C, No SVS

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
System Voltage Low	P0562	Diagnoses the 12V battery system low	System voltage low	Battery voltage <= 9.00	System voltage low diag enable = TRUE	1.00	400 failures out of 500 samples	Type C, No SVS
					Run Crank voltage	Voltage ≥ 6.00 volts	12.5 ms / sample	
					Engine speed >=	400.00		

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
System Voltage High	P0563	Diagnoses the 12V battery system high	System voltage high	Battery voltage >= 18.00	System voltage high diag enable = TRUE Run Crank voltage	1.00 Voltage ≥ 6.00 volts	400 failures out of 500 samples 12.5 ms / sample	Type C, No SVS

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
Cruise Control Mutil-Functon Switch Circuit	P0564	Detect when cruise control multi-function switch circuit (analog) voltage is in an invalid range	Cruise Control analog circuit voltage must be "between ranges" for greater than a calibratable period of time.	The cruise control analog voltage A/D count ratio is considerred to be "between ranges" when the ratio is measured in the following ranges: 0.28 -0.31, 0.415-0.445, 0.585 - 0.615 0.78 - 0.81, 1.005 - 1.035	CAN cruise switch diagnostic enable in ECM	1.00	fail continuously for greater than 0.500 seconds	Type C, No SVS , special type C

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
Cruise Control On Switch Circuit	P0565	Detects a failure of the cruise on/off switch in a continously applied state	Cruise Control On switch remains applied for greater than a calibratable period of time.	fail continuously in the applied state for greater than 20.00 seconds	CAN cruise switch diagnostic enable in ECM	1.00	fail continuously for greater than 20.00 seconds	Type C, No SVS , special type C

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
Cruise Control Resume Circuit	P0567	Detects a failure of the cruise resume switch in a continously applied state	Cruise Control Resume switch remains applied for greater than a calibratable period of time.	fail continuously in the applied state for greater than 89.000 seconds	CAN cruise switch diagnostic enable in ECM	1.00	fail continuously for greater than 89.000 seconds	Type C, No SVS , special type C

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
Cruise Control Set Circuit	P0568	Detects a failure of the cruise set switch in a continously applied state	Cruise Control Set switch remains applied for greater than a calibratable period of time.	fail continuously in the applied state for greater than 89.000 seconds	CAN cruise switch diagnostic enable in ECM	1.00	fail continuously for greater than 89.000 seconds	Type C, No SVS , special type C

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
Cruise Control Cancel Switch Circuit	P056C		Cruise Control Cancel switch remains applied for greater than a calibratable period of time.	fail continously in the applied state for greater than 20.00 seconds	CAN cruise switch diagnostic enable in ECM	1.00	fail continuously for greater than 20.00 seconds	Type C, No SVS , special type C

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
Cruise Control Input Circuit	P0575	Determines if cruise switch state received from the BCM is valid.	If x of y rolling count / protection value faults occur, disable cruise for duration of fault	Message <> 2's complement of message Message rollling count<>previous message rolling count value plus one	Cruise Control Switch Serial Data Error Diagnostic Enable Serial communication to BCM Power Mode Engine Running	1.00 No loss of communication = RUN = TRUE	10 failures out of / 16 samples Performed on every received message 10 rolling count failures out of / 16 samples Performed on every received messagw	Type C, No SVS , special type C

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
Brake Pedal Position Sensor Circuit Range/ Performance	P057B	This diagnostic monitors the Brake Pedal Position Sensor for a stuck in range failure	.		Brake Pedal Position Sensor Circuit Range / Performance Diagnostic Enable	1.00 ignition voltage > 10.00		MIL: Type A, 1 Trips
			Calculated EWMA value must be greater than calibratable theshold after calibratable number of tests have completed to report a "test passed" for P057B	EWMA value looked up in supporting table **P057B KtBRKI_K_FastTestPointWeight** P057B as a function of calculated brake pedal position delta EWMA value is > 0.80	calculated brake pedal position delta sample counter > 50.00 for fast test OR calculated brake pedal position delta sample counter > 1,000.00 for slow test	calculated brake pedal position delta > 8.00 OR (for slow test) shift lever has been in park once this key cycle vehicle speed >= 5.00 accelerator pedal position < 5.00	total number of EWMA tests > 20.00	
			Calculated EWMA Value must be less than calibratable threshold after calibratable number of tests have completed to report a "test failed" for P057B. This test runs once per key cycle	EWMA value looked up in supporting table **P057B KtBRKI_K_CmpltTestPointWeight** P057B as a function of calculated brake pedal position delta EWMA value is less thatn 0.40	no DTC's active (P057C, P057D)	shift lever has been in park once this key cycle vehicle speed >= 5.00 accelerator pedal position < 5.00	total number of EWMA tests > 2.00	

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
Brake Pedal Position Sensor Circuit Low	P057C	detects short to ground for brake pedal position sensor	If x of y samples are observed below failure threshold, default brake pedal position to zero percent.	5.00	Brake Pedal Position Sensore Low Voltage Diagnostic Enable	1.00	20 / 32.00 counts	MIL: Type A, 1 Trips

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
Brake Pedal Position Sensor Circuit High	P057D	detects open circuit for brake pedal position sensor	If x of y samples are observed above failure threshold, default brake pedal position to zero percent and set DTC	95.00	Brake Pedal Position Sensore High Voltage Diagnostic Enable	1.00	20.00 / 32.00 counts	MIL: Type A, 1 Trips

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
Brake Pedal Position Sensor Circuit Intermittent/ Erratic	P057E	detects noisy / erratic ouput for brake pedal position sensor	If x of y samples are observed above failure threshold, default brake pedal position to zero percent and set DTC	25.00	Brake Pedal Position Sensor Circuit Intermittent / Erratic Diagnostic Enable	1.00	10.00 / 16.00 counts	MIL: Type A, 1 Trips

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
Cruise Control Multi-function Circuit Low Voltage	P0580	detects short to ground failure for cruise multi-function switch circuit	Cruise Control analog circuit voltage must be in an "Open Short To Ground" range for greater than a calibratable period of time.	The cruise control analog voltage A/D count ratio is considerred to be "open short to ground when the ratio is measured in the following rangs: 0 - 0.185	CAN cruise switch diagnostic enable in ECM	1.00	fail continuously for greater than 2.00 seconds	Type C, No SVS , special type C

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
Cruise Control Multi-function Circuit High Voltage	P0581		Cruise Control analog circuit voltage must be in "Short To Power" range for greater than a calibratable period of time.	The cruise control analog voltage A/D count ratio is considered to be "short to power" when the ratio is measured in the following range: 1.005 - 1.035	CAN cruise switch diagnostic enable in ECM	1.00	fail continuously for greater than 2.00 seconds	Type C, No SVS , special type C

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
Control 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 A, 1 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.	
			The Primary Processor's calculated checksum does not match the stored checksum value for a selected subset of the calibrations.	2 consecutive failures detected or 5 total failures detected.			Diagnostic runs continuously. Will report a detected fault within 200 ms.	
			The Secondary 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.	
				In all cases, the failure count is cleared when controller shuts down				

16 OBDG04 ECM Summary Tables (Initial DTCs)

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
Control Module Not Programmed	P0602	This DTC will be stored if the ECU is a service part that has not been programmed.	Service (reflash) controller calibration present	= 1		none	Diagnostic runs at powerup and once per second continuously after that	Type A, 1 Trips

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
ECM Long Term Memory Reset	P0603	This DTC detects an invalid NVM.	Static NVM region error detected during initialization				Diagnostic runs at controller power up.	Type A, 1 Trips
			Perserved NVM region error detected during initialization				Diagnostic runs at controller power up.	
			ECC ROM fault detected in NVM Flash region ECC ROM Error Count >	3			Diagnostic runs at controller power up.	
			Perserved NVM region error detected during shut down.				Diagnostic runs at controller power down.	

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
ECM RAM Failure	P0604	Indicates that the ECM has detected a RAM fault	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 A, 1 Trips
			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 >=	5 counts			Will finish first memory scan within 30 seconds at all engine conditions - diagnostic runs continuously (background loop)	
			Indicates that the primary processor detects a mismatch between the data and dual data is found during RAM updates. Detects a mismatch in data and dual data updates >	0.45891 s			When dual store updates occur.	

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
			Indicates that the primary processor detects an illegal write attempt to protected RAM. Number of illegal writes are >	65,534 counts			Diagnostic runs continuously (background loop)	
			Indicates that the secondary processor is unable to correctly read data from or write data to system RAM. Detects data read does not match data written >=	5 counts			Will finish first memory scan within 30 seconds at all engine conditions - diagnostic runs continuously (background loop)	

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
Internal ECM Processor Integrity Fault	P0606	Indicates that the ECM has detected an internal processor integrity fault	Loss or invalid message of SPI communication from the Secondary Processor at initialization detected by the Primary Processor or loss or invalid message of SPI communication from the Secondary Processor after a valid message was received by the Primary Processor	Loss or invalid message at initialization detected or loss or invalid message after a valid message was recieved		Run/Crank voltage >= 6.41 or Run/Crank voltage >= 11.00 , else the failure will be reported for all conditions	In the primary processor, 159 / 399 counts intermittent or 39 counts continuous; 39 counts continuous @ initialization. 12.5 ms /count in the ECM main processor	Type A, 1 Trips
			Loss or invalid message of SPI communication from the Primary Processor at initialization detected by the Secondary Processor or loss or invalid message of SPI communication from the Primary Processor after a valid message was received by the Secondary Processor	Loss or invalid message at initialization detected or loss or invalid message after a valid message was recieved			In the secondary processor, 20 / 200 counts intermittent or 0.1875 s continuous; 0.4750 s continuous @ initialization. 12.5 ms /count in the ECM secondary processor	
			Checks for stack over or underflow in secondary processor by looking for corruption of known pattern at stack boundaries. Checks number of stack over/ under flow since last powerup reset >=	5		KeMEMD_b_StackLimitTestEnbl == 1 Value of KeMEMD_b_StackLimitTestEnbl is: 1 . (If 0, this test is disabled)	variable, depends on length of time to corrupt stack	
			MAIN processor is verified by responding to a seed sent from the secondary with a key response to secondary. Checks number of incorrect keys	2 incorrect seeds within 8 messages, 0.2000 seconds		ignition in Run or Crank	150 ms for one seed continually failing	

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
			received > or Secondary processor has not received a new within time limit					
			Time new seed not received exceeded			always running	0.450 seconds	
			MAIN processor receives seed in wrong order			always running	3 / 17 counts intermittent. 50 ms/count in the ECM main processor	
			2 fails in a row in the Secondary processor's ALU check			KePISD_b_ALU_TestEnbld == 1 Value of KePISD_b_ALU_TestEnbld is: 1 . (If 0, this test is disabled)	25 ms	
			2 fails in a row in the Secondary processor's configuration register masks versus known good data			KePISD_b_ConfigRegTestEnbld == 1 Value of KePISD_b_ConfigRegTestEnbld is: 1 . (If 0, this test is disabled)	12.5 to 25 ms	
			Secondary processor detects an error in the toggling of a hardware discrete line controlled by the MAIN processor: number of discrete changes > = or < = over time window(50ms)	7 17		KePISD_b_MainCPU_SOH_FltEnbld == 1 Value of KePISD_b_MainCPU_SOH_FltEnbld is: 1 . (If 0, this test is disabled) time from initialization >= 0.4875 seconds	50 ms	
			Software background task first pass time to complete exceeds			Run/Crank voltage > 6.41	360.000 seconds	

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
			2 fails in a row in the MAIN processor's ALU check			KePISD_b_ALU_TestEnbld == 1 Value of KePISD_b_ALU_TestEnbld is: 1 . (If 0, this test is disabled)	25 ms	
			2 fails in a row in the MAIN processor's configuration register masks versus known good data			KePISD_b_ConfigRegTestEnbld == 1 Value of KePISD_b_ConfigRegTestEnbld is: 1 . (If 0, this test is disabled)	12.5 to 25 ms	
			Checks number of stack over/under flow since last powerup reset >=	3		KeMEMD_b_StackLimitTestEnbl == 1 Value of KeMEMD_b_StackLimitTestEnbl is: 1 . . (If 0, this test is disabled)	variable, depends on length of time to corrupt stack	
			Voltage deviation >	0.4950		KePISD_b_A2D_CnvrtrTestEnbld == 1 Value of KePISD_b_A2D_CnvrtrTestEnbld is: 1 . (If 0, this test is disabled)	5 / 10 counts or 0.150 seconds continuous; 50 ms/count in the ECM main processor	
			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)		KeMEMD_b_FlashECC_CktTestEnbl == 1 Value of KeMEMD_b_FlashECC_CktTestEnbl is: 1 . (If 0, this test is disabled)	variable, depends on length of time to access flash with corrupted memory	
			Checks for ECC (error	3 (results in MIL),		KeMEMD_b_RAM_ECC_	variable,	

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
			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 >=	5 (results in MIL and remedial action)		CktTestEnbl == 1 Value of KeMEMD_b_RAM_ECC_CktTestEnbl is: 1 . (If 0, this test is disabled)	depends on length of time to write flash to RAMvariable, depends on length of time to write flash to RAM	
			MAIN processor DMA transfer from Flash to RAM has 1 failure			KePISD_b_DMA_XferTestEnbld == 1 Value of KePISD_b_DMA_XferTestEnbld is: 0 . (If 0, this test is disabled)	variable, depends on length of time to write flash to RAM	
			Safety critical software is not executed in proper order.	>= 1 incorrect sequence.		Table, f(Core, Loop Time). See supporting tables: **P0606_Program Sequence Watch Enable f(Core, Loop Time)** (If 0, this Loop Time test is disabled)	Fail Table, f(Loop Time). See supporting tables: **P0606_PSW Sequence Fail f (Loop Time)** / Sample Table, f (Loop Time)See supporting tables: **P0606_PSW Sequence Sample f(Loop Time)** counts 50 ms/count in the ECM main processor	

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
			MAIN processor determines a seed has not changed within a specified time period within the 50ms task.	Previous seed value equals current seed value.		KePISD_b_SeedUpdKeyStorFltEnbl == 1 Value of KePISD_b_SeedUpdKeyStorFltEnbl is: 1 . (If 0, this test is disabled)	Table, f(Loop Time). See supporting tables: **P0606_Last Seed Timeout f (Loop Time)**	

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
Starter Relay Control Circuit Open	P0615	Diagnoses the starter relay control open circuit	Starter relay control open circuit	Controller internal diagnostic	Starter control diag enable = TRUE Engine speed Run Crank voltage	1.00 ≥ 0.00 RPM ≥ 11.00 volts	40 failures out of 50 samples 50 ms / sample	Type C, No SVS

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
Starter Relay Control Circuit Low Voltage	P0616	Diagnoses the starter relay control circuit low voltage	Starter relay control circuit low voltage	Controller internal diagnostic	Starter control diag enable = TRUE Engine speed Run Crank voltage	1.00 ≥ 0.00 RPM ≥ 6.41 volts	8 failures out of 10 samples 50 ms / sample	Type C, No SVS

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
Starter Relay Control Circuit High Voltage	P0617	Diagnoses the starter relay control circuit high voltage	Starter relay control circuit high voltage	Controller internal diagnostic	Starter control diag enable = TRUE	1.00	40 failures out of 50 samples	Type C, No SVS
					Engine speed	≥ 0.00 RPM	50 ms / sample	
					Run Crank voltage	≥ 6.41 volts		

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
Fuel Pump Relay Control Circuit Open	P0627	Diagnoses the fuel pump relay control high side driver circuit for circuit faults	Voltage high during driver off state (indicates open circuit)	Open circuit: ≥ 200 K Ω impedance between signal and controller ground	Run/Crank Voltage Engine Speed	Voltage ≥ 11.00 volts ≥ 0 RPM	8 failures out of 10 samples 250 ms / sample	Type B, 2 Trips Note: In certain controllers P0629 may also set (Fuel Pump Relay Control Short to Power)

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
Fuel Pump Relay Control Circuit Low Voltage	P0628	Diagnoses the fuel pump relay control high side driver circuit for circuit faults	Voltage low during driver on state (indicates short to ground)	Short to ground: ≤ 0.5 Ω impedance between signal and controller ground	Run/Crank Voltage Engine Speed	Voltage ≥ 11.00 volts ≥ 0 RPM	8 failures out of 10 samples 250 ms / sample	Type B, 2 Trips

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
Fuel Pump Relay Control Circuit High Voltage	P0629	Diagnoses the fuel pump relay control high side driver circuit for circuit faults	Voltage high during driver off state (indicates short to power)	Short to power: ≤ 0.5 Ω impedance between signal and controller power	Run/Crank Voltage Engine Speed	Voltage ≥ 11.00 volts ≥ 0 RPM	8 failures out of 10 samples 250 ms / sample	Type B, 2 Trips Note: In certain controllers P0627 may also set (Fuel Pump Relay Control Open Circuit)

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
Powertrain Internal Control Module EEPROM Error	P062F	This DTC detects a NVM long term performance.	HWIO reports that writing to NVM (at shutdown) will not succeed				Diagnostic runs at controller power up.	Type B, 2 Trips
			HWIO reports the assembly calibration integrity check has failed				Diagnostic runs at controller power up.	

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
VIN Not Programmed or Mismatched - Engine Control Module (ECM)	P0630	This DTC checks that the VIN is correctly written	At least one of the programmed VIN digits	= 00 or FF	OBD Manufacturer Enable Counter	= 0	250 ms / test Continuous	Type A, 1 Trips

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
5 Volt Reference #1 Circuit	P0641	Detects a continuous or intermittent short on the 5 volt reference circuit #1	ECM Vref1 < or ECM Vref1 > or the difference between ECM filtered Vref1 and Vref1 >	4.875 5.125 0.0495		Run/Crank voltage > 6.41	19 / 39 counts or 0.1875 sec continuous; 12.5 ms/count in main processor	Type A, 1 Trips

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
Malfunction Indicator Lamp (MIL) Control Circuit (ODM) Open	P0650	Diagnoses the malfunction indicator lamp control low side driver circuit for circuit faults.	Voltage low during driver off state (indicates open circuit)	Open circuit: ≥ 200 K Ω impedance between signal and controller ground	Run/Crank Voltage Remote Vehicle Start is not active	Voltage ≥ 11.00 volts	1 failures out of 1 samples 50 ms / sample	Type B, No MIL NO MIL Note: In certain controllers P263A may also set (MIL Control Short to Ground)

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
5 Volt Reference #2 Circuit	P0651	Detects a continuous or intermittent short on the 5 volt reference circuit #2	ECM Vref2 < or ECM Vref2 > or the difference between ECM filtered Vref2 and Vref2 >	4.875 5.125 0.0495		Run/Crank voltage > 6.41	19 / 39 counts or 0.1875 sec continuous; 12.5 ms/count in main processor	Type A, 1 Trips

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
Shared High Side Drive #1 Control Circuit Low (STG) - (GEN III Controllers ONLY)	P0658	Diagnoses shared high side driver circuit low voltage	Shared high side drive #1 control circuit low voltage	Controller internal diagnostic	Shared high side drive #1 low diag enable Powertrain relay voltage Run Crank voltage Powertrain relay state	= 1.00 >= 11.00 > 6.00 = ON	20 failures out of 25 samples 100 ms / sample	Type B, 2 Trips

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
Shared High Side Drive #1 Control Circuit High (STP) - (GEN III Controllers ONLY)	P0659	Diagnoses shared high side driver circuit low voltage	Shared high side drive #1 control circuit low voltage	Controller internal diagnostic	Shared high side drive #1 diag enable Powertrain relay voltage Run Crank voltage Powertrain relay state	= 1.00 >= 11.00 > 6.00 = ON	20 failures out of 25 samples 100 ms / sample	Type B, 2 Trips

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
Powertrain Relay Control (ODM) Open	P0685	Diagnoses the powertrain relay control low side driver circuit for circuit faults	Voltage low during driver off state (indicates open circuit)	Open Circuit: ≥ 200 K Ω ohms impedance between signal and controller ground	Run/Crank Voltage	Voltage ≥ 11.00 volts	8 failures out of 10 samples 250 ms / sample	Type B, 2 Trips Note: In certain controllers P0686 may also set (Powertrain Relay Control Short to Ground).

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
Powertrain Relay Control (ODM) Low	P0686	Diagnoses the powertrain relay control low side driver circuit for circuit faults	Voltage low during driver off state (indicates short-to-ground)	Short to ground: ≤ 0.5 Ω impedance between signal and controller ground	Run/Crank Voltage	Voltage ≥ 11.00 volts	8 failures out of 10 samples 250 ms / sample	Type B, 2 Trips Note: In certain controllers P0685 may also set (Powertrain Relay Control Open Circuit).

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
Powertrain Relay Control (ODM) High	P0687	Diagnoses the powertrain relay control low side driver circuit for circuit faults	Voltage high during driver on state (indicates short to power)	Short to power: ≤ 0.5 Ω impedance between signal and controller power	Run/Crank Voltage	Voltage ≥ 11.00 volts	8 failures out of 10 samples 250 ms / sample	Type B, 2 Trips

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
Control Module Power Relay Feedback Circuit Low Voltage	P0689	Diagnoses control module relay feedback circuit low voltage	Control module relay feedback circuit low voltage	Powertrain relay voltage <= 5.00	Powertrain relay short low diagnostic enable Run Crank voltage Powertrain relay state	= 1.00 > 9.00 = ON	5 failures out of 6 samples 1000 ms / sample	Type C, No SVS

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
Powertrain Relay Feedback Circuit High	P0690	This DTC is a check to determine if the Powertrain relay is functioning properly.	Powertrain Relay Voltage	>= 4.00 volts will increment the fail counter	Powertrain relay commanded “OFF” No active DTCs:	>= 2.00 seconds PowertrainRelayStateOn_FA	50 failures out of 63 samples 100ms / Sample	Type B, 2 Trips

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
Cooling Fan 1 Relay Control Circuit Low Voltage (ODM)	P0691	Diagnoses the cooling fan 1 relay control low side driver circuit for circuit faults	Voltage low during driver off state (indicates short-to-ground)	Short to ground: ≤ 0.5 Ω impedance between signal and controller ground	Powertrain Relay Voltage	Voltage ≥ 11.00 volts	50 failures out of 63 samples 100 ms / sample	Type B, 2 Trips Note: In certain controllers P0480 may also set (Fan 1 Open Circuit).

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
Cooling Fan 1 Relay Control Circuit High Voltage (ODM)	P0692	Diagnoses the cooling fan 1 relay control low side driver circuit for circuit faults	Voltage high during driver on state (indicates short to power)	Short to power: ≤ 0.5 Ω impedance between signal and controller power	Powertrain Relay Voltage	Voltage ≥ 11.00 volts	50 failures out of 63 samples 100 ms / sample	Type B, 2 Trips

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
5 Volt Reference #3 Circuit	P0697	Detects a continuous or intermittent short on the 5 volt reference circuit #3	ECM Vref3 < or ECM Vref3 > or the difference between ECM filtered Vref3 and Vref3 >	4.875 5.125 0.0495		Run/Crank voltage > 6.41	19 / 39 counts or 0.1875 sec continuous; 12.5 ms/count in main processor	Type A, 1 Trips

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
5 Volt Reference #4 Circuit	P06A3	Detects a continuous or intermittent short on the 5 volt reference circuit #4	ECM Vref4 < or ECM Vref4 > or the difference between ECM filtered Vref4 and Vref4 >	4.875 5.125 0.0495		Run/Crank voltage > 6.41	19 / 39 counts or 0.1875 sec continuous; 12.5 ms/count in main processor	Type A, 1 Trips

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
Transmission Control Module (TCM) Requested MIL Illumination	P0700	Monitors the TCM MIL request message to determine when the TCM has detected a MIL illuminating fault.	Transmission Emissions-Related DTC set			Time since power-up ≥ 3 seconds	Continuous	Type A, No MIL

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
Traction Control Torque Request Circuit	P0856	Determines if torque request from the EBTCM is valid	Protection error - Serial Communication 2's complement message - ($1C7/$1C9 for engine torque, $1CA/$1C6 for axle torque) OR Rolling count error - Serial Communication message ($1C7/$1C9 for engine torque, $1CA/ $1C6 for axle torque) rolling count index value OR Multi-transition error - EBCM torque intervention type request change OR Range Error - Torque request greater than torque request diagnostic maximum threshold	Message <> 2's complement of message Message rolling count value <> previous message rolling count value plus one Requested torque intervention type toggles from an increasing request to not an increasing request then back to an increasing request within 200ms > 250 Nm for engine torque based traction torque system, OR > 250 Nm for axle torque based traction torque system	Serial communication to EBTCM (U0108) Power Mode Engine Running Status of traction in GMLAN message ($4E9)	No loss of communication = Run = True = Traction Present	>= 6 protection value errors out of 10 samples Performed on every received message >= 6 rolling count errors out of 10 samples Performed on every received message >= 3 multi-transitions errors out of 5 samples. Performed every 200 ms >= 6 range errors out of 10 samples Performed on every received message	Type C, No SVS Safety Special Type C

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
Engine Coolant Temperature Sensor Not Plausible) (TSRD	P111E	This DTC detects a difference between ECT and two other temp sensors after a soak condition.	**Sensor usage definitions:** **Sensor1 =** CeECTR_e_ECT_Snsr (Sensor1 is the temp sensor most impacted by the block heater (if equipped)) **Sensor2 =** CeECTR_e_IAT_Snsr **Sensor3 =** CeECTR_e_OAT_Snsr ================== A failure will be reported if any of the following occur: 1) Sensor1 power up absolute temp difference to Sensor2 and Sensor3 is (Sensor1 fast fail) . 2) Sensor1 power up temp is greater than Sensor2 and Sensor3 in this range: (and a block heater has not been detected) 3) Sensor1 power up temp is lower than Sensor2 and Sensor3 by this amount: 4) Sensor1 power up temp is ≥ Sensor2 and	≥ 100.0 ºC ≥ 20.0 and < 100.0 ºC ≤ 20.0 Deg ºC	No Active DTC's Engine Off Soak Time Propulsion Off Soak Time Non-volatile memory initization Test complete this trip Test aborted this trip Test disabled this trip Ambient LowFuelCondition Diag ================== Block Heater detection is **enabled** when either of the following occurs: 1) Sensor1 power up temp is greater than Sensor2 and Sensor3 in this range: 2) Cranking time ================== Block Heater is **detected**	VehicleSpeedSensor_FA IAT_SensorCircuitFA THMR_RCT_Sensor_Ckt_FA ECT_Sensor_Ckt_FA EngineModeNotRunTimerError EngineModeNotRunTimer_FA OAT_PtEstFiltFA OAT_PtEstRawFA PSAR_PropSysInactveCrs_FA DRER_DiagSystemDsbl > 28,800 seconds > 25,200 seconds = Not occurred = False = False = False ≥ -7 ºC = False ================== ≥ 20.0 ºC and < 100.0 ºC < 409.6 Seconds ==================	1 failure to set DTC 1 sec/ sample Once per valid cold start	Type B, 2 Trips

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
			Sensor3 by 20.0 ºC and the time spent cranking the engine without starting is ≥ 409.6 seconds with the LowFuelConditionDiag	= False	and diagnostic is aborted when 1) or 2) occurs. 1a) IAT monitoring is enabled after the following Vehicle drive constraints 1b) Drive time 1c) Vehicle speed 1d) Additional Vehicle drive time is provided to 1b when Vehicle speed is below 1c as follows: 1e) IAT drops from power up IAT 2a) ECT monitoring is enabled after engine start in the following engine run time window 2b) Sensor1 temp derivative during the test is: 2c) Consectutive samples of 2b) being true are: ================= Diagnostic is **aborted** when 3) or 4) occurs: 3) Engine run time with vehicle speed below 1b 4) Engine off time (i.e. auto stop) during Block heater detection	> 400 Seconds with > 14.9 MPH and 1.00 times the seconds with vehicle speed below 1b ≥ 8.0 ºC 1.0 <= seconds <= 40.0 < -0.10 ºC/sec ≥ 4 samples ================== ≥ 1,800 Seconds ≥ 300.0 Seconds		

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
Fuel Rail Pressure (FRP) Sensor B Circuit Low Voltage	P127C	Determine when a short circuit to ground affects fuel rail pressure (secondary) sensor.	Fuel rail pressure sensor output (as percentage of supply voltage)	< 4.3 %	Starter motor is not engaged OR Starter motor has been engaged for a time OR Run crank voltage	 ≥ 15 s > 8.4 V	38 failures out of 55 samples OR 22 continuous failures out of 55 samples 6.25 ms/samples	Type A, 1 Trips

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
Fuel Rail Pressure (FRP) Sensor B Circuit High Voltage	P127D	Determine when a short circuit to voltage affects fuel rail pressure (secondary) sensor.	Fuel rail pressure sensor output (as percentage of supply voltage)	< 94.8 %	Starter motor is not engaged OR Starter motor has been engaged for a time OR Run crank voltageNo low ignition voltage	 ≥ 15 s > 8.4 V	38 failures out of 76 samples OR 22 continuous failures out of 76 samples 6.25 ms/samples	Type A, 1 Trips

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
EGR Slow Response - Increasing Flow	P140B	This monitor (in increasing flow direction) detects failures in the air system such to not fulfil the request of EGR flow in the intake manifold during transient conditions. It works only closed loop EGR control zone. This monitor is used to detect any malfunction in the EGR system that lead to slow down the air control causing the vehicle's emissions to exceed OBDII limits. The aim of the EGR flow slow response monitor is to detect small leakages in the pipe after the compressor or in the intake/exhaust manifold. This monitor could also detect slow responding EGR valves, or skewed MAF sensor vanes since the boost pressure is usually controlled by the turbocharger actuator. Slow responding throttle and VGT vanes could also affect the EGR flow response time.	Error difference between the desired EGR rate and the actual EGR rate during transient air control conditions. The absolute error is averaged over a calibrate-able cumulative transient time.	> **P140B: Increasing EGR slow response threshold** [%]	Calibration on diagnostic enabling	**P140B, P140C: EGR slow response enabling** ==TRUE	Test is evaluated after the enabling conditions are satisfied for a number of samples >= 200.00 sampling time is 25ms	Type B, 2 Trips
					Engine Running	==TRUE		
					Cranking ignition in range	Battery voltage > 11.00 [V]		
					Relay voltage in range	Powertrain relay voltage > 11.00 [V]		
					Air Control is Active (air control in closed loop)	AIC_AirCntrlShtOffAction ==Ce_AICR_e_CntrlActv		
					Air control active condition lasts for a time	> 10.00 [s]		
					Desired EGR rate	> 0 [%]		
					A combustion mode transition is NOT active	==TRUE		
					OBD Coolant Enable Criteria	==TRUE		
					Exhaust manifold pressure is valid	EXM_ExhMnfdPresNotVld ==FALSE		
					Throttle measured	> 90.00 [%]		

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
					position			
					Nominal valve total flow is valid	EGR_VlvTotFlowNomNotVld ==FALSE		
					Outside air temperature	> -7.00 [°C]		
					Ambient air pressure	> 74.80 [kPa]		
					Engine speed	> 1,500.00 [rpm] AND < 3,000.00 [rpm]		
					Desired fuel quantity	> 10.00 [mm^3] AND < 50.00 [mm^3]		
					Exhaust manifold pressure	> 100.00 [kPa] AND < 250.00 [kPa]		
					Desired air request is steady state: AirReq-AirReqOld	> -70.00 [mg/s] AND < -10.00 [mg/s]		
					Air control tracking error	< 0 [mg]		
					Check that EGR valve position is below a threshold OR it is above that threshold	< 70.00 [%] > 0.00 [s]		

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
					for a time delay			

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
EGR Slow Response - Decreasing Flow	P140C	This monitor (in decreasing flow direction) detects failures in the air system such to not fulfil the request of EGR flow in the intake manifold during transient conditions. It works only closed loop EGR control zone. This monitor is used to detect any malfunction in the EGR system that lead to slow down the air control causing the vehicle's emissions to exceed OBDII limits. The aim of the EGR flow slow response monitor is to detect small obstructions in the exhaust pipe. This monitor could also detect slow responding EGR valves, or skewed MAF sensor vanes since the boost pressure is usually controlled by the turbocharger actuator. Slow responding throttle and VGT vanes could also affect the EGR flow response time.	Error difference between the desired EGR rate and the actual EGR rate during transient air control conditions. The absolute error is averaged over a calibrate-able cumulative transient time.	> **P140C: Decreasing EGR slow response threshold** [%]	Calibration on diagnostic enabling Engine Running Cranking ignition in range Relay voltage in range Air Control is Active (air control in closed loop) Air control active condition lasts for a time Desired EGR rate A combustion mode transition is NOT active OBD Coolant Enable Criteria Exhaust manifold pressure is valid Throttle measured	**P140B, P140C: EGR slow response enabling** ==TRUE ==TRUE Battery voltage > 11.00 [V] Powertrain relay voltage > 11.00 [V] AIC_AirCntrlShtOffAction ==Ce_AICR_e_CntrlActv > 10.00 [s] > 0 [%] ==TRUE ==TRUE EXM_ExhMnfdPresNotVld ==FALSE > 90.00 [%]	Test is evaluated after the enabling conditions are satisfied for a number of samples >= 200.00 sampling time is 25ms	Type B, 2 Trips

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
					position			
					Nominal valve total flow is valid	EGR_VlvTotFlowNomNotVld ==FALSE		
					Outside air temperature	> -7.00 [°C]		
					Ambient air pressure	> 74.80 [kPa]		
					Engine speed	> 1,500.00 [rpm] AND < 3,000.00 [rpm]		
					Desired fuel quantity	> 10.00 [mm^3] AND < 50.00 [mm^3]		
					Exhaust manifold pressure	> 100.00 [kPa] AND < 250.00 [kPa]		
					Desired air request is steady state: AirReq-AirReqOld	> 10.00 [mg/s] AND < 70.00 [mg/s]		
					Air control tracking error	> 0 [mg]		

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
Transmission Engine Speed Request Circuit	P150C	Determines if engine speed request from the TCM is valid	Serial Communication rolling count value	+ 1 from previous $19D message (PTEI3)	Diagnostic enable bit	1	Diagnostic runs in 12.5 ms loop	Type B, 2 Trips
			Transmission engine speed protection	not equal to 2's complement of transmission engine speed request + Transmission alive rolling count	Engine run time	0.50 sec		
					# of Protect Errors	12 protect errors within the sample period 20		
					# of Alive Rolling Errors	6 rolling count errors out of 10 samples		
					No idle diagnostic 506/507 code	IAC_SystemRPM_FA		
					No Serial communication loss to TCM	(U0101)		
					Engine Running	= TRUE		
					Power mode	Run Crank Active		

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
Cruise Control Switch State Undertermin ed	P155A	Detects when cruise switch state cannot be determined, such as low voltage conditions	cruise switch state is received as "undetermined" for greater than a calibratable time	fail continuously for greater than 0.5 seconds			fail continuously for greater than 0.5 seconds	Type C, No SVS , special type C

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
Sensor Bus Relay Feedback Circuit High Voltage	P157A	This DTC checks that the Sensor Bus Relay output is not stuck high	The Sensor Bus Relay ouput is stuck high	>= KeSBRR_Cnt_SB_RlyStkHiFailThrsh within KeSBRR_Cnt_SB_RlyStkHiSmplThrsh samples	The Sensor Bus Relay output has been inactive	>= KeSBRR_t_SB_RelayCommandedOff		Type B, 2 Trips

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
Internal Control Module Pressure Regulator 1 Control Performance	P163A		Current flowing through metering unit valve OR Current flowing through metering unit valve	> 2.80 A < 0.05 A	Powertrain relay voltage Rail pressure is governed by Metering Unit No active DTC since key is on:	≥ 11.0 V FHP_MU_DrvrCloseTFTKO FHP_MU_DrvrOpenTFTKO	160 failures out of 250 samples 6.25 ms/sample	Type B, 2 Trips

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
Internal Control Module Pressure Regulator 2 Control Performance	P163B		Current flowing through pressure regulator valve OR Current flowing through pressure regulator valve	> 2.80 A < 0.05 A	Powertrain relay voltage Rail pressure is governed by Pressure Regulator No active DTC since key is on:	≥ 11.0 V FHP_PR_DrvrCloseTFTKO FHP_PR_DrvrOpenTFTKO	160 failures out of 250 samples 6.25 ms/sample	Type B, 2 Trips

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
Ignition Voltage Correlation	P1682	Detect a continuous or intermittent out of correlation between the Run/Crank Ignition Voltage & the Powertrain Relay Ignition Voltage	|Run/Crank – PT Relay Ignition| >	3.00 Volts		Powertrain commanded on AND (Run/Crank voltage > Table, f(IAT). See supporting tables: **P1682_PT Relay Pull-in Run/Crank Voltage f(IAT)** OR PT Relay Ignition voltage > 5.50) AND Run/Crank voltage > 5.50 .	240 / 480 counts or 0.175 sec continuous; 12.5 ms/count in main processor	Type A, 1 Trips

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
Turbocharger Boost Control A Slow Response - Increasing Pressure	P168A	This monitor (in increasing pressure direction) detects failures in the charging air system such to not fulfil the request of boost pressure in the intake manifold. It works only in transient closed loop boost pressure control zone. This monitor is used to detect any malfunction in the boost pressure system that lead to slow down the boost pressure control causing the vehicle's emissions to exceed OBDII limits. The aim of the boost pressure slow response monitor is to detect small leakages in the pipe after the compressor or in the intake/exhaust manifold (increasing pressure). This monitor could also detect slow responding VGT vanes since the boost pressure is usually controlled by the turbocharger actuator. Slow responding throttle and EGR valves could also affect the boost pressure response time.	Error difference between the desired boost pressure used by the closed loop boost pressure control and the actual intake manifold pressure measured by the MAP sensor. The error is averaged over a calibrate-able cumulative transient time. The setpoint used for closed loop control is the intake manifold pressure: in this situation the diagnostic monitors the boost pressure closed loop control tracking error.	> **P168A: Positive boost slow response threshold** [kPa]	Calibration on diagnostic enabling	**P168A, P168B: Boost pressure slow response enabling** ==TRUE	Test is evaluated after the enabling conditions are satisfied for a number of samples >= 300.00 sampling time is 25ms	Type X, No MIL
					Engine Running	==TRUE		
					Cranking ignition in range	Battery voltage > 11.00 [V]		
					Relay voltage in range	Powertrain relay voltage > 11.00 [V]		
					Difficult launch NOT detected	Refer to "LDT_DifficultLaunchActive" Free Form		
					Boost control in closed loop	AIC_BstCntrlCL==TRUE		
					Boost control in closed loop condition lasts for a time	> 0.20 [s]		
					No active transition from one combustion mode to another	==TRUE		
					Engine Coolant Temperature OR OBD Coolant Enable Criteria	> 70.00 [°C] ==TRUE		

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
					Outside air temperature	> -7.00 [°C]		
					Ambient air pressure	> 69.60 [kPa]		
					Throttle Valve measured position	>= 90.00 [%]		
					Engine speed	> 1,500.00 [rpm] AND < 3,500.00 [rpm]		
					Desired fuel quantity	> 30.00 [mm^3] AND < 100.00 [mm^3]		
					Desired boost pressure is steady state: BstRespTgt - BstRespTgAirReqOld	> 2.00 [kPa/s] AND < 100.00 [kPa/s]		
					Boost pressure current tracking error (not averaged over the cumulative transient time)	> 0 [kPa]		
					No active DTCs	AIC_BstSysDiagDenomDsbl ==FALSE		
			Error difference between the desired intake boost pressure and the actual intake manifold pressure measured by the MAP	> **P168A: Positive boost slow response threshold** [kPa]	Calibration on diagnostic enabling	**P168A, P168B: Boost pressure slow response enabling** ==TRUE	Test is evaluated after the enabling conditions are satisfied for a	

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
			sensor. The error is averaged over a calibrate-able cumulative transient time. The setpoint used for closed loop control is the conversion of the desired upstream throttle boost pressure (target) in desired intake boost pressure. The conversion of the setpoint is done calculating the pressure drop over the throttle valve that is strictly dependent on the valve position.		Engine Running	==TRUE	number of samples >= 300.00 sampling time is 25ms	
					Cranking ignition in range	Battery voltage > 11.00 [V]		
					Relay voltage in range	Powertrain relay voltage > 11.00 [V]		
					Difficult launch NOT detected	Refer to "LDT_DifficultLaunchActive" Free Form		
					Boost control in closed loop	AIC_BstCntrlCL==TRUE		
					Boost control in closed loop condition lasts for a time	> 0.20 [s]		
					No active transition from one combustion mode to another	==TRUE		
					Engine Coolant Temperature OR OBD Coolant Enable Criteria	> 70.00 [°C] ==TRUE		
					Outside air temperature	> -7.00 [°C]		
					Ambient air pressure	> 69.60 [kPa]		

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
					Throttle Valve measured position	>= 100.00 [%]		
					Engine speed	> 1,500.00 [rpm] AND < 3,500.00 [rpm]		
					Desired fuel quantity	> 30.00 [mm^3] AND < 100.00 [mm^3]		
					Desired boost pressure is steady state: BstRespTgt - BstRespTgAirReqOld	> 2.00 [kPa/s] AND < 100.00 [kPa/s]		
					Boost pressure current tracking error (not averaged over the cumulative transient time)	> 0 [kPa]		
					No active DTCs	AIC_BstSysDiagDenomDsbl ==FALSE		

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
Turbocharger Boost Control A Slow Response - Decreasing Pressure	P168B	This monitor (in decreasing pressure direction) detects failures in the charging air system such to not fulfil the request of boost pressure in the intake manifold. It works only in transient closed loop boost pressure control zone. This monitor is used to detect any malfunction in the boost pressure system that lead to slow down the boost pressure control causing the vehicle's emissions to exceed OBDII limits. The aim of the boost pressure slow response monitor is to detect small obstructions in the exhaust pipe (decreasing pressure). This monitor could also detect slow responding VGT vanes since the boost pressure is usually controlled by the turbocharger actuator. Slow responding throttle and EGR valves could also affect the boost pressure response time.	Error difference between the desired boost pressure used by the closed loop boost pressure control and the actual intake manifold pressure measured by the MAP sensor. The error is averaged over a calibrate-able cumulative transient time. The setpoint used for closed loop control is the intake manifold pressure: in this situation the diagnostic monitors the boost pressure closed loop control tracking error.	> **P168B: Negative boost slow response threshold** [kPa]	Calibration on diagnostic enabling Engine Running Cranking ignition in range Relay voltage in range Difficult launch NOT detected Boost control in closed loop Boost control in closed loop condition lasts for a time No active transition from one combustion mode to another Engine Coolant Temperature OR OBD Coolant Enable Criteria	**P168A, P168B: Boost pressure slow response enabling** ==TRUE ==TRUE Battery voltage > 11.00 [V] Powertrain relay voltage > 11.00 [V] Refer to "LDT_DifficultLaunchActive" Free Form AIC_BstCntrlCL==TRUE > 0.20 [s] ==TRUE > 70.00 [°C] ==TRUE	Test is evaluated after the enabling conditions are satisfied for a number of samples >= 250.00 sampling time is 25ms	Type X, No MIL

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
					Outside air temperature	> -7.00 [°C]		
					Ambient air pressure	> 69.60 [kPa]		
					Throttle Valve measured position	>= 90.00 [%]		
					Engine speed	> 1,500.00 [rpm] AND < 3,500.00 [rpm]		
					Desired fuel quantity	> 30.00 [mm^3] AND < 100.00 [mm^3]		
					Desired boost pressure is steady state: BstRespTgt - BstRespTgAirReqOld	> -125.00 [kPa/s] < -2.00 [kPa/s]		
					Boost pressure current tracking error (not averaged over the cumulative transient time)	< 0 [kPa]		
					No active DTCs	AIC_BstSysDiagDenomDsbl ==FALSE		
			Error difference between the desired intake boost pressure and the actual intake manifold pressure measured by the MAP	> **P168B: Negative boost slow response threshold** [kPa]	Calibration on diagnostic enabling	**P168A, P168B: Boost pressure slow response enabling** ==TRUE	Test is evaluated after the enabling conditions are satisfied for a	

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
			sensor. The error is averaged over a calibrate-able cumulative transient time. The setpoint used for closed loop control is the conversion of the desired upstream throttle boost pressure (target) in desired intake boost pressure. The conversion of the setpoint is done calculating the pressure drop over the throttle valve that is strictly dependent on the valve position.		Engine Running Cranking ignition in range Relay voltage in range Difficult launch NOT detected Boost control in closed loop Boost control in closed loop condition lasts for a time No active transition from one combustion mode to another Engine Coolant Temperature OR OBD Coolant Enable Criteria Outside air temperature Ambient air pressure	==TRUE Battery voltage > 11.00 [V] Powertrain relay voltage > 11.00 [V] Refer to "LDT_DifficultLaunchActive" Free Form AIC_BstCntrlCL==TRUE > 0.20 [s] ==TRUE > 70.00 [°C] ==TRUE > -7.00 [°C] > 69.60 [kPa]	number of samples >= 250.00 sampling time is 25ms	

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
					Throttle Valve measured position	>= 100.00 [%]		
					Engine speed	> 1,500.00 [rpm] AND < 3,500.00 [rpm]		
					Desired fuel quantity	> 30.00 [mm^3] AND < 100.00 [mm^3]		
					Desired boost pressure is steady state: BstRespTgt - BstRespTgAirReqOld	> -125.00 [kPa/s] AND < -2.00 [kPa/s]		
					Boost pressure current tracking error (not averaged over the cumulative transient time)	< 0 [kPa]		
					No active DTCs	AIC_BstSysDiagDenomDsbl ==FALSE		

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
Ignition Voltage Correlation #2	P16A7	Detect a continuous or intermittent out of correlation between the Run/Crank Ignition Voltage & the Powertrain Relay Ignition Voltage #2	|Run/Crank – PT Relay Ignition| >	3.00 Volts		Powertrain commanded on AND (Run/Crank voltage > Table, f(IAT). See supporting tables: **P1682_PT Relay Pull-in Run/Crank Voltage f(IAT)** OR PT Relay Ignition voltage > 5.50) AND Run/Crank voltage > 5.50 .	240 / 480 counts or 0.175 sec continuous; 12.5 ms/count in main processor	Type A, 1 Trips

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
Engine Controls Ignition Relay Feedback Circuit 2 Low Voltage - (GEN III Controllers ONLY)	P16AF	Diagnoses ignition feedback circuit 2 low voltage	Engine controls ignition relay feedback circuit 2 low voltage	Relay voltage <= 5.00	Powertrain relay low diag enable Powertrain relay voltage Run Crank voltage Powertrain relay state	= 1.00 >= 11.00 > 9.00 = ON	5 failures out of 6 samples 1000 ms / sample	Type C, No SVS

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
Engine Controls Ignition Relay Feedback Circuit 2 High Voltage - (GEN III Controllers ONLY)	P16B3	Diagnoses ignition feedback circuit 2 high voltage	Engine controls ignition relay feedback circuit 2 high voltage	Relay voltage >= 4.00	Powertrain relay high diag enable Powertrain relay state	= 1.00 = INACTIVE	50 failures out of 63 samples 100 ms / sample	Type B, 2 Trips

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
Sensor Bus Relay Control Circuit	P16D7	This DTC checks that the Sensor Bus Relay output circuit is not an open circuit	The Sensor Bus Relay output circuit is open	>= KeSBRD_Cnt_RlyOpenFail within KeSBRD_Cnt_RlyOpenSmpl samples	The Sensor Bus Relay Commanded Output state	= Off		Type A, 1 Trips

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
Sensor Bus Relay Control Circuit Low	P16D8	This DTC checks that the Sensor Bus Relay output circuit is not shorted to ground	The Sensor Bus Relay output circuit is shorted to ground	>= KeSBRD_Cnt_RlyGsht Fail within KeSBRD_Cnt_RlyGsht Smpl samples	The Sensor Bus Relay Commanded Output state	= Off		Type A, 1 Trips

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
Sensor Bus Relay Control Circuit High	P16D9	This DTC checks that the Sensor Bus Relay output is not shorted to power	The Sensor Bus Relay output circuit is shorted to power	>= KeSBRD_Cnt_RlyPsht Fail within KeSBRD_Cnt_RlyPsht Smpl samples	The Sensor Bus Relay Commanded Output state	= On		Type B, 2 Trips

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
Control Module Serial Peripheral Interface Bus 1	P16F0	This DTC detects intermitent and continuous invalid SPI messages.	This function detects a serial communications fault based upon the detection of missing or invalid (receive) message within the main processor before receiving a valid message.			Run/Crank voltage > 6.41	39 / 399 counts continuous; 12.5 ms /count in the ECM main processor	Type A, 1 Trips
			This function detects a serial communications fault based upon the detection of missing or invalid (receive) message within the main processor after receiving a valid message.			Run/Crank voltage > 6.41	159 / 399 counts continuous; 12.5 ms /count in the ECM main processor	

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
Internal Control Module Redundant Memory Performance (Diesel)	P16F3	Detect Processor Calculation faults due to RAM corruptions, ALU failures and ROM failures For all of the following cases: If the individual diagnostic threshold is equal to 2048 ms, this individual case is not applicable. If any of the following cases are X out of Y diagnostics and the fail (x) is greater than the sample (Y), this individual case is also not applicable.	Torque Learn offset is out of bounds given by threshold range	High Threshold 0.00 Nm Low Threshold 0.00 Nm	Ignition State	Accessory, run or crank	Up/down timer 175 ms continuous, 0.5 down time multipier	Type A, 1 Trips
			Commanded Predicted Engine Torque and its dual store do not match	N/A	Ignition State	Accessory, run or crank	Up/down timer 2,048 ms continuous, 0.5 down time multipier	
			Zero pedal axle torque is out of bounds given by threshold range	High Threshold 3,800.00 Nm Low Threshold -65,535.00 Nm	Ignition State	Accessory, run or crank	Up/down timer 175 ms continuous, 0.5 down time multipier	

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
			Creep Coast Axle Torque is out of bounds given by threshold range	High Threshold 3,800.00 Nm Low Threshold -65,535.00 Nm	Ignition State	Accessory, run or crank	Up/down timer 2,048 ms continuous, 0.5 down time multipier	
			Rate limited vehicle speed and its dual store do not equal	N/A		Time since first CAN message with vehicle speed >= 0.500 sec	10 / 20 counts; 25.0msec/count	
			Commanded engine torque due to fast actuators and its dual store do not equal	N/A	Ignition State	Accessory, run or crank	Up/down timer 446 ms continuous, 0.5 down time multipier	

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
			Commanded engine torque due to slow actuators and its dual store do not equal	N/A	Ignition State	Accessory, run or crank	Up/down timer 446 ms continuous, 0.5 down time multipier	
			TOS to wheel speed conversion factor is out of bounds given by threshold range	High Threshold: 1.10 T/C Range Hi 0.10 T/C Range Lo Low Threshold: 1.10 T/C Range Hi 0.10 T/C Range Lo	Ignition State	Accessory, run or crank	255 / 6 counts; 25.0msec/count	
			Transfer case neutral request from four wheel drive logic does not match	N/A	Ignition State	Accessory, run or crank	5 / 280 counts; 25.0msec/count	

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
			with operating conditions			Transfer case range valid and not over-ridden FWD Apps only		
			Driver progression mode and its dual store do not equal	N/A	Ignition State	Accessory, run or crank	Up/down timer 475 ms continuous, 0.5 down time multipier	
			Predicted torque for uncorrected zero pedal determination is greater than calculated limit.	Table, f(Engine, Oil Temp). **P16F3_Speed Control External Load f(Oil Temp, RPM)** + 110.00 Nm	Ignition State	Accessory, run or crank	Up/down timer 2,048 ms continuous, 0.5 down time multipier	
			Engine Predicted Request Without Motor is greater than its redundant calculation plus threshold	4,096.00 Nm	Ignition State	Accessory, run or crank	Up/down timer 2,048 ms continuous, 0.5 down time multipier	

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
			Engine Immediate Request Without Motor is greater than its redundant calculation plus threshold	109.00 Nm	Ignition State	Accessory, run or crank	Up/down timer 146 ms continuous, 0.5 down time multipier	
			Commanded Predicted Engine Request is greater than its redundant calculation plus threshold	4,096.00 Nm	Ignition State	Accessory, run or crank	Up/down timer 2,048 ms continuous, down time multipier 0.5	

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
			Commanded Hybrid Predicted Crankshaft Request is greater than its redundant calculation plus threshold	4,096.00 Nm	Ignition State	Accessory, run or crank	Up/down timer 2,048 ms continuous, 0.5 down time multipier	
			Commanded Hybrid Immediate Crankshaft Request is less than its redundant calculation minus threshold	4,096.00 Nm	Ignition State	Accessory, run or crank	Up/down timer 2,048 ms continuous, 0.5 down time multipier	
			Commanded Immediate Engine Request is greater than its redundant calculation plus threshold	110.00 Nm	Ignition State	Accessory, run or crank	Up/down timer 475 ms continuous, 0.5 down time	

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
							multipier	
			Engine Speed Lores Intake Firing (event based) calculation not equal its redundant calculation	N/A		Engine speed greater than 0rpm	Up/down timer 146 ms continuous, 0.5 down time multipier	
			Engine Speed Lores Intake Firing timing (event based) calculation not equal its redundant calculation	N/A		Engine speed greater than 0rpm	Up/down timer 146 ms continuous, 0.5 down time multipier	
			Idle speed control calculated predicted minimum torque request exceeds calculated torque limit	**P16F3_Speed Control External Load f(Oil Temp, RPM)** + 110.00 Nm	Ignition State	Accessory, run or crank	Up/down timer 2,048 ms continuous, 0.5 down time	

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
							multipier	
			Idle speed control calculated predicted minimum torque without reserves exceeds calculated torque limit	**P16F3_Speed Control External Load f(Oil Temp, RPM)** + 110.00 Nm	Ignition State	Accessory, run or crank	Up/down timer 2,048 ms continuous, 0.5 down time multipier	
			Difference between Driver Requested Immediate Torque primary path and its secondary exceeds threshold	3,800.00 Nm	Ignition State	Accessory, run or crank	Up/down timer 2,048 ms continuous, 0.5 down time multipier	
			Driver Immediate Request is less than its redundant calculation minus threshold	3,800.00 Nm	Ignition State	Accessory, run or crank	Up/down timer 475 ms continuous, 0.5 down time multipier	

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
			Commanded Immediate Request is greater than its redundant calculation plus threshold OR Commanded Immediate Request is less than its redundant calculation minus threshold	3,800.00 Nm	Ignition State	Accessory, run or crank	Up/down timer 475 ms continuous, 0.5 down time multipier	

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
			Commanded Immediate Response Type is set to Inactive	N/A	Ignition State	Accessory, run or crank	Up/down timer 475 ms continuous, 0.5 down time multipier	
			Difference between Cruise Axle Torque Arbitrated Request and Cruise Axle Torque Request exceeds threshold	475.00 Nm		Cruise has been engaged for more than 4.00 seconds	Up/down timer 2,048 ms continuous, 0.5 down time multipier	
			Desired engine torque request greater than redundant calculation plus threshold	109.00 Nm	Ignition State	Accessory, run or crank	Up/down timer 2,048 ms continuous, 0.5 down time multipier	

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
			Absolute difference of adjustment factor based on temperature and its dual store above threshold	550.50 m/s	Ignition State	Accessory, run or crank	Up/down timer 2,048 ms continuous, 0.5 down time multipier	
			1. Absolute difference of redundant calculated engine speed above threshold	500 RPM		Engine speed greater than 0 RPM	Up/down timer 146 ms continuous, 0.5 down time multipier	
			Speed Control's Preditcted Torque Request and its dual store do not match	N/A	Ignition State	Accessory, run or crank	Up/down timer 2,048 ms continuous, 0.5 down time multipier	
			Engine oil temperature and its dual store do not match	N/A	Ignition State	Accessory, run or crank	Up/down timer 357 ms continuous, 0.5	

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
							down time multipier	
			Difference of base friction torque and its redundant calculation is out of bounds given by threshold range	High Threshold 110.00 Nm Low Threshold -110.00 Nm	Ignition State	Accessory, run or crank	Up/down timer 475 ms continuous, 0.5 down time multipier	
			AC friction torque is greater than commanded by AC control software or less than threshold limit	High Threshold 35.00 Nm Low Threshold 0.00 Nm	Ignition State	Accessory, run or crank	Up/down timer 475 ms continuous, 0.5 down time multipier	
			Generator friction torque	High Threshold	Ignition State	Accessory, run or crank	Up/down timer	

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
			is out of bounds given by threshold range	110.00 Nm Low Threshold 0.00 Nm			475 ms continuous, 0.5 down time multipier	
			Engine Torque Closed Loop Fuel Quantity Correction higher then threshold OR Engine Torque Closed Loop Fuel Quantity Correction lower then threshold	10.96 mm3 - 10.96 mm3	Engine cranking or engine running		Up/down timer 446 ms continuous, 0.5 down time multipier	
			1. Difference of reserve torque value and its redundant calculation exceed threshold	1. 109.00 Nm 2. N/A		1. & 2.: Torque reserve (condition when spark control greater than optimum to allow fast transitions for	Up/down timer 475 ms continuous, 0.5 down time	

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
			OR 2. Reserve request does not agree with operating conditions or Difference of final predicted torque and its redundant calculation exeed threshold OR 3. Rate of change of reserve torque exceeds threshold, increasing direction only OR 4. Reserve engine torque above allowable capacity threshold	3. 109.00 Nm 4. 109.00 Nm	3. & 4.: Ignition State	torque disturbances) > 110.00 Nm 3. & 4.: Accessory, run or crank	multipier	
			Min. Axle Torque Capacity is greater than threshold	0.00 Nm	Ignition State	Accessory, run or crank	Up/down timer 175 ms continuous, 0.5 down time multipier	

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
			Driver Predicted Request is greater than its redundant calculation plus threshold OR Driver Predicted Request is less than its redundant calculation minus threshold	65,535.00 Nm	Ignition State	Accessory, run or crank	Up/down timer 2,048 ms continuous, 0.5 down time multipier	
			Predicted torque for zero pedal determination is greater than calculated limit.	Table, f(Oil Temp, RPM). See supporting tables: **P16F3_Speed Control External Load f(Oil Temp, RPM)** + 110.00 Nm	Ignition State	Accessory, run or crank	Up/down timer 2,048 ms continuous, 0.5 down time multipier	
			Commanded Predicted	1 Nm	Ignition State	Accessory, run or crank	Up/down timer	

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
			Axle Torque and its dual store do not match				475 ms continuous, 0.5 down time multipier	
			Rate limited cruise axle torque request and its dual store do not match within a threshold	475.00 Nm	Ignition State	Accessory, run or crank	Up/down timer 163 ms continuous, 0.5 down time multipier	
			1. Absolute difference of Calculated accelerator pedal position compensated for carpet learn and error conditions and its redundant calculation is out of bounds given by threshold range OR 2. Absolute difference of Calculated accelerator pedal position compensated for carpet learn and error conditions and its dual store do not equal	1. 5.00 % 2. N/A 3. N/A	Ignition State	Accessory, run or crank	Up/down timer 475 ms continuous, 0.5 down time multipier	

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
			OR 3. Absolute difference of Calculated accelerator pedal position and its dual store do not equal					
			Commanded axle torque is greater than its redundant calculation by threshold	65,535.00 Nm	Ignition State	Accessory, run or crank	Up/down timer 2,048 ms continuous, 0.5 down time multipier	
			Commanded axle torque is less than its redundant calculation by threshold	5,700.00 Nm	Ignition State	Accessory, run or crank	Up/down timer 2,048 ms continuous, 0.5 down time multipier	
			AC friction torque is greater than commanded by AC control software	35.00 Nm	Ignition State	Accessory, run or crank	Up/down timer 2,048 ms continuous, 0.5	

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
							down time multipier	
			Engine Speed Lores Intake Firing (time based) calculation does not equal its redundant calculation	N/A		Engine speed >0rpm	Up/down timer 175 ms continuous, 0.5 down time multipier	
			Transmission Torque Request cacluations do not equal their dual stores	N/A		Run or Crank = TRUE > 0.50 s	16 / 32 counts; 25.0msec/count	
			Pedal learns and their redundant calculation do not equal		Ignition State	Accessory, run or crank	Up/down timer 475 ms continuous, 0.5 down time multipier	
			Requested fuel mass is greater or equal to its redundant calculation plus threshold	18.31 mg	Engine running No rich combustion mode No cranking phase No fuel cut off request		Up/down timer 446.41 ms continuous, 0.5 down time multiplier	

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
			Engine friction torque is greater than its redundant calculation plus threshold OR Engine friction torque is lower than its redundant calculation minus threshold	110.00 Nm 110.00 Nm	Engine running		Up/down timer 475.00 ms continuous, 0.5 down time multiplier	
			High Pressure Pump Torque Load is greater than threshold OR High Pressure Pump Torque Load is lower than threshold	110.00 Nm 0.00 Nm	Engine running		Up/down timer 475.00 ms continuous, 0.5 down time multiplier	
			Pumping Losses is lower than threshold OR Pumping Losses rate of change signal greater than P2D2 threshold	0.00 Nm 6.88 Nm	Engine running		Up/down timer 475.00 ms continuous, 0.5 down time multiplier	
			Start Up Engine Friction Compensation greater than threshold OR Start Up Engine Friction Compensation lower than threshold	110.00 Nm 0.00 Nm	Engine running		Up/down timer 151.88 ms continuous, 0.5 down time multiplier	
			Limited Immediate Indicated Torque request is greater than its	110.00 Nm	Engine running		Up/down timer 446.41 ms continuous,	

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
			redundant calculation plus threshold				0.5 down time multiplier	
			Active damping torque reduction greater than threshold OR Active damping torque reduction lower than threshold	110.00 Nm -110.00 Nm	Engine running		Up/down timer 146.41 ms continuous, 0.5 down time multiplier	
			Fuel volume request greater than its redundant calculation plus threshold	21.93 mm3	Engine running No rich combustion mode		Up/down timer 446.41 ms continuous, 0.5 down time multiplier	
			Absolute value of the sum of the Fuel Volumes in the pulse train minus Fuel Volume Request minus Main Correction greater than threshold	21.93 mm3	Engine Running No rich combustion mode Main pulse quantity already compensated with main correction is greater than or equal to zero		Up/down timer 146.41 ms continuous, 0.5 down time multiplier	
			Cumulative Programmed Energizing Time greater then its redundant calculation plus threshold (Note: when an emission test is performed the threshold is incremented by a further value)	170.34 us additional value for emission tests: 0.00 us	Engine running		Up/down timer 146.41 ms continuous, 0.5 down time multiplier	
			Cumulative Desired Energizing Time greater than its redundant	170.34 us	Engine Running		Up/down timer 146.41 ms continuous,	

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
			calculation plus threshold (Note: when an emission test is performed the threshold is incremented by a further value)	additional value for emission tests: 0.00 us			0.5 down time multiplier	
			Difference between Fuel Rail Pressure Event Based Signal and Fuel Rail Pressure Time Based signal higher than threshold OR Difference between Fuel Rail Pressure Event Based Signal and Fuel Rail Pressure Time Based signal lower than threshold	300.00 MPa -40.00 MPa	Engine running Delta Filtered Pressure value lower than AND Delta Filtered Pressure value greater than	3,000.00 MPa/s -3,000.00 MPa/s	Up/down timer 446.41 ms continuous, 0.5 down time multiplier	
			Absolute difference between Main Correction and its redundant calculation greater than or equal to threshold	21.93 mm3	Engine running No rich combustion mode		Up/down timer 146.41 ms continuous, 0.5 down time multiplier	
			Cylinder Balancing Fuel Quantity Compensation converted in Energizing Time greater than its redundant calculation plus threshold OR (only if cylinder balancing detected a fault) Cylinder Balancing Fuel Quantity Compensation	**P16F3_CB safety deadband threshold f (Fuel Rail Pressure)** us **P16F3_CB safety deadband threshold f (Fuel Rail Pressure)** us	Engine running		Up/down timer 146.41 ms continuous, 0.5 down time multiplier	

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
			converted in Energizing Time greater than threshold					
			Absolute value of the difference between the calculated EIA compensation and its redundant calculation greater than threshold	**P16F3_EIA safety deadband threshold f (Fuel Rail Pressure)** us	Engine cranking or engine running		Up/down timer 146.41 ms continuous, 0.5 down time multiplier	
			Absolute value of the weighted delta energizing time greater then threshold	**P16F3_SQA safety deadband threshold f (Fuel Rail Pressure)** us	Ignition State	Accessory, run or crank	Up/down timer 446.41 ms continuous, 0.5 down time multiplier	
			Oil Pump Low Pressure Offset Friction greater then zero OR Oil Pump Low Pressure Offset Friction lower then threshold	-3.00 Nm	Engine running		Up/down timer 475.00 ms continuous, 0.5 down time multiplier	
			Absolute value of fuel mass compensated for coolant temperature greater then threshold	9.16 mg	Engine running No rich combustion mode No cranking phase No fuel cut off request		Up/down timer 446.41 ms continuous, 0.5 down time multiplier	
			Absolute value of fuel mass compensated for air temperature greater then threshold	9.16 mg	Engine running No rich combustion mode No cranking phase No fuel cut off request	Accessory, run or crank	Up/down timer 446.41 ms continuous, 0.5 down time multiplier	

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
			Difference between Energizing Time Compensation for Temperature Specific Current (TSC) and its redundant calculation greater then threshold	**P16F3_TSC safety deadband threshold f (Fuel Rail Pressure)** us	Engine Running AND Engine State is Syncronous		Up/down timer 446.41 ms continuous, 0.5 down time multiplier	
			Absolute value of Main correction compensation based on coolant temperature greater then threshold	10.96 mm3	Engine Running No rich combustion mode		Up/down timer 146.41 ms continuous, 0.5 down time multiplier	
			Rail Pressure Wave Compensation greater than threshold	**P16F3_Rail Pressure Wave Compensation f(Fuel Rail Pressure, Fuel Quantity)** MPa	Engine cranking or running		Up/down timer 446.41 ms continuous, 0.5 down time multiplier	
			Injector Valve Closing Adjustment energizing time correction greater then threshold OR Injector Valve Closing Adjustment energizing time correction lower then threshold	**P16F3_VCA safety max deadband threshold f(Fuel Rail Pressure)** us **P16F3_VCA safety min deadband threshold f(Fuel Rail Pressure)** us	Engine Cranking or engine running		Up/down timer 446.41 ms continuous, 0.5 down time multiplier	
			Desired Immediate Indicated torque greater then its redundant calculation plus threshold	110.00 Nm	Engine running		Up/down timer 446.41 ms continuous, 0.5 down time multiplier	

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
			Fuel Temperature Energizing Time Compensation greater then its redundant calculation plus threshold	**P16F3_FTD safety deadband threshold f (Fuel Rail Pressure)** us	(Engine running OR engine cranking occurred in current driving cycle) AND FUL_InjLeakTempValid	 = TRUE	Up/down timer 151.88 ms continuous, 0.5 down time multiplier	
			Absolute value of the diffence between current and previous Fuel Injector Backflow Temperature greater then threshold	10.00 °C/100ms	Engine cranking or engine running ECT_Sensor_FA AND FTS_FTS_CktFA AND FTS_FTS_PlFA AND XOY_SecurityFlt_CeXOYR_e_FULR_FTD_RateLimFlt AND XOY_SecurityFlt_CeXOYR_e_ETMR_FTD_RedntCalcFlt	 = FALSE = FALSE = FALSE = FALSE = FALSE	Up/down timer 151.88 ms continuous, 0.5 down time multiplier	
			Increase of pumping losses due to exhaust brake actuation less then threshold	0.00 Nm	Ignition State	Accessory, run or crank	Up/down timer 475.00 ms continuous, 0.5	

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
							down time multiplier	
			Exhaust Brake Torque Capacity less then Threshold	0.00 Nm	Ignition State	Accessory, run or crank	Up/down timer 475.00 ms continuous, 0.5 down time multiplier	
			Delta Engine Fuel Temperature less than zero		Engine Fuel Temperature below threshold Engine cranking or engine running	80.00 ° C	Up/down timer 462.50 ms continuous, 0.5 down time multiplier	
			Combustion Mode Arbitration Winner is higher than the maximum expected combustion mode OR Previous Combustion Mode Arbitration Winner is higher than the maximum expected combustion mode OR Combustion Mode Arbitration Winner is equal to Previous Combustion Mode Arbitration Winner and not equal to Normal combustion Mode		Engine cranking or engine running		Up/down timer 162.50 ms continuous, 0.5 down time multiplier	
			The sum of Low, Middle		Engine cranking or engine		Up/down timer	

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
			and High Barometric Correction Factors greater than 1		running		462.50 ms continuous, 0.5 down time multiplier	

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
Transmission Mode Switch Signal Circuit Include for programs that are NOT hybrid start stop conventional	P1762	Vehicles that are not hybrid start stop conventional applications, this diagnoses the transmission mode switch signal circuit (BCM to ECM Rolling Count check)	Rolling count value received from BCM does not match expected value	= TRUE	Engine Speed Engine Speed Engine speed between min/max for Vehicle Speed for	≥ 200 RPM ≤ 7,500 RPM ≥ 5.0 seconds ≤ 318.14 MPH ≥ 5.0 seconds	> 3 error counts for > 10.0 seconds 100 ms / sample	Type C, No SVS

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
SCR NOx Catalyst Efficiency Below Threshold Bank 1	P20EE	This diagnosis checks if there is a malfunctioning in the SCR conversion system through its SCR NOx Conversion Efficiency. SCR conversion efficiency is evalueted by two NOx Sensors (Upstrem & Downstrem SCR). Monitoring is executed by compararing a mesured NOx efficiency and expected conversion efficiency: - Measured Efficiency is calculated as η_Eff_Msrd = 1 - [∫ NOx_Dwn_Msrd / ∫ NOx_Up_Msrd] - Expected Efficiency is evalueted as η_Eff_Ref = 1 - [∫ NOx_Dwn_Ref / ∫ NOx_Up_Msrd]	- If EWMA feature is not enable (1 == 0 [Boolean]), SCR measured NOx conversion efficiency (η_Eff_Msrd) lower than expected one (η_Eff_Ref) - If EWMA feature is enable (1 == 1 [Boolean]), EWMA filtering is apply to the difference between SCR measured NOx conversion efficiency (η_Eff_Msrd) and expected one(η_Eff_Ref)	- If EWMA filter is not enable (1 == 0 [Boolean]) --> η_Eff_Ref - If EWMA filter is enable (1 == 1 [Boolean]) --> Fail Threshold is = 0, Repass Threshold is = 0	Test enabled by calibration; No active DTCs; Debounce time has to be elapsed after SCR Chemical Model is healed; Debounce time has to be elapsed after exiting from Transient Dosing forced by Remedial Action (conditions active only if Market ≠ USA_CARB) Diagnostic system not disabled; Test not yet executed on current key cycle except the case where EWMA filtering is enabled and in Rapid Response (RR) or Fast Initial Response (FIR) status;	CalOut = 1 [Boolean]; ≠ NOX_Snsr1_NOx_Flt ≠ NOX_NOx_SnsrSCR_DwnFlt ≠ EGT_TempSCR_UpFlt ≠ EGP_PresSCR_UpFlt ≠ EXM_TurbFlowNotValid ≠ SCR_RDP_Flt ≠ SCR_TipStuckFltSt ≠ SCR_ChemicalMdlFlt; Debounce = 300 [sec]; Debounce = 300 [sec]; NotDsbl = True [Boolean]; NotRun = True [Boolean];	One failure to set the DTC	Type A, 1 Trips

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
					Test per trip up to calibrateable value when EWMA filter is active and in Fast Initail Response (FIR) status;	FIR Test Trip < 2 ;		
					Total Test executed in Rapid Response Fast Initail Response (FIR) up to calibrateable value when EWMA filtering is active	FIR Tot Test < 2 ;		
					Test per trip up to calibrateable value when EWMA filter is active and in Rapid Response (RR) status;	RR Test Trip < 6 ;		
					Total Test executed in Rapid Response (RR) up to calibrateable value when EWMA filtering is active;	RR Tot Test < 6 ;		
					DEF system ready to inject;	DEF Ready = True [Boolean];		
					Urea inside the Tank not frozen;	DEF Tank Status = DEF_TankNotFrozen [Enumerative];		
					Debounce time has to be elapsed after DEF Defrost has been complited ;	Debounce = 300 [sec];		
					Engine Torque request higher than calibration;	Torque >= 65 [Nm];		
					Upstream SCR NOx Sensor measurement	Reliable = True [Boolean];		

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
					reliable;			
					Downstream SCR NOx Sensor measurement reliable;	Reliable = True [Boolean];		
					Slip detection reliable;	Slip Reliable = True [Boolean];		
					Number of successfully completed DPF regeneration events has occurred after vehicle exit from assembly plant (SCR Catalyst De-Greened);	DPF Rgn Compt > 0 [-];		
					SCR Service Bay Test not active;	Service Bay Test == ServNotRunning [Enumerative];		
					Debounce time has to be elapsed after exiting from SCR Service Bay Test;	Debounce = 300 [sec];		
					Outside Ambient Temperature higher than calibration with hysteresis;	OAT > -7 [°C]; -7 [°C] < hysteresis range < -7 [°C]		
					Ambient Pressure higher than calibration with hysteresis;	Pressure > 70 [kPa]; 70 [°C] < hysteresis range < 70 [°C]		
					Urea Dosing activation by SCR mean temperature condition;	SCR mean Temperature > 190 [°C]; 180 [°C] < hysteresis range < 190 [°C]		
					Debounce time has been elapsed after Urea Dosing activation by SCR mean temperature	Debounce = 180 [sec];		

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
					becomes true;			
					Difference between SCR upstream and SCR downstream temperatures has to be: - higher than first calibration curve (f[SCR mean Temperature]) AND - lower than second calibration curve (f[SCR mean Temperature]);	SCR Up/Down Diff Temperature > **T_MinTempGrad** [°C] Temperature < **T_MaxTempGrad** [°C];		
					Debounce time has to be elapsed when difference between SCR upstream and SCR downstream temperatures condition becomes in range	Debounce = 30 [sec];		
					Exhaust mass flow and SCR average temperature shall be within calibrateable region defined by 2 size table (f [Exhaust mass flow, SCR average Temperature]), enablement occur if table output is greater than calibration;	**K_EffExhFlowCond** > 1 [-];		
					Debounce time has to be elapsed when exhaust mass flow and SCR average temperature condition becomes in range;	Debounce = 30 [sec];		

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
					SCR mean Temperature time derivative is inside a region defined by maximum and minimum calibrations and debounce time has been elapsed base on following logic: - while SCR mean Temperature time derivative is out of the region, the system continuously evaluete the debounce time base on calibration curve (f[SCR mean Temperature time derivative]) and record the maximum value; - instead when SCR mean Temperature time derivative enter inside region, countdown start until debounce time has been reached;	-5 < Delta Temperature < 5 [°C/sec]; Debounce = **t_DerTempDsblTmr** [sec];		
					Upstream SCR NOx flow measurement lower than calibration and debounce time has been elapsed base on following logic: - while SCR NOx flow measurement higher than calibration, the system continuously evaluete the NOx avarage flow; - instead when SCR NOx flow measurement becomes lower than calibration, debounce time base on calibration curve	NOx Up Flow < 75 [mg/s]; Debounce = **t_NOxFlowIncDsblTmr** [sec]; Max Debounce = 5 [sec];		

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
					(f[NOx avarage flow, time spent with NOx flow higher than calibration]) is evalueted and countdown start until debounce time has been elapsed. Limitation on the debouce time is always applied; Upstream SCR NOx flow measurement higher than calibration; Upstream SCR NOx Sensor measurement higher than calibration; Upstream SCR NOx Sensor measurement lower than calibration; Downstream SCR NOx Sensor measurement higher than calibration; Upstream SCR NOx flow measurement lower than calibration; Upstream SCR absolute NOx derivative flow lower than calibration; NO2/NO ratio shall be: - higher than first calibrateable value AND - lower than second calibrateable value; Debounce time has to be elapsed when all NOx	NOx Up Flow > 10 [mg/ s]; NOx Up > 100 [ppm]; NOx Up < 500 [ppm]; NOx Dwn > -1 [ppm]; NOx Up Flow < 75 [mg/ s]; Delta NOx Up Flow < 35 [mg/sec^2]; NO2/NO > 0 [-] NO2/NO < 1 [-];		

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
					conditions (except Upstream SCR NOx flow measurement lower than calibration) becomes true; Slip conditions: - debounce time has to be elapsed when slip goes off, OR - when slip is active NOx Upstream flow accumulated shall be greater than a calibration curve (f[SCR Temperature]); No DPF / DeHC combustion modes has to be active; Debounce time has to be elapsed after exiting from a DPF / DeHC combustion modes; NH3 storage deviation error has to be: - higher than first calibration curve (f[SCR Average Temperature]) AND - lower than second calibration curve (f[SCR Average Temperature]);	Debounce = 0 [sec]; Debounce = 30 [sec] ∫ NOx_Up > **m_SlipNOxIntglThrsh** [mg]; Cmb ≠ DPF_HiO2 | DPF_LoO2 | DPF_EngPrtct_HiO2 | DPF_EngPrtct_LoO2 | DPF_PN | DPF_RichIdle | DeHC_Drive | DeHC_Park [Enumerative]; Debounce = 300 [sec]; NH3 Deviation > **m_NH3_StrgDevErrMinThrsh** [g] NH3 Deviation <		

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
					NH3 storage has to be: - higher than first calibration curve (f[SCR Average Temperature]) AND - lower than second calibration curve (f[SCR Average Temperature]); Debounce time has been elapsed when NH3 storage deviation error or NH3 storage conditions becomes in range; SCR Dosing in NH3 Storage Control or in Intrusive NH3 Storage Control; Debounce time has to be counted after entering on NH3 Storage Control;	**m_NH3_StrgDevErrMax Thrsh** [g]; NH3 Storage > **m_NH3_StrgMinThrsh** [g] NH3 Storage < **m_NH3_StrgMaxThrsh** [g]; Debounce = 3 [sec]; Dos = NH3_StrgCntrl | Intrsv_NH3_StrgCntrl [Enumerative]; Debounce = 0 [sec];		

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
Accelerator Pedal Position (APP) Sensor 1 Lo	P2122	Detect a continuous or intermittent short or open in the APP sensor #1 on Main processor	APP1 Voltage <	0.4625		Run/Crank voltage > 6.41 No 5V reference error or fault for # 4 5V reference circuit (P06A3)	19 / 39 counts or 14 counts continuous; 12.5 ms/count in the main processor	Type A, 1 Trips

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Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
Accelerator Pedal Position (APP) Sensor 1 Hi	P2123	Detect a continuous or intermittent short or open in the APP sensor #1 on Main processor	APP1 Voltage >	4.7500		Run/Crank voltage > 6.41 No 5V reference error or fault for # 4 5V reference circuit (P06A3)	19 / 39 counts or 14 counts continuous; 12.5 ms/count in the main processor	Type A, 1 Trips

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
Accelerator Pedal Position (APP) Sensor 2 Lo	P2127	Detect a continuous or intermittent short or open in the APP sensor #2 on Main processor	APP2 Voltage <	0.3250		Run/Crank voltage > 6.41 No 5V reference error or fault for # 4 5V reference circuit (P0697)	19 / 39 counts or 14 counts continuous; 12.5 ms/count in the main processor	Type A, 1 Trips

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
Accelerator Pedal Position (APP) Sensor 2 Hi	P2128	Detect a continuous or intermittent short or open in the APP sensor #2 on Main processor	APP2 Voltage >	2.6000		Run/Crank voltage > 6.41 No 5V reference error or fault for # 4 5V reference circuit (P0697)	19 / 39 counts or 14 counts continuous; 12.5 ms/count in the main processor	Type A, 1 Trips

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
Accelerator Pedal Position (APP) Sensor 1-2 Correlation	P2138	Detects a continuous or intermittent correlation fault between APP sensors #1 and #2 on Main processor	Difference between APP1 displaced and APP2 displaced >	5.000 % offset at min. pedal position with a linear threshold to 10.001 % at max. pedal position		Run/Crank voltage > 6.41 No APP sensor faults (P2122, P2123,P2127, P2128) No 5V reference errors or faulst for # 3 & # 4 5V reference circuits (P06A3, P0697)	19 / 39 counts intermittent or 15 counts continuous, 12.5 ms/count in the main processor	Type A, 1 Trips
			Difference between (normalized min APP1) and (normalized min APP2) >	5.000 % Vref		Run/Crank voltage > 6.41 No APP sensor faults (P2122, P2123,P2127, P2128) No 5V reference errors or faulst for # 3 & # 4 5V reference circuits (P06A3, P0697)	19 / 39 counts intermittent or 15 counts continuous, 12.5 ms/count in the main processor	

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
Transfer Case Speed Sensor Output (TCSS)	P2160	No activity in the TCSS Signal circuit	TCSS Raw Speed	≤ 25 RPM			≥ 4.50 seconds	Type B, 2 Trips
					engine torque high (transmission PARK or NEUTRAL) AND	>= 8,191.75 Nm		
					engine torque low (transmission PARK or NEUTRAL) once engine torque high met	> 8,191.75 Nm		
					engine torque high (transmission not PARK and not NEUTRAL) AND	>= 80.00 Nm		
					engine torque low (transmission not PARK and not NEUTRAL) once engine torque high met	> 35.00 Nm		
					driver accelerator pedal position high (transmission PARK or NEUTRAL) AND	>= 100.00 %		
					driver accelerator pedal position low (transmission PARK or NEUTRAL) once driver accelerator pedal position high met	> 8.00 %		
					accelerator pedal position high (transmission not PARK and not NEUTRAL) AND	>= 5.00 %		
					driver accelerator pedal position low (transmission not PARK and not NEUTRAL) once driver accelerator pedal position high met	> 3.00 %		

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
					PTO	not active		
					engine torqure inaccurate	FALSE		
					engine speed inaccurate	FALSE		
					transmission output speed inaccurate	FALSE		
					transmission range AND	< NEUTRAL (PARK OR REVERSE)		
					transmission range previous loop (12.5 msec) AND (	< NEUTRAL (PARK OR REVERSE)		
					transmission range change REVERSE calibration enabled OR	= 0		
					transmission range change NEUTRAL calibration enabled) AND transmission range NOT transmission range previous loop (12.5 msec) RUN range change timer, range change timer	= 0	>= **P2160 range change delay time** seconds	
					igntion run crank voltage AND	> 6.00 volts		
					igntion run crank voltage AND	>= 9.00 volts		
					igntion run crank voltage	<= 32.00 volts		
					engine speed	>= 300 RPM		

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
					transmission output speed	>= 181 RPM		
					P2160 enabled calibration	= 1		
					P2160	not fault active		
					OR			
					P2160	not test fail this key on		

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
Transfer Case Speed Sensor Output (TCSS)	P2161	TCSS Circuit Signal Intermittent	TCSS delta fail count	>= 5 counts				Type B, 2 Trips
					loop to loop TCSS delta speed AND loop to loop TCSS delta speed remains	>= 650 RPM > 250 RPM	>= 3.00 seconds (TCSS delta fail count then increments)	
					TCSS speed raw OR TCSS last valid raw	>= 150 RPM >= 150 RPM	>= 6.00 seconds	
					transmission range AND transmission range previous loop (12.5 msec) AND (transmission range change REVERSE calibration enabled OR transmission range change NEUTRAL calibration enabled) AND transmission range NOT transmission range previous loop (12.5 msec) RUN range change timer, range change timer	< NEUTRAL (PARK OR REVERSE) < NEUTRAL (PARK OR REVERSE) = 0 = 0	>= **P2160 range change delay time** seconds	

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
					TOSS raw OR (TOSS raw - TCSS raw, delta speed loop to loop (12.5 msec) AND TOSS raw speed)	= 0 RPM <= 4,095 RPM >= 350 RPM	>= 0.00	
					TCSS raw last valid speed	>= 500 RPM		
					TCSS raw	>= 500 RPM		
					engine speed	>= 350		
					4WD range change time out		>= 5.00 seconds	
					engine speed inaccurate	= FALSE		
					transmission output speed inaccurate	= FALSE		
					PTO	not active		
					P2161 OR P2161	not fault active not test fail this key on		

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
Intake Air Temperature Sensor 1 / 2 Correlation	P2199	Detects a difference between the IAT and IAT2 sensors	ABS (IAT - IAT2)	> 55.0 deg C	Powertrain Relay Voltage for a time No Active DTCs:	>= 11.0 Volts >= 0.9 seconds PowertrainRelayFault	40 failures out of 50 samples 1 sample every 100 msec	Type B, 2 Trips

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
Barometric Pressure (BARO) Sensor Performance	P2227	This monitor is used to identify BARO sensor internal faults (measurement with an offset or a drift). The plausibility monitor compares the BARO, MAP and TCIAP pressures when the Throttle valve is open, the engine speed and the fuel injected quantity are below a threshold (engine idle condition) and the engine coolant temperature is higher than a threshold: in that condition the three sensors are expected to measure the same pressure. If BARO sensor drifts from the other two a specific DTC sets.	Difference (absolute value) in measured pressure between BARO sensor and TCIAP sensor AND Difference (absolute value) in measured pressure between BARO sensor and MAP sensor AND Difference (absolute value) in measured pressure between TCIAP sensor and MAP sensor	> **P0106, P2227, P227B, P00C7: Maximum pressure difference** [kPa] > **P0106, P2227, P227B, P00C7: Maximum pressure difference** [kPa] < **P0106, P2227, P227B, P00C7: Maximum pressure difference** [kPa]	Correlation diagnostic enabled by calibration Engine is running Cranking ignition in range Engine speed Requested fuel Throttle measured position Engine Coolant Temperature OR OBD Coolant Enable Criteria No faults are present	1.00 ==TRUE ==TRUE Battery voltage > 11.00 [V] < 1,100.00 [rpm] < 50.00 [mm^3] > 90.00 [%] > 70.00 [°C] ==TRUE CrankSensor_FA ==FALSE FUL_GenericInjSysFA ==FALSE TPS_PstnSnsrFA ==FALSE MAP_SensorCircuitFA ==FALSE AAP2_SnsrCktFA ==FALSE AAP_AAP5_SnsrCktFA	320.00 fail counters over 400.00 sample counters sampling time is 12.5 ms	Type B, 2 Trips

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
						==FALSE AAP_AAP2_SnsrStabFA ==FALSE AAP_AAP5_SnsrStabFA ==FALSE ECT_Sensor_FA ==FALSE MAF_MAF_SnsrFA ==FALSE		
			BARO Pressure OR BARO Pressure	< 50.0 kPa > 115.0 kPa	Time between current ignition cycle and the last time the engine was running Engine is not rotating No Active DTCs: No Pending DTCs:	> 5.0 seconds EngineModeNotRunTimer Error MAP_SensorCircuitFA AAP_SnsrCktFA MAP_SensorCircuitFP AAP_SnsrCktFP	4 failures out of 5 samples 1 sample every 12.5 msec	

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
Barometric Pressure (BARO) Sensor Circuit Low (Diesel, pull-down)	P2228	Detects a continuous short to low or open in either the signal circuit or the BARO sensor.	BARO Voltage	< 35.5 % of 5 Volt Range (1.8 Volts = 50.0 kPa)			320 failures out of 400 samples 1 sample every 12.5 msec	Type B, 2 Trips

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
Barometric Pressure (BARO) Sensor Circuit High (Diesel, pull-down)	P2229	Detects an open sensor ground, continuous short to high in either the signal circuit or the BARO sensor.	BARO Voltage	> 94.1 % of 5 Volt Range (4.7 Volts = 115.1 kPa)			320 failures out of 400 samples 1 sample every 12.5 msec	Type B, 2 Trips

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
Barometric Pressure (BARO) Sensor Circuit Intermittent	P2230	Detects a noisy or erratic barometric pressure input	String Length Where: "String Length" = sum of "Diff" calculated over And where: "Diff" = ABS(current BARO reading - BARO reading from 12.5 milliseconds previous)	> 100 kPa 80 consecutive BARO samples			4 failures out of 5 samples Each sample takes 1.0 seconds	Type B, 2 Trips

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
Turbocharger/ Supercharger Boost System A Performance	P2263	This monitor is used to detect any malfunction in the boost pressure control system that lead to very high or low intake manifold pressure that could lead to overspeed the turbine. It works only in steady state closed loop pressure control zone, tipically in the turbine overspeed area outside of the FTP test cycle. The DTC checks a positive or negative control deviation of the boost pressure indicating an underboost or overboost condition. The aim of the boost pressure system performance monitor is to detect leakages in the pipe after the compressor or in the intake/exhaust manifold (underboost) or obstructions in the exhaust pipe (overboost) that leads to overspeed the turbine	Boost pressure tracking error: difference between the desired boost pressure and the measured pressure at intake manifold by MAP sensor.	> (**P2263: Boost pressure system performance high threshold (throttle control not active)** [kPa] x **P0234, P2263: Overboost barometric correction**) OR < (**P2263: Boost pressure system performance low threshold (throttle control not active)** [kPa] x **P0299, P2263: Underboost barometric correction**)	Diagnostic enabled by calibration Engine Running Cranking ignition in range Relay voltage in range Difficult launch NOT detected Boost Pressure Control Closed Loop active No active transition from one combustion mode to another Outside Air Temperature Desired Boost Pressure steady state: BstDes-BstDes_Old Engine Coolant Temperature OR	1.00 ==TRUE ==TRUE Battery voltage > 11.00 [V] Powertrain relay voltage > 11.00 [V] Refer to "LDT_DifficultLaunchActive" Free Form AIC_BstCntrlCL==TRUE ==TRUE > -7.00 [°C] AND < 55.00 [°C] > -18 [kPa/s] AND < 24 [kPa/s] > 70 [°C]	160.00 fail counters over 200.00 sample counters sampling time is 25ms	Type A, 1 Trips

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
					OBD Coolant Enable Criteria, AND Engine Coolant Temperature	==TRUE < 117 [°C]		
					Ambient Air Pressure	> 70 [kPa] AND < 110 [kPa]		
					Throttle Valve position	>= 75.00 [%]		
					Engine speed	> 2,750.00 [rpm] AND < 3,500.00 [rpm]		
					Desired intake Boost pressure	> 200.00 [kPa] AND < 270.00 [kPa]		
					No active DTCs	AIC_BstSysDiagDenomDsbl ==FALSE		
					Timer delay once all above conditions are fulfilled	> **P2263: Boost pressure system performance monitor delay timer** [s]		
			Boost pressure tracking error: difference between the desired boost pressure and the measured pressure at intake manifold by MAP	> (	Diagnostic enabled by calibration Engine Running	1.00 ==TRUE ==TRUE	160.00 fail counters over 200.00 sample counters sampling time is	

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
			sensor.	**P2263: Boost pressure system performance high threshold (throttle control active)** [kPa] x **P0234, P2263: Overboost barometric correction**) OR < (**P2263: Boost pressure system performance low threshold (throttle control active)** [kPa] x **P0299, P2263: Underboost barometric correction**)	Cranking ignition in range Relay voltage in range Difficult launch NOT detected Boost Pressure Control Closed Loop active No active transition from one combustion mode to another Outside Air Temperature Desired Boost Pressure steady state: BstDes-BstDes_Old Engine Coolant Temperature OR OBD Coolant Enable Criteria, AND Engine Coolant Temperature	Battery voltage > 11.00 [V] Powertrain relay voltage > 11.00 [V] Refer to "LDT_DifficultLaunchActive" Free Form AIC_BstCntrlCL==TRUE ==TRUE > -7.00 [°C] AND < 55.00 [°C] > -18 [kPa/s] AND < 24 [kPa/s] > 70 [°C] ==TRUE < 117 [°C]	25ms	

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
					Ambient Air Pressure	> 70 [kPa] AND < 110 [kPa]		
					Throttle Valve position	>= 100.00 [%]		
					Engine speed	> 2,750.00 [rpm] AND < 3,500.00 [rpm]		
					Desired intake Boost pressure	> 200.00 [kPa] AND < 270.00 [kPa]		
					No active DTCs	AIC_BstSysDiagDenomDsbl ==FALSE		
					Timer delay once all above conditions are fulfilled	> **P2263: Boost pressure system performance monitor delay timer** [s]		

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
Water in Fuel Sensor Circuit	P2264		Water In Fuel signal	= TRUE	Powertrain relay voltage No error for Engine Not Running timer (refer to EngineModeNotRunTimer Error Ignition off time Ignition on time Test if Software and Calibration versions match (refer to 'MEMR FNA Matched Flag' free form)	≥ 11.0 V = FALSE) > 28,799.0 s > 0.30 s < 1.80 s	10 failure out of 14 samples 100 ms/sample	Type C, No SVS

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
Barometric Pressure Sensor C Circuit Range/ Performance	P227B	This monitor is used to identify TCIAP sensor internal faults (measurement with an offset or a drift). The plausibility monitor compares the BARO, MAP and TCIAP pressures when the Throttle valve is open, the engine speed and the fuel injected quantity are below a threshold (engine idle condition) and the engine coolant temperature is higher than a threshold: in that condition the three sensors are expected to measure the same pressure. If TCIAP sensor drifts from the other two a specific DTC sets.	Difference (absolute value) in measured pressure between BARO sensor and TCIAP sensor AND Difference (absolute value) in measured pressure between TCIAP sensor and MAP sensor AND Difference (absolute value) in measured pressure between BARO sensor and MAP sensor	> **P0106, P2227, P227B, P00C7: Maximum pressure difference** [kPa] > **P0106, P2227, P227B, P00C7: Maximum pressure difference** [kPa] < **P0106, P2227, P227B, P00C7: Maximum pressure difference** [kPa]	Correlation diagnostic enabled by calibration Engine is running Cranking ignition in range Engine speed Requested fuel Throttle measured position Engine Coolant Temperature OR OBD Coolant Enable Criteria No faults are present	1.00 ==TRUE ==TRUE Battery voltage > 11.00 [V] < 1,100.00 [rpm] < 50.00 [mm^3] > 90.00 [%] > 70.00 [°C] ==TRUE CrankSensor_FA ==FALSE FUL_GenericInjSysFA ==FALSE TPS_PstnSnsrFA ==FALSE MAP_SensorCircuitFA ==FALSE AAP2_SnsrCktFA ==FALSE AAP_AAP5_SnsrCktFA ==FALSE	320.00 fail counters over 400.00 sample counters sampling time is 12.5 ms	Type B, 2 Trips

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
						AAP_AAP2_SnsrStabFA ==FALSE AAP_AAP5_SnsrStabFA ==FALSE ECT_Sensor_FA ==FALSE MAF_MAF_SnsrFA ==FALSE		
			TCIAP Pressure OR TCIAP Pressure	< 50.0 kPa > 115.0 kPa	Time between current ignition cycle and the last time the engine was running Engine is not rotating No Active DTCs: No Pending DTCs:	> 5.0 seconds EngineModeNotRunTimer Error MAP_SensorCircuitFA AAP_SnsrCktFA AAP2_SnsrCktFA AAP3_SnsrCktFA MAP_SensorCircuitFP AAP_SnsrCktFP AAP2_SnsrCktFP AAP3_SnsrCktFP	4 failures out of 5 samples 1 sample every 12.5 msec	

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
Barometric Pressure Sensor Circuit C Low (Diesel, pull-up)	P227C	Detects a continuous short to low in either the signal circuit or the BARO C sensor.	BARO C Voltage	< 39.0 % of 5 Volt Range (2.0 Volts = 49.7 kPa)			320 failures out of 400 samples 1 sample every 12.5 msec	Type B, 2 Trips

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
Barometric Pressure Sensor Circuit C High (Diesel, pull-up)	P227D	Detects an open sensor ground, continuous short to high or open in either the signal circuit or the BARO C sensor.	BARO C Voltage	> 90.0 % of 5 Volt Range (4.5 Volts = 115.0 kPa)			320 failures out of 400 samples 1 sample every 12.5 msec	Type B, 2 Trips

16 OBDG04 ECM Summary Tables (Initial DTCs)

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
Barometric Pressure Sensor C Circuit Intermittent/ Erratic	P227E	Detects a noisy or erratic barometric pressure B input	String Length Where: "String Length" = sum of "Diff" calculated over And where: "Diff" = ABS(current BARO C reading - BARO C reading from 12.5 milliseconds previous)	> 200 kPa 80 consecutive BARO C samples			4 failures out of 5 samples Each sample takes 1.0 seconds	Type B, 2 Trips

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
Fuel Pressure Regulator 1 - Forced Engine Shutdown	P228A	Determine when rail pressure is lower than desired setpoint and pressure regulator 1 has achieved its maximum authority.	Rail pressure setpoint - measured rail pressure Commanded fuel flow for metering unit	> 40 MPa ≥ Maximum fuel flow deliverable by high pressure pump (refer to RailPresCntrl section)	Run crank voltage Engine running Metering Unit controlled in closed loop No DTC active since key is on:	≥ 11.0 V P000F	640 failures out of 800 samples 12.5 ms/sample	Type A, 1 Trips

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
Fuel Pressure Regulator 2 - Forced Engine Shutdown	P228B	Determine when rail pressure is lower than desired setpoint and pressure regulator 2 has achieved its maximum authority.	Rail pressure setpoint - measured rail pressure Commanded pressure for pressure regulator valve	> 40 MPa ≥ **P228B Pressure Regulator completely closed command**	Run crank voltage Engine running Pressure Regulator controlled in closed loop	≥ 11.0 V	640 failures out of 800 samples 12.5 ms/sample	Type A, 1 Trips

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
Fuel Pressure Regulator 1 Exceeded Control Limits - Pressure Too Low (Common debouncer)	P228C	Determine when rail pressure is lower than desired setpoint.	Rail pressure setpoint - measured rail pressure Fuel injected quantity	> **P228C Positive rail pressure deviation (MU)** > 3.0 mm^3/stroke	Run crank voltage Engine running Metering Unit controlled in closed loop (**P228C P228D Low fuel level calibrated as enabling condition (MU)** AND LowFuelConditionDiagnostic (**P228C P228D Air ambient pressure calibrated as enabling condition (MU)** AND Air ambient pressure (**P228C P228D Air ambient temperature calibrated as enabling condition (MU)** AND Air ambient temperature No DTC active since key is on:	≥ 11.0 V = FALSE) ≥ 60 kPa) ≥ -7 °C) P000F	640 failures out of 800 samples 12.5 ms/sample MIL is illuminated according to 'similar engine conditions' criteria.	Type B, 2 Trips
			Rail pressure setpoint - measured rail pressure Fuel injected quantity	> **P229A Positive rail pressure deviation (PR)** > 3.0 mm^3/stroke	Run crank voltage Engine running Pressure Regulator controlled in closed loop	≥ 11.0 V	640 failures out of 800 samples 12.5 ms/sample MIL is illuminated according to	

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
					P229A P229B Low fuel level calibrated as (**enabling condition (PR)** AND LowFuelConditionDiagnostic (**P229A P229B Air ambient pressure calibrated as enabling condition (PR)** AND Air ambient pressure (**P229A P229B Air ambient temperature calibrated as enabling condition (PR)** AND Air ambient temperature	= FALSE) ≥ 60 kPa) ≥ -7 °C)	'similar engine conditions' criteria.	

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
Fuel Pressure Regulator 1 Exceeded Control Limits - Pressure Too High (Common debouncer)	P228D	Determine when rail pressure is higher than desired setpoint.	Rail pressure setpoint - measured rail pressure Fuel injected quantity Fuel temperature	< **P228D Negative rail pressure deviation (MU)** > 3.0 mm^3/stroke > -40 °C	Run crank voltage Engine running Metering Unit controlled in closed loop (**P228C P228D Low fuel level calibrated as enabling condition (MU)** AND LowFuelConditionDiagnostic (**P228C P228D Air ambient pressure calibrated as enabling condition (MU)** AND Air ambient pressure (**P228C P228D Air ambient temperature calibrated as enabling condition (MU)** AND Air ambient temperature No DTC active since key is on:	≥ 11.0 V = FALSE) ≥ 60 kPa) ≥ -7 °C) P000F	640 failures out of 800 samples 12.5 ms/sample MIL is illuminated according to 'similar engine conditions' criteria.	Type B, 2 Trips
			Rail pressure setpoint - measured rail pressure Fuel injected quantity	< -15 MPa > 3.0 mm^3/stroke	Run crank voltage Engine running Pressure Regulator controlled in closed loop	≥ 11.0 V	640 failures out of 800 samples 12.5 ms/sample MIL is illuminated according to	

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
					P229A P229B Low fuel level calibrated as (**enabling condition (PR)** AND LowFuelConditionDiagnostic (**P229A P229B Air ambient pressure calibrated as enabling condition (PR)** AND Air ambient pressure (**P229A P229B Air ambient temperature calibrated as enabling condition (PR)** AND Air ambient temperature	 = FALSE) ≥ 60 kPa) ≥ -7 °C)	'similar engine conditions' criteria.	

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
Fuel Pressure Regulator 2 Performance	P2293	Determine when rail pressure is above maximum threshold when pressure is governed by Pressure Regulator valve.	Rail pressure	> **P2293 Maximum rail pressure with PR**	Run crank voltage Rail pressure is governed by Pressure Regulator	≥ 11.0 V	160 failures out of 229 samples OR 160 continuous failures out of 229 samples 6.25 ms/sample	Type A, 1 Trips

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
Fuel Pressure Regulator 2 Control Circuit	P2294	Determine when an open circuit affects Fuel Pressure Regulator 2 (Pressure Regulator Valve) control circuit.	Impedence between signal and controller ground	≥ 200 kΩ	Powertrain relay voltage Run crank voltage Engine not cranking **Pressure Regulator Valve present**	≥ 11.0 V > 6.0 V	44 failures out of 88 samples 6.25 ms/sample	Type A, 1 Trips

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
Fuel Pressure Regulator Solenoid 2 Control Circuit Low Voltage	P2295	Determine when short circuit to ground affects Fuel Pressure Regulator 2 (Pressure Regulator Valve) control circuit.	Impedence between signal and controller ground	≤ 0.5 Ω	Powertrain relay voltage Run crank voltage Engine not cranking **Pressure Regulator Valve present**	≥ 11.0 V > 6.0 V	44 failures out of 88 samples 6.25 ms/sample	Type A, 1 Trips

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
Fuel Pressure Regulator Solenoid 2 Control Circuit High Voltage	P2296	Determine when short circuit to power affects Fuel Pressure Regulator 2 (Pressure Regulator Valve) control circuit.	Impedence between signal and controller power	≤ 0.5 Ω	Powertrain relay voltage Run crank voltage Engine not cranking **Pressure Regulator Valve present**	≥ 11.0 V > 6.0 V	44 failures out of 88 samples 6.25 ms/sample	Type A, 1 Trips

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
Closed Loop Reductant Injection Control At Limit - Flow Too Low	P249D	This diagnosis checks if the DEF injection system has exceeded limit of correction authority Monitoring is executed by compararing Long Term Adaptation Factor (LTAF) with a calibratable threshold: LTAF > OBD High Threshold The longterm adaptation factor is created based on the information given by the NH3 storage correction strategy, this factor represents the deviation of the complete SCR system measured and shall be used to compensate it by making a correction over the DEF injection quantity	Long Term Adaptation Factor (LTAF) higher than calibrateable Threshold	LTAF > 1.69	Test enabled by calibration;	CalOut = 1 [Boolean];	One failure to set the DTC	Type B, 2 Trips

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
Closed Loop Reductant Injection Control At Limit - Flow Too High	P249E	This diagnosis checks if the DEF injection system has exceeded limit of correction authority Monitoring is executed by compararing Long Term Adaptation Factor (LTAF) with a calibratable threshold: LTAF < OBD Low Threshold The longterm adaptation factor is created based on the information given by the NH3 storage correction strategy, this factor represents the deviation of the complete SCR system measured and shall be used to compensate it by making a correction over the DEF injection quantity	Long Term Adaptation Factor (LTAF) lower than calibrateable Threshold	LTAF < 0.41	Test enabled by calibration;	CalOut = 1 [Boolean];	One failure to set the DTC	Type B, 2 Trips

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
Transmission Control Torque Request Circuit	P2544	Determines if the torque request from the TCM is valid	Protection error - Serial Communication message 2's complement not equal ($189/$199) OR Rolling count error - Serial Communication message ($189/$199) rolling count index value OR Range Error - Serial Communication message - ($189/$199) TCM Requested Torque Increase OR Multi-transition error - Trans torque intervention type request change	Message <> two's complement of message Message <> previous message rolling count value + one > 500 Nm Requested torque intervention type toggles from an increasing request to not an increasing request then back to an increasing request within 200ms	Diagnostic Status Power Mode Ignition Voltage Engine Running Run/Crank Active No Serial communication loss to TCM (U0101)	Enabled = Run > 6.41 volts = True > 0.50 Sec No loss of communication	>= 16 protection value errors out of 20 samples. Performed on every received message >= 6 Rolling count errors out of 10 samples. Performed on every received message >=6 range errors out of 10 samples. Performed on every received message >=3 multi-transitions errors out of 5 samples. Performed every 200 msec	Type B, 2 Trips

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
Performance Traction Torque & Speed Request Circuit	P2548	Determines if torque and/or speed request from the EBTCM is valid	Protection error - Serial Communication message ($1C8) 2's complement not equal Engine Torque Request Engine Speed Request OR Rolling count error - Serial Communication message ($1C8) rolling count index value	Message <> two's complement of message Message <> two's complement of message Message <> previous message rolling count value + one	Diagnostic Status Run/Crank Active Ignition Voltage No Serial communication loss to EBTCM (U0121)	Enabled > 0.50 seconds > 6.41 volts No loss of communication	Fail Threshold: >= 10 errors out of 20 samples Pass Threshold: >= 10 samples during key cycle. OR Fail Threshold >= 6 Rolling count errors out of 10 samples Performed on every received message	Type B, 2 Trips

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
Unmetered Fuel - Forced Engine Shutdown	P25BD	Determines if engine overspeed condition is occuring when no fuel is being delivered	Engine Speed exceeds a threshold for a period of time	Fail Condition: Engine Speed > 5,000 RPM		Engine Speed > 1,500 RPM	Fail threshold: Overspeed condition TRUE > 25.0 seconds	Type A, 1 Trips
			Engine Speed less than a threshold for a period of time	Pass Condition: Engine Speed < (5,000 - 300) RPM		Engine Speed > 1,500 RPM	Pass threshold: Overspeed condition FALSE > 25.0 seconds	

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
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. 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.	Count Up Test: Time difference between the current read and the previous read of the timer Range Test: The variation of the HWIO timer and mirror timer is	> 1.50 seconds > 0.25 %.			Count Up Test: 4 failures out of 20 samples 1 sec / sample Continuous while run/crank is not active and until controller shutdown is initiated. Range Test: Once per trip when controller shutdown is initiated or run/ crank becomes active.	Type B, 2 Trips

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
Malfunction Indicator Lamp (MIL) Control Circuit (ODM) Low	P263A	Diagnoses the malfunction indicator lamp control low side driver circuit for circuit faults.	Voltage low during driver off state (indicates short-to-ground)	Short to ground: ≤ 0.5 Ω impedance between signal and controller ground	Run/Crank Voltage Remote Vehicle Start is not active	Voltage ≥ 11.00 volts	1 failures out of 1 samples 50 ms / sample	Type B, No MIL NO MIL Note: In certain controllers P0650 may also set (MIL Control Open Circuit)

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
Malfunction Indicator Lamp (MIL) Control Circuit (ODM) High	P263B	Diagnoses the malfunction indicator lamp control low side driver circuit for circuit faults.	Voltage high during driver on state (indicates short to power)	Short to power: ≤ 0.5 Ω impedance between signal and controller power	Run/Crank Voltage Remote Vehicle Start is not active	Voltage ≥ 11.00 volts	4 failures out of 5 samples 50 ms / sample	Type B, No MIL NO MIL

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
Shared High Side Drive #2 Control Circuit Low (STG) - (GEN III Controllers ONLY)	P2670	Diagnoses shared high side driver circuit low voltage	Shared high side drive #2 control circuit low voltage	Controller internal diagnostic	Shared high side drive #2 low diag enable Powertrain relay voltage Run Crank voltage Powertrain relay state	= 1.00 >= 11.00 > 6.00 = ON	20 failures out of 25 samples 100 ms / sample	Type B, 2 Trips

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
Shared High Side Drive #2 Control Circuit High (STP) - (GEN III Controllers ONLY)	P2671	Diagnoses shared high side driver circuit high voltage	Shared high side drive #2 control circuit high voltage	Controller internal diagnostic	Shared high side drive #2 diag enable Powertrain relay voltage Run Crank voltage Powertrain relay state	= 1.00 >= 11.00 > 6.00 = ON	20 failures out of 25 samples 100 ms / sample	Type B, 2 Trips

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
Fuel Supply Heater Control Circuit/Open	P2687	Determine when an open circuit affects Fuel Supply Heater control circuit.	Impedence between signal and controller ground	≥ 200 kΩ	Run crank voltage Powertrain relay voltage Engine not cranking	> 6.0 V ≥ 11.0 V	10 failures out of 20 samples 100 ms/sample	Type C, No SVS

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
Fuel Supply Heater Control Circuit Low	P2688	Determine when short circuit to ground affects Fuel Supply Heater control circuit.	Impedence between signal and controller ground	≤ 0.5 Ω	Run crank voltage Powertrain relay voltage Engine not cranking	> 6.0 V ≥ 11.0 V	10 failures out of 20 samples 100 ms/sample	Type C, No SVS

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
Fuel Supply Heater Control Circuit High	P2689	Determine when short circuit to power affects Fuel Supply Heater control circuit.	Impedence between signal and controller power	≤ 0.5 Ω	Run crank voltage Powertrain relay voltage Engine not cranking	> 6.0 V ≥ 11.0 V	10 failures out of 20 samples 100 ms/sample	Type C, No SVS

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
Four Wheel Drive Low Switch Circuit	P2771	Fail Case 1: Continuous Open (Stuck Off) in the Four Wheel Drive Low Switch CircuitFail Case 2: Ground (Stuck On) in the Four Wheel Drive Low Switch Circuit	4WD Low Switch Transfer case gear ratio 4WD Low Switch Transfer case gear ratio	= TRUE ≥ 5.700 and ≤ 8.000 = FALSE ≥ 0.700 and ≤ 1.550	Engine Torque Engine Speed Ignition voltage Throttle position Transmission Temperature Engine Run time Vehicle Speed TPS_FA VehicleSpeedSensor_FA EngineTorqureInaccurate Transmission gear P0502, P0503, P0722, P0723, P215C, P2160, P2161, U0101 Clutch Transmission Input Speed Signal	30.0 ≤ N-M ≤ 8,191.8 1,000 ≤ RPM ≤ 5,500 9.0 ≤ Volts ≤ 32.00 3.0 ≤ % ≤ 99.0 -40.0 ≤ ºC ≤ 130.0 >= 10.0 Sec >= 5.00 Mph False False FALSE Not in Park, Reverse, or Neutral Not Fault Active Engaged (Manual transmission only) Valid (Automatic transmission only)	≥ 2.0 sec≥ 7.0 sec	Type B, 2 Trips

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
Transfer Case Control Module Transfer Case Command State Rationality - 4wd high command not 4wd high ratio	P279A	Monitor measures transfer case gear ratio is 4wd low ratio or neutral ratio while the transfer case control module command state is 4wd high.	measured transfer case ratio is 4wd high ratio AND measured transfer case ratio calculation updated (measured transfer case ratio = transmission output speed / transfer case output speed)	= FALSE = TRUE	transfer case contol module transfer case command state	= 4wd high	weighted fail count >= 5 out of sample count >= 280 (12.5 milleseconds per count)	Type B, 2 Trips
					weighted fail count	= **P279A P279B P279C Transfer Case Control Module Transfer Case Command State Rationality (weighting factor)** (see supproting table)		
					measured transfer case ratio is 4wd high ratio set to TRUE AND measured tranfer case ratio calculation updated set to TRUE	measured transfer case ratio >= **P279A Transfer Case Control Module Transfer Case Command State Rationality (margin of error low)** (see supporting table) AND measured transfer case ratio <= **P279A Transfer Case Control Module Transfer Case Command State Rationality (margin of error high)** (see supporting table)		
					transfer case output speed sensor configuration = CeFWDD_e_UseTCSS	transfer case output speed sensor configuration = CeFWDD_e_UseTCSS = FALSE		

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
					P0502 fault active AND P0503 fault active AND P0722 fault active AND P0723 fault active AND P2160 fault active AND P2616 fault active vehicle drive wheel type configuration NOT CeFWDG_e_No_AWD_Or_FWD AND NOT CeFWDG_e_Versatrak_AWD AND NOT CeFWDG_e_FWD_AWD_SingleSpd	= FALSE = FALSE = FALSE = FALSE = FALSE vehicle drive wheel type configuration = CeFWDR_e_FWD_ECM_TCM_TCCM		

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
Transfer Case Control Module Transfer Case Command State Rationality - 4wd low command not 4wd low ratio	P279B	Monitor measures transfer case gear ratio is 4wd high ratio or neutral ratio while the transfer case control module command state is 4wd low.	measured transfer case ratio is 4wd low ratio AND measured transfer case ratio calculation updated (measured transfer case ratio = transmission output speed / transfer case output speed)	= FALSE = TRUE	transfer case contol module transfer case command state weighted fail count measured transfer case ratio is 4wd low ratio set to TRUE AND measured tranfer case ratio calculation updated set to TRUE transfer case output speed sensor configuration = CeFWDD_e_UseTCSS	= 4wd low = **P279A P279B P279C Transfer Case Control Module Transfer Case Command State Rationality (weighting factor)** (see supproting table) measured transfer case ratio >= **P279A Transfer Case Control Module Transfer Case Command State Rationality (margin of error low)** (see supporting table) AND measured transfer case ratio <= **P279A Transfer Case Control Module Transfer Case Command State Rationality (margin of error high)** (see supporting table) transfer case output speed sensor configuration = CeFWDD_e_UseTCSS = FALSE	weighted fail count >= 5 out of sample count >= 280 (12.5 milleseconds per count)	Type B, 2 Trips

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
					P0502 fault active AND P0503 fault active AND P0722 fault active AND P0723 fault active AND P2160 fault active AND P2616 fault active vehicle drive wheel type configuration NOT CeFWDG_e_No_AWD_Or_FWD AND NOT CeFWDG_e_Versatrak_AWD AND NOT CeFWDG_e_FWD_AWD_SingleSpd	= FALSE = FALSE = FALSE = FALSE = FALSE vehicle drive wheel type configuration = CeFWDR_e_FWD_ECM_TCM_TCCM		

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
Transfer Case Control Module Transfer Case Command State Rationality - 4wd neutral command not 4wd neutral ratio	P279C	Monitor measures transfer case gear ratio is 4wd high ratio or 4wd low ratio while the transfer case control module command state is 4wd neutral.	measured transfer case ratio is 4wd neutral ratio AND measured transfer case ratio calculation updated (measured transfer case ratio = transmission output speed / transfer case output speed)	= FALSE = TRUE	transfer case contol module transfer case command state weighted fail count measured transfer case ratio is 4wd neutral ratio set to TRUE AND measured tranfer case ratio calculation updated set to TRUE when ratio check 1 AND ratio check 2	= 4wd neutral = **P279A P279B P279C Transfer Case Control Module Transfer Case Command State Rationality (weighting factor)** (see supproting table) ratio check 1: measured transfer case ratio >= **P279C Transfer Case Control Module Transfer Case Command State Rationality (margin of error high 1)** (see supporting table) OR measured transfer case ratio <= **P279C Transfer Case Control Module Transfer Case Command State Rationality (margin of error low 1)** ratio check 2 measured transfer case ratio >=	weighted fail count >= 5 out of sample count >= 280 (12.5 milleseconds per count)	Type A, 1 Trips

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
					transfer case output speed sensor configuration = CeFWDD_e_UseTCSS P0502 fault active AND P0503 fault active AND P0722 fault active AND P0723 fault active AND P2160 fault active AND P2616 fault active vehicle drive wheel type configuration NOT CeFWDG_e_No_AWD_Or_FWD AND NOT CeFWDG_e_Versatrak_AWD AND NOT CeFWDG_e_FWD_AWD_SingleSpd	**P279C Transfer Case Control Module Transfer Case Command State Rationality (margin of error high 2)** (see supporting table) OR measured transfer case ratio <= **P279C Transfer Case Control Module Transfer Case Command State Rationality (margin of error low 2)** transfer case output speed sensor configuration = CeFWDD_e_UseTCSS = FALSE = FALSE = FALSE = FALSE = FALSE = FALSE vehicle drive wheel type configuration = CeFWDR_e_FWD_ECM_TCM_TCCM		

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
					neutral rationality enabled	= 1		

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
Control Module Communication on Bus A Off	U0073	This DTC monitors for a BUS A off condition	Bus off failures exceeds before the sample time of is reached	5 counts (equivalent to 0.06 seconds) 0.56 seconds	General Enable Criteria: U0073 Normal CAN transmission on Bus A Device Control High Voltage Virtual Network Management Ignition Voltage Criteria: Run/Crank Ignition voltage Power Mode Off Cycle Enable Criteria: KeCAND_b_OffKeyCycleDiagEnbl Ignition Accessory Line and Battery Voltage General Enable Criteria and either Ignition Voltage Criteria or Off Cycle Enable Criteria met for > 3.0000 seconds CAN hardware is bus OFF for	 Not Active on Current Key Cycle Enabled Not Active Not Active > 6.41 Volts = run = 1 (1 indicates enabled) = Active > 11.00 Volts > 0.1125 seconds	Diagnostic runs in 12.5 ms loop	Type A, 1 Trips

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
Control Module Communication on Bus B Off	U0074	This DTC monitors for a BUS B off condition	Bus off failures exceeds before the sample time of is reached	5 counts (equivalent to 0.06 seconds) 0.56 seconds	General Enable Criteria: U0074 Normal CAN transmission on Bus B Device Control High Voltage Virtual Network Management Ignition Voltage Criteria: Run/Crank Ignition voltage Power Mode Off Cycle Enable Criteria: KeCAND_b_OffKeyCycleDiagEnbl Ignition Accessory Line and Battery Voltage General Enable Criteria and either Ignition Voltage Criteria or Off Cycle Enable Criteria met for > 3.0000 seconds CAN hardware is bus OFF for	 Not Active on Current Key Cycle Enabled Not Active Not Active > 6.41 Volts = run = 1 (1 indicates enabled) = Active > 11.00 Volts > 0.1125 seconds	Diagnostic runs in 12.5 ms loop	Type A, 1 Trips

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
Lost Communication With TCM	U0101	This DTC monitors for a loss of communication with the transmission control module	Message is not received from controller for		General Enable Criteria:		Diagnostic runs in 12.5 ms loop	Type B, 2 Trips
					U0073	Not Active on Current Key Cycle		
			Message $0BD	≥ 10.0 seconds	Normal CAN transmission on Bus A	Enabled		
			Message $0C7	≥ 10.0 seconds	Device Control	Not Active		
			Message $0F9	≥ 10.0 seconds				
			Message $189	≥ 10.0 seconds	High Voltage Virtual Network Management	Not Active		
			Message $199	≥ 10.0 seconds	Ignition Voltage Criteria:			
			Message $19D	≥ 10.0 seconds	Run/Crank Ignition voltage	> 6.41 Volts		
			Message $1AF	≥ 10.0 seconds				
			Message $1F5	≥ 10.0 seconds	Power Mode	= run		
			Message $4C9	≥ 10.0 seconds				
					Off Cycle Enable Criteria:			
					KeCAND_b_OffKeyCycleDiagEnbl	= 1 (1 indicates enabled)		
					Ignition Accessory Line and	= Active		
					Battery Voltage	> 11.00 Volts		
					General Enable Criteria and either Ignition Voltage Criteria or Off Cycle Enable Criteria met for > 3.0000 seconds			
					Power Mode is in accessory or run or crank and High Voltage Virtual Network Management is			

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
					not active for	> 0.4000 seconds		
					U0101	Not Active on Current Key Cycle		
					TCM	is present on the bus		

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
Lost Communication With Transfer Case Control Module	U0102	This DTC monitors for a loss of communication with the transfer case control module	Message is not received from controller for Message $1CB Message $1CC	 ≥ 10.0 seconds ≥ 10.0 seconds	General Enable Criteria: U0073 Normal CAN transmission on Bus A Device Control High Voltage Virtual Network Management Ignition Voltage Criteria: Run/Crank Ignition voltage Power Mode Off Cycle Enable Criteria: KeCAND_b_OffKeyCycleDiagEnbl Ignition Accessory Line and Battery Voltage General Enable Criteria and either Ignition Voltage Criteria or Off Cycle Enable Criteria met for > 3.0000 seconds Power Mode is in accessory or run or crank and High Voltage Virtual Network Management is	 Not Active on Current Key Cycle Enabled Not Active Not Active > 6.41 Volts = run = 1 (1 indicates enabled) = Active > 11.00 Volts	Diagnostic runs in 12.5 ms loop	Type B, 2 Trips "Special Type C"

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
					not active for	> 0.4000 seconds		
					U0102	Not Active on Current Key Cycle		
					TCCM	is present on the bus		

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
Lost Communication With Reductant Control Module (SCR)	U010E	This DTC monitors for a loss of communication with the Reductant Control Module (SCR)	Message is not received from controller for Message $092 Message $4CC Message $4CD Message $4E5 Message $4E6 Message $4E7 Message $4E8 Message $4E9	 ≥ 10.00 seconds ≥ 10.00 seconds ≥ 10.00 seconds ≥ 10.00 seconds ≥ 10.00 seconds ≥ 10.00 seconds ≥ 10.00 seconds ≥ 10.00 seconds	General Enable Criteria: U0074 Normal CAN transmission on Bus B Device Control High Voltage Virtual Network Management Ignition Voltage Criteria: Run/Crank Ignition voltage Power Mode Off Cycle Enable Criteria: KeCAND_b_OffKeyCycleDiagEnbl Ignition Accessory Line and Battery Voltage General Enable Criteria and either Ignition Voltage Criteria or Off Cycle Enable Criteria met for > 3.0000 seconds Power Mode is in accessory or run or crank and High Voltage Virtual Network Management is	 Not Active on Current Key Cycle Enabled Not Active Not Active > 6.41 Volts = run = 1 (1 indicates enabled) = Active > 11.00 Volts	Diagnostic runs in 12.5 ms loop	Type A, 1 Trips

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
					not active for	> 0.4000 seconds		
					U010E	Not Active on Current Key Cycle		
					Reductant Control Module	is present on the bus		

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
Lost Communication With Anti-Lock Brake System (ABS) Control Module	U0121	This DTC monitors for a loss of communication with the Anti-Lock Brake System (ABS) Control Module (Non-OBD Module ID 243).	Message is not received from controller for Message $0C1 Message $0C5 Message $1C7 Message $1E9 Message $2F1 Message $2F9	 ≥ 10.0 seconds ≥ 10.0 seconds ≥ 10.0 seconds ≥ 10.0 seconds ≥ 10.0 seconds ≥ 10.0 seconds	General Enable Criteria: U0073 Normal CAN transmission on Bus A Device Control High Voltage Virtual Network Management Ignition Voltage Criteria: Run/Crank Ignition voltage Power Mode Off Cycle Enable Criteria: KeCAND_b_OffKeyCycleDiagEnbl Ignition Accessory Line and Battery Voltage General Enable Criteria and either Ignition Voltage Criteria or Off Cycle Enable Criteria met for > 3.0000 seconds Power Mode is in accessory or run or crank and High Voltage Virtual	 Not Active on Current Key Cycle Enabled Not Active Not Active > 6.41 Volts = run = 1 (1 indicates enabled) = Active > 11.00 Volts	Diagnostic runs in 12.5 ms loop	Type C, No SVS "Special Type C"

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
					Network Management is not active for	> 0.4000 seconds		
					U0121	Not Active on Current Key Cycle		
					Anti-Lock Brake System Control Module	is present on the bus		

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
Lost Communication With Body Control Module	U0140	This DTC monitors for a loss of communication with the Body Control Module.	Message is not received from controller for Message $0F1 Message $12A Message $1E1 Message $1F1 Message $1F3 Message $3C9 Message $3CB Message $3F1 Message $451 Message $4D7 Message $4E1 Message $4E9	 ≥ 10.0 seconds ≥ 10.0 seconds ≥ 10.0 seconds ≥ 10.0 seconds ≥ 10.0 seconds ≥ 10.0 seconds ≥ 10.0 seconds ≥ 10.0 seconds ≥ 10.0 seconds ≥ 10.0 seconds ≥ 10.0 seconds ≥ 10.0 seconds	General Enable Criteria: U0073 Normal CAN transmission on Bus A Device Control High Voltage Virtual Network Management Ignition Voltage Criteria: Run/Crank Ignition voltage Power Mode Off Cycle Enable Criteria: KeCAND_b_OffKeyCycleDiagEnbl Ignition Accessory Line and Battery Voltage General Enable Criteria and either Ignition Voltage Criteria or Off Cycle Enable Criteria met for > 3.0000 seconds Power Mode is in accessory or run or crank and High Voltage Virtual Network Management is not active for	 Not Active on Current Key Cycle Enabled Not Active Not Active > 6.41 Volts = run = 1 (1 indicates enabled) = Active > 11.00 Volts > 0.4000 seconds	Diagnostic runs in 12.5 ms loop	Type C, No SVS "Special Type C"

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
					U0140 Body Control Module	Not Active on Current Key Cycle is present on the bus		

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
Lost Communication With NOx Sensor A	U029D	This DTC monitors for a loss of communication with the NOx Sensor A	Message is not received from controller for Message $0B0 Message $0B1 Message $0B5 Message $0B7 Message $289 Message $293 Message $591	 ≥ 10.00 seconds ≥ 10.00 seconds ≥ 10.00 seconds ≥ 10.00 seconds ≥ 10.00 seconds ≥ 10.00 seconds ≥ 10.00 seconds	General Enable Criteria: U0074 Normal CAN transmission on Bus B Device Control High Voltage Virtual Network Management Ignition Voltage Criteria: Run/Crank Ignition voltage Power Mode Off Cycle Enable Criteria: KeCAND_b_OffKeyCycleDiagEnbl Ignition Accessory Line and Battery Voltage General Enable Criteria and either Ignition Voltage Criteria or Off Cycle Enable Criteria met for > 3.0000 seconds Power Mode is in accessory or run or crank and High Voltage Virtual Network Management is	 Not Active on Current Key Cycle Enabled Not Active Not Active > 6.41 Volts = run = 1 (1 indicates enabled) = Active > 11.00 Volts	Diagnostic runs in 12.5 ms loop	Type A, 1 Trips

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
					not active for	> 0.4000 seconds		
					U029D	Not Active on Current Key Cycle		
					NOx Sensor A	is present on the bus		

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
Lost Communication With NOx Sensor B (post catalyst NOx sensor)	U029E	This DTC monitors for a loss of communication with the NOx Sensor B	Message is not received from controller for Message $0A4 Message $0B2 Message $0B6 Message $0B8 Message $28B Message $294 Message $592	 ≥ 10.00 seconds ≥ 10.00 seconds ≥ 10.00 seconds ≥ 10.00 seconds ≥ 10.00 seconds ≥ 10.00 seconds ≥ 10.00 seconds	General Enable Criteria: U0074 Normal CAN transmission on Bus B Device Control High Voltage Virtual Network Management Ignition Voltage Criteria: Run/Crank Ignition voltage Power Mode Off Cycle Enable Criteria: KeCAND_b_OffKeyCycleDiagEnbl Ignition Accessory Line and Battery Voltage General Enable Criteria and either Ignition Voltage Criteria or Off Cycle Enable Criteria met for > 3.0000 seconds Power Mode is in accessory or run or crank and High Voltage Virtual Network Management is	 Not Active on Current Key Cycle Enabled Not Active Not Active > 6.41 Volts = run = 1 (1 indicates enabled) = Active > 11.00 Volts	Diagnostic runs in 12.5 ms loop	Type A, 1 Trips

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
					not active for	> 0.4000 seconds		
					U029E	Not Active on Current Key Cycle		
					NOx Sensor B	is present on the bus		

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
Lost Communication With PM Sensor (Diesel Particulate)	U02A3	This DTC monitors for a loss of communication with the PM Sensor (Diesel Particulate)	Message is not received from controller for Message $3A3 Message $3A5 Message $3A7 Message $3A9 Message $3AB Message $497	 ≥ 10.00 seconds ≥ 10.00 seconds ≥ 10.00 seconds ≥ 10.00 seconds ≥ 10.00 seconds ≥ 10.00 seconds	General Enable Criteria: U0074 Normal CAN transmission on Bus B Device Control High Voltage Virtual Network Management Ignition Voltage Criteria: Run/Crank Ignition voltage Power Mode Off Cycle Enable Criteria: KeCAND_b_OffKeyCycleDiagEnbl Ignition Accessory Line and Battery Voltage General Enable Criteria and either Ignition Voltage Criteria or Off Cycle Enable Criteria met for > 3.0000 seconds Power Mode is in accessory or run or crank and High Voltage Virtual Network Management is	 Not Active on Current Key Cycle Enabled Not Active Not Active > 6.41 Volts = run = 1 (1 indicates enabled) = Active > 11.00 Volts	Diagnostic runs in 12.5 ms loop	Type B, 2 Trips

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
					not active for	> 0.4000 seconds		
					U02A3	Not Active on Current Key Cycle		
					PM Sensor (Diesel Particulate)	is present on the bus		

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
Turbocharger/ Supercharger Boost Control A Position Exceeded Learning Limit	P003A	This monitor checks if the VGT position analog or SENT sensor has an offset with respect to the nominal positions where the valve does the learning procedure (fully closed and/or fully open)	analog position raw voltage when the valve is in fully closed position < low threshold OR analog position raw voltage when the valve is in fully closed position > high threshold OR analog position raw voltage when the valve is in wide open position < low threshold OR analog position raw voltage when the valve is in wide open position > high threshold	< 74.30 %5V OR > 87.30 %5V OR < 5.00 %5V OR > 30.00 %5V	Test enabled by calibration Key signal is off Learning procedure at key off in fully closed and/or wide open positions have been successfully completed) End Of Trip event has elapsed	1.00 ==TRUE VGT_PstnSnsrFA == FALSE VGT_ActCktFA == FALSE VGT_PstnCntrlFA == FALSE	No debounce is present: DTC sets as soon as the error is present Function task: at key off	Type B, 2 Trips
			SENT position raw voltage when the valve is in fully closed position < low threshold OR SENT position raw voltage when the valve is in fully closed position > high threshold OR SENT position raw voltage when the valve is	< 74.30 %5V OR > 87.30 %5V OR < 5.00 %5V	Test enabled by calibration Key signal is off Learning procedure at key off in fully closed and/or wide open positions have been successfully completed (no faults present on VGT position sensor, VGT valve, VGTposition deviation)	1.00 ==TRUE VGT_PstnSnsrFA == FALSE VGT_ActCktFA == FALSE VGT_PstnCntrlFA == FALSE	No debounce is present: DTC sets as soon as the error is present Function task: at key off	

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
			in wide open position < low threshold OR SENT position raw voltage when the valve is in wide open position > high threshold	 OR > 30.00 %5V	End Of Trip event has elapsed			

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
Turbo/Super Charger Boost Control Solenoid Circuit	P0045	This monitor checks if the vacuum VGT command is in open circuit This monitor checks if the DC-Motor VGT commands are in open circuit	Error interface provided by HWIO	== TRUE	Test enabled by calibration System out of the cranking phase PT relay supply voltage in range Error interface provided by HWIO != INDETERMINATE (VGT is driven OFF) Shared High Side driver driven closed	1.00 ==TRUE > 11.00 [V]	24.00 fail counts out of 30.00 sample counts Function task: 100 ms	Type A, 1 Trips
			Error interface provided by HWIO	== TRUE	Test enabled by calibration System out of the cranking phase PT relay supply voltage in range Error interface provided by HWIO != INDETERMINATE	1.00 ==TRUE > 11.00 [V]	24.00 fail counts out of 30.00 sample counts Function task: 100 ms	

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
Turbo/Super Charger Boost Control Solenoid Circuit Low	P0047	This monitor checks if the vacuum VGT command is shorted to ground This monitor checks if the DC-Motor VGT commands are shorted to ground	Error interface provided by HWIO	== TRUE	Test enabled by calibration System out of the cranking phase PT relay supply voltage in range Error interface provided by HWIO != INDETERMINATE (VGT is driven OFF) Shared High Side driver driven closed	1.00 ==TRUE > 11.00 [V]	24.00 fail counts out of 30.00 sample counts Function task: 100 ms	Type A, 1 Trips
			Error interface provided by HWIO	== TRUE	Test enabled by calibration System out of the cranking phase PT relay supply voltage in range Error interface provided by HWIO != INDETERMINATE	1.00 ==TRUE > 11.00 [V]	24.00 fail counts out of 30.00 sample counts Function task: 100 ms	

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
Turbo/Super Charger Boost Control Solenoid Circuit High	P0048	This monitor checks if the vacuum VGT command is shorted to power supply This monitor checks if the DC-Motor VGT commands are shorted to power supply	Error interface provided by HWIO	== TRUE	Test enabled by calibration System out of the cranking phase PT relay supply voltage in range Error interface provided by HWIO != INDETERMINATE (VGT is driven ON) Shared High Side driver driven closed	1.00 ==TRUE > 11.00 [V]	24.00 fail counts out of 30.00 sample counts Function task: 100 ms	Type A, 1 Trips
			Error interface provided by HWIO	== TRUE	Test enabled by calibration System out of the cranking phase PT relay supply voltage in range Error interface provided by HWIO != INDETERMINATE	1.00 ==TRUE > 11.00 [V]	24.00 fail counts out of 30.00 sample counts Function task: 100 ms	

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
Charge Air Cooler Temperature Sensor Circuit Range/ Performance Bank	P007B	The charge air cooler up air temperature sensor output shall be monitored to detect rationality faults. This monitor checks if there is wiring harness poor contacts or internal fault (offset) in the Charge air cooler up air temperature sensor.	Charge air cooler up air temperature is compared at power up with an average temperature calculated using the intake manifold air temperature sensor and the fuel temperature sensor over a calibratable number of samples	> 20.00 [°C]	Enabling calibration set to TRUE	1.00 ==TRUE	Test executed after a counter of 1.00 samples Functional task: 100 ms	Type B, 2 Trips
					Key on and engine not running or engine running for less than a calibratable time	>= 0.10 [s]		
					Engine NOT in cranking phase	==TRUE		
					Runk Crank Relay voltage in range	> 11.00 [V]		
					No faults detected on engine off timer	EngineModeNotRunTimer Error ==FALSE		
					The engine has not run for a calibratable time since last key off	>= 28,800.00 [s]		
					Absolute value of the difference between intake manifold air temperature and fuel temperature smaller than a calibratable threshold	< 45.00 [°C]		
					No electrical or self-correlated faults detected on charge air cooler up air temperature sensors	CIT_CAC_UpCktFA ==FALSE CIT_CAC_UpSelfCorFA ==FALSE		

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
					No faults detected on intake manifold air temperature sensor No faults detected on fuel temperature sensor	MnfdTempSensorFA ==FALSE FTS_FTS_Flt==FALSE		

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Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
Charge Air Cooler Temperature Sensor Circuit Low Bank1	P007C	This monitor checks if Charge air cooler up air temperature sensor wiring harness is in open circuit (if the sensor is connected with the ECU with an internal pull-down resistance),Charge air cooler up air temperature sensor wiring harness short circuit to ground	Charge air cooler up air temperature resistance value < minimum calibratable threshold	< 7.00 [ohm]	Enabling calibration set to TRUE Runk Crank Relay voltage in range Key on or engine running Engine not cranking	1.00 ==TRUE > 11.00 [V]	50.00 fail counter over 63.00 sample counter Functional task: 100 ms	Type B, 2 Trips

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
Charge Air Cooler Temperature Sensor Circuit High Bank 1	P007D	This monitor checks if Charge air cooler up air temperature sensor wiring harness is in open circuit (if the sensor is connected with the ECU with an internal pull-up resistance) and if Charge air cooler up air temperature sensor wiring harness is short circuit to power supply	Charge air cooler up air temperature resistance value > maximum calibratable threshold	> 1,020,852.00 [ohm]	Enablement calibration set to TRUE Runk Crank Relay voltage in range Key on or engine running Engine not cranking	1.00 ==TRUE > 11.00 [V]	50.00 fail counter over 63.00 sample counter Functional task: 100 ms	Type B, 2 Trips

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
Charge Air Cooler Temperature Sensor Circuit Intermittent/ Erratic Bank1	P007E	This monitor checks if there is problem on wiring harness poor contacts for Charge air cooler up air temperature sensor or Charge air cooler up air temperature sensor internal fault (intermittent).	Charge air cooler up air temperature value > T_MAX_threshold Charge air cooler up air temperature value < T_MIN_threshold where - T_MAX_threshold = (1 - alpha)*T_MAX + alpha*T_last_good - T_MIN_threshold = (1 - alpha)*T_MIN + alpha*T_last_good - alpha = e^(#fails + 1)*(ts/ tau) - #fails = number of consecutive samples where the test failed - ts = sensor sampling time - tau = sensor filter response time - T_MAX = sensor maximum actual reading - T_MIN = sensor minimum actual reading - T_last_good = last good temperature measured by the sensor	> 300.00 [°C] < -40.00 [°C]	Enablement calibration set to TRUE Runk Crank Relay voltage in range Key on or engine running Engine not cranking No fault on CAC Up Temperature sensor	1.00 ==TRUE > 11.00 [V] CIT_CAC_UpCktFA	50.00 fail counter over 63.00 sample counter Functional task: 100 ms	Type B, 2 Trips

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
Mass Air Flow (MAF) Sensor Performance	P0101	This monitor checks if the MAF sensor measure is coherent with MAF estimation when the Hp EGR and LP EGR are closed. It is able to detect MAF sensor wiring harness poor contacts,MAF sensor internal fault (offset),Leaks from the induction air circuit,Leaks from the recirculation exhuast gas circuit.	Drift high check: the drift of the mass air flow sensor is calculated as the ratio between the MAF sensor reading (multiplied by the **P0101: Pulsation Map**) and the estimated mass air flow > calibratable threshold	> 1.20 [ratio]	Test enabled by calibration	1.00 ==TRUE	400.00 fail counts out of 500.00 sample counts	Type B, 2 Trips
					PT relay supply voltage in range	> 11.00 [V]	functional task:12.5 ms	
					Share High Side driver closed			
			Drift low check: the drift of the mass air flow sensor is calculated as the ratio between the MAF sensor reading (multiplied by the **P0101: Pulsation Map**) and the estimated mass air flow < calibratable threshold	< 0.80 [ratio]	Estimated mass air flow is valid	MAF_AirFlowEstdSS_NotVld ==FALSE		
					No Electrical or offset fault present on MAF sensor	MAF_MAF_SnsrCktOffstFA AND MAF_MAF_SnsrCktOffstTFKO ==FALSE		
					Outside Temperature in range (this condition is Market dependent, for OBD the OAT information shall be determinate using the estimtion value, for not OBD is used the OAT sensor value)	> -7.00 [°C]		
					No Fault present on Ouside AIr temperature (OBD Market	OAT_PtEstFiltFA ==FALSE		
					NON OBD Market)	OAT_OAT_SnsrNonEmissFA		

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
						==FALSE		
					Induction air temperature	> -7.00 [°C]		
					No fault present on inductant temperature sensor	IAT_SensorFA AND IAT_SensorTFTKO ==FALSE		
					Engine coolant temperature in range OR OBD Coolant Enable Criteria	< 117.00 [°C] > 50.00 [°C] ==TRUE		
					No faults detected on engine coolant temperature sensor	ECT_Sensor_FA AND ECT_Sensor_TFTKO ==FALSE		
					Barometric pressure within a calibratable range	< 69.60 [kPa] > 110.00 [kPa]		
					No faults detected on barometric pressure sensor	AAP_AmbientAirPresDfltd AND AAP_AmbPresSnsrTFTKO ==FALSE		
					The throttle valve more open than a calibratable value	> 85.00 [%]		
					No faults detected on Throttle system affecting	TPS_PstnSnsrFA ==FALSE		

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
					the condition “Throttle valve open”			
					The HP EGR valve more closed than a calibratable value	<= 1.00 [%]		
					No faults detected on HP EGR system affecting the condition “HP EGR valve closed”	EGR_PstnSnsrFA ==FALSE		
					Engine workis in IDLE, OVERRUN or LOAD condition			
			Drift high check: the drift of the mass air flow sensor is calculated as the ratio between the MAF sensor reading (multiplied by the **P0101: Pulsation Map**) and the estimated mass air flow > calibratable threshold	> 1.20 [ratio]	Enablement calibration set to TRUE	0.00 ==TRUE	400.00 fail counter out of 500.00 sample counter functional task:12.5 ms	
					Calibratable SCR dosing condition	IF 0.00 ==TRUE, SCR dosing condition is NH3 storage control OR intrusive NH3 storage control OR transient dosing control		
			Drift low check: the drift of the mass air flow sensor is calculated as the ratio between the MAF sensor reading (multiplied by the **P0101: Pulsation Map**) and the estimated mass air flow < calibratable threshold	< 0.80 [ratio]	SCR predicted NOx conversion efficiency greater than a calibrateable threshold	> 0.85 [ratio]		
					Engine working in idle condition for a calibratable time	> 5.00 [s]		

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
					Air control is working only in EGR control			
					Vehicle speed below a calibratable value	< 3.00 [kph]		
					No faults detected on vehicle speed sensor	VehicleSpeedSensor_FA ==FALSE		
					PT relay supply voltage in range	> 11.00 [V]		
					Share High Side driver closed			
					Estimated mass air flow is valid	MAF_AirFlowEstdSS_NotVld ==FALSE		
					No Electrical or offset fault present on MAF sensor	MAF_MAF_SnsrCktOffstFA AND MAF_MAF_SnsrCktOffstTFKO ==FALSE		
					Inductant Temperature in range (this condition is Market dependent, for OBD ithe OAT information shall be determinate using the estimtion value, for	> -7.00 [°C]		

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
					not OBD is used the OAT sensor value)			
					No Fault present on Ouside AIr temperature (OBD Market	OAT_PtEstFiltFA ==FALSE		
					NON OBD Market)	OAT_OAT_SnsrNonEmissFA ==FALSE		
					Induction air temperature within a calibratable range	> -7.00 [°C]		
					No fault present on inductant temperature sensor	IAT_SensorFA AND IAT_SensorTFTKO ==FALSE		
					Engine coolant temperature in range OR OBD Coolant Enable Criteria	< 117.00 [°C] > 50.00 [°C] ==TRUE		
					No faults detected on engine coolant temperature sensor	ECT_Sensor_FA AND ECT_Sensor_TFTKO ==FALSE		
					Barometric pressure within a calibratable range	< 69.60 [kPa] > 110.00 [kPa]		
					No faults detected on barometric pressure	AAP_AmbientAirPresDfltd AND		

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
					sensor	AAP_AmbPresSnsrTFTKO ==FALSE		
					The throttle valve more open than a calibratable value	> 85.00 [%]		
					No faults detected on Throttle system affecting the condition “Throttle valve open”	TPS_PstnSnsrFA ==FALSE		

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
Mass Air Flow (MAF) Sensor Circuit Low	P0102	This monitor checks if the MAF sensor is out of electrical range low	MAF frequency value < minimum calibratable threshold	< 276.00 [Hz]	Test enabled by calibration	1.00 ==TRUE	100.00 fail counts out of 125.00 sample counts Function task:Lores C	Type B, 2 Trips
					Engine speed above a threshold	>= 650.00 [rpm]		
					PT relay supply voltage in range	> 11.00 [V]		
					Share High Side Driver closed			
					Conditions above valid for a more than a calibratable time	1.00 [s]		

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
Mass Air Flow (MAF) Sensor Circuit High	P0103	This Monitor checks if the MAF sensor is out of electrical range high	MAF frequency value > maximum calibratable threshold	> 12,500.00 [Hz]	Test enabled by calibration Engine speed above a threshold PT relay supply voltage in range Share High Side Driver closed Condition above valid for a more than a calibratable time	1.00 ==TRUE >= 650.00 [rpm] > 11.00 [V] 1.00 [s]	100.00 fail counts out of 125.00 sample counts Function task:Lores C	Type B, 2 Trips

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
O2S Slow Response Rich to Lean Bank 1 Sensor 2	P013A	This DTC checks if oxygen value dynamic is slower compared to a functioning sensor. Test is performed in transitions from high load to overrun. Once generic enabling conditions are met, diagnosis waits for engine operating point stability (in terms of engine speed and fuel injected). When a stable operating point is reached for a calibrated time and an overrun condition is detected, the delta between the actual O2 value (a) and the one in fresh air (b = 20.95 %) is calculated. Then two thresholds are calculated as percentage of the initial delta: O2_Thrsh1 = a + (b - a) * 0.30 O2_Thrsh2 = a + (b - a) * 0.70 Two timers are incremented to evaluate sensor dynamic while O2 moves from O2 initial value (a) to O2_Thrsh2	One of the following conditions shall be true: EWMA filtered O2 raising time from O2 initial value (a) to O2_Thrsh2 EWMA filtered O2 raising time from O2_Thrsh1 value to O2_Thrsh2	> 3.50 [s] > 2.40 [s]	**Global Enabling Condition** Engine running System voltage in range Sensor is fully operative (No SQA learning is active AND Boolean Flag used to enable SQA learning active status is TRUE) No After Injection release No Exhaust Brake active i.e. intake manifold pressure Enabled in combustion mode No pending or confirmed DTCs	> 11.00 [V] OXY_NOx2_O2_RawNotRlb == FALSE FAD_SQA_LrnET_Enbl == FALSE 1 [boolean] < 299.00 [kPa] **KaOXYD_b_NOx2_IncrDynChkCmbEnbl** NOX_Snsr2_NotVld OXY_NOx2SignRngChkFlt OXY_NOx2ChkFlt FHP_InjLeakageFA (MAF_MAF_SnsrFA AND MAF_MAF_SnsrTFTKO) EGR_PstnShtOffReqFA (MAP_SensorFA	EWMA filtering: multiple tests per trip are allowed.	Type B, 2 Trips

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
		and from O2_Thrsh1 to O2_Thrsh2. EWMA is applied on both timers.				AND MAP_SensorTFTKO)		
					Additional enabling conditions for transitioning state machine from stable operation state to wait overrun state:			
					Operating point reached and stable i.e. following conditions are met for a time	> 2.00 [s]		
					a. Engine speed in operating range	> 1,250 [rpm] < 3,000 [rpm]		
					b. Injected fuel quantity in operating range	> 15 [mm^3] < 70 [mm^3]		
					c. Fuel variation	< 2.00 [mm^3]		
					Additional enabling conditions for transitioning state machine from wait overrun state to timer evaluation state:			
					Injected fuel quantity goes to in a time	= 0 [mm^3] < 2.00 [s]		
					Additional enabling conditions when in timer evaluation state:			
					EGR position	< 100 [%]		

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
O2S Slow Response Lean to Rich Bank 1 Sensor 2	P013B	This DTC checks if oxygen value dynamic is slower compared to a functioning sensor. Test is performed in transitions from overrun to high load. Once generic enabling conditions are met, diagnosis waits for an overrun stable condition. After that a fuel increase is detected within a calibrated time. Different timers are updated: - Timer_1 is incremented when O2Model < 19.00 [%] AND O2 > 19.00 [%] - Timer_2 is incremented when O2Model < 19.00 [%] AND O2 < 19.00 [%] - Timer_3 is incremented when O2Model < 19.00 [%] AND O2Model > 15.00 [%] - Timer_4 is incremented when O2Model < 19.00 [%] AND O2Model > 12.00 [%] - Timer_5 is incremented when O2Model < 19.00 [%] O2Model is based on	One of the following conditions shall be true: EWMA filtered Timer_1 EWMA filtered Timer_error	 > 1.00 [s] > 2.50 [-]	**Global Enabling Condition** Engine running System voltage in range Sensor is fully operative No SQA learning is active AND Boolean Flag used to enable SQA learning check is TRUE No After Injection release Enabled in combustion mode No pending or confirmed DTCs Sensor 1 is fully operative	 > 11.00 [V] OXY_O2_NOx2_SDC_CrtdNotRlb == FALSE FAD_SQA_LrnET_Enbl == FALSE 1 [boolean] **KaOXYD_b_NOx2_DecrDynChkCmbEnbl** NOX_Snsr2_NotVld OXY_NOx2SignRngChkFlt OXY_NOx2ChkFlt FHP_InjLeakageFA (MAF_MAF_SnsrFA AND MAF_MAF_SnsrTFTKO) EGR_PstnShtOffReqFA OXY_NOx1_O2_Flt OXY_O2_NOx1_SDC_CrtdNotRlb	EWMA filtering: multiple tests per trip are allowed.	Type B, 2 Trips

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
		Bank 1 Sensor 1 O2 measurement. Test ends when one of the following condition is verified: - O2 < 15.00 [%] - Timer_5 > 30.00 [s] - Timer_4 > 100.00 [s] After test end, all the following condition shall be verified to evaluate test validity: - Timer_4 < 100.00 [s] - O2Model < 12.00 [%] - Timer_3 < 0.00 [s] If test is valid: Timer_error = (Timer_2 - Timer_3) / Timer_3 is calculated and EWMA is applied on Timer_1 and on Time_error.			**Additional enabling conditions for transitioning state machine from stable operation state to wait fuel injection state:** Operating point reached and stable i.e. following conditions are met for a time a. Engine speed in operating range b. Injected fuel quantity **Additional enabling conditions for transitioning state machine from wait fuel injection state to timer evaluation state:** Injected fuel quantity **Additional enabling conditions when in timer evaluation state:** Injected fuel quantity within a time	> 1.00 [s] > 1,250 [rpm] < 3,000 [rpm] < 1 [mm^3] > 1 [mm^3] > 20 [mm^3] < 1.00 [s]		

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
O2 Sensor Slow Response - Rich to Lean Bank 1 Sensor 1	P014C	This DTC checks if oxygen value dynamic is slower compared to a functioning sensor. Test is performed in transitions from high load to overrun. Once generic enabling conditions are met, diagnosis waits for engine operating point stability (in terms of engine speed and fuel injected). When a stable operating point is reached for a calibrated time and an overrun condition is detected, the delta between the actual O2 value (a) and the one in fresh air (b = 20.95 %) is calculated. Then two thresholds are calculated as percentage of the initial delta: O2_Thrsh1 = a + (b - a) * 0.30 O2_Thrsh2 = a + (b - a) * 0.70 Two timers are incremented to evaluate sensor dynamic while O2 moves from O2 initial value (a) to O2_Thrsh2	One of the following conditions shall be true: EWMA filtered O2 raising time from O2 initial value (a) to O2_Thrsh2 EWMA filtered O2 raising time from O2_Thrsh1 value to O2_Thrsh2	 > 2.00 [s] > 0.80 [s]	**Global Enabling Condition** Engine running System voltage in range Sensor is fully operative (No SQA learning is active AND Boolean Flag used to enable SQA learning active status is TRUE) No After Injection release No Exhaust Brake active i.e. intake manifold pressure Enabled in combustion mode No pending or confirmed DTCs	 > 11.00 [V] OXY_NOx1_O2_RawNotRlb == FALSE FAD_SQA_LrnET_Enbl == FALSE 1 [boolean] < 299.00 [kPa] **KaOXYD_b_NOx1_IncrDynChkCmbEnbl** NOX_Snsr1_NotVld OXY_NOx1SignRngMinFlt OXY_NOx1SignRngMaxFlt OXY_NOx1ChkOvrrnFlt OXY_NOx1ChkLoadFlt FHP_InjLeakageFA (MAF_MAF_SnsrFA AND	Once per trip Note: if EWMA Fast Initial Response is active OR EWMA Rapid Response is active than multiple tests per trip are allowed.	Type B, 2 Trips

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
		and from O2_Thrsh1 to O2_Thrsh2. EWMA is applied on both timers.				MAF_MAF_SnsrTFTKO) EGR_PstnShtOffReqFA (MAP_SensorFA AND MAP_SensorTFTKO)		
					Additional enabling conditions for transitioning state machine from stable operation state to wait overrun state: Operating point reached and stable i.e. following conditions are met for a time	> 2.00 [s]		
					a. Engine speed in operating range	> 1,250 [rpm] < 3,000 [rpm]		
					b. Injected fuel quantity in operating range	> 15 [mm^3] < 70 [mm^3]		
					c. Fuel variation	< 2.00 [mm^3]		
					Additional enabling conditions for transitioning state machine from wait overrun state to timer evaluation state: Injected fuel quantity goes to in a time	= 0 [mm^3] < 2.00 [s]		
					Additional enabling conditions when in timer evaluation state: EGR position	< 100 [%]		

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
O2 Sensor Slow Response - Lean to Rich Bank 1 Sensor 1	P014D	This DTC checks if oxygen value dynamic is slower compared to a functioning sensor. Test is performed in transitions from overrun to high load. Once generic enabling conditions are met, diagnosis waits for an overrun stable condition. After that a fuel increase is detected within a calibrated time. Different timers are updated: - Timer_1 is incremented when O2Model < 19.00 [%] AND O2 > 19.00 [%] - Timer_2 is incremented when O2Model < 19.00 [%] AND O2 < 19.00 [%] - Timer_3 is incremented when O2Model < 19.00 [%] AND O2Model > 15.00 [%] - Timer_4 is incremented when O2Model < 19.00 [%] AND O2Model > 12.00 [%] - Timer_5 is incremented when O2Model < 19.00 [%] O2Model is based on	One of the following conditions shall be true: EWMA filtered Timer_1 EWMA filtered Timer_error	 > 1.00 [s] > 1.50 [-]	**Global Enabling Condition** Engine running System voltage in range Sensor is fully operative No SQA learning is active AND Boolean Flag used to enable SQA learning check is TRUE No After Injection release Enabled in combustion mode No pending or confirmed DTCs	 > 11.00 [V] OXY_O2_NOx1_SDC_CrtdNotRlb == FALSE FAD_SQA_LrnET_Enbl == FALSE 1 [boolean] **KaOXYD_b_NOx1_DecrDynChkCmbEnbl** NOX_Snsr1_NotVld OXY_NOx1SignRngMinFlt OXY_NOx1SignRngMaxFlt OXY_NOx1ChkOvrrnFlt OXY_NOx1ChkLoadFlt FHP_InjLeakageFA (MAF_MAF_SnsrFA AND MAF_MAF_SnsrTFTKO) EGR_PstnShtOffReqFA	Once per trip Note: if EWMA Fast Initial Response is active OR EWMA Rapid Response is active than multiple tests per trip are allowed.	Type B, 2 Trips

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
		injected fuel quantity and air mass. Test ends when one of the following condition is verified: - O2 < 15.00 [%] - Timer_5 > 10.00 [s] - Timer_4 > 100.00 [s] After test end, all the following condition shall be verified to evaluate test validity: - Timer_4 < 100.00 [s] - O2Model < 12.00 [%] - Timer_3 < 0.00 [s] If test is valid: Timer_error = (Timer_2 - Timer_3) / Timer_3 is calculated and EWMA is applied on Timer_1 and on Time_error.			**Additional enabling conditions for transitioning state machine from stable operation state to wait fuel injection state:** Operating point reached and stable i.e. following conditions are met for a time a. Engine speed in operating range b. Injected fuel quantity **Additional enabling conditions for transitioning state machine from wait fuel injection state to timer evaluation state:** Injected fuel quantity **Additional enabling conditions when in timer evaluation state:** Injected fuel quantity within a time	OXY_O2_NOx1PlausMdlFlt > 1.00 [s] > 1,250 [rpm] < 3,000 [rpm] < 1 [mm^3] > 1 [mm^3] > 20 [mm^3] < 1.00 [s]		

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
Fuel Trim System Lean Bank 1	P0171	This DTC monitors if FSA control system has reached its maximum authority and cannot achieve the target. An error shall be detected when the fuel adjustment value (mm3) released by FSA is saturatedat its minimum value.	Released FSA fuel correction value	< **KtFADC_V_FSA_Fuel Min** [mm3]	System voltage in range FSA correction release enabled (FSA Learning is active OR DFSA Learning is active) for a time Ambient air pressure OBD Coolant Enable Criteria OR Engine coolant temperature Ambient air temperature No Low fuel tank level indication No pending or confirmed DTCs	> 11.00 [V] FAD_FSA_NormRngCrtn Valid (FAD_FSA_EnblLrn OR FAD_DFSA_EnblLrn) > 1.00 [s] > 67.00 [kPa] = TRUE > 45.00 [°C] > -7.00 [°C] LowFuelConditionDiagnostic AmbPresDfltdStatus (ECT_Sensor_TFTKO AND ECT_Sensor_FA) OAT_PtEstFiltFA	Time counter: 280 failures out of 400 samples. Time task 25[ms]	Type B, 2 Trips

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
Fuel Trim System Rich Bank 1	P0172	This DTC monitors if FSA control system has reached its maximum authority and cannot achieve the target. An error shall be detected when the fuel adjustment value (mm3) released by FSA is saturatedat its maximum value.	Released FSA fuel correction value	> **KtFADC_V_FSA_FuelMax** [mm3]	System voltage in range FSA correction release enabled (FSA Learning is active OR DFSA Learning is active) for a time Ambient air pressure OBD Coolant Enable Criteria OR Engine coolant temperature Ambient air temperature No Low fuel tank level indication No pending or confirmed DTCs	> 11.00 [V] FAD_FSA_NormRngCrtnValid (FAD_FSA_EnblLrn OR FAD_DFSA_EnblLrn) > 1.00 [s] > 67.00 [kPa] = TRUE > 45.00 [°C] > -7.00 [°C] LowFuelConditionDiagnostic AmbPresDfltdStatus (ECT_Sensor_TFTKO AND ECT_Sensor_FA) OAT_PtEstFiltFA	Time counter: 280 failures out of 400 samples. Time task 25[ms]	Type B, 2 Trips

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
Cylinder 1 Injection Timing Perfomance - Over Retarded	P01CB	This diagnosis is able to detect an excessive negative drift on fuel injection quantity and timing affecting injector 1. During Diesel Fuel Cut-off conditions SQA command the injection of a known quantity on one injector (e.g. 1,5mm^3) and checks, by means of crank-wheel sensor, the angular acceleration produced during the combustion phase. By comparing the angular acceleration value produced during the combustion phase with the angular acceleration that would be produced during the combustion of a nominal fuel quantity (e.g. 1,5mm3), the SQA is able to calculate the drift, in term of energizing time, on injector 1. Several injections, with different injection quantities, are performed in order to extrapolate the results and obtain the injector behaviour in the small quantity area. This energizing time is then used for the	Suspicious confidence level of tested injector (To fail suspicious), function of Current Energizing time calculated with SSQA and delta Energizing time calculated in the previous test: **KtFADD_Pct_SSQA_InjSuspConfLvl** (Delta Enegizing Time, Delta Energizing Time old) In case the first test fails: Delta Energizing time calculated with VSQA (To fail Validation)	< 50.00 [%] > 80.00 [us]	SQA Diagnosis enabled SSQA and VSQA enabled via calibration Baro Pressure Ambient temp No Low Fuel level tank indication AND Boolean Flag used to enable low fuel level check is TRUE XSQA Learning conditions enabled	1.00 0.00 >= 72.00 [kPa] >= -7.00 [°C] LowFuelConditionDiagnostic 1.00 FAD_XSQA_LrnCondEnbl	Inj_To_PassFail_SSQA Number of injections in case sospicious pass or (if sospicious fails) Inj_To_PassFail_SSQA +Inj_To_PassFail_VSQA number of injections to pass or fail validation Once per Trip if suspicious and validations (in case of sospicious injectors detected) have been already completed in the previous driving cycle, otherwise the diagnosis starts from the interrupted status. Sample Rate: [1 Sample every cylinder firing event].	Type X, No MIL

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
		diagnostic test that is performed in two different steps: The first is the suspicious (SSQA) in which all the injectors are classified as suspicious or not suspicious. During this phase several injections are performed on all the injectors in order to calculate the drift, in term of energizing time, of each injector. The drift found is then used together with the drift found in the previous test to enter a calibrate-able map in which a confidence level between 0 and 100% is given to each injector. The confidence levels depends on the delta energizing time between two consecutive tests. An injector is considered suspicious if the confidence level is lower than a calibrate-able threshold. The suspicious phase can only report test pass for not suspicious injectors while the injectors that fail the suspicious are tested by means of VSQA (Validation Small						

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
		Quantity Adjustment) in order to validate or not the fault. The validation starts from the most suspicious injector (with lower confidence level) found during Suspicious phase and performs a calibrate-able number of injections, generally higher than the number of injection performed during suspicious, in order to find out a more accurate drift value for the tested injector. If the Delta Energizing time calculated during this phase is higher than a calibrate-able threshold a DTC is set.						

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
Cylinder 1 Injection Timing Perfomance - Over Advanced	P01CC	This diagnosis is able to detect an excessive positive drift on fuel injection quantity and timing affecting injector 1. During Diesel Fuel Cut-off conditions SQA command the injection of a known quantity on one injector (e.g. 1,5mm^3) and checks, by means of crank-wheel sensor, the angular acceleration produced during the combustion phase. By comparing the angular acceleration value produced during the combustion phase with the angular acceleration that would be produced during the combustion of a nominal fuel quantity (e.g. 1,5mm3), the SQA is able to calculate the drift, in term of energizing time, on injector 1. Several injections, with different injection quantities, are performed in order to extrapolate the results and obtain the injector behaviour in the small quantity area. This energizing time is then used for the	Suspicious confidence level of tested injector (To fail suspicious), function of Current Energizing time calculated with SSQA and delta Energizing time calculated in the previous test: **KtFADD_Pct_SSQA_InjSuspConfLvl** (Delta Enegizing Time, Delta Energizing Time old) In case the first test fails: Delta Energizing time calculated with VSQA (To fail Validation)	< 50.00 [%] < -80.00 [us]	SQA Diagnosis enabled SSQA and VSQA enabled via calibration Baro Pressure Ambient temp No Low Fuel level tank indication AND Boolean Flag used to enable low fuel level check is TRUE XSQA Learning conditions enabled	1.00 0.00 >= 72.00 [kPa] >= -7.00 [°C] LowFuelConditionDiagnostic 1.00 FAD_XSQA_LrnCondEnbl	Inj_To_PassFail_SSQA Number of injections in case sospicious pass or (if sospicious fails) Inj_To_PassFail_SSQA +Inj_To_PassFail_VSQA number of injections to pass or fail validation Once per Trip if suspicious and validations (in case of sospicious injectors detected) have been already completed in the previous driving cycle, otherwise the diagnosis starts from the interrupted status. Sample Rate: [1 Sample every cylinder firing event].	Type X, No MIL

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
		diagnostic test that is performed in two different steps: The first is the suspicious (SSQA) in which all the injectors are classified as suspicious or not suspicious. During this phase several injections are performed on all the injectors in order to calculate the drift, in term of energizing time, of each injector. The drift found is then used together with the drift found in the previous test to enter a calibrate-able map in which a confidence level between 0 and 100% is given to each injector. The confidence levels depends on the delta energizing time between two consecutive tests. An injector is considered suspicious if the confidence level is lower than a calibrate-able threshold. The suspicious phase can only report test pass for not suspicious injectors while the injectors that fail the suspicious are tested by means of VSQA (Validation Small						

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
		Quantity Adjustment) in order to validate or not the fault. The validation starts from the most suspicious injector (with lower confidence level) found during Suspicious phase and performs a calibrate-able number of injections, generally higher than the number of injection performed during suspicious, in order to find out a more accurate drift value for the tested injector. If the Delta Energizing time calculated during this phase is lower than a calibrate-able threshold a DTC is set.						

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
Cylinder 2 Injection Timing Perfomance - Over Retarded	P01CD	This diagnosis is able to detect an excessive negative drift on fuel injection quantity and timing affecting injector 2. During Diesel Fuel Cut-off conditions SQA command the injection of a known quantity on one injector (e.g. 1,5mm^3) and checks, by means of crank-wheel sensor, the angular acceleration produced during the combustion phase. By comparing the angular acceleration value produced during the combustion phase with the angular acceleration that would be produced during the combustion of a nominal fuel quantity (e.g. 1,5mm3), the SQA is able to calculate the drift, in term of energizing time, on injector 2. Several injections, with different injection quantities, are performed in order to extrapolate the results and obtain the injector behaviour in the small quantity area. This energizing time is then used for the	Suspicious confidence level of tested injector (To fail suspicious), function of Current Energizing time calculated with SSQA and delta Energizing time calculated in the previous test: **KtFADD_Pct_SSQA_InjSuspConfLvl** (Delta Enegizing Time, Delta Energizing Time old) In case the first test fails: Delta Energizing time calculated with VSQA (To fail Validation)	< 50.00 [%] > 80.00 [us]	SQA Diagnosis enabled SSQA and VSQA enabled via calibration Baro Pressure Ambient temp No Low Fuel level tank indication AND Boolean Flag used to enable low fuel level check is TRUE XSQA Learning conditions enabled	1.00 0.00 >= 72.00 [kPa] >= -7.00 [°C] LowFuelConditionDiagnostic 1.00 FAD_XSQA_LrnCondEnbl	Inj_To_PassFail_SSQA Number of injections in case sospicious pass or (if sospicious fails) Inj_To_PassFail_SSQA +Inj_To_PassFail_VSQA number of injections to pass or fail validation Once per Trip if suspicious and validations (in case of sospicious injectors detected) have been already completed in the previous driving cycle, otherwise the diagnosis starts from the interrupted status. Sample Rate: [1 Sample every cylinder firing event].	Type X, No MIL

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
		diagnostic test that is performed in two different steps: The first is the suspicious (SSQA) in which all the injectors are classified as suspicious or not suspicious. During this phase several injections are performed on all the injectors in order to calculate the drift, in term of energizing time, of each injector. The drift found is then used together with the drift found in the previous test to enter a calibrate-able map in which a confidence level between 0 and 100% is given to each injector. The confidence levels depends on the delta energizing time between two consecutive tests. An injector is considered suspicious if the confidence level is lower than a calibrate-able threshold. The suspicious phase can only report test pass for not suspicious injectors while the injectors that fail the suspicious are tested by means of VSQA (Validation Small						

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
		Quantity Adjustment) in order to validate or not the fault. The validation starts from the most suspicious injector (with lower confidence level) found during Suspicious phase and performs a calibrate-able number of injections, generally higher than the number of injection performed during suspicious, in order to find out a more accurate drift value for the tested injector. If the Delta Energizing time calculated during this phase is higher than a calibrate-able threshold a DTC is set.						

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
Cylinder 2 Injection Timing Perfomance - Over Advanced	P01CE	This diagnosis is able to detect an excessive positive drift on fuel injection quantity and timing affecting injector 2. During Diesel Fuel Cut-off conditions SQA command the injection of a known quantity on one injector (e.g. 1,5mm^3) and checks, by means of crank-wheel sensor, the angular acceleration produced during the combustion phase. By comparing the angular acceleration value produced during the combustion phase with the angular acceleration that would be produced during the combustion of a nominal fuel quantity (e.g. 1,5mm3), the SQA is able to calculate the drift, in term of energizing time, on injector 2. Several injections, with different injection quantities, are performed in order to extrapolate the results and obtain the injector behaviour in the small quantity area. This energizing time is then used for the	Suspicious confidence level of tested injector (To fail suspicious), function of Current Energizing time calculated with SSQA and delta Energizing time calculated in the previous test: **KtFADD_Pct_SSQA_InjSuspConfLvl** (Delta Enegizing Time, Delta Energizing Time old) In case the first test fails: Delta Energizing time calculated with VSQA (To fail Validation)	< 50.00 [%] < -80.00 [us]	SQA Diagnosis enabled SSQA and VSQA enabled via calibration Baro Pressure Ambient temp No Low Fuel level tank indication AND Boolean Flag used to enable low fuel level check is TRUE XSQA Learning conditions enabled	1.00 0.00 >= 72.00 [kPa] >= -7.00 [°C] LowFuelConditionDiagnostic 1.00 FAD_XSQA_LrnCondEnbl	Inj_To_PassFail_SSQA Number of injections in case sospicious pass or (if sospicious fails) Inj_To_PassFail_SSQA +Inj_To_PassFail_VSQA number of injections to pass or fail validation. Once per Trip if suspicious and validations (in case of sospicious injectors detected) have been already completed in the previous driving cycle, otherwise the diagnosis starts from the interrupted status. Sample Rate: [1 Sample every cylinder firing event].	Type X, No MIL

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
		diagnostic test that is performed in two different steps: The first is the suspicious (SSQA) in which all the injectors are classified as suspicious or not suspicious. During this phase several injections are performed on all the injectors in order to calculate the drift, in term of energizing time, of each injector. The drift found is then used together with the drift found in the previous test to enter a calibrate-able map in which a confidence level between 0 and 100% is given to each injector. The confidence levels depends on the delta energizing time between two consecutive tests. An injector is considered suspicious if the confidence level is lower than a calibrate-able threshold. The suspicious phase can only report test pass for not suspicious injectors while the injectors that fail the suspicious are tested by means of VSQA (Validation Small						

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
		Quantity Adjustment) in order to validate or not the fault. The validation starts from the most suspicious injector (with lower confidence level) found during Suspicious phase and performs a calibrate-able number of injections, generally higher than the number of injection performed during suspicious, in order to find out a more accurate drift value for the tested injector. If the Delta Energizing time calculated during this phase is lowerthan a calibrate-able threshold a DTC is set.						

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
Cylinder 3 Injection Timing Perfomance - Over Retarded	P01CF	This diagnosis is able to detect an excessive negative drift on fuel injection quantity and timing affecting injector 3. During Diesel Fuel Cut-off conditions SQA command the injection of a known quantity on one injector (e.g. 1,5mm^3) and checks, by means of crank-wheel sensor, the angular acceleration produced during the combustion phase. By comparing the angular acceleration value produced during the combustion phase with the angular acceleration that would be produced during the combustion of a nominal fuel quantity (e.g. 1,5mm3), the SQA is able to calculate the drift, in term of energizing time, on injector 3. Several injections, with different injection quantities, are performed in order to extrapolate the results and obtain the injector behaviour in the small quantity area. This energizing time is then used for the	Suspicious confidence level of tested injector (To fail suspicious), function of Current Energizing time calculated with SSQA and delta Energizing time calculated in the previous test: **KtFADD_Pct_SSQA_InjSuspConfLvl** (Delta Enegizing Time, Delta Energizing Time old) In case the first test fails: Delta Energizing time calculated by VSQA (To fail Validation)	< 50.00 [%] > 80.00 [us]	SQA Diagnosis enabled SSQA and VSQA enabled via calibration Baro Pressure Ambient temp No Low Fuel level tank indication AND Boolean Flag used to enable low fuel level check is TRUE XSQA Learning conditions enabled	1.00 0.00 >= 72.00 [kPa] >= -7.00 [°C] LowFuelConditionDiagnostic 1.00 FAD_XSQA_LrnCondEnbl	Inj_To_PassFail_SSQA Number of injections in case sospicious pass or (if sospicious fails) Inj_To_PassFail_SSQA +Inj_To_PassFail_VSQA number of injections to pass or fail validation Once per Trip if suspicious and validations (in case of sospicious injectors detected) have been already completed in the previous driving cycle, otherwise the diagnosis starts from the interrupted status. Sample Rate: [1 Sample every cylinder firing event].	Type X, No MIL

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
		diagnostic test that is performed in two different steps: The first is the suspicious (SSQA) in which all the injectors are classified as suspicious or not suspicious. During this phase several injections are performed on all the injectors in order to calculate the drift, in term of energizing time, of each injector. The drift found is then used together with the drift found in the previous test to enter a calibrate-able map in which a confidence level between 0 and 100% is given to each injector. The confidence levels depends on the delta energizing time between two consecutive tests. An injector is considered suspicious if the confidence level is lower than a calibrate-able threshold. The suspicious phase can only report test pass for not suspicious injectors while the injectors that fail the suspicious are tested by means of VSQA (Validation Small						

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
		Quantity Adjustment) in order to validate or not the fault. The validation starts from the most suspicious injector (with lower confidence level) found during Suspicious phase and performs a calibrate-able number of injections, generally higher than the number of injection performed during suspicious, in order to find out a more accurate drift value for the tested injector. If the Delta Energizing time calculated during this phase is higher than a calibrate-able threshold a DTC is set.						

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
Cylinder 3 Injection Timing Perfomance - Over Advanced	P01D0	This diagnosis is able to detect an excessive positive drift on fuel injection quantity and timing affecting injector 3. During Diesel Fuel Cut-off conditions SQA command the injection of a known quantity on one injector (e.g. 1,5mm^3) and checks, by means of crank-wheel sensor, the angular acceleration produced during the combustion phase. By comparing the angular acceleration value produced during the combustion phase with the angular acceleration that would be produced during the combustion of a nominal fuel quantity (e.g. 1,5mm3), the SQA is able to calculate the drift, in term of energizing time, on injector 3. Several injections, with different injection quantities, are performed in order to extrapolate the results and obtain the injector behaviour in the small quantity area. This energizing time is then used for the	Suspicious confidence level of tested injector (To fail suspicious), function of Current Energizing time calculated with SSQA and delta Energizing time calculated in the previous test: **KtFADD_Pct_SSQA_InjSuspConfLvl** (Delta Enegizing Time, Delta Energizing Time old) In case the first test fails: Delta Energizing time calculated by VSQA (To fail Validation)	< 50.00 [%] < -80.00 [us]	SQA Diagnosis enabled SSQA and VSQA enabled Baro Pressure Ambient temp No Low Fuel level tank indication AND Boolean Flag used to enable low fuel level check is TRUE (x)SQA injection management enabled	1.00 0.00 >= 72.00 [kPa] >= -7.00 [°C] LowFuelConditionDiagnostic 1.00 FAD_XSQA_LrnCondEnbl	Inj_To_PassFail_SSQA Number of injections in case sospicious pass or (if sospicious fails) Inj_To_PassFail_SSQA +Inj_To_PassFail_VSQA number of injections to pass or fail validation. Once per Trip if suspicious and validations (in case of sospicious injectors detected) have been already completed in the previous driving cycle, otherwise the diagnosis starts from the interrupted status. Sample Rate: [1 Sample every cylinder firing event].	Type X, No MIL

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
		diagnostic test that is performed in two different steps: The first is the suspicious (SSQA) in which all the injectors are classified as suspicious or not suspicious. During this phase several injections are performed on all the injectors in order to calculate the drift, in term of energizing time, of each injector. The drift found is then used together with the drift found in the previous test to enter a calibrate-able map in which a confidence level between 0 and 100% is given to each injector. The confidence levels depends on the delta energizing time between two consecutive tests. An injector is considered suspicious if the confidence level is lower than a calibrate-able threshold. The suspicious phase can only report test pass for not suspicious injectors while the injectors that fail the suspicious are tested by means of VSQA (Validation Small						

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
		Quantity Adjustment) in order to validate or not the fault. The validation starts from the most suspicious injector (with lower confidence level) found during Suspicious phase and performs a calibrate-able number of injections, generally higher than the number of injection performed during suspicious, in order to find out a more accurate drift value for the tested injector. If the Delta Energizing time calculated during this phase is lowerthan a calibrate-able threshold a DTC is set.						

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
Cylinder 4 Injection Timing Perfomance - Over Retarded	P01D1	This diagnosis is able to detect an excessive negative drift on fuel injection quantity and timing affecting injector 4. During Diesel Fuel Cut-off conditions SQA command the injection of a known quantity on one injector (e.g. 1,5mm^3) and checks, by means of crank-wheel sensor, the angular acceleration produced during the combustion phase. By comparing the angular acceleration value produced during the combustion phase with the angular acceleration that would be produced during the combustion of a nominal fuel quantity (e.g. 1,5mm3), the SQA is able to calculate the drift, in term of energizing time, on injector 4. Several injections, with different injection quantities, are performed in order to extrapolate the results and obtain the injector behaviour in the small quantity area. This energizing time is then used for the	Suspicious confidence level of tested injector (To fail suspicious), function of Current Energizing time calculated with SSQA and delta Energizing time calculated in the previous test: **KtFADD_Pct_SSQA_InjSuspConfLvl** (Delta Enegizing Time, Delta Energizing Time old) In case the first test fails: Delta Energizing time calculated by VSQA (To fail Validation)	< 50.00 [%] > 80.00 [us]	SQA Diagnosis enabled SSQA and VSQA enabled Baro Pressure Ambient temp No Low Fuel level tank indication AND Boolean Flag used to enable low fuel level check is TRUE (x)SQA injection management enabled	1.00 0.00 >= 72.00 [kPa] >= -7.00 [°C] LowFuelConditionDiagnostic 1.00 FAD_XSQA_LrnCondEnbl	Inj_To_PassFail_SSQA Number of injections in case sospicious pass or (if sospicious fails) Inj_To_PassFail_SSQA +Inj_To_PassFail_VSQA number of injections to pass or fail validation Once per Trip if suspicious and validations (in case of sospicious injectors detected) have been already completed in the previous driving cycle, otherwise the diagnosis starts from the interrupted status. Sample Rate: [1 Sample every cylinder firing event].	Type X, No MIL

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
		diagnostic test that is performed in two different steps: The first is the suspicious (SSQA) in which all the injectors are classified as suspicious or not suspicious. During this phase several injections are performed on all the injectors in order to calculate the drift, in term of energizing time, of each injector. The drift found is then used together with the drift found in the previous test to enter a calibrate-able map in which a confidence level between 0 and 100% is given to each injector. The confidence levels depends on the delta energizing time between two consecutive tests. An injector is considered suspicious if the confidence level is lower than a calibrate-able threshold. The suspicious phase can only report test pass for not suspicious injectors while the injectors that fail the suspicious are tested by means of VSQA (Validation Small						

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
		Quantity Adjustment) in order to validate or not the fault. The validation starts from the most suspicious injector (with lower confidence level) found during Suspicious phase and performs a calibrate-able number of injections, generally higher than the number of injection performed during suspicious, in order to find out a more accurate drift value for the tested injector. If the Delta Energizing time calculated during this phase is higher than a calibrate-able threshold a DTC is set.						

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
Cylinder 4 Injection Timing Perfomance - Over Advanced	P01D2	This diagnosis is able to detect an excessive positive drift on fuel injection quantity and timing affecting injector 4. During Diesel Fuel Cut-off conditions SQA command the injection of a known quantity on one injector (e.g. 1,5mm^3) and checks, by means of crank-wheel sensor, the angular acceleration produced during the combustion phase. By comparing the angular acceleration value produced during the combustion phase with the angular acceleration that would be produced during the combustion of a nominal fuel quantity (e.g. 1,5mm3), the SQA is able to calculate the drift, in term of energizing time, on injector 4. Several injections, with different injection quantities, are performed in order to extrapolate the results and obtain the injector behaviour in the small quantity area. This energizing time is then used for the	Suspicious confidence level of tested injector (To fail suspicious), function of Current Energizing time calculated with SSQA and delta Energizing time calculated in the previous test: **KtFADD_Pct_SSQA_InjSuspConfLvl** (Delta Enegizing Time, Delta Energizing Time old) In case the first test fails: Delta Energizing time calculated by VSQA (To fail Validation)	< 50.00 [%] < -80.00 [us]	SQA Diagnosis enabled SSQA and VSQA enabled Baro Pressure Ambient temp No Low Fuel level tank indication AND Boolean Flag used to enable low fuel level check is TRUE (x)SQA injection management enabled	1.00 0.00 >= 72.00 [kPa] >= -7.00 [°C] LowFuelConditionDiagnostic 1.00 FAD_XSQA_LrnCondEnbl	Inj_To_PassFail_SSQA Number of injections in case sospicious pass or (if sospicious fails) Inj_To_PassFail_SSQA +Inj_To_PassFail_VSQA number of injections to pass or fail validation. Once per Trip if suspicious and validations (in case of sospicious injectors detected) have been already completed in the previous driving cycle, otherwise the diagnosis starts from the interrupted status. Sample Rate: [1 Sample every cylinder firing event].	Type X, No MIL

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
		diagnostic test that is performed in two different steps: The first is the suspicious (SSQA) in which all the injectors are classified as suspicious or not suspicious. During this phase several injections are performed on all the injectors in order to calculate the drift, in term of energizing time, of each injector. The drift found is then used together with the drift found in the previous test to enter a calibrate-able map in which a confidence level between 0 and 100% is given to each injector. The confidence levels depends on the delta energizing time between two consecutive tests. An injector is considered suspicious if the confidence level is lower than a calibrate-able threshold. The suspicious phase can only report test pass for not suspicious injectors while the injectors that fail the suspicious are tested by means of VSQA (Validation Small						

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
		Quantity Adjustment) in order to validate or not the fault. The validation starts from the most suspicious injector (with lower confidence level) found during Suspicious phase and performs a calibrate-able number of injections, generally higher than the number of injection performed during suspicious, in order to find out a more accurate drift value for the tested injector. If the Delta Energizing time calculated during this phase is lowerthan a calibrate-able threshold a DTC is set.						

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
Injector 1 Open Circuit	P0201	This DTC checks the Injector 1 circuit for electrical integrity during operation.	Low current through the low side driver during operation indicates open circuit	Open circuit: circuit attached to the Controller external connections has an impedance >= 200 K Ohm	Test enabled by calibration; and Battery voltage and Key ON and Engine is not cranking and Engine Running and FUL_OutEnblCyl_CiEPSR_CylinderA	== 1 [Boolean] > 11.00 [V] - - >= 1.00 [s] == 0 [Boolean]	5 failures out of 10 samples 100 ms/sample Continuous	Type A, 1 Trips

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
Injector 2 Open Circuit	P0202	This DTC checks the Injector 2 circuit for electrical integrity during operation.	Low current through the low side driver during operation indicates open circuit	Open circuit: circuit attached to the Controller external connections has an impedance >= 200 K Ohm	Test enabled by calibration; and Battery voltage and Key ON and Engine is not cranking and Engine Running and FUL_OutEnblCyl_CiEPSR_CylinderD	== 1 [Boolean] > 11.00 [V] - - >= 1.00 [s] == 0 [Boolean]	5 failures out of 10 samples 100 ms/sample Continuous	Type A, 1 Trips

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
Injector 3 Open Circuit	P0203	This DTC checks the Injector 3 circuit for electrical integrity during operation.	Low current through the low side driver during operation indicates open circuit	Open circuit: circuit attached to the Controller external connections has an impedance >= 200 K Ohm	Test enabled by calibration; and Battery voltage and Key ON and Engine is not cranking and Engine Running and FUL_OutEnblCyl_CiEPSR_CylinderB	== 1 [Boolean] > 11.00 [V] - - >= 1.00 [s] == 0 [Boolean]	5 failures out of 10 samples 100 ms/sample Continuous	Type A, 1 Trips

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
Injector 4 Open Circuit	P0204	This DTC checks the Injector 4 circuit for electrical integrity during operation.	Low current through the low side driver during operation indicates open circuit	Open circuit: circuit attached to the Controller external connections has an impedance >= 200 K Ohm	Test enabled by calibration; and Battery voltage and Key ON and Engine is not cranking and Engine Running and FUL_OutEnblCyl_CiEPSR_CylinderC	== 1 [Boolean] > 11.00 [V] - - >= 1.00 [s] == 0 [Boolean]	5 failures out of 10 samples 100 ms/sample Continuous	Type A, 1 Trips

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
Cylinder 1 Injection Timing	P020A	This DTC detects an Injector fault or ECU fault that causes pull In period of the current pulse out of range on injector 1 The pull in period is the time for the injection current to rise to the current level (17.50 [A]) at the beginning of the pulse	Measurement of the Pull In period of the current pulse of the injector 1 provided by HWIO	< 0.00 [us] OR > 130.00 [us]	Test enabled by calibration; and Battery voltage and Key ON and No active DTC's: and At least one injection pulse is requested by the application software (FUL_FuelInjectedCyl_CiEPSR_CylinderA	== 1 [Boolean] > 11.00 [V] - FUL_InjCktTFTKO FUL_CntrlrStTFTKO FUL_BoostVoltTFTKO - == TRUE);	10 failures out of 20 samples 1 sample every engine cycle Continuous	Type A, 1 Trips

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
Cylinder 2 Injection Timing	P020B	This DTC detects an Injector fault or ECU fault that causes pull In period of the current pulse out of range on injector 2 The pull in period is the time for the injection current to rise to the current level (17.50 [A]) at the beginning of the pulse	Measurement of the Pull In period of the current pulse of the injector 2 provided by HWIO	< 0.00 [us] OR > 130.00 [us]	Test enabled by calibration; and Battery voltage and Key ON and No active DTC's: and At least one injection pulse is requested by the application software (FUL_FuelInjectedCyl_CiEPSR_CylinderD	== 1 [Boolean] > 11.00 [V] - FUL_InjCktTFTKO FUL_CntrlrStTFTKO FUL_BoostVoltTFTKO - == TRUE);	10 failures out of 20 samples 1 sample every engine cycle Continuous	Type A, 1 Trips

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
Cylinder 3 Injection Timing	P020C	This DTC detects an Injector fault or ECU fault that causes pull In period of the current pulse out of range on injector 3 The pull in period is the time for the injection current to rise to the current level (17.50 [A]) at the beginning of the pulse	Measurement of the Pull In period of the current pulse of the injector 3 provided by HWIO	< 0.00 [us] OR > 130.00 [us]	Test enabled by calibration; and Battery voltage and Key ON and No active DTC's: and At least one injection pulse is requested by the application software; (FUL_FuelInjectedCyl_CiEPSR_CylinderB	== 1 [Boolean] > 11.00 [V] - FUL_InjCktTFTKO FUL_CntrlrStTFTKO FUL_BoostVoltTFTKO - == TRUE);	10 failures out of 20 samples 1 sample every engine cycle Continuous	Type A, 1 Trips

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
Cylinder 4 Injection Timing	P020D	This DTC detects an Injector fault or ECU fault that causes pull In period of the current pulse out of range on injector 4 The pull in period is the time for the injection current to rise to the current level (17.50 [A]) at the beginning of the pulse	Measurement of the Pull In period of the current pulse of the injector 4 provided by HWIO	< 0.00 [us] OR > 130.00 [us]	Test enabled by calibration; and Battery voltage and Key ON and No active DTC's: and At least one injection pulse is requested by the application software; (FUL_FuelInjectedCyl_CiEPSR_CylinderC	== 1 [Boolean] > 11.00 [V] - FUL_InjCktTFTKO FUL_CntrlrStTFTKO FUL_BoostVoltTFTKO - == TRUE);	10 failures out of 20 samples 1 sample every engine cycle Continuous	Type A, 1 Trips

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
Injector 1 Control Circuit Low Voltage	P0261	This DTC detects a short circuit to ground of the low side driver circuit of Injector 1.	Voltage low across low side drive during off state indicates short-to-ground	Short to ground: impedence between LS pin and controller ground <= 0.5 [Ohm]	Test enabled by calibration; and Battery voltage and Key ON and Engine is not cranking and Engine Running and FUL_OutEnblCyl_CiEPSR_CylinderA	== 1 [Boolean] > 11.00 [V] - - >= 1.00 [s] == 0 [Boolean]	5 failures out of 10 samples 100 ms/sample Continuous	Type A, 1 Trips

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
Injector 1 Control Circuit High Voltage	P0262	This DTC detects a short circuit to power supply of the low side driver circuit of Injector 1	Voltage high across low side driver during On state indicates short to power	Short to power: impedence between LS pin and controller power <= 0.5 [Ohm]	Test enabled by calibration; and Battery voltage and Key ON and Engine is not cranking and Engine Running and FUL_OutEnblCyl_CiEPSR_CylinderA	== 1 [Boolean] > 11.00 [V] - - >= 1.00 [s] == 0 [Boolean]	5 failures out of 10 samples 100 ms/sample Continuous	Type A, 1 Trips

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
Cylinder Balance 1 Maximum Authority Reached	P0263	The Cylinder Balancing (CB) strategy is able to get a cylinder by cylinder external torque equalization to improve engine smooth running (less engine speed roughness, more driving comfort).. The Cylinder Balancing uses as input of the closed loop the unbalancing signal and provide, as output, the fuel volume correction to apply on each cylinder. The target of the closed loop is to get zero unbalancing on all cylinders. The unbalancing signal cointains the torque formed during the combustion phase of each cylinder. This diagnosis is able to detect if Cylinder Balancing fuel volume correctionapplied on cylinder 1 reach the saturation (positive or negative) without achieve the target (zero unbalancing). When CB correction for cylinder 1 reach the saturation (positive or negative) the CB control system sets a Boolean flag to true in order to inform the Max	Cylinder Balancing Fuel Volume Correction on cylinder 1 saturated (positive or negative).	FAD_CB_Cyl_A_HiSaturated ==TRUE OR FAD_CB_Cyl_A_LoSaturated ==TRUE	Test enabled by calibration	1.00	125.00 Fails Samples over 175.00 samples. 1 sample every cylinder firing event.	Type B, 2 Trips
					No faults detected on injectors	FUL_GenericInjSysFlt		
					Fuel Injector Disable Device Control not active	FUL_InjectorDisable		
					CB enabled in closed loop	FAD_CB_CntrlType ==CeFADC_e_CB_CL_Enbl		
					EOL injector codes written	FAD_EIA_DID_Written		
					No errors related to redundant calculation of EOL injector codes	FAD_EIA_RedntFlt		
					No Low fuel tank level indication	LowFuelConditionDiagnostic		
					Fuel request higher than a calibrateable threshold	>= 15.00 [mm3/stroke]		
					Engine coolant temperature higher than a calibrateable threshold	>= -20.00 [°C]		
					No faults on Engine coolant temperature sensor.	(ECT_Sensor_TFTKO AND ECT_Sensor_FA)		

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
		Authority diagnosis that the Cylinder 1 is saturated. If this signal remains true for a debouncing time a DTC is stored.						

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
Injector 2 Control Circuit Low Voltage	P0264	This DTC detects a short circuit to ground of the low side driver circuit of Injector 2.	Voltage low across low side drive during off state indicates short-to-ground	Short to ground: impedence between LS pin and controller ground <= 0.5 [Ohm]	Test enabled by calibration; and Battery voltage and Key ON and Engine is not cranking and Engine Running and FUL_OutEnblCyl_CiEPSR_CylinderD	== 1 [Boolean] > 11.00 [V] - - >= 1.00 [s] == 0 [Boolean]	5 failures out of 10 samples 100 ms/sample Continuous	Type A, 1 Trips

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
Injector 2 Control Circuit High Voltage	P0265	This detects a short circuit to power supply of the low side driver circuit of Injector 2.	Voltage high across low side driver during On state indicates short to power	Short to power: impedence between LS pin and controller power <= 0.5 [Ohm]	Test enabled by calibration; and Battery voltage and Key ON and Engine is not cranking and Engine Running and FUL_OutEnblCyl_CiEPSR_CylinderD	== 1 [Boolean] > 11.00 [V] - - >= 1.00 [s] == 0 [Boolean]	5 failures out of 10 samples 100 ms/sample Continuous	Type A, 1 Trips

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
Cylinder Balance 2 Maximum Authority Reached	P0266	The Cylinder Balancing (CB) strategy is able to get a cylinder by cylinder external torque equalization to improve engine smooth running (less engine speed roughness, more driving comfort).. The Cylinder Balancing uses as input of the closed loop the unbalancing signal and provide, as output, the fuel volume correction to apply on each cylinder. The target of the closed loop is to get zero unbalancing on all cylinders. The unbalancing signal cointains the torque formed during the combustion phase of each cylinder. This diagnosis is able to detect if Cylinder Balancing fuel volume correctionapplied on cylinder 2 reach the saturation (positive or negative) without achieve the target (zero unbalancing). When CB correction for cylinder 2 reach the saturation (positive or negative) the CB control system sets a Boolean flag to true in order to inform the Max	Cylinder Balancing Fuel Volume Correction on cylinder 2 saturated (positive or negative).	FAD_CB_Cyl_D_HiSaturated ==TRUE OR FAD_CB_Cyl_D_LoSaturated ==TRUE	Test enabled by calibration No faults detected on injectors Fuel Injector Disable Device Control not active CB enabled in closed loop EOL injector codes written No errors related to redundant calculation of EOL injector codes No Low fuel tank level indication Fuel request higher than a calibrateable threshold Engine coolant temperature higher than a calibrateable threshold No faults on Engine coolant temperature sensor.	1.00 FUL_GenericInjSysFlt FUL_InjectorDisable FAD_CB_CntrlType ==CeFADC_e_CB_CL_Enbl FAD_EIA_DID_Written FAD_EIA_RedntFlt LowFuelConditionDiagnostic >= 15.00 [mm3/stroke] >= -20.00 [°C] (ECT_Sensor_TFTKO AND ECT_Sensor_FA)	125.00 Fail Samples over 175.00 samples. 1 sample every cylinder firing event.	Type B, 2 Trips

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
		Authority diagnosis that the Cylinder 2 is saturated. If this signal remains true for a debouncing time a DTC is stored.						

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
Injector 3 Control Circuit Low Voltage	P0267	This DTC detects a short circuit to ground of the low side driver circuit of Injector 3.	Voltage low across low side drive during off state indicates short-to-ground	Short to ground: impedence between LS pin and controller ground <= 0.5 [Ohm]	Test enabled by calibration; and Battery voltage and Key ON and Engine is not cranking and Engine Running and FUL_OutEnblCyl_CiEPSR_CylinderB	== 1 [Boolean] > 11.00 [V] - - >= 1.00 [s] == 0 [Boolean]	5 failures out of 10 samples 100 ms/sample Continuous	Type A, 1 Trips

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
Injector 3 Control Circuit High Voltage	P0268	This DTC detects a short circuit to power supply of the low side driver circuit of Injector 3.	Voltage high across low side driver during On state indicates short to power	Short to power: impedence between LS pin and controller power <= 0.5 [Ohm]	Test enabled by calibration; and Battery voltage and Key ON and Engine is not cranking and Engine Running and FUL_OutEnblCyl_CiEPSR_CylinderB	== 1 [Boolean] > 11.00 [V] - - >= 1.00 [s] == 0 [Boolean]	5 failures out of 10 samples 100 ms/sample Continuous	Type A, 1 Trips

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
Cylinder Balance 3 Maximum Authority Reached	P0269	The Cylinder Balancing (CB) strategy is able to get a cylinder by cylinder external torque equalization to improve engine smooth running (less engine speed roughness, more driving comfort).. The Cylinder Balancing uses as input of the closed loop the unbalancing signal and provide, as output, the fuel volume correction to apply on each cylinder. The target of the closed loop is to get zero unbalancing on all cylinders. The unbalancing signal cointains the torque formed during the combustion phase of each cylinder. This diagnosis is able to detect if Cylinder Balancing fuel volume correctionapplied on cylinder 3 reach the saturation (positive or negative) without achieve the target (zero unbalancing). When CB correction for cylinder 3 reach the saturation (positive or negative) the CB control system sets a Boolean flag to true in order to inform the Max	Cylinder Balancing Fuel Volume Correction on cylinder 3 saturated (positive or negative).	FAD_CB_Cyl_B_HiSaturated ==TRUE OR FAD_CB_Cyl_B_LoSaturated ==TRUE	Test enabled by calibration No faults detected on injectors Fuel Injector Disable Device Control not active CB enabled in closed loop EOL injector codes written No errors related to redundant calculation of EOL injector codes No Low fuel tank level indication Fuel request higher than a calibrateable threshold Engine coolant temperature higher than a calibrateable threshold No faults on Engine coolant temperature sensor.	1.00 FUL_GenericInjSysFlt FUL_InjectorDisable FAD_CB_CntrlType ==CeFADC_e_CB_CL_Enbl FAD_EIA_DID_Written FAD_EIA_RedntFlt LowFuelConditionDiagnostic >= 15.00 [mm3/stroke] >= -20.00 [°C] (ECT_Sensor_TFTKO AND ECT_Sensor_FA)	125.00 Fail Samples over 175.00 samples. 1 sample every cylinder firing event.	Type B, 2 Trips

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
		Authority diagnosis that the Cylinder 3 is saturated. If this signal remains true for a debouncing time a DTC is stored.						

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
Charge Air Cooler Efficiency Below Threshold	P026A	This monitor checks if the charge air cooler is efficently working	The efficiency value is calculated using the charger air cooler upstream and downstream temperature and the Engine coolant temperature. The average value of this calculation is compared with a calibratable threshold.	< 50.00 [%]	Test enabled by calibration The vehicle speed shall be greater than a calibratable value Air mass flow within a calibratable window The engine coolant temperature shall be greater than a calibratable threshold OR OBD Coolant Enable Criteria The throttle value shall be greater than a calibratalbe value The pressure compressor ratio shall be greater than a calibratable value The temperature difference from upstream charge air cooler and the ambient temperature shall be greater than a calibratable value The environmental	1.00 ==TRUE > 40.00 [kph] > 20.00 [mg/s] < 2,000.00 [mg/s] > 70.00 [°C] ==TRUE > 90.00 [%] > 1.30 [ratio] > 40.00 [°C] > 69.60 [kPa]	Test executed after a counter of 800.00 samples Function task: 100 ms	Type B, 2 Trips

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
					pressure shall be greater than a calibratable value			
					The environmental temperature shall be greater than a calibratable value	> -7.00 [°C]		
					No fault on vehicle speed	VehicleSpeedSensor_FA ==FALSE		
					No fault on enginee coolant temperature	ECT_Sensor_FA ==FALSE		
					No fault on throttle position	TPS_PstnSnsrFA ==FALSE		
					No fault on ambient pressure	AAP_AmbientAirPresDfltd ==FALSE		
					No fault on ambient temperature	OAT_PtEstFiltFA ==FALSE		
					No fault on charge air cooler upstream and downstream temperature sensors	CIT_CAC_UpFA==FALSE CIT_CAC_DwnFA ==FALSE		
					No fault on MAF sensors	MAF_MAF_SnsrFA ==FALSE		
					All the enabling conditions shall be fulfilled for a	>= 0.50 [s]		

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
					calibrate-able time			

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
Fuel Injection Quantity Lower Than Expected	P026C	An error shall be detected when the fuel adjustment value (mm3) released by FSA is below a calibrated threshold.	Released FSA fuel correction value	< **KtFADD_V_FSA_ECM_LoThrsh** [mm^3]	System voltage in range FSA correction release enabled (FSA Learning is active OR DFSA Learning is active) for a time Ambient air pressure OBD Coolant Enable Criteria OR Engine coolant temperature Ambient air temperature Gear engaged Engine speed for a time Injected fuel quantity for a time Vehicle speed for a time No Low fuel tank level indication No pending or confirmed DTCs	> 11.00 [V] FAD_FSA_NormRngCrtn Valid (FAD_FSA_EnblLrn OR FAD_DFSA_EnblLrn) > 8.00 [s] > 67.00 [kPa] = TRUE > 45.00 [°C] > -7.00 [°C] different from Neutral or Parking < 1,200 [rpm] > 255 *0.025 [s] < 65.00 [mm^3] > 255 *0.025 [s] < 3.0 [kph] > 255 *0.025 [s] LowFuelConditionDiagnostic AmbPresDfltdStatus (ECT_Sensor_TFTKO AND ECT_Sensor_FA)	Time counter: 280 failures out of 560 samples. Time task 25[ms]	Type B, 2 Trips

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
						OAT_PtEstFiltFA FAD_FSA_LrnShtOffReq OXY_eqr_TurbDwn_FSA_NotVld Transmission Estimated Gear Validity		

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
Fuel Injection Quantity Higher Than Expected	P026D	An error shall be detected when the fuel adjustment value (mm^3) released by FSA is above a calibrated threshold.	Released FSA fuel correction value	> **KtFADD_V_FSA_ECM_HiThrsh** [mm^3]	System voltage in range FSA correction release enabled (FSA Learning is active OR DFSA Learning is active) for a time Ambient air pressure OBD Coolant Enable Criteria OR Engine coolant temperature Ambient air temperature Gear engaged Engine speed for a time Injected fuel quantity for a time Vehicle speed for a time No Low fuel tank level indication No pending or confirmed DTCs	> 11.00 [V] FAD_FSA_NormRngCrtn Valid (FAD_FSA_EnblLrn OR FAD_DFSA_EnblLrn) > 8.00 [s] > 67.00 [kPa] = TRUE > 45.00 [°C] > -7.00 [°C] different from Neutral or Parking < 1,200 [rpm] > 255 *0.025 [s] < 65.00 [mm^3] > 255 *0.025 [s] < 3.0 [kph > 255 *0.025 [s] LowFuelConditionDiagnostic AmbPresDfltdStatus (ECT_Sensor_TFTKO AND ECT_Sensor_FA)	Time counter: 280 failures out of 560 samples. Time task 25[ms]	Type B, 2 Trips

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
						OAT_PtEstFiltFA FAD_FSA_LrnShtOffReq OXY_eqr_TurbDwn_FSA_NotVld Transmission Estimated Gear Validity		

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
Injector 4 Control Circuit Low Voltage	P0270	This DTC detects a short circuit to ground of the low side driver circuit of Injector 4.	Voltage low across low side drive during off state indicates short-to-ground	Short to ground: impedence between LS pin and controller ground <= 0.5 [Ohm]	Test enabled by calibration; and Battery voltage and Key ON and Engine is not cranking and Engine Running and FUL_OutEnblCyl_CiEPSR_CylinderC	== 1 [Boolean] > 11.00 [V] - - >= 1.00 [s] == 0 [Boolean]	5 failures out of 10 samples 100 ms/sample Continuous	Type A, 1 Trips

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
Injector 4 Control Circuit High Voltage	P0271	This DTC detects a short circuit to power supply of the low side driver circuit of Injector 4.	Voltage high across low side driver during On state indicates short to power	Short to power: impedence between LS pin and controller power <= 0.5 [Ohm]	Test enabled by calibration; and Battery voltage and Key ON and Engine is not cranking and Engine Running and FUL_OutEnblCyl_CiEPSR_CylinderC	== 1 [Boolean] > 11.00 [V] - - >= 1.00 [s] == 0 [Boolean]	5 failures out of 10 samples 100 ms/sample Continuous	Type A, 1 Trips

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
Cylinder Balance 4 Maximum Authority Reached	P0272	The Cylinder Balancing (CB) strategy is able to get a cylinder by cylinder external torque equalization to improve engine smooth running (less engine speed roughness, more driving comfort).. The Cylinder Balancing uses as input of the closed loop the unbalancing signal and provide, as output, the fuel volume correction to apply on each cylinder. The target of the closed loop is to get zero unbalancing on all cylinders. The unbalancing signal cointains the torque formed during the combustion phase of each cylinder. This diagnosis is able to detect if Cylinder Balancing fuel volume correctionapplied on cylinder 4 reach the saturation (positive or negative) without achieve the target (zero unbalancing). When CB correction for cylinder 4 reach the saturation (positive or negative) the CB control system sets a Boolean flag to true in order to inform the Max	Cylinder Balancing Fuel Volume Correction on cylinder 4 saturated (positive or negative).	FAD_CB_Cyl_C_HiSaturated ==TRUE OR FAD_CB_Cyl_C_LoSaturated ==TRUE	Test enabled by calibration No faults detected on injectors Fuel Injector Disable Device Control not active CB enabled in closed loop EOL injector codes written No errors related to redundant calculation of EOL injector codes No Low fuel tank level indication Fuel request higher than a calibrateable threshold Engine coolant temperature higher than a calibrateable threshold No faults on Engine coolant temperature sensor.	1.00 FUL_GenericInjSysFlt FUL_InjectorDisable FAD_CB_CntrlType ==CeFADC_e_CB_CL_Enbl FAD_EIA_DID_Written FAD_EIA_RedntFlt LowFuelConditionDiagnostic >= 15.00 [mm3/stroke] >= -20.00 [°C] (ECT_Sensor_TFTKO AND ECT_Sensor_FA)	125.00 Fail Samples over 175.00 samples. 1 sample every cylinder firing event.	Type B, 2 Trips

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
		Authority diagnosis that the Cylinder 4 is saturated. If this signal remains true for a debouncing time a DTC is stored.						

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
Cylinder 1 Fuel Injector Offset Learning At Min Limit	P02CC	This diagnosis (Min Authority monitoring) performs a check on the absolute Energizing Time learnt by SQA (Small Quantity Adjustment). During Diesel Fuel Cut-off conditions SQA command the injection of a known quantity on one injector (e.g. 1,5mm^3) and checks, by means of crank-wheel sensor, the torque produced during the combustion phase. Two different learning strategies are used: Target SQA (TSQA): This strategy is a closed loop between fuel quantity injected and torque produced during combustion phase. The fuel quantity injected is increased/decreased until the angular acceleration target is reached. The Delta Energizing Time needed to achieve the target is then stored in SQA Map. Extrapolated SQA (ESQA): With this strategy several injections with different injection quantities are performed and, for	Each time a new value is entered in SQA map the diagnosis checks if: - DeltaET learnt by (x) SQA on cylinder 1. The result of this test is then stored in a boolean NV array cointaing the status of Minimum authority test (TRUE=Saturated, FALSE= Not saturated) for all the rail pressure levels defined for SQA. The DTC for minimum authority reached is set if, at least one element of the array is equal to TRUE and is unset when all the elements of the array are equal to FALSE.	 < **KaFADC_t_SQA_MinAdptDeltET[us]**	SQA Diagnosis enabled (x)SQA injection management enabled	1.00 FAD_SQA_InjMgntEnbld	Time required to perform a learning with (x) SQA. 1 Sample every cylinder firing event.	Type B, 2 Trips

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
		each quantity, a delta ET is calculated using the difference between the torque produced during the combustion phase and the torque that would be produced during the combustion of a nominal fuel quantity. The results are then extrapolated in order to find the behaviour in all small quantity area. Each time a new value is entered in SQA map, regardless the strategies used to perform the learning (TSQA, ESQA, …), the diagnosis checks if the DeltaET learned by SQA is lower than a calibrateable threshold. The result of this test is then stored in a boolean NV array containing the status of Minimum authority test (TRUE=Saturated, FALSE= Not saturated) for all the rail pressure levels defined for SQA. The DTC for minimum authority reached is set if, at least one element of the array is equal to TRUE and is unset when all the elements of the array are equal to FALSE (no saturated values stored in SQA						

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
		map).						

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
Cylinder 1 Fuel Injector Offset Learning At Max Limit	P02CD	This diagnosis (Max Authority monitoring) performs a check on the absolute Energizing Time learnt by SQA (Small Quantity Adjustment). During Diesel Fuel Cut-off conditions SQA command the injection of a known quantity on one injector (e.g. 1,5mm^3) and checks, by means of crank-wheel sensor, the torque produced during the combustion phase. Two different learning strategies are used: Target SQA (TSQA): This strategy is a closed loop between fuel quantity injected and torque produced during combustion phase. The fuel quantity injected is increased/decreased until the angular acceleration target is reached. The Delta Energizing Time needed to achieve the target is then stored in SQA Map. Extrapolated SQA (ESQA): With this strategy several injections with different injection quantities are performed and, for	Each time a new value is entered in SQA map the diagnosis checks if: - DeltaET learnt by (x) SQA on cylinder 1. The result of this test is then stored in a boolean NV array cointaing the status of Maximum authority test (TRUE=Saturated, FALSE= Not saturated) for all the rail pressure levels defined for SQA. The DTC for maximum authority reached is set if, at least one element of the array is equal to TRUE and is unset when all the elements of the array are equal to FALSE.	> **KaFADC_t_SQA_MaxAdptDeltET[us]**	SQA Diagnosis enabled (x)SQA injection management enabled	1.00 FAD_SQA_InjMgntEnbld	Time required to perform a learning with (x) SQA. [Sample Rate: 1 Sample every cylinder firing event].	Type B, 2 Trips

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
		each quantity, a delta ET is calculated using the difference between the torque produced during the combustion phase and the torque that would be produced during the combustion of a nominal fuel quantity. The results are then extrapolated in order to find the behaviour in all small quantity area. Each time a new value is entered in SQA map, regardless the strategies used to perform the learning (TSQA, ESQA, …), the diagnosis checks if the DeltaET learned by SQA is higher than a calibrateable threshold. The result of this test is then stored in a boolean NV array containing the status of Maximum authority test (TRUE=Saturated, FALSE= Not saturated) for all the rail pressure levels defined for SQA. The DTC for maximum authority reached is set if, at least one element of the array is equal to TRUE and is unset when all the elements of the array are equal to FALSE (no saturated values stored in SQA						

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
		map).						

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
Cylinder 2 Fuel Injector Offset Learning At Min Limit	P02CE	This diagnosis (Min Authority monitoring) performs a check on the absolute Energizing Time learnt by SQA (Small Quantity Adjustment). During Diesel Fuel Cut-off conditions SQA command the injection of a known quantity on one injector (e.g. 1,5mm^3) and checks, by means of crank-wheel sensor, the torque produced during the combustion phase. Two different learning strategies are used: Target SQA (TSQA): This strategy is a closed loop between fuel quantity injected and torque produced during combustion phase. The fuel quantity injected is increased/decreased until the angular acceleration target is reached. The Delta Energizing Time needed to achieve the target is then stored in SQA Map. Extrapolated SQA (ESQA): With this strategy several injections with different injection quantities are performed and, for	Each time a new value is entered in SQA map the diagnosis checks if: - DeltaET learnt by (x) SQA on cylinder 2. The result of this test is then stored in a boolean NV array cointaing the status of Minimum authority test (TRUE=Saturated, FALSE= Not saturated) for all the rail pressure levels defined for SQA. The DTC for minimum authority reached is set if, at least one element of the array is equal to TRUE and is unset when all the elements of the array are equal to FALSE.	 < **KaFADC_t_SQA_MinAdptDeltET[us]**	SQA Diagnosis enabled (x)SQA injection management enabled	1.00 FAD_SQA_InjMgntEnbld	Time required to perform a learning with (x) SQA. [Sample Rate: 1 Sample every cylinder firing event].	Type B, 2 Trips

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
		each quantity, a delta ET is calculated using the difference between the torque produced during the combustion phase and the torque that would be produced during the combustion of a nominal fuel quantity. The results are then extrapolated in order to find the behaviour in all small quantity area. Each time a new value is entered in SQA map, regardless the strategies used to perform the learning (TSQA, ESQA, …), the diagnosis checks if the DeltaET learned by SQA is lower than a calibrateable threshold. The result of this test is then stored in a boolean NV array containing the status of Minimum authority test (TRUE=Saturated, FALSE= Not saturated) for all the rail pressure levels defined for SQA. The DTC for minimum authority reached is set if, at least one element of the array is equal to TRUE and is unset when all the elements of the array are equal to FALSE (no saturated values stored in SQA						

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
		map).						

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
Cylinder 2 Fuel Injector Offset Learning At Max Limit	P02CF	This diagnosis (Max Authority monitoring) performs a check on the absolute Energizing Time learnt by SQA (Small Quantity Adjustment). During Diesel Fuel Cut-off conditions SQA command the injection of a known quantity on one injector (e.g. 1,5mm^3) and checks, by means of crank-wheel sensor, the torque produced during the combustion phase. Two different learning strategies are used: Target SQA (TSQA): This strategy is a closed loop between fuel quantity injected and torque produced during combustion phase. The fuel quantity injected is increased/decreased until the angular acceleration target is reached. The Delta Energizing Time needed to achieve the target is then stored in SQA Map. Extrapolated SQA (ESQA): With this strategy several injections with different injection quantities are performed and, for	Each time a new value is entered in SQA map the diagnosis checks if: - DeltaET learnt by (x) SQA on cylinder 2. The result of this test is then stored in a boolean NV array cointaing the status of Maximum authority test (TRUE=Saturated, FALSE= Not saturated) for all the rail pressure levels defined for SQA. The DTC for maximum authority reached is set if, at least one element of the array is equal to TRUE and is unset when all the elements of the array are equal to FALSE.	> **KaFADC_t_SQA_MaxAdptDeltET[us]**	SQA Diagnosis enabled (x)SQA injection management enabled	1.00 FAD_SQA_InjMgntEnbld	Time required to perform a learning with (x) SQA. [Sample Rate: 1 Sample every cylinder firing event].	Type B, 2 Trips

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
		each quantity, a delta ET is calculated using the difference between the torque produced during the combustion phase and the torque that would be produced during the combustion of a nominal fuel quantity. The results are then extrapolated in order to find the behaviour in all small quantity area. Each time a new value is entered in SQA map, regardless the strategies used to perform the learning (TSQA, ESQA, …), the diagnosis checks if the DeltaET learned by SQA is higher than a calibrateable threshold. The result of this test is then stored in a boolean NV array containing the status of Maximum authority test (TRUE=Saturated, FALSE= Not saturated) for all the rail pressure levels defined for SQA. The DTC for maximum authority reached is set if, at least one element of the array is equal to TRUE and is unset when all the elements of the array are equal to FALSE (no saturated values stored in SQA						

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
		map).						

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
Cylinder 3 Fuel Injector Offset Learning At Min Limit	P02D0	This diagnosis (Min Authority monitoring) performs a check on the absolute Energizing Time learnt by SQA (Small Quantity Adjustment). During Diesel Fuel Cut-off conditions SQA command the injection of a known quantity on one injector (e.g. 1,5mm^3) and checks, by means of crank-wheel sensor, the torque produced during the combustion phase. Two different learning strategies are used: Target SQA (TSQA): This strategy is a closed loop between fuel quantity injected and torque produced during combustion phase. The fuel quantity injected is increased/decreased until the angular acceleration target is reached. The Delta Energizing Time needed to achieve the target is then stored in SQA Map. Extrapolated SQA (ESQA): With this strategy several injections with different injection quantities are performed and, for	Each time a new value is entered in SQA map the diagnosis checks if: - DeltaET learnt by (x) SQA on cylinder 3. The result of this test is then stored in a boolean NV array cointaing the status of Minimum authority test (TRUE=Saturated, FALSE= Not saturated) for all the rail pressure levels defined for SQA. The DTC for minimum authority reached is set if, at least one element of the array is equal to TRUE and is unset when all the elements of the array are equal to FALSE.	< **KaFADC_t_SQA_MinAdptDeltET[us]**	SQA Diagnosis enabled (x)SQA injection management enabled	1.00 FAD_SQA_InjMgntEnbld	Time required to perform a learning with (x) SQA. [Sample Rate: 1 Sample every cylinder firing event].	Type B, 2 Trips

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
		each quantity, a delta ET is calculated using the difference between the torque produced during the combustion phase and the torque that would be produced during the combustion of a nominal fuel quantity. The results are then extrapolated in order to find the behaviour in all small quantity area. Each time a new value is entered in SQA map, regardless the strategies used to perform the learning (TSQA, ESQA, …), the diagnosis checks if the DeltaET learned by SQA is lower than a calibrateable threshold. The result of this test is then stored in a boolean NV array containing the status of Minimum authority test (TRUE=Saturated, FALSE= Not saturated) for all the rail pressure levels defined for SQA. The DTC for minimum authority reached is set if, at least one element of the array is equal to TRUE and is unset when all the elements of the array are equal to FALSE (no saturated values stored in SQA						

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
		map).						

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
Cylinder 3 Fuel Injector Offset Learning At Max Limit	P02D1	This diagnosis (Max Authority monitoring) performs a check on the absolute Energizing Time learnt by SQA (Small Quantity Adjustment). During Diesel Fuel Cut-off conditions SQA command the injection of a known quantity on one injector (e.g. 1,5mm^3) and checks, by means of crank-wheel sensor, the torque produced during the combustion phase. Two different learning strategies are used: Target SQA (TSQA): This strategy is a closed loop between fuel quantity injected and torque produced during combustion phase. The fuel quantity injected is increased/decreased until the angular acceleration target is reached. The Delta Energizing Time needed to achieve the target is then stored in SQA Map. Extrapolated SQA (ESQA): With this strategy several injections with different injection quantities are performed and, for	Each time a new value is entered in SQA map the diagnosis checks if: - DeltaET learnt by (x) SQA on cylinder 3 The result of this test is then stored in a boolean NV array cointaing the status of Maximum authority test (TRUE=Saturated, FALSE= Not saturated) for all the rail pressure levels defined for SQA. The DTC for maximum authority reached is set if, at least one element of the array is equal to TRUE and is unset when all the elements of the array are equal to FALSE.	> **KaFADC_t_SQA_MaxAdptDeltET[us]**	SQA Diagnosis enabled (x)SQA injection management enabled	1.00 FAD_SQA_InjMgntEnbld	Time required to perform a learning with (x) SQA. [Sample Rate: 1 Sample every cylinder firing event].	Type B, 2 Trips

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
		each quantity, a delta ET is calculated using the difference between the torque produced during the combustion phase and the torque that would be produced during the combustion of a nominal fuel quantity. The results are then extrapolated in order to find the behaviour in all small quantity area. Each time a new value is entered in SQA map, regardless the strategies used to perform the learning (TSQA, ESQA, …), the diagnosis checks if the DeltaET learned by SQA is higher than a calibrateable threshold. The result of this test is then stored in a boolean NV array containing the status of Maximum authority test (TRUE=Saturated, FALSE= Not saturated) for all the rail pressure levels defined for SQA. The DTC for maximum authority reached is set if, at least one element of the array is equal to TRUE and is unset when all the elements of the array are equal to FALSE (no saturated values stored in SQA						

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
		map).						

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
Cylinder 4 Fuel Injector Offset Learning At Min Limit	P02D2	This diagnosis (Min Authority monitoring) performs a check on the absolute Energizing Time learnt by SQA (Small Quantity Adjustment). During Diesel Fuel Cut-off conditions SQA command the injection of a known quantity on one injector (e.g. 1,5mm^3) and checks, by means of crank-wheel sensor, the torque produced during the combustion phase. Two different learning strategies are used: Target SQA (TSQA): This strategy is a closed loop between fuel quantity injected and torque produced during combustion phase. The fuel quantity injected is increased/decreased until the angular acceleration target is reached. The Delta Energizing Time needed to achieve the target is then stored in SQA Map. Extrapolated SQA (ESQA): With this strategy several injections with different injection quantities are performed and, for	Each time a new value is entered in SQA map the diagnosis checks if: - DeltaET learnt by (x) SQA on cylinder 4. The result of this test is then stored in a boolean NV array cointaing the status of Minimum authority test (TRUE=Saturated, FALSE= Not saturated) for all the rail pressure levels defined for SQA. The DTC for minimum authority reached is set if, at least one element of the array is equal to TRUE and is unset when all the elements of the array are equal to FALSE.	< **KaFADC_t_SQA_MinAdptDeltET[us]**	SQA Diagnosis enabled (x)SQA injection management enabled	1.00 FAD_SQA_InjMgntEnbld	Time required to perform a learning with (x) SQA. [Sample Rate: 1 Sample every cylinder firing event].	Type B, 2 Trips

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
		each quantity, a delta ET is calculated using the difference between the torque produced during the combustion phase and the torque that would be produced during the combustion of a nominal fuel quantity. The results are then extrapolated in order to find the behaviour in all small quantity area. Each time a new value is entered in SQA map, regardless the strategies used to perform the learning (TSQA, ESQA, …), the diagnosis checks if the DeltaET learned by SQA is lower than a calibrateable threshold. The result of this test is then stored in a boolean NV array containing the status of Minimum authority test (TRUE=Saturated, FALSE= Not saturated) for all the rail pressure levels defined for SQA. The DTC for minimum authority reached is set if, at least one element of the array is equal to TRUE and is unset when all the elements of the array are equal to FALSE (no saturated values stored in SQA						

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
		map).						

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
Cylinder 4 Fuel Injector Offset Learning At Max Limit	P02D3	This diagnosis (Max Authority monitoring) performs a check on the absolute Energizing Time learnt by SQA (Small Quantity Adjustment). During Diesel Fuel Cut-off conditions SQA command the injection of a known quantity on one injector (e.g. 1,5mm^3) and checks, by means of crank-wheel sensor, the torque produced during the combustion phase. Two different learning strategies are used: Target SQA (TSQA): This strategy is a closed loop between fuel quantity injected and torque produced during combustion phase. The fuel quantity injected is increased/decreased until the angular acceleration target is reached. The Delta Energizing Time needed to achieve the target is then stored in SQA Map. Extrapolated SQA (ESQA): With this strategy several injections with different injection quantities are performed and, for	Each time a new value is entered in SQA map the diagnosis checks if: - DeltaET learnt by (x) SQA on cylinder 4 The result of this test is then stored in a boolean NV array cointaing the status of Maximum authority test (TRUE=Saturated, FALSE= Not saturated) for all the rail pressure levels defined for SQA. The DTC for maximum authority reached is set if, at least one element of the array is equal to TRUE and is unset when all the elements of the array are equal to FALSE.	> **KaFADC_t_SQA_MaxAdptDeltET[us]**	SQA Diagnosis enabled (x)SQA injection management enabled	1.00 FAD_SQA_InjMgntEnbld	Time required to perform a learning with (x) SQA. [Sample Rate: 1 Sample every cylinder firing event].	Type B, 2 Trips

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
		each quantity, a delta ET is calculated using the difference between the torque produced during the combustion phase and the torque that would be produced during the combustion of a nominal fuel quantity. The results are then extrapolated in order to find the behaviour in all small quantity area. Each time a new value is entered in SQA map, regardless the strategies used to perform the learning (TSQA, ESQA, …), the diagnosis checks if the DeltaET learned by SQA is higher than a calibrateable threshold. The result of this test is then stored in a boolean NV array containing the status of Maximum authority test (TRUE=Saturated, FALSE= Not saturated) for all the rail pressure levels defined for SQA. The DTC for maximum authority reached is set if, at least one element of the array is equal to TRUE and is unset when all the elements of the array are equal to FALSE (no saturated values stored in SQA						

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
		map).						

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
Diesel Intake Air Flow Control Circuit/Open	P02E0	This monitor checks if the Throttle commands are in open circuit	Error interface provided by HWIO	Error interface provided by HWIO == TRUE	Test enabled by calibration System out of the cranking phase PT relay supply voltage in range Error interface provided by HWIO != INDETERMINATE Valve moved to a position different from wide open	1.00 ==TRUE > 11.00 [V]	96.00 fail counts out of 120.00 sample counts Function task: 12.5 ms	Type B, 2 Trips

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
Diesel Intake Air Flow Control Circuit Low	P02E2	This monitor checks if the Throttle commands are shorted to ground	Error interface provided by HWIO	Error interface provided by HWIO == TRUE	Test enabled by calibration System out of the cranking phase PT relay supply voltage in range Error interface provided by HWIO != INDETERMINATE	1.00 ==TRUE > 11.00 [V]	96.00 fail counts out of 120.00 sample counts Function task: 12.5 ms	Type B, 2 Trips

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
Diesel Intake Air Flow Control Circuit High	P02E3	This monitor checks if the Throttle commands are shorted to power supply	Error interface provided by HWIO	Error interface provided by HWIO == TRUE	Test enabled by calibration	1.00 ==TRUE	96.00 fail counts out of 120.00 sample counts Function task: 12.5 ms	Type B, 2 Trips
					System out of the cranking phase			
					PT relay supply voltage in range	> 11.00 [V]		
					Error interface provided by HWIO != INDETERMINATE			

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
Diesel Intake Air Flow Control Stuck Open	P02E4	This monitor checks if the Throttle valve got mechanically stuck in a position more open than what is required by the control	position tracking error (setpoint position - measured position) < negative threshold AND valve duty cycle < negative threshold	< -8.00 [%] AND < -80.00 [%]	Test enabled by calibration System out of the cranking phase Position control in closed loop (no faults present on Throttle position sensor, Throttle valve, Throttle position deviation)	1.00 == TRUE TPS_PstnShtOffReq == TRUE	640.00 fail counts out of 800.00 sample counts Function task: 6.25 ms after 96.00 fail counts out of 120.00 sample counts Function task: 12.5 ms	Type A, 1 Trips

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
Diesel Intake Air Flow Control Stuck Closed	P02E5	This monitor checks if the Throttle valve got mechanically stuck in a position more closed than what is required by the control	position tracking error (setpoint position - measured position) > positive threshold AND valve duty cycle > positive threshold	> 8.00 [%] AND > 80.00 [%]	Test enabled by calibration System out of the cranking phase Position control in closed loop (no faults present on Throttle position sensor, Throttle valve, Throttle position deviation)	1.00 == TRUE TPS_PstnShtOffReq == FALSE	640.00 fail counts out of 800.00 sample counts Function task: 6.25 ms	Type A, 1 Trips

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
Diesel Intake Air Flow Position Sensor Circuit Low	P02E8	This monitor checks if the Throttle position analog or SENT sensor is out of electrical range low	analog position raw voltage < low threshold	< 1.00 %5V	Test enabled by calibration System out of the cranking phase PT relay supply voltage in range	1.00 ==TRUE > 11.00 [V]	192.00 fail counts out of 240.00 sample counts Function task: 6.25 ms	Type B, 2 Trips
			SENT position raw voltage < low threshold	< 1.00 %5V	Test enabled by calibration System out of the cranking phase PT relay supply voltage in range No faults present on Throttle SENT out of range and SENT performance	1.00 ==TRUE > 11.00 [V] TPS_SENT_OOR_Flt == FALSE TPS_SENT_PerfFlt == FALSE	192.00 fail counts out of 240.00 sample counts Function task: 6.25 ms	

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
Diesel Intake Air Flow Position Sensor Circuit High	P02E9	This monitor checks if the Throttle position analog or SENT sensor is out of electrical range low	analog position raw voltage > high threshold	> 99.00 %5V	Test enabled by calibration System out of the cranking phase PT relay supply voltage in range	1.00 ==TRUE > 11.00 [V]	192.00 fail counts out of 240.00 sample counts Function task: 6.25 ms	Type B, 2 Trips
			SENT position raw voltage > highthreshold	> 99.00 %5V	Test enabled by calibration System out of the cranking phase PT relay supply voltage in range No faults present on Throttle SENT out of range and SENT performance	1.00 ==TRUE > 11.00 [V] TPS_SENT_OOR_Flt== FALSE TPS_SENT_PerfFlt== FALSE	192.00 fail counts out of 240.00 sample counts Function task: 6.25 ms	

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
Diesel Intake Air Flow Control Motor Current Range/ Performance	P02EB	This monitor checks if an excessive current flows through the Throttle DC-Motor (e.g. shunt circuit between load, Throttle DC-Motor internal faults, etc).	Error interface provided by HWIO	Error interface provided by HWIO == TRUE	Test enabled by calibration System out of the cranking phase PT relay supply voltage in range No faults present on Throttle DC Motor current range/performance	1.00 ==TRUE > 11.00 [V] TPS_MtrCurrLimTFTKO == FALSE	96.00 fail counts out of 120.00 sample counts Function task: 12.5 ms	Type B, 2 Trips

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
Glow Plug/ Heater Indicator Control Circuit Low	P037A	This DTC checks the wait to start lamp circuit for electrical integrity during operation. Wait to start lamp pin shorted to ground.	Wait to start lamp pin shorted to ground. Test performed by HWIO.	Fault present reported by HWIO VeGLOO_e_GP_Lmp Gsht == CeTRUE	Glow Lamp is present; Test enabled by calibration; Key on and engine running (cranking excluded); Battery voltage in range; Diagnostic system is not disabled;	1.00 [boolean] 1.00 [boolean] VePMDR_b_RunCrankActive = TRUE; VeEMDR_b_EngModeCrank = FALSE; VeLVTR_b_RunCrankIgnInRange = TRUE; VeDRER_DiagSystemDsbl = FALSE;	10.00 fail samples over 15.00 samples. * Ground short monitoring is implemented in HWIO level wich means no further debouncing is needed in case of short to ground Time task: 100 [ms]	Type B, 2 Trips

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
Glow Plug/ Heater Indicator Control Circuit High	P037B	This DTC checks the wait to start lamp circuit for electrical integrity during operation. Wait to start lamp pin shorted to high voltage.	Wait to start lamp pin shorted to power. Test performed by HWIO.	Fault present reported by HWIO VeGLOO_e_GP_LmpPsht == CeTRUE	Glow Lamp is present; Test enabled by calibration; Key on and engine running (cranking excluded); Battery voltage in range; Diagnostic system is not disabled;	1.00 [boolean] 1.00 [boolean] VePMDR_b_RunCrankActive = TRUE; VeEMDR_b_EngModeCrank = FALSE; VeLVTR_b_RunCrankIgnInRange = TRUE; VeDRER_DiagSystemDsbl = FALSE;	10.00 fail samples over 20.00 samples. Time task: 100 [ms]	Type B, 2 Trips

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
Glow Plug Sense Circuit Low	P037E	This DTC checks the circuit for electrical integrity during operation of glow plug sub-system. ECU internal fault.	Voltage feedback above threshold depending on system current and RunCrank relay voltage	battery_voltage - voltage_feedback > **KtGLOD_U_VoltLoDelMax** [V]	Test enabled by calibration; Key on and engine running (cranking excluded); Battery voltage in range; Enable_ON interface is true; No electrical fault detected on glow plugs; No faults detected on glow plug system supply; Diagnostic system is not disabled;	1.00 [boolean] VePMDR_b_RunCrankActive = TRUE; VeEMDR_b_EngModeCrank = FALSE; VeLVTR_b_RunCrankIgnInRange = TRUE; VeGLOO_b_GlowPlugEnbl = TRUE; VeGLOO_b_ElectFlt = FALSE; GLO_GlowPlugSplyVoltCktTFTKO VeDRER_DiagSystemDsbl = FALSE;	60.00 fail samples over 120.00 samples Time task: 50 [ms]	Type B, 2 Trips

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
Glow Plug Sense Circuit High	P037F	This DTC checks the circuit for electrical integrity during operation of glow plug sub-system. ECU internal fault.	Voltage feedback over a threshold depending on RunCrank relay voltage	voltage_feedback > 5.00 [V]	Test enabled by calibration; Key on and engine running (cranking excluded); Battery voltage in range; Enable_ON interface is true; No electrical fault detected on glow plugs; No faults detected on glow plug system supply; Diagnostic system is not disabled;	1.00 [boolean] VePMDR_b_RunCrankActive = TRUE; VeEMDR_b_EngModeCrank = FALSE; VeLVTR_b_RunCrankIgnInRange = TRUE; VeGLOO_b_GlowPlugEnbl = TRUE; VeGLOO_b_ElectFlt = FALSE; GLO_GlowPlugSplyVoltCktTFTKO VeDRER_DiagSystemDsbl = FALSE;	40.00 fail samples over 80.00 samples Time task: 50 [ms]	Type B, 2 Trips

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
Glow Plug/ Heater Indicator Control Circuit/Open	P0381	This DTC checks the wait to start lamp circuit for electrical integrity during operation. Wait to start lamp pin open circuit.	Wait to start lamp pin open circuit. Test performed by HWIO.	Fault present reported by HWIO VeGLOO_e_GP_Lmp Open == CeTRUE	Glow Lamp is present; Test enabled by calibration; Key on and engine running (cranking excluded); Battery voltage in range; Diagnostic system is not disabled;	1.00 [boolean] 1.00 [boolean] VePMDR_b_RunCrankActive = TRUE; VeEMDR_b_EngModeCrank = FALSE; VeLVTR_b_RunCrankIgnInRange = TRUE; VeDRER_DiagSystemDsbl = FALSE;	10.00 fail samples over 15.00 samples. * Open load monitoring is implemented in HWIO level wich means no further debouncing is needed in case of open load Time task: 100 [ms]	Type B, 2 Trips

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
Exhaust Gas Recirculation (EGR) Solenoid Control Circuit	P0403	This monitor checks if the HP EGR commands are in open circuit	Error interface provided by HWIO	Error interface provided by HWIO == TRUE	Test enabled by calibration System out of the cranking phase PT relay supply voltage in range Error interface provided by HWIO != INDETERMINATE Valve moved to a position different from fully closed driver is OFF	1.00 ==TRUE > 11.00 [V]	96.00 fail counts out of 120.00 sample counts Function task: 12.5 ms	Type B, 2 Trips

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
Exhaust Gas Recirculation (EGR) Position Sensor A Circuit Low Voltage	P0405	This monitor checks if the HP EGR position analog sensor is out of electrical range low	analog position raw voltage < low threshold	< 4.50 %5V	Test enabled by calibration	1.00 ==TRUE	96.00 fail counts out of 120.00 sample counts Function task: 6.25 ms	Type B, 2 Trips
					System out of the cranking phase			
					PT relay supply voltage in range	> 11.00 [V]		

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
Exhaust Gas Recirculation (EGR) Position Sensor A Circuit High Voltage	P0406	This monitor checks if the HP EGRposition analog sensor is out of electrical range high	analog position raw voltage > highthreshold	> 95.00 %5V	Test enabled by calibration System out of the cranking phase PT relay supply voltage in range	1.00 ==TRUE > 11.00 [V]	96.00 fail counts out of 120.00 sample counts Function task: 6.25 ms	Type B, 2 Trips

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
EGR Temperature Sensor2 Ckt Low	P040C	Diagnose the EGR Down Stream Temperature sensor circuit low	The ECM detects that the measured resistance of the temperature sensor is out of range low.	Measured Resistance of the Temperature sensor < 146.65 Ω impedance	System supply voltage Output driver is commanded on Ignition switch is in crank or run position	> 11.00 Volts	40 failures out of 50 samples 100 ms /sample, continuous	Type B, 2 Trips

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
EGR Temperature Sensor2 Ckt High	P040D	Diagnose the EGR Down Stream Temperature sensor circuit high	The ECM detects that the measured resistance of the temperature sensor is out of range high.	Measured Resistance of the Temperature sensor > 884.60 Ω impedance	System supply voltage Output driver is commanded on Ignition switch is in crank or run position	> 11.00 Volts	40 failures out of 50 samples 100 ms /sample, continuous	Type B, 2 Trips

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
EGR Temperature Sensor2 Ckt Intermittent/ Erratic	P040E	Detects a temperature sensor that is showing erratic or intermittent temperature readings	The absoluted value of the loop to loop (100 ms / sample) resistance change of the temperature sensor is greater than the allowed rate of change.	Delta chage > 25.00 Ω impedance	System supply voltage Output driver is commanded on Ignition switch is in crank or run position	> 11.00 Volts	40 failures out of 50 samples 100 ms /sample, continuous	Type B, 2 Trips

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
EGR Temperature Sensor1 Ckt Low	P041C	Diagnose the EGR Up Stream Temperature sensor circuit low	The ECM detects that the measured resistance of the temperature sensor is out of range low.	Measured Resistance of the Temperature sensor < 146.65 Ω impedance	System supply voltage Output driver is commanded on Ignition switch is in crank or run position	> 11.00 Volts	40 failures out of 50 samples 100 ms /sample, continuous	Type B, 2 Trips

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
EGR Temperature Sensor1 Ckt High	P041D	Diagnose the EGR Up Stream Temperature sensor circuit high	The ECM detects that the measured resistance of the temperature sensor is out of range high.	Measured Resistance of the Temperature sensor > 884.60 Ω impedance	System supply voltage Output driver is commanded on Ignition switch is in crank or run position	> 11.00 Volts	40 failures out of 50 samples 100 ms /sample, continuous	Type B, 2 Trips

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
EGR Temperature Sensor1 Ckt Intermittent/ Erratic	P041E	Detects a temperature sensor that is showing erratic or intermittent temperature readings	The absoluted value of the loop to loop (100 ms / sample) resistance change of the temperature sensor is greater than the allowed rate of change.	Delta chage > 25.00 Ω impedance	System supply voltage Output driver is commanded on Ignition switch is in crank or run position	> 11.00 Volts	40 failures out of 50 samples 100 ms /sample, continuous	Type B, 2 Trips

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
Exhaust Gas Recirculation Control Stuck Open	P042E	This monitor checks if the HP EGR valve got mechanically stuck in a position more open than what is required by the control	position tracking error (setpoint position - measured position) < negative threshold AND valve duty cycle < negative threshold	< -8.00 [%] AND < -80.00 [%]	Test enabled by calibration System out of the cranking phase Position control in closed loop (no faults present on HP EGR position sensor, HP EGR valve, position deviation)	1.00 ==TRUE EGR_PstnShtOffReq == FALSE	160.00 fail counts out of 200.00 sample counts Function task: 6.25 ms	Type A, 1 Trips

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
Exhaust Gas Recirculation Control Stuck Closed	P042F	This monitor checks if the HP EGR valve got mechanically stuck in a position more closed than what is required by the control	position tracking error (setpoint position - measured position) > positive threshold AND valve duty cycle > positive threshold	> 8.00 [%] AND > 80.00 [%]	Test enabled by calibration System out of the cranking phase Position control in closed loop (no faults present on HP EGR position sensor, HP EGR valve, position deviation)	1.00 ==TRUE EGR_PstnShtOffReq== FALSE	160.00 fail counts out of 200.00 sample counts Function task: 6.25 ms after 96.00 fail counts out of 120.00 sample counts Function task: 12.5 ms	Type A, 1 Trips

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
Exhaust Gas Recirculation (EGR) Solenoid Control Circuit Low Voltage	P0489	This monitor checks if the HP EGR commands are shorted to ground	Error interface provided by HWIO	Error interface provided by HWIO == TRUE	Test enabled by calibration System out of the cranking phase PT relay supply voltage in range Error interface provided by HWIO != INDETERMINATE	1.00 ==TRUE > 11.00 [V]	96.00 fail counts out of 120.00 sample counts Function task: 12.5 ms	Type B, 2 Trips

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
Exhaust Gas Recirculation (EGR) Solenoid Control Circuit High Voltage	P0490	This monitor checks if the HP EGR commands are shorted to power supply	Error interface provided by HWIO	Error interface provided by HWIO == TRUE	Test enabled by calibration	1.00 ==TRUE	96.00 fail counts out of 120.00 sample counts Function task: 12.5 ms	Type B, 2 Trips
					System out of the cranking phase			
					PT relay supply voltage in range	> 11.00 [V]		
					Error interface provided by HWIO != INDETERMINATE			

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
Exhaust Gas Recirculation A Control Position Exceeded Learning Limit	P049D	This monitor checks if the HP EGR position analog sensor has an offset with respect to the nominal position where the valve does the learning procedure (fully closed)	analog position raw voltage when the valve is in fully closed position < low threshold OR analog position raw voltage when the valve is in fully closed position > highthreshold	< 16.40 %5V OR > 25.10 %5V	Test enabled by calibration IF AT KEY OFF: Learning procedure at key off in fully closed position has been successfully completed (no faults present on HP EGR position sensor, HP EGR valve, HP EGR position deviation) End Of Trip event has elapsed IF IN NORMAL RUNNING: Learning procedure in normal running in fully closed position has been successfully completed (no faults present on HP EGR position sensor, HP EGR valve, HP EGR position deviation) Key signal is on	1.00 ==TRUE EGR_PstnShtOffReq == FALSE EGR_PstnShtOffReq== FALSE	1.00 fail counts out of 1.00 sample counts Function task: in normal running and / or at key off	Type B, 2 Trips

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
Positive Crankcase Ventilation Heater Control Circuit /Open	P053A	This DTC checks the circuit for electrical integrity during operation. Crankcase ventilation heater control pin open load.	Open circuit communicated by HWIO	Test performed by HWIO GetHWIO_e_CrankcaseVentHtrOpen == 1	Test enabled by calibration; Key on or engine running (cranking excluded, Engine cranking equal to 0); Power train relay voltage in range; Engine temperature is under a calibrate-able threshold;	1.00 VePMDR_b_RunCrankActive == True; VeEMDR_b_EngModeCrank ==False; > 11.00 [V] < 90.00 [°C]	Time Counter: 20 failures out of 40 samples. Time Task 100 [ms]	Type C, No SVS

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
Positive Crankcase Ventilation Heater Control Circuit Low	P053B	This DTC checks the circuit for electrical integrity during operation. Crankcase ventilation heater control pin short to ground.	Short circuit to ground communicated by HWIO	Test performed by HWIO (GetHWIO_e_CrankcaseVentHtrGsht==1)	Test enabled by calibration; Key on or engine running (cranking excluded, Engine cranking equal to 0); Power train relay voltage in range; Engine temperature is under a calibrate-able threshold;	1.00 VePMDR_b_RunCrankActive == True; VeEMDR_b_EngModeCrank ==False; > 11.00 [V] < 90.00 [°C]	Time Counter: 20 failures out of 40 samples. Time Task 100 [ms]	Type C, No SVS

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
Positive Crankcase Ventilation Heater Control Circuit High	P053C	This DTC checks the circuit for electrical integrity during operation. Crankcase ventilation heater control pin short to high voltage.	Short circuit to supply communicated by HWIO	Test performed by HWIO (GetHWIO_e_CrankcaseVentHtrPsht==1)	Test enabled by calibration;	1.00	Time Counter: 20 failures out of 40 samples. Time Task 100 [ms]	Type C, No SVS
					Key on or engine running (cranking excluded, Engine cranking equal to 0);	VePMDR_b_RunCrankActive == True; VeEMDR_b_EngModeCrank ==False;		
					Power train relay voltage in range;	> 11.00 [V]		
					Engine temperature is under a calibrate-able threshold;	< 90.00 [°C]		

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
Exhaust Gas Temperature Sensor Circuit Low Bank 1 Sensor 1	P0545	This diagnosis verify if the exhaust gas temperature 1 (EGT1) sensor signal is shorted to GND	EGT1 output resistance value	< 160 [Ohm]	Test enabled by calibration (TRUE--> enable FALSE --> disable) and with Engine cranking and with Battery voltage and with key on	1 [Boolean] == FALSE > 11.00 [V] == TRUE	10 fail samples over 20 samples Function task: 100ms	Type B, 2 Trips

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
Exhaust Gas Temperature Sensor Circuit High Bank 1 Sensor 1	P0546	This diagnosis verify if the exhaust gas temperature 1 (EGT1) signal is shorted to power supply or it is in open circuit	EGT1 output resistance value	> 900 [Ohm]	Test enabled by calibration (TRUE--> enable FALSE --> disable)	1 [Boolean]	10 fail samples over 20 samples Function task: 100ms	Type B, 2 Trips
					and with			
					Engine cranking	== FALSE		
					and with			
					Battery voltage	> 11.00 [V]		
					and with			
					key on	== TRUE		

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
Idle Control System - Fuel Quantity Lower Than Expected	P054E	This DTC detects if the fuel quantity of the torque forming pulses is lower than the expected fuel quantity request when the engine is idle. Depending on combustion mode and gear, different maps of fuel quantity thresholds can be used. Each map depends on engine speed and engine coolant temperature	Depending on Combustion Mode case **SCR Temp1:** (<u>transmission in Gear:</u> Fuel quantity of the torque forming pulses <u>transmission in Park/ Neutral:</u> Fuel quantity of the torque forming pulses) case **SCR Temp2** (<u>transmission in Gear:</u> Fuel quantity of the torque forming pulses	< 0.5* **P054E_IFM_MinFuelIdleT1_G** [mm^3] depending on engine speed and engine coolant temperature < 0.5* **P054E_IFM_MinFuelIdleT1_PN** [mm^3] depending on engine speed and engine coolant temperature < 0.5* **P054E_IFM_MinFuelIdleT2_G** [mm^3] depending on engine speed and engine coolant	**For enabling the monitor, all the following conditions must be satisfied continuously for more than** Test enabled by calibration and current gear and depending on **Gear Selection Calibration =** CeFULR_e_InGearNeutralPark (<u>CeFULR_e_InGear:</u> transmission <u>CeFULR_e_NeutralPark:</u> transmission <u>CeFULR_e_InGearNeutralPark:</u> transmission) and engine speed and engine speed	5.00 [s] 1.00 [Boolean] unchanged in gear in park/neutral in gear and in park neutral > hysteresis(511.00 , 511.00 + 0.00)[rpm] <hysteresis(1,560.00 , 1,560.00 + 0.00)[rpm]	200.00 failures out of 255.00 samples 1 sample every cylinder firing event	Type B, 2 Trips

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
			transmission in Park/ Neutral: Fuel quantity of the torque forming pulses) case **SCR Temp3** (transmission in Gear: Fuel quantity of the torque forming pulses transmission in Park/ Neutral: Fuel quantity of the torque forming pulses) case **HC unloading driving and park/neutral**	temperature < 0.5* **P054E_IFM_MinFuelIdleT2_PN** [mm^3] depending on engine speed and engine coolant temperature < 0.5* **P054E_IFM_MinFuelIdleT3_G** [mm^3] depending on engine speed and engine coolant temperature < 0.5* **P054E_IFM_MinFuelIdleT3_PN** [mm^3] depending on engine speed and engine coolant temperature	and (OBD Coolant Enable Criteria OR engine coolant temperature) and outside air temperature and vehicle speed and enabled in the combustion mode and Accelerator Pedal Position and Engine running and Run Crank voltage and No active DTC's: Depending on the **OAT Source Calibration**	== TRUE > hysteresis(-21.00 , -20.00) [°C] > hysteresis(-21.00 , -20.00) [°C] < 3.00 [kph] **P054E_IFM_CombModesEnbl** <= 0.05 [%] - >= 11.00 [V]		

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
			(HCS_DeHC_Drive || HCS_DeHC_Park): (transmission in Gear: Fuel quantity of the torque forming pulses transmission in Park/ Neutral: Fuel quantity of the torque forming pulses) **default:** (transmission in Gear: Fuel quantity of the torque forming pulses transmission in Park/ Neutral: Fuel quantity of the torque forming pulses	< 0.5* **P054E_IFM_MinFuelIdleHC_G** [mm^3] depending on engine speed and engine coolant temperature < 0.5* **P054E_IFM_MinFuelIdleHC_PN** [mm^3] depending on engine speed and engine coolant temperature < 0.5* **P054E_IFM_MinFuelIdleC1_G** [mm^3] depending on engine speed and engine coolant temperature < 0.5*	= CeOATR_e_ECM_OAT_Sensor (CeOATR_e_NonOBD_NonECM_NonVICM: default:)	OAT_OAT_SnsrNonEmissFA OAT_PtEstFiltFA CrankSensor_TFTKO ECT_Sensor_FA Transmission Estimated Gear Validity VehicleSpeedSensor_FA AcceleratorPedalFailure (FUL_GenericInjSysFA AND FUL_GenericInjSysFlt)		

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
			)	**P054E_IFM_MinFuelIdleC1_PN** [mm^3] depending on engine speed and engine coolant temperature				

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.

Idle Control System - Fuel Quantity Higher Than Expected	P054F	This DTC detects if the fuel quantity of the torque forming pulse is higher than the expected fuel quantity request when the engine is idle. Depending on combustion mode and gear, different maps of fuel quantity thresholds can be used. Each map depends on engine speed and engine coolant temperature	Depending on Combustion Mode
			
			case **SCR Temp1**:
			{
			transmission in Gear:
			Fuel quantity of the torque forming pulses
			
			transmission in Park/ Neutral:
			Fuel quantity of the torque forming pulses
			
			}
			
			case **SCR Temp2**
			{
			transmission in Gear:
			Fuel quantity of the torque forming pulses
				> 1.5* **P054F_IFM_MaxFuelIdleT1_G** [mm^3] depending on engine speed and engine coolant temperature
				
				> 1.5* **P054F_IFM_MaxFuelIdleT1_PN** [mm^3] depending on engine speed and engine coolant temperature
				
				> 1.5* **P054F_IFM_MaxFuelIdleT2_G** [mm^3] depending on engine speed and engine coolant temperature
					For enabling the monitor, all the following conditions must be satisfied continuously for more than
					
					Test enabled by calibration
					
					and
					current gear
					
					and
					depending on **Gear Selection Calibration =** CeFULR_e_InGearNeutralPark
					{
					CeFULR_e_InGear:
					transmission
					
					CeFULR_e_NeutralPark:
					transmission
					
					CeFULR_e_InGearNeutralPark:
					transmission
					}
					
					and
					engine speed
					
					and
					engine speed
					
					and
						5.00 [s]
						
						1.00 [Boolean]
						
						unchanged
						
						in gear
						
						in park/neutral
						
						in gear and in park neutral
						
						> hysteresis(511.00 , 511.00 + 0.00) [rpm]
						
						< hysteresis(1,560.00 , 1,560.00 + 0.00) [rpm]
							200.00 failures out of 255.00 samples
							
							1 sample every cylinder firing event
								Type B, 2 Trips

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
			transmission in Park/ Neutral:		{ OBD Coolant Enable Criteria	== TRUE		
			Fuel quantity of the torque forming pulses	> 1.5* **P054F_IFM_MaxFuelIdleT2_PN** [mm^3] depending on engine speed and engine coolant temperature	OR engine coolant temperature	> hysteresis(-21.00 , -20.00) [°C]		
					}			
			}		and outside air temperature	> hysteresis(-21.00 , -20.00) [°C]		
			case **SCR Temp3** { transmission in Gear:		and vehicle speed	< 3.00 [kph]		
			Fuel quantity of the torque forming pulses	> 1.5* **P054F_IFM_MaxFuelIdleT3_G** [mm^3] depending on engine speed and engine coolant temperature	and enabled in the combustion mode	**P054E_IFM_CombModesEnbl**		
					and Accelerator Pedal Position	<= 0.05 [%]		
			transmission in Park/ Neutral:		and Engine running	-		
			Fuel quantity of the torque forming pulses	> 1.5* **P054F_IFM_MaxFuelIdleT3_PN** [mm^3] depending on engine speed and engine coolant temperature	and Run Crank voltage	>= 11.00 [V]		
					and No active DTC's:			
			} case **HC unloading driving and park/neutral (HCS_DeHC_Drive ||**		Depending on the **OAT Source Calibration** = CeOATR_e_ECM_OAT_Sensor { CeOATR_e_NonOBD_NonECM_NonVICM:			

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.

			HCS_DeHC_Park):
			{
			transmission in Gear:
			Fuel quantity of the torque forming pulses
			
			transmission in Park/ Neutral:
			Fuel quantity of the torque forming pulses
			
			}
			
			default:
			{
			transmission in Gear:
			Fuel quantity of the torque forming pulses
			
			transmission in Park/ Neutral:
			Fuel quantity of the torque forming pulses
				> 1.5* **P054F_IFM_MaxFuelIdleHC_G** [mm^3] depending on engine speed and engine coolant temperature
				
				> 1.5* **P054F_IFM_MaxFuelIdleHC_PN** [mm^3] depending on engine speed and engine coolant temperature
				
				> 1.5* **P054F_IFM_MaxFuelIdleC1_G** [mm^3] depending on engine speed and engine coolant temperature
				
				> 1.5* **P054F_IFM_MaxFuelIdleC1_PN** [mm^3] depending on engine speed and
					default:
					}
						OAT_OAT_SnsrNonEmissFA
						
						OAT_PtEstFiltFA
						
						CrankSensor_TFTKO
						
						ECT_Sensor_FA
						
						Transmission Estimated Gear Validity
						
						VehicleSpeedSensor_FA
						
						AcceleratorPedalFailure
						
						(FUL_GenericInjSysFA AND FUL_GenericInjSysFlt)		

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
			}	engine coolant temperature				

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
Internal Control Module Fuel Injector Control Performance	P062B	This DTC Diagnoses the internal fuel injector control module circuit for circuit faults. The following check are performed: - Chip initialization - Boost voltage - chip test - Code and Parameter - SPI error (SPI communication failed)	Driver Status OR (Driver Status for a number of samples)	== FAILED (chip test not passed OR Wrong download of microcode OR SPI error) == NOT INITIALIZED (chip not initialized OR Boost Voltage < 52 [V]) > 10 samples	Test enabled by calibration; and Battery voltage and Key ON and Engine is not cranking and Boost Voltage has achieved (at least one time)	== 1 [Boolean] > 11.00 [V] - - 52.00 [V]	4 failures out of 8 samples 12.5 ms / sample Continuous	Type A, 1 Trips

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
Fuel Injector Driver Circuit Performance Bank 1	P062D	This DTC detects if there is: open circuit of the power supply line of the injector or Boost voltage fault or ECU internal fault The monitoring determines if the boost voltage is above a threshold or below another threshlod with hysteresis	Internal ECU Boost Voltage	> 75.00 [V] OR < hysteresis(52.00 , 53.00) [V]	Test enabled by calibration; and Battery voltage and Key ON and Engine is not cranking	== 1 [Boolean] > 11.00 [V] - -	14 failures out of 20 samples 6.25 ms/sample Continuous	Type A, 1 Trips

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
Cylinder 1 Glow Plug Circuit Low	P066A	This DTC checks the circuit for electrical integrity during operation. Glow plug 1 pin short to ground.	Cylinder 1 Glow Plug Circuit Low Test performed by HWIO	Fault present reported by HWIO VaGLOO_e_GlowPlugGshtErr{}{CiEPSR_CylinderA} ==True	Test enabled by calibration; Key on and engine running (cranking excluded); Battery voltage in range; No faults detected on glow plug system supply; Duty cycle above a calibratable threshold; Diagnostic system is not disabled;	1.00 [boolean] VePMDR_b_RunCrankActive = TRUE; VeEMDR_b_EngModeCrank = FALSE; VeLVTR_b_RunCrankIgnInRange = TRUE; GLO_GlowPlugSplyVoltCktTFTKO 2.00 [%] VeDRER_DiagSystemDsbl = FALSE;	10.00 fail samples over 20.00 samples Time task: 100 [ms]	Type B, 2 Trips + glow lamp ON

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
Cylinder 1 Glow Plug Circuit High	P066B	This DTC checks the circuit for electrical integrity during operation. Glow plug 1 pin short to high voltage.	Cylinder 1 Glow Plug Circuit High Test performed by HWIO	Fault present reported by HWIO VaGLOO_e_GlowPlugPsht {CiEPSR_CylinderA} ==True	Test enabled by calibration; Key on and engine running (cranking excluded); Battery voltage in range; No faults detected on glow plug system supply; Diagnostic system is not disabled;	1.00 [boolean] VePMDR_b_RunCrankActive = TRUE; VeEMDR_b_EngModeCrank = FALSE; VeLVTR_b_RunCrankIgnInRange = TRUE; GLO_GlowPlugSplyVoltCktTFTKO VeDRER_DiagSystemDsbl = FALSE;	10.00 fail samples over 20.00 samples Time task: 100 [ms]	Type B, 2 Trips + glow lamp ON

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
Cylinder 2 Glow Plug Circuit Low	P066C	This DTC checks the circuit for electrical integrity during operation. Glow plug 2 pin short to ground.	Cylinder 2 Glow Plug Circuit Low Test performed by HWIO	Fault present reported by HWIO VaGLOO_e_GlowPlugGshtErr {CiEPSR_CylinderB} ==True	Test enabled by calibration; Key on and engine running (cranking excluded); Battery voltage in range; No faults detected on glow plug system supply; Duty cycle above a calibratable threshold; Diagnostic system is not disable;	1.00 [boolean] VePMDR_b_RunCrankActive = TRUE; VeEMDR_b_EngModeCrank = FALSE; VeLVTR_b_RunCrankIgnInRange = TRUE; GLO_GlowPlugSplyVoltCktTFTKO 2.00 [%] VeDRER_DiagSystemDsbl = FALSE;	10.00 fail samples over 20.00 samples Time task: 100 [ms]	Type B, 2 Trips + glow lamp ON

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
Cylinder 2 Glow Plug Circuit High	P066D	This DTC checks the circuit for electrical integrity during operation. Glow plug 2 pin short to high voltage.	Cylinder 2 Glow Plug Circuit High Test performed by HWIO	Fault present reported by HWIO VaGLOO_e_GlowPlugPsht {CiEPSR_CylinderB} ==True	Test enabled by calibration; Key on and engine running (cranking excluded); Battery voltage in range; No faults detected on glow plug system supply; Diagnostic system is not disabled;	1.00 [boolean] VePMDR_b_RunCrankActive = TRUE; VeEMDR_b_EngModeCrank = FALSE; VeLVTR_b_RunCrankIgnInRange = TRUE; GLO_GlowPlugSplyVoltCktTFTKO VeDRER_DiagSystemDsbl = FALSE;	10.00 fail samples over 20.00 samples Time task: 100 [ms]	Type B, 2 Trips + glow lamp ON

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
Cylinder 3 Glow Plug Circuit Low	P066E	This DTC checks the circuit for electrical integrity during operation. Glow plug 3 pin short to ground.	Cylinder 3 Glow Plug Circuit Low Test performed by HWIO	Fault present reported by HWIO VaGLOO_e_GlowPlugGshtErr {CiEPSR_CylinderC} ==True	Test enabled by calibration; Key on and engine running (cranking excluded); Battery voltage in range; No faults detected on glow plug system supply; Duty cycle above a calibratable threshold; Diagnostic system is not disable;	1.00 [boolean] VePMDR_b_RunCrankActive = TRUE; VeEMDR_b_EngModeCrank = FALSE; VeLVTR_b_RunCrankIgnInRange = TRUE; GLO_GlowPlugSplyVoltCktTFTKO 2.00 [%] VeDRER_DiagSystemDsbl = FALSE;	10.00 fail samples over 20.00 samples Time task: 100 [ms]	Type B, 2 Trips + glow lamp ON

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
Cylinder 3 Glow Plug Circuit High	P066F	This DTC checks the circuit for electrical integrity during operation. Glow plug 3 pin short to high voltage.	Cylinder 3 Glow Plug Circuit High Test performed by HWIO	Fault present reported by HWIO VaGLOO_e_GlowPlugPsht {CiEPSR_CylinderC} ==True	Test enabled by calibration; Key on and engine running (cranking excluded); Battery voltage in range; No faults detected on glow plug system supply; Diagnostic system is not disabled;	1.00 [boolean] VePMDR_b_RunCrankActive = TRUE; VeEMDR_b_EngModeCrank = FALSE; VeLVTR_b_RunCrankIgnInRange = TRUE; GLO_GlowPlugSplyVoltCktTFTKO VeDRER_DiagSystemDsbl = FALSE;	10.00 fail samples over 20.00 samples Time task: 100 [ms]	Type B, 2 Trips + glow lamp ON

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
Cylinder 1 Glow Plug Circuit/Open	P0671	This DTC checks the circuit for electrical integrity during operation. Glow plug 1 pin open load.	Cylinder 1 Glow Plug Circuit Open Test performed by HWIO	Fault present reported by HWIO VaGLOO_e_GlowPlug Open {CiEPSR_CylinderA} ==True	Test enabled by calibration; Key on and engine running (cranking excluded); Battery voltage in range; No faults detected on glow plug system supply; Duty cycle above a calibratable threshold; Diagnostic system is not disabled;	1.00 [boolean] VePMDR_b_RunCrankActive = TRUE; VeEMDR_b_EngModeCrank = FALSE; VeLVTR_b_RunCrankIgnInRange = TRUE; GLO_GlowPlugSplyVoltCktTFTKO 2.00 [%] VeDRER_DiagSystemDsbl = FALSE;	10.00 fail samples over 20.00 samples Time task: 100 [ms]	Type B, 2 Trips + glow lamp ON

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
Cylinder 2 Glow Plug Circuit/Open	P0672	This DTC checks the circuit for electrical integrity during operation. Glow plug 2 pin open load.	Cylinder 2 Glow Plug Circuit Open Test performed by HWIO	Fault present reported by HWIO VaGLOO_e_GlowPlug Open {CiEPSR_CylinderB} ==True	Test enabled by calibration; Key on and engine running (cranking excluded); Battery voltage in range; No faults detected on glow plug system supply; Duty cycle above a calibratable threshold; Diagnostic system is not disabled;	1.00 [boolean] VePMDR_b_RunCrankActive = TRUE; VeEMDR_b_EngModeCrank = FALSE; VeLVTR_b_RunCrankIgnInRange = TRUE; GLO_GlowPlugSplyVoltCktTFTKO 2.00 [%] VeDRER_DiagSystemDsbl = FALSE;	10.00 fail samples over 20.00 samples Time task: 100 [ms]	Type B, 2 Trips + glow lamp ON

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
Cylinder 3 Glow Plug Circuit/Open	P0673	This DTC checks the circuit for electrical integrity during operation. Glow plug 3 pin open load.	Cylinder 3 Glow Plug Circuit Open Test performed by HWIO	Fault present reported by HWIO VaGLOO_e_GlowPlugOpen {CiEPSR_CylinderC} ==True	Test enabled by calibration; Key on and engine running (cranking excluded); Battery voltage in range; No faults detected on glow plug system supply; Duty cycle above a calibratable threshold; Diagnostic system is not disabled;	1.00 [boolean] VePMDR_b_RunCrankActive = TRUE; VeEMDR_b_EngModeCrank = FALSE; VeLVTR_b_RunCrankIgnInRange = TRUE; GLO_GlowPlugSplyVoltCktTFTKO 2.00 [%] VeDRER_DiagSystemDsbl = FALSE;	10.00 fail samples over 20.00 samples Time task: 100 [ms]	Type B, 2 Trips + glow lamp ON

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
Cylinder 4 Glow Plug Circuit/Open	P0674	This DTC checks the circuit for electrical integrity during operation. Glow plug 4 pin open load.	Cylinder 3 Glow Plug Circuit Open Test performed by HWIO	Fault present reported by HWIO VaGLOO_e_GlowPlugOpen {CiEPSR_CylinderD} ==True	Test enabled by calibration; Key on and engine running (cranking excluded); Battery voltage in range; No faults detected on glow plug system supply; Duty cycle above a calibratable threshold; Diagnostic system is not disabled;	1.00 [boolean] VePMDR_b_RunCrankActive = TRUE; VeEMDR_b_EngModeCrank = FALSE; VeLVTR_b_RunCrankIgnInRange = TRUE; GLO_GlowPlugSplyVoltCktTFTKO 2.00 [%] VeDRER_DiagSystemDsbl = FALSE;	10.00 fail samples over 20.00 samples Time task: 100 [ms]	Type B, 2 Trips + glow lamp ON

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
Cylinder 4 Glow Plug Circuit Low	P067A	This DTC checks the circuit for electrical integrity during operation. Glow plug 4 pin short to ground.	Cylinder 4 Glow Plug Circuit Low Test performed by HWIO	Fault present reported by HWIO VaGLOO_e_GlowPlugGshtErr {CiEPSR_CylinderD} ==True	Test enabled by calibration; Key on and engine running (cranking excluded); Battery voltage in range; No faults detected on glow plug system supply; Duty cycle above a calibratable threshold; Diagnostic system is not disable;	1.00 [boolean] VePMDR_b_RunCrankActive = TRUE; VeEMDR_b_EngModeCrank = FALSE; VeLVTR_b_RunCrankIgnInRange = TRUE; GLO_GlowPlugSplyVoltCktTFTKO 2.00 [%] VeDRER_DiagSystemDsbl = FALSE;	10.00 fail samples over 20.00 samples Time task: 100 [ms]	Type B, 2 Trips + glow lamp ON

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
Cylinder 4 Glow Plug Circuit High	P067B	This DTC checks the circuit for electrical integrity during operation. Glow plug 4 pin short to high voltage.	Cylinder 4 Glow Plug Circuit High Test performed by HWIO	Fault present reported by HWIO VaGLOO_e_GlowPlugPsht {CiEPSR_CylinderD} ==True	Test enabled by calibration; Key on and engine running (cranking excluded); Battery voltage in range; No faults detected on glow plug system supply; Diagnostic system is not disabled;	1.00 [boolean] VePMDR_b_RunCrankActive = TRUE; VeEMDR_b_EngModeCrank = FALSE; VeLVTR_b_RunCrankIgnInRange = TRUE; GLO_GlowPlugSplyVoltCktTFTKO VeDRER_b_DiagSystemDsbl = FALSE;	10.00 fail samples over 20.00 samples Time task: 100 [ms]	Type B, 2 Trips + glow lamp ON

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
Reductant Pump Driver High Temperature	P103F	This diagnosis verifies that the Motor Mosfet Driver Temperature is too High	Motor Mosfet Driver Temperature too High Error status == FAULT	VeSCRR_e_PmpDrvrHiTemp == FAULT	Test enabled by calibration Key on (OR engine running) Engine is not cranking Battery voltage No loss of CAN communication Motor Mosfet Driver Temperature too High Error status provided by DEF control module different from INDETERMINATE	1.00 [Boolean] (VePMDR_b_RunCrankActive==TRUE) (VeEMDR_b_EngModeCrank == FALSE) > 11.00 [V] (VeLVTR_b_PT_RelayInRange== TRUE) U010E, Lost Communication With Reductant Control Module (SCR) (GetCANR_b_LostComm_FltN = FALSE) VeSCRR_e_PmpDrvrHiTemp != Indeterminate)	40.00 failures out of 50.00 samples Time basis = 100ms/sample	Type A, 1 Trips

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
Reductant Pump A Control Circuit Shorted	P1040	This diagnosis verifies that the DEF pump phases are shorted	Motor Pump Phases Shorted Error status provided by DEF control module == FAULT	VeSCRR_e_PmpMtrShorted==FAULT	Test enabled by calibration Key on (OR engine running) Engine is not cranking Battery voltage No loss of CAN comunication Motor Pump Phases Shorted Error status provided by DEF control module different from indeterminate	1.00 (VePMDR_b_RunCrankActive==TRUE) VeEMDR_b_EngModeCrank == FALSE > 11.00 [V] (VeLVTR_b_PT_RelayInRange== TRUE) U010E, Lost Communication With Reductant Control Module (SCR) (GetCANR_b_LostComm_FltN= FALSE) (VeSCRR_e_PmpMtrShorted != Indeterminate)	20.00 failures out of 25.00 samples Time basis = 100ms/sample	Type A, 1 Trips

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
Reductant Injection Valve Supply Voltage Circuit Low Bank 1 Unit 1	P1048	This diagnosis verifies if a DEF dosing valve high side short to ground occurred	HWIO interface DEFMV_ENABLE_GROUND_SHORT = Fault	VeHWIO_e_DEFMV_Enbl_Gsht == CeSCRR_e_Fault	Test enabled by calibration Key on (OR engine running) Engine is not cranking Battery voltage HWIO interface DEFMV_ENABLE_GROUND_SHORT different from INDETERMINATE	1.00 (VePMDR_b_RunCrankActive == TRUE) (VeEMDR_b_EngModeCrank == FALSE) > 11.00 [V] (VeLVTR_b_PT_RelayInRange== TRUE) (VeHWIO_e_DEFMV_Enbl_Gsht != CeSCRR_e_Indeterminate)	30.00 failures out of 60.00 samples Time basis = 100ms/sample	Type A, 1 Trips

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
Reductant Injection Valve Supply Voltage Circuit High Bank 1 Unit 1	P1049	This diagnosis verifies if a DEF dosing valve high side short to power occurred	HWIO interface DEFMV_ENABLE_POWER_SHORT = Fault	VeHWIO_e_DEFMV_Enbl_Psht == CeSCRR_e_Fault	Test enabled by calibration Key on (OR engine running) Engine is not cranking Battery voltage HWIO interface DEFMV_ENABLE_POWER_SHORT different from INDETERMINATE	1.00 (VePMDR_b_RunCrankActive == TRUE) (VeEMDR_b_EngModeCrank == FALSE) > 11.00 [V] (VeLVTR_b_PT_RelayInRange== TRUE) (VeHWIO_e_DEFMV_Enbl_Psht != CeSCRR_e_Indeterminate)	30.00 failures out of 60.00 samples Time basis = 100ms/sample	Type A, 1 Trips

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
Reductant Level Sensor- Invalid Range	P1050	This diagnosis verifies that the DEF level sensor raw signal is not within plausible range	DEF level sensor raw value is not within calibrated range (for discrete level sensor, each discrete level has its plausible range)	NOT (VeSCRR_Pct_DEF_LevelRaw > 2.00 AND VeSCRR_Pct_DEF_LevelRaw < 5.50) AND NOT (VeSCRR_Pct_DEF_LevelRaw > 17.30 AND VeSCRR_Pct_DEF_LevelRaw < 22.00) AND NOT (VeSCRR_Pct_DEF_LevelRaw > 32.90 AND VeSCRR_Pct_DEF_LevelRaw < 38.80) AND NOT (VeSCRR_Pct_DEF_LevelRaw > 63.10 AND VeSCRR_Pct_DEF_LevelRaw < 69.40)	Test enabled by calibration Key on (OR engine running) Engine is not cranking Battery voltage No loss of CAN communication No electrical faults on DEF level sensor Discrete Level sensor used	1.00 (VePMDR_b_RunCrankActive==TRUE) (VeEMDR_b_EngModeCrank == FALSE) > 11.00 [V] (VeLVTR_b_RunCrankIgnInRange == TRUE) U010E, Lost Communication With Reductant Control Module (SCR) (GetCANR_b_LostComm_FltN= FALSE) SCR_DEFLS_ElecFltSt == FALSE CeSCRI_e_DEF_LvlSnsrDiscrete == CeSCRI_e_DEF_LvlSnsrDiscrete	40.00 failures out of 50.00 samples Time basis = 100ms/sample	Type B, 2 Trips

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
Reductant Heater 1 Driver Over Temperature Fault	P1051	This diagnosis verifies if the driver of the DEF tank heater is affected by overtemperature	Tank Heater driver over temperature flag reports a fail	VeSCRR_e_HeatA_OverTemp == CeSCRR_e_fault	Test enabled by calibration Temperature used by the heating strategy to switch on the heaters < threshold Battery voltage Key on (OR engine running) Engine is not cranking No loss of CAN communication DEF Temperature sensor not in fault Tank Heater driver over temperature flag different from INDETERMINATE	1.00 min (VeOATR_T_OutsideAirNonEmiss, VeSCRC_T_DEF_Tank) < 60.00 > 11.00 [V] (VeLVTR_b_RunCrankIgnInRange == TRUE) (VePMDR_b_RunCrankActive==TRUE) (VeEMDR_b_EngModeCrank == FALSE) U010E, Lost Communication With Reductant Control Module (SCR) (GetCANR_b_LostComm_FltN= FALSE) SCR_DEFTS_FA == FALSE VeSCRR_e_HeatA_OverTemp != CeSCRR_e_Indeterminate	8.00 failures out of 10.00 samples Time basis = 500ms/sample	Type A, 1 Trips

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
Reductant Heater 2 Driver Over Temperature Fault	P1052	This diagnosis verifies if the driver of the DEF dosing line heater is affected by overtemperature	Line Heater driver over temperature flag reports a fail	VeSCRR_e_HeatB_OverTemp == CeSCRR_e_fault	Test enabled by calibration	1.00 == TRUE	8.00 failures out of 10.00 samples Time basis = 500ms/sample	Type A, 1 Trips
					Temperature used by the heating strategy to switch on the heaters < threshold	min (VeOATR_T_OutsideAirNonEmiss, VeSCRC_T_DEF_Tank) < 60.00		
					Battery voltage	> 11.00 [V] (VeLVTR_b_RunCrankIgnInRange == TRUE)		
					Key on (OR engine running)	VePMDR_b_RunCrankActive==TRUE		
					Engine is not cranking	(VeEMDR_b_EngModeCrank == FALSE)		
					No loss of CAN communication	U010E, Lost Communication With Reductant Control Module (SCR) (GetCANR_b_LostComm_FltN= FALSE)		
					Line Heater driver over temperature flag different from INDETERMINATE	VeSCRR_e_HeatB_OverTemp != CeSCRR_e_Indeterminate		

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
Reductant Pump A Speed Low	P105A	This diagnosis verifies that the DEF pump rotor is stalled	DEF pump commanded to move forward or reverse AND DEF Pump Motor speed within calibrated range	VeSCRR_n_PmpMtrSpd > -650.00 AND VeSCRR_n_PmpMtrSpd < 650.00	Test enabled by calibration	1.00	160.00 failures out of 200.00 samples Time basis = 25ms	Type A, 1 Trips
					Engine is not cranking	VeEMDR_b_EngModeCrank == FALSE		
					Battery voltage	> 11.00 [V] (VeLVTR_b_PT_RelayInRange== TRUE)		
					Key on (OR engine running)	VePMDR_b_RunCrankActive==TRUE		
					PWM_pump_command not in fault	SCR_DEF_PumpCmdFA == FALSE		
					DEF motor pump not in fault	SCR_DEFPM_FA == FALSE		
					No loss of CAN communication	U010E, Lost Communication With Reductant Control Module (SCR) (GetCANR_b_LostComm_FltN= FALSE)		
					Tank Defrost phase completed	VeSCRC_b_PmpRtrFrozen == FALSE		
					DEF pump commanded to move forward or reverse	VeSCRC_Pct_Pump > 39.00 AND VeSCRC_Pct_Pump < 81.00 OR		

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
						VeSCRC_Pct_Pump > 11.00 AND VeSCRC_Pct_Pump < 31.00		

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
Rail Pressure deviation during cut off	P1089	This diagnosis is able to check if, during SQA learning, the pressure set-point requested by SQA is correctly reached and maintained (in rail pressure range defined for SQA), in order to allow SQA to perform the learning.	Fuel Rail pressure	> SQA Rail Pressure Set-point + **KaFADC_p_SQA_Lrn Delt** OR < SQA Rail Pressure Set-point - **KaFADC_p_SQA_Lrn Delt**	Test enabled by calibration All enabling conditions for SQA learning different from Rail Pressure in range are satified Calibrateable delay time since SQA started to request rail pressure set-point has expired.	1.00 FAD_SQA_LrnPresEnbl 3,500.00	800.00 Fail Samples over 1,143.00 samples. 1 Sample every 12,5ms.	Type B, 2 Trips

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
Reductant Injector Temperature - Exhaust Gas Temperature Not Plausible	P10D1	This monitor measures the temperature of DEF injector coil and compares to reference temperature after long soak.	Difference between coil temperature and reference temperature greater than calibratable value.	> 30.00	Test enabled by calibration (TRUE->Enable False -> Disable) DEF Injector Fault State (No fault on injector) Powertrain relay in range Long Engine off soak period has elapsed (sec) Service Test Run/Crank is Active Engine in Cranking Phase Powertrain Relay in-Range Diag System Disable Coil Temp Rationality Diag Inhibited Coil Temperature Estimation Available	1.00 == FALSE == TRUE >= 28,800.00 == FALSE == TRUE == FALSE == TRUE == FALSE == FALSE == TRUE	Single decision criteria. Function Task: 25ms	Type B, 2 Trips

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
Charge Air Cooler Temperature Sensor Circuit Range/ Performance Bank 1 Sensor 2	P10D5	The charge air cooler down air temperature sensor output shall be monitored to detect rationality faults, sensor wiring harness poor contacts and sensor internal fault (offset).	Charge air cooler down air temperature is compared at power up with an average temperature calculated using the intake manifold air temperature sensor (A) and the fuel temperature sensor (B) over a calibratable number of samples (nMaxRat).		Enablement calibration set to TRUE	1.00 ==TRUE	Test executed after a counter of 1.00 samples	Type B, 2 Trips
					Runk Crank Relay voltage in range	> 11.00 [V]	Functional task: 100 ms	
					Key on and engine not running or engine running for less than a calibratable time	>= 0.10 [s]		
			When the number of samples nMaxRat is counted the following test shall be perfomed: TavAB-TavLPE > maximum calibratable threshold	> 20.00 [°C]	Engine not in cranking phase			
					The engine has not run for a calibratable time since last key off	>= 28,800.00 [s]		
					No faults detected on engine off timer	EngineModeNotRunTimer Error ==FALSE		
					Absolute value of the difference between intake manifold air temperature and fuel temperature smaller than a calibratable threshold	< 45.00 [°C]		
					No electrical or self-correlated faults detected on charge air cooler down air temperature sensors	CIT_CAC_DwnCktFA ==FALSE OR CIT_CAC_DwnSelfCorFA ==FALSE		

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
					No faults detected on intake manifold air temperature sensor	MnfdTempSensorFA ==FALSE		
					No faults detected on fuel temperature sensor	FTS_FTS_Flt==FALSE		

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
Charge Air Cooler Temperature Sensor Circuit High Bank1 Sensor 2	P10D6	This monitor checks if Charge air cooler down air temperature sensor wiring harness is in open circuit (if the sensor is connected with the ECU with an internal pull-up resistance) and if Charge air cooler down air temperature sensor wiring harness is short circuit to power supply.	Charge air cooler down air temperature resistance value > maximum calibratable threshold	> 1,020,852.00 [ohm]	Enablement calibration set to TRUE Runk Crank Relay voltage in range Key on or engine running Engine not cranking	1.00 ==TRUE > 11.00 [V]	50.00 fail counter over 63.00 sample counter Functional task: 100 ms	Type B, 2 Trips

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
Charge Air Cooler Temperature Sensor Circuit Low Bank1 Sensor 2	P10D7	This monitor checks if Charge air cooler down air temperature sensor wiring harness is in open circuit (if the sensor is connected with the ECU with an internal pull-down resistance) and if Charge air cooler down air temperature sensor wiring harness is short circuit to ground	Charge air cooler down air temperature resistance value < minimum calibratable threshold	< 7.00 [ohm]	Enablement calibration set to TRUE Runk Crank Relay voltage in range Key on or engine running Engine not cranking	1.00 ==TRUE > 11.00 [V]	50.00 fail counter over 63.00 sample counter Functional task: 100 ms	Type B, 2 Trips

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
Charge Air Cooler Temperature Sensor Circuit Intermittent/ Erratic Bank1 Sensor 2	P10D8	This monitor checks if Charge air cooler down air temperature sensor wiring harness has poor contacts, or internal fault (intermittent).	Charge air cooler down air temperature value > T_MAX_threshold Charge air cooler down air temperature value < T_MIN_threshold where - T_MAX_threshold = (1 - alpha)*T_MAX + alpha*T_last_good - T_MIN_threshold = (1 - alpha)*T_MIN + alpha*T_last_good - alpha = e^(#fails + 1)*(ts/ tau) - #fails = number of consecutive samples where the test failed - ts = sensor sampling time - tau = sensor filter response time - T_MAX = sensor maximum actual reading - T_MIN = sensor minimum actual reading - T_last_good = last good temperature measured by the sensor	> 300.00 [°C] < -40.00 [°C]	Enablement calibration set to TRUE Runk Crank Relay voltage in range Key on or engine running Engine not cranking No electrical faults detected on charge air cooler down air temperature sensor	1.00 ==TRUE > 11.00 [V] CIT_CAC_DwnCktFA ==FALSE	50.00 fail counter over 63.00 sample counter Functional task: 100 ms	Type B, 2 Trips

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
Exhaust Gas Temperature Sensor Not Plausible Bank 1 Sensor 1	P113B	This diagnosis is function of two separate monitors. 1) This diagnosis verify if, at key on, the temperature value read by exhaust gas temperature 1(EGT1) sensor is almost equal to the reference temperature. Reference temperature is calculated as average value among all the available system temperature sensors (exhaust temperature sensors, coolant temperature sensor, fuel temperature sensor, ambient temperature sensor, intake temperature sensor). The number of sensor used for the average calculation shall be at least 4 but which sensor to use is calibratable and the sensor should not be faulted. The reference temperature is calculated at the system start up after a calibratable engine stop when all the temperature are supposed to be similar.	|Reference temperature at system cold start up (EGT_Avg) – EGT1 temperature|	> 20 [°C]	Test enabled by calibration (TRUE--> enable FALSE --> disable) and with Battery voltage and with No Active DTCs and with **Reference temperature calculation done:** - key on and with - minimum engine-off time and with - Minimum number of sensor available for calculation	1 [Boolean] > 11.00 [V] EGT_ExhGas1_CktTFTKO [Boolean] == TRUE > 28,800.00 [sec] >=4	2 fail samples out of 2 samples Function task: 100ms	Type B, 2 Trips
			Difference between EGT1 measured temperature and modeled temperature is greater than a threshold for a period of time.	(Measured EGT1 - Modeled EGT1) > 100.00 OR (Measured EGT1 - Modeled EGT1) < -100.00	Test Enabled by calibration and Diag System Disable and Battery Voltage and	1.00 == FALSE > 11.00 Volts	6.00 fail samples out of 8.00 Each sample is 10.00 seconds long	

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
		2) This diagnosis compares the measured EGT to a model EGT when entry conditions permit. The difference between the values is averaged over a time window. After this time window has elapsed, the average difference is compared to a threshold. The result is then input to an X out of Y counter.			EGT1 Model Temperature Fault and Engine Off Timer and EGT1 Model Temperature and EGT1 Model Temperature and Time since last DPF regeneration and Fuel Rate and Engine Speed within bounds determined by calibration map and Model Temperature Rate of change limited to: over a time period of:	== FALSE > 3,600.00 seconds > -40.00 degC < 850.00 degC > 180.00 seconds **EGT1 DynChk EngPtEnbl** 7.00 degC CeEGTR_e_IndexMax5000ms		

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
Exhaust Gas Temperature Sensor Not Plausible Bank 1 Sensor 2	P113C	This diagnosis is function of two separate monitors. 1) This diagnosis verify if, at key on, the temperature value read by exhaust gas temperature 2 (EGT2) sensor is almost equal to the reference temperature. Reference temperature is calculated as average value among all the available systemtemperature sensors(exhaust temperature sensors, coolant temperature sensor, fuel temperature sensor, ambient temperature sensor, intake temperature sensor). The number of sensor used for the average calculation shall be at least 4 but which sensor to use is calibratableand the sensor should not be faulted. The reference temperature is calculated at the system start up after a calibratable engine stop when all the	|Reference temperature at system cold start up (EGT_Avg) – EGT2 temperature| See the Description Tab for Reference Temperature, (**T_AvrKeyOn**) definition.	> 20 [°C]	Test enabled by calibration (TRUE--> enable FALSE --> disable) and with Battery voltage and with No Active DTCs and with **Reference temperature calculation done:** - key on and with - minimum engine-off time and with - Minimum number of sensor available for calculation	1 [Boolean] > 11.00 [V] EGT_ExhGas2_CktTFTKO ==TRUE > 28,800.00 [sec] >=4	2 fail samples out of 2 samples Function task: 100ms	Type B, 2 Trips
			Difference between EGT2 measured temperature and modeled temperature is greater than a threshold for a period of time.	(Measured EGT2 - Modeled EGT2) > 100.00 OR (Measured EGT2 - Modeled EGT2) < -100.00	Test Enabled by calibration and Diag System Disable and Battery Voltage and	1.00 == FALSE > 11.00 Volts	6.00 fail samples out of 8.00 Each sample is 10.00 seconds long	

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
		temperature are supposed to be similar. 2) This diagnosis compares the measured EGT to a model EGT when entry conditions permit. The difference between the values is averaged over a time window. After this time window has elapsed, the average difference is compared to a threshold. The result is then input to an X out of Y counter.			EGT2Model Temperature Fault and Engine Off Timer and EGT2Model Temperature and EGT2 Model Temperature and Time since last DPF regeneration and Fuel Rate and Engine Speed within bounds determined by calibration map and Model Temperature Rate of change limited to: over a time period of:	== FALSE > 3,600.00 seconds > -40.00 degC < 850.00 degC > 180.00 seconds **EGT2 DynChk EngPtEnbl** 7.00 degC CeEGTR_e_IndexMax5000ms		

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
Exhaust Gas Temperature Sensor Not Plausible Bank 1 Sensor 3	P113D	This diagnosis is function of two separate monitors. 1) This diagnosis verify if, at key on, the temperature value read by exhaust gas temperature 3 (EGT3) sensor is almost equal to the reference temperature. Reference temperature is calculated as average value among all the available systemtemperature sensors(exhaust temperature sensors, coolant temperature sensor, fuel temperature sensor, ambient temperature sensor, intake temperature sensor). The number of sensor used for the average calculation shall be at least 4 but which sensor to use is calibratableand the sensor should not be faulted. The reference temperature is calculated at the system start up after a calibratable engine stop when all the	|Reference temperature at system cold start up (EGT_Avg) – EGT3 temperature| See the Description Tab for Reference Temperature, (**T_AvrKeyOn**) definition	> 20 [°C]	Test enabled by calibration (TRUE--> enable FALSE --> disable) and with Battery voltage and with No Active DTCs and with **Reference temperature calculation done:** - key on and with - minimum engine-off time and with - Number of sensor available for calculation	1 [Boolean] > 11.00 [V] EGT_ExhGas3_CktTFTKO ==TRUE > 28,800.00 [sec] >=4	2 fail samples out of 2 samples Function task: 100ms	Type B, 2 Trips
			Difference between EGT3 measured temperature and modeled temperature is greater than a threshold for a period of time.	(Measured EGT3 - Modeled EGT3) > 100.00 OR (Measured EGT3 - Modeled EGT3) < -100.00	Test Enabled by calibration and Diag System Disable and Battery Voltage and	1.00 == FALSE > 11.00 Volts	6.00 fail samples out of 8.00 Each sample is 10.00 seconds long	

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
		temperature are supposed to be similar. 2) This diagnosis compares the measured EGT to a model EGT when entry conditions permit. The difference between the values is averaged over a time window. After this time window has elapsed, the average difference is compared to a threshold. The result is then input to an X out of Y counter.			EGT3 Model Temperature Fault and Engine Off Timer and EGT3 Model Temperature and EGT3 Model Temperature and Time since last DPF regeneration and Fuel Rate and Engine Speed within bounds determined by calibration map and Model Temperature Rate of change limited to: over a time period of:	== FALSE > 3,600.00 seconds > -40.00 degC < 850.00 degC > 180.00 seconds **EGT3 DynChk EngPtEnbl** 7.00 degC CeEGTR_e_IndexMax5000ms		

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
Exhaust Gas Temperature Sensor 4 Not Plausible	P113E	This diagnosis is function of two separate monitors. 1) This diagnosis verify if, at key on, the temperature value read by exhaust gas temperature 4 (EGT4) sensor is almost equal to the reference temperature. Reference temperature is calculated as average value among all the available systemtemperature sensors(exhaust temperature sensors, coolant temperature sensor, fuel temperature sensor, ambient temperature sensor, intake temperature sensor). The number of sensor used for the average calculation shall be at least 4 but which sensor to use is calibratableand the sensor should not be faulted. The reference temperature is calculated at the system start up after a calibratable engine stop when all the	|Reference temperature at system cold start up (EGT_Avg) – EGT4 temperature| See the Description Tab for Reference Temperature, (**T_AvrKeyOn**) definition	> 20 [°C]	Test enabled by calibration (TRUE--> enable FALSE --> disable) and with Battery voltage and with No Active DTCs and with Reference temperature calculation done: - key on and with - minimum engine-off time and with - Number of sensor available for calculation	1 [Boolean] > 11.00 [V] EGT_ExhGas4_CktTFTKO ==TRUE > 28,800.00 [sec] >=4	2 fail samples out of 2 samples Function task: 100ms	Type B, 2 Trips
			Difference between EGT4 measured temperature and modeled temperature is greater than a threshold for a period of time.	(Measured EGT4 - Modeled EGT4) > 100.00 OR (Measured EGT4 - Modeled EGT4) < -100.00	Test Enabled by calibration and Diag System Disable and Battery Voltage and EGT4 Model Temperature Fault	1.00 == FALSE > 11.00 Volts == FALSE	6.00 fail samples out of 8.00 Each sample is 2.00 seconds long	

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
		temperature are supposed to be similar. 2) This diagnosis compares the measured EGT to a model EGT when entry conditions permit. The difference between the values is averaged over a time window. After this time window has elapsed, the average difference is compared to a threshold. The result is then input to an X out of Y counter.			and Engine Off Timer and EGT4 Model Temperature and EGT4 Model Temperature and Time since last DPF regeneration and Fuel Rate and Engine Speed within bounds determined by calibration map and Model Temperature Rate of change limited to: over a time period of:	 > 3,600.00 seconds > 100.00 degC < 1,000.00 degC > 300.00 seconds **EGT4 DynChk EngPtEnbl** 1,000.00 degC CeEGTR_e_IndexMax5000ms		

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
Exhaust Gas Temperature Sensor 5 Not Plausible	P113F	This diagnosis is function of two separate monitors. 1) This diagnosis verify if, at key on, the temperature value read by exhaust gas temperature 5 (EGT5) sensor is almost equal to the reference temperature. Reference temperature is calculated as average value among all the available systemtemperature sensors(exhaust temperature sensors, coolant temperature sensor, fuel temperature sensor, ambient temperature sensor, intake temperature sensor). The number of sensor used for the average calculation shall be at least 4 but which sensor to use is calibratableand the sensor should not be faulted. The reference temperature is calculated at the system start up after a calibratable engine stop when all the	|Reference temperature at system cold start up (EGT_Avg) – EGT5 temperature| See the Description Tab for Reference Temperature, (**T_AvrKeyOn**) definition	> 20 [°C]	Test enabled by calibration (TRUE--> enable FALSE --> disable) and with Battery voltage and with No Active DTCs and with Reference temperature calculation done: - key on and with - minimum engine-off time and with - Number of sensor availablefor calculation	1 [Boolean] > 11.00 [V] EGT_ExhGas5_CktTFTKO ==TRUE > 28,800.00 [sec] >=4	2 fail samples out of 2 samples Function task: 100ms	Type B, 2 Trips
			Difference between EGT5 measured temperature and modeled temperature is greater than a threshold for a period of time.	(Measured EGT5- Modeled EGT5) > 100.00 OR (Measured EGT5- Modeled EGT5) < -100.00	Test Enabled by calibration and Diag System Disable and Battery Voltage and EGT5 Model Temperature Fault	1.00 == FALSE > 11.00 Volts == FALSE	6.00 fail samples out of 8.00 Each sample is 2.00 seconds long	

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
		temperature are supposed to be similar. 2) This diagnosis compares the measured EGT to a model EGT when entry conditions permit. The difference between the values is averaged over a time window. After this time window has elapsed, the average difference is compared to a threshold. The result is then input to an X out of Y counter.			and Engine Off Timer and EGT5 Model Temperature and EGT5 Model Temperature and Time since last DPF regeneration and Fuel Rate and Engine Speed within bounds determined by calibration map and Model Temperature Rate of change limited to: over a time period of:	 > 3,600.00 seconds > 100.00 degC < 1,000.00 degC > 300.00 seconds **EGT5 DynChk EngPtEnbl** 1,000.00 degC CeEGTR_e_IndexMax5000ms		

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
NOx Sensor 1 O2 Reference Voltage Circuit	P115E	This diagnosis verifies Upstream NOx gen3 sensor O2 binary reference voltage pin for Open Load Circuit	Check if there is an open circuit on NOx Sensor 1 O2 Binary reference voltage (P+ pin)	open circuit on P+ pin	NOx sensor is Gen3.0	TRUE	Time counter: 20 fails out of 40 samples Task=25ms	Type A, 1 Trips
					Powertrain relay voltage	> 11.00 V		
					NOx Sensor Bus relay is commanded ON	TRUE		
					CAN_LostComm_FltN_BusB_NOxSnsr_A	FALSE		
					Sensor supply in range	> 10.8V		
					Sensor dewpoint is reached	TRUE		
					(Sensor heater raw resistance - sensor heater target resistance) / sensor heater target resistence	< 0.03 % >- 0.03 %		

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
NOx Sensor 1 O2 Reference Voltage Circuit Low Voltage	P115F	This diagnosis verifies Upstream NOx gen3 sensor binary reference voltage pin for Short to Ground	Check if there is a short circuit to ground on NOx Sensor 1 O2 Binary reference voltage (P+ pin)	groundshort on P+ pin	NOx sensor is Gen3.0 Powertrain relay voltage NOx Sensor Bus relay is commanded ON CAN_LostComm_FltN_BusB_NOxSnsr_A Sensor supply in range Sensor dewpoint is reached (Sensor heater raw resistance - sensor heater target resistance) / sensor heater target resistence	TRUE > 11.00 V TRUE FALSE > 10.8V TRUE < 0.03 % >- 0.03 %	Time counter: 20 fails out of 40 samples Task=25ms	Type B, 2 Trips

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
NOx Sensor 1 O2 Reference Voltage Circuit High Voltage	P1160	This diagnosis verifies Upstream NOx gen3 sensor binary reference voltage pin for Short to Battery	Check if there is a short circuit to power supply on NOx Sensor 1 O2 Binary reference voltage (P+ pin)	powershort on P+ pin	NOx sensor is Gen3.0	TRUE	Time counter: 20 fails out of 40 samples Task=25ms	Type B, 2 Trips
					Powertrain relay voltage	> 11.00 V		
					NOx Sensor Bus relay is commanded ON	TRUE		
					CAN_LostComm_FltN_BusB_NOxSnsr_A	FALSE		
					Sensor supply in range	> 10.8V		
					Sensor dewpoint is reached	TRUE		
					(Sensor heater raw resistance - sensor heater target resistance) / sensor heater target resistence	< 0.03 % >- 0.03 %		

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
NOx Sensor 1 O2 Signal Circuit	P116A	This diagnosis verifies Upstream NOx gen3 sensor linear lambda circuit pin for Open Load Circuit	Check if there is an open circuit on NOx Sensor 1 O2 Linear pin (P-)	open circuit on P- pin	NOx sensor is Gen3.0 Powertrain relay voltage NOx Sensor Bus relay is commanded ON CAN_LostComm_FltN_BusB_NOxSnsr_A Sensor supply in range Sensor dewpoint is reached (Sensor heater raw resistance - sensor heater target resistance) / sensor heater target resistence	TRUE > 11.00 V TRUE FALSE > 10.8V TRUE < 0.03 % >- 0.03 %	Time counter: 20 fails out of 40 samples Task=25ms	Type A, 1 Trips

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
NOx Sensor 1 O2 Signal Circuit Low Voltage	P116B	This diagnosis verifies Upstream NOx gen3 sensor linear lambda circuit pin for Short to Ground	Check if there is a short circuit to ground on NOx Sensor 1 O2 Linear pin (P-)	groundshort on P- pin	NOx sensor is Gen3.0 Powertrain relay voltage NOx Sensor Bus relay is commanded ON CAN_LostComm_FltN_BusB_NOxSnsr_A Sensor supply in range Sensor dewpoint is reached (Sensor heater raw resistance - sensor heater target resistance) / sensor heater target resistence	TRUE > 11.00 V TRUE FALSE > 10.8V TRUE < 0.03 % >- 0.03 %	Time counter: 20 fails out of 40 samples Task=25ms	Type B, 2 Trips

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
NOx Sensor 1 O2 Signal Circuit High Voltage	P116C	This diagnosis verifies Upstream NOx gen3 sensor linear lambda circuit pin for Short to Battery	Check if there is a short circuit to power supply on NOx Sensor 1 O2 Linear pin (P-)	powershort on P- pin	NOx sensor is Gen3.0 Powertrain relay voltage NOx Sensor Bus relay is commanded ON CAN_LostComm_FltN_BusB_NOxSnsr_A Sensor supply in range Sensor dewpoint is reached (Sensor heater raw resistance - sensor heater target resistance) / sensor heater target resistence	TRUE > 11.00 V TRUE FALSE > 10.8V TRUE < 0.03 % >- 0.03 %	Time counter: 20 fails out of 40 samples Task=25ms	Type B, 2 Trips

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
NOx Sensor 1 O2 Pump Current Control Circuit	P116D	This diagnosis verifies Upstream NOx gen3 sensor O2 reference circuit pin for Open Load Circuit	Check if there is an open circuit on NOx Sensor 1 O2 Reference pin(M1, auxiliary pumping current)	open circuit on M1 pin	NOx sensor is Gen3.0 Powertrain relay voltage NOx Sensor Bus relay is commanded ON CAN_LostComm_FltN_BusB_NOxSnsr_A Sensor supply in range Sensor dewpoint is reached (Sensor heater raw resistance - sensor heater target resistance) / sensor heater target resistence	TRUE > 11.00 V TRUE FALSE > 10.8V TRUE < 0.03 % >- 0.03 %	Time counter: 20 fails out of 40 samples Task=25ms	Type A, 1 Trips

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
NOx Sensor 1 O2 Pump Current Control Circuit Low Voltage	P116E	This diagnosis verifies Upstream NOx gen3 sensor O2 reference circuit pin for Short to Ground	Check if there is a short circuit to ground on NOx Sensor 1 O2 Reference pin (M1, auxiliary pumping current)	groundshort on M1 pin	NOx sensor is Gen3.0 Powertrain relay voltage NOx Sensor Bus relay is commanded ON CAN_LostComm_FltN_BusB_NOxSnsr_A Sensor supply in range Sensor dewpoint is reached (Sensor heater raw resistance - sensor heater target resistance) / sensor heater target resistence	TRUE > 11.00 V TRUE FALSE > 10.8V TRUE < 0.03 % >- 0.03 %	Time counter: 20 fails out of 40 samples Task=25ms	Type B, 2 Trips

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
NOx Sensor 1 O2 Pump Current Control Circuit High Voltage	P116F	This diagnosis verifies Upstream NOx gen3 sensor O2 reference circuit pin for Short to Battery	Check if there is a short circuit to power supply on NOx Sensor 1 O2 Reference pin (M1, auxiliary pumping current)	powershort on M1 pin	NOx sensor is Gen3.0 Powertrain relay voltage NOx Sensor Bus relay is commanded ON CAN_LostComm_FltN_BusB_NOxSnsr_A Sensor supply in range Sensor dewpoint is reached (Sensor heater raw resistance - sensor heater target resistance) / sensor heater target resistence	TRUE > 11.00 V TRUE FALSE > 10.8V TRUE < 0.03 % >- 0.03 %	Time counter: 20 fails out of 40 samples Task=25ms	Type B, 2 Trips

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
Particulate Matter Sensor Temperature Not Plausible	P118B	This diagnosis detects a soot sensor temperature sensor damaged or a possible parassitic resistance on the wiring harness between the soot sensor heater and the soot sensor control unit	The absolute value of the difference between the soot sensor electrode temperature at power-up and the average of temperature sensors (EGT_Avg)	> 20.00 °C	Key is turned on Ignition voltage in range Soot Sensor bus relay is commanded on No electrical fault active on Soot Sensor bus relay No faults of CAN communication loss with Soot Sensor No Soot Sensor supply undervoltage detected, i.e. supply sensor voltage for a time No electrical fault detected on Soot Sensor If enabled, the Soot Sensor temperature circuit low and high monitoring reported a test pass Ambient Air pressure Ambient air pressure sensor not faulty Time since Soot Sensor heating off when the sensor temperature has	NOT(SBR_RlyFA) NOT(U02A3) > 9.00 V > 0.10 s NOT(SOT_EleclFault) TPTKO on P1477 TPTKO on P1478 >1.00 KPa AmbPresDfltdStatus = CeAAPR_e_AmbPresNot Dfltd > 28,800.00 s	No time debounce	Type B, 2 Trips

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
					been stored is Timer since Soot Sensor heating off is not affected by error on module off timer Calculation of the reference temperature at system start up is valid (this also include engine off timer and engine movement) Diagnostic has not yet reported a pass or failure	 NOT(ModuleOffTimeErr) EGT_TempAvgVld NOT (TPTKO OR TFTKO) on P118B		

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
NOx Sensor 1 O2 Low Reference Circuit	P1192	This diagnosis verifies Upstream NOx gen3 sensor Low Reference Circuit for Open Load Circuit	Check if there is an open circuit on NOx Sensor 1 Low Reference pin (Ref)	open circuit on Ref pin	NOx sensor is Gen3.0 Powertrain relay voltage NOx Sensor Bus relay is commanded ON CAN_LostComm_FltN_BusB_NOxSnsr_A Sensor supply in range Sensor dewpoint is reached (Sensor heater raw resistance - sensor heater target resistance) / sensor heater target resistence	TRUE > 11.00 V TRUE FALSE > 10.8V TRUE < 0.03 % >- 0.03 %	Time counter: 20 fails out of 40 samples Task=25ms	Type A, 1 Trips

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
NOx Sensor 1 O2 Low Reference Circuit Low Voltage	P1193	This diagnosis verifies Upstream NOx gen3 sensor Low Reference Circuit for Short to Ground	Check if there is an short circuit to ground on NOx Sensor 1 Low Reference pin (Ref)	groundshort on Ref pin	NOx sensor is Gen3.0 Powertrain relay voltage NOx Sensor Bus relay is commanded ON CAN_LostComm_FltN_BusB_NOxSnsr_A Sensor supply in range Sensor dewpoint is reached (Sensor heater raw resistance - sensor heater target resistance) / sensor heater target resistence	TRUE > 11.00 V TRUE FALSE > 10.8V TRUE < 0.03 % >- 0.03 %	Time counter: 20 fails out of 40 samples Task=25ms	Type B, 2 Trips

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
NOx Sensor 1 O2 Low Reference Circuit High Voltage	P1194	This diagnosis verifies Upstream NOx gen3 sensor Low Reference Circuit for Short to Battery	Check if there is an short circuit to power supply on NOx Sensor 1 Low Reference pin (Ref)	powershort on Ref pin	NOx sensor is Gen3.0 Powertrain relay voltage NOx Sensor Bus relay is commanded ON CAN_LostComm_FltN_BusB_NOxSnsr_A Sensor supply in range Sensor dewpoint is reached (Sensor heater raw resistance - sensor heater target resistance) / sensor heater target resistence	TRUE > 11.00 V TRUE FALSE > 10.8V TRUE < 0.03 % >- 0.03 %	Time counter: 20 fails out of 40 samples Task=25ms	Type B, 2 Trips

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
NOx Sensor 1 Signal Circuit	P119A	This diagnosis verifies Upstream NOx gen3 sensor NOx Circuit for Open Load Circuit	Check if there is an open circuit on NOx Sensor 1 NOx-related measurement pin (M2)	open circuit on M2	NOx sensor is Gen3.0	TRUE	Time counter: 20 fails out of 40 samples Task=25ms	Type A, 1 Trips
					Powertrain relay voltage	> 11.00 V		
					NOx Sensor Bus relay is commanded ON	TRUE		
					CAN_LostComm_FltN_BusB_NOxSnsr_A	FALSE		
					Sensor supply in range	> 10.8V		
					Sensor dewpoint is reached	TRUE		
					(Sensor heater raw resistance - sensor heater target resistance) / sensor heater target resistence	< 0.03 % >- 0.03 %		

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
NOx Sensor 1 Signal Circuit Low Voltage	P119B	This diagnosis verifies Upstream NOx gen3 sensor NOx Circuit for Short to Ground	Check if there is a short circuit to ground on NOx Sensor 1 NOx-related measurement pin (M2)	groundshort on M2 pin	NOx sensor is Gen3.0	TRUE	Time counter: 20 fails out of 40 samples Task=25ms	Type B, 2 Trips
					Powertrain relay voltage	> 11.00 V		
					NOx Sensor Bus relay is commanded ON	TRUE		
					CAN_LostComm_FltN_BusB_NOxSnsr_A	FALSE		
					Sensor supply in range	> 10.8V		
					Sensor dewpoint is reached	TRUE		
					(Sensor heater raw resistance - sensor heater target resistance) / sensor heater target resistence	< 0.03 % >- 0.03 %		

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
NOx Sensor 1 Signal Circuit High Voltage	P119C	This diagnosis verifies Upstream NOx gen3 sensor NOx Circuit for Short to Battery	Check if there is a short circuit to power supply on NOx Sensor 1 NOx-related measurement pin (M2)	powershort on M2 pin	NOx sensor is Gen3.0	TRUE	Time counter: 20 fails out of 40 samples Task=25ms	Type B, 2 Trips
					Powertrain relay voltage	> 11.00 V		
					NOx Sensor Bus relay is commanded ON	TRUE		
					CAN_LostComm_FltN_BusB_NOxSnsr_A	FALSE		
					Sensor supply in range	> 10.8V		
					Sensor dewpoint is reached	TRUE		
					(Sensor heater raw resistance - sensor heater target resistance) / sensor heater target resistence	< 0.03 % >- 0.03 %		

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
NOx Sensor 2 Signal Circuit	P119D	This diagnosis verifies Downstream NOx gen3 sensor NOx Circuit for Open Load Circuit	Check if there is an open circuit on NOx Sensor 2 NOx-related measurement pin (M2)	open circuit on M2 pin	NOx sensor is Gen3.0 Powertrain relay voltage NOx Sensor Bus relay is commanded ON CAN_LostComm_FltN_BusB_NOxSnsr_B Sensor supply in range Sensor dewpoint is reached (Sensor heater raw resistance - sensor heater target resistance) / sensor heater target resistence	TRUE > 11.00 V TRUE FALSE > 10.8V TRUE < 0.03 % >- 0.03 %	Time counter: 20 fails out of 40 samples Task=25ms	Type A, 1 Trips

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
NOx Sensor 2 Signal Circuit Low Voltage	P119E	This diagnosis verifies Downstream NOx gen3 sensor NOx Circuit for Short to Ground	Check if there is a short circuit to ground on NOx Sensor 2 NOx-related measurement pin (M2)	groundshort on M2 pin	NOx sensor is Gen3.0 Powertrain relay voltage NOx Sensor Bus relay is commanded ON CAN_LostComm_FltN_BusB_NOxSnsr_B Sensor supply in range Sensor dewpoint is reached (Sensor heater raw resistance - sensor heater target resistance) / sensor heater target resistence	TRUE > 11.00 V TRUE FALSE > 10.8V TRUE < 0.03 % >- 0.03 %	Time counter: 20 fails out of 40 samples Task=25ms	Type B, 2 Trips

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
NOx Sensor 2 Signal Circuit High Voltage	P119F	This diagnosis verifies Downstream NOx gen3 sensor NOx Circuit for Short to Battery	Check if there is a short circuit to power supply on NOx Sensor 2 NOx-related measurement pin (M2)	powershort on M2 pin	NOx sensor is Gen3.0	TRUE	Time counter: 20 fails out of 40 samples Task=25ms	Type B, 2 Trips
					Powertrain relay voltage	> 11.00 V		
					NOx Sensor Bus relay is commanded ON	TRUE		
					CAN_LostComm_FltN_BusB_NOxSnsr_B	FALSE		
					Sensor supply in range	> 10.8V		
					Sensor dewpoint is reached	TRUE		
					(Sensor heater raw resistance - sensor heater target resistance) / sensor heater target resistence	< 0.03 % >- 0.03 %		

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
O2 Sensor Performance During Deceleration Fuel Cut Off Bank 1 Sensor 2	P11B3	This DTC aims to detect a drift of Sensor 2 O2 measured value (A) from Sensor 1 O2 measured value (B) when the latter can be considered stable during overrun condition.	EWMA filtered error (A - B) in overrun condition is out of plausible range	> 1.38 [%] < -2.83 [%]	Engine running System voltage in range Sensor is fully operative Sensor 1 is fully operative No pending or confirmed DTCs DTC P2297 is running Air mass flown since P2297	 > 11.00 [V] OXY_O2_NOx2_PresCmpNotRlb ==FALSE OXY_O2_NOx1_PresCmpNotRlb == FALSE NOX_Snsr2_NotVld (MAF_SensorFA AND MAF_SensorTFTKO) OXY_NOx1_O2_Flt OXY_NOx2SignRngChkFlt NOX_Snsr2_PresFlt (see P2297 Fault code) > 30.00 [g]	EWMA filtering: multiple tests per trip are allowed.	Type B, 2 Trips

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
NOx Sensor 2 O2 Reference Voltage Circuit	P11BE	This diagnosis verifies Dowstream NOx gen3 sensor binary reference voltage pin for Open Load Circuit	Check if there is an open circuit on NOx Sensor 2 O2 Binary reference voltage (P+ pin)	open circuit on P+ pin	NOx sensor is Gen3.0 Powertrain relay voltage NOx Sensor Bus relay is commanded ON CAN_LostComm_FltN_BusB_NOxSnsr_B Sensor supply in range Sensor dewpoint is reached (Sensor heater raw resistance - sensor heater target resistance) / sensor heater target resistence	TRUE > 11.00 V TRUE FALSE > 10.8V TRUE < 0.03 % >- 0.03 %	Time counter: 20 fails out of 40 samples Task=25ms	Type A, 1 Trips

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
NOx Sensor 2 O2 Reference Voltage Circuit Low Voltage	P11BF	This diagnosis verifies Downstream NOx gen3 sensor binary reference voltage pin for Short to Ground	Check if there is a short circuit to ground on NOx Sensor 2 O2 Binary reference voltage (P+ pin)	groundshort on P+ pin	NOx sensor is Gen3.0 Powertrain relay voltage NOx Sensor Bus relay is commanded ON CAN_LostComm_FltN_BusB_NOxSnsr_B Sensor supply in range Sensor dewpoint is reached (Sensor heater raw resistance - sensor heater target resistance) / sensor heater target resistence	TRUE > 11.00 V TRUE FALSE > 10.8V TRUE < 0.03 % >- 0.03 %	Time counter: 20 fails out of 40 samples Task=25ms	Type B, 2 Trips

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
NOx Sensor 2 O2 Reference Voltage Circuit High Voltage	P11C0	This diagnosis verifies Downstream NOx gen3 sensor binary reference voltage pin for Short to Battery	Check if there is an short circuit to power supply on NOx Sensor 2 O2 Binary reference voltage (P+ pin)	powershort on P+ pin	NOx sensor is Gen3.0 Powertrain relay voltage NOx Sensor Bus relay is commanded ON CAN_LostComm_FltN_BusB_NOxSnsr_B Sensor supply in range Sensor dewpoint is reached (Sensor heater raw resistance - sensor heater target resistance) / sensor heater target resistence	TRUE > 11.00 V TRUE FALSE > 10.8V TRUE < 0.03 % >- 0.03 %	Time counter: 20 fails out of 40 samples Task=25ms	Type B, 2 Trips

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
NOx Sensor 1 Heater Ground Circuit	P11C5	This diagnosis verifies Upstream NOx gen3 sensor heater ground circuit open	Check if there is an open circuit on NOx Sensor 1 heater reference pin (H-)	open circuit on H- pin	NOx sensor is Gen3.0	TRUE	Time counter: 20 fails out of 40 samples Task=25ms	Type A, 1 Trips
					Powertrain relay voltage	> 11.00 V		
					NOx Sensor Bus relay is commanded ON	TRUE		
					CAN_LostComm_FltN_BusB_NOxSnsr_A	FALSE		
					Sensor supply in range	> 10.8V		

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
NOx Sensor 1 Heater Ground Circuit High Voltage	P11C6	This diagnosis verifies Upstream NOx gen3 sensor heater ground circuit Short to Battery	Check if there is short circuit to power supply on NOx Sensor 1 heater reference pin (H-)	powershort on H-	NOx sensor is Gen3.0	TRUE	Time counter: 20 fails out of 40 samples Task=25ms	Type B, 2 Trips
					Powertrain relay voltage	> 11.00 V		
					NOx Sensor Bus relay is commanded ON	TRUE		
					CAN_LostComm_FltN_BusB_NOxSnsr_A	FALSE		
					Sensor supply in range	> 10.8V		
					Sensor dewpoint is reached	TRUE		
					(Sensor heater raw resistance - sensor heater target resistance) / sensor heater target resistence	< 0.03 % >- 0.03 %		

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
NOx Sensor 2 Heater Ground Circuit	P11C7	This diagnosis verifies Downstream NOx gen3 sensor heater ground circuit open	Check if there is an open circuit on NOx Sensor 2 heater reference pin (H-)	open circuit on H- pin	NOx sensor is Gen3.0	TRUE	Time counter: 20 fails out of 40 samples Task=25ms	Type A, 1 Trips
					Powertrain relay voltage	> 11.00 V		
					NOx Sensor Bus relay is commanded ON	TRUE		
					CAN_LostComm_FltN_BusB_NOxSnsr_B	FALSE		
					Sensor supply in range	> 10.8V		

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
NOx Sensor 2 Heater Ground Circuit High Voltage	P11C8	This diagnosis verifies Dowmstream NOx gen3 sensor heater ground circuit Short to Battery	Check if there is a short circuit to power on NOx Sensor 2 heater reference pin (H-)	powershort on H- pin	NOx sensor is Gen3.0 Powertrain relay voltage NOx Sensor Bus relay is commanded ON CAN_LostComm_FltN_BusB_NOxSnsr_B Sensor supply in range Sensor dewpoint is reached (Sensor heater raw resistance - sensor heater target resistance) / sensor heater target resistence	TRUE > 11.00 V TRUE FALSE > 10.8V TRUE < 0.03 % >- 0.03 %	Time counter: 20 fails out of 40 samples Task=25ms	Type B, 2 Trips

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
NOx Sensor Performance - Signal Low Bank 1 Sensor 1	P11CC	This diagnosis verifies the plausibility of Upstream NOx sensor signal	Check if (Upstream NOx Sensor signal - NOx Model)/NOx Model with EWMA filter is above or below two calibratable thresholds	< -50 % OR > 38.00 %	Engine is running Powertrain relay voltage No failure on any NOx model inputs Injection small quantity adjustment (SQA) learning is not active No failure on NOx1 CAN communication No electrical failure on NOx1 sensor No out of range low failure on NOx1 sensor No out of range high failure on NOx1 sensor No current control failure on NOx1 sensor No failure on outside air temperature sensor No failure on ambient air temperature sensor no falut on upstream catalyst exhaust pressure model inputs No failure on engine coolant temperature	TRUE > 11.00 V EXM_NOxMdl_ExhMnfdNotVld ==FALSE FAD_SQA_LrnET_Enbl ==FALSE CAN_LostComm_FltN_BusB_NOxSnsr_A ==FALSE NOX_Snsr1_ElecFA ==FALSE NOX_NOx1_OutOfRngLoFlt ==FALSE NOX_NOx1_OutOfRngHiFlt ==FALSE NOX_NOx1_StBitChkFlt ==FALSE OAT_PtEstFiltFA ==FALSE AmbPresDfltdStatus ==FALSE EGP_PresCatUpFlt ==FALSE ECT_Sensor_FA	Test per trip: 1 If Fast Initial Response EWMA is active then 0 test per trip are allowed If Fast Initial Response EWMA is active then 0 test per trip are allowed	Type B, 2 Trips

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
					sensor No failure on injectors No failure on high pressure fuel rail system No failure on intake manifold absolute pressure sensor Modeled Upstream NOx concentration Steady state detection: a) Modeled Upstream NOx concentration step at 100 ms. b) condition a) is fulfilled for time Ambient air pressure Outside air temperature Combustion mode dependent enabling flag Intake manifold absolute pressure Injection fuel quantity requested	==FALSE FUL_GenericInjSysFlt ==FALSE FHP_InjLeakage ==FALSE MAP_SensorFA==FALSE > 100 ppm < 5 ppm > 5.00 sec > 70 kPa < 120 kPa > -7 °C < 45 °C **NOX_S1_PlausChkEnblCmbMode** < 250 kPA For normal combustion mode: > 17.00 mm^3 < 50.00 mm^3 For other combustion modes: > 15 mm^3		

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
						< 30 mm^3		
					Engine speed	For normal combustion mode: > 1,500 rpm < 2,000 rpm For other combustion modes: > 0 rpm < 0 rpm		
					Engine coolant temperature	> 70 °C < 120 °C		
					Sensor dewpoint is reached	TRUE		
					Diagnostic test results during EWMA FIR mode	< 0		

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
NOx Sensor 2 O2 Signal Circuit	P11D0	This diagnosis verifies Dowstream NOx gen3 sensor O2 reference circuit pin for Open Load Circuit	Check if there is an open circuit on NOx Sensor 2 O2 Linear pin (P-)	open circuit on P-	NOx sensor is Gen3.0 Powertrain relay voltage NOx Sensor Bus relay is commanded ON CAN_LostComm_FltN_BusB_NOxSnsr_B Sensor supply in range Sensor dewpoint is reached (Sensor heater raw resistance - sensor heater target resistance) / sensor heater target resistence	TRUE > 11.00 V TRUE FALSE > 10.8V TRUE < 0.03 % >- 0.03 %	Time counter: 20 fails out of 40 samples Task=25ms	Type A, 1 Trips

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
NOx Sensor 2 O2 Signal Circuit Low Voltage	P11D1	This diagnosis verifies Downstream NOx gen3 sensor linear lambda circuit pin for Short to Ground	Check if there is a short circuit to ground on NOx Sensor 2 O2 Linear pin (P-)	groundshort on P- pin	NOx sensor is Gen3.0 Powertrain relay voltage NOx Sensor Bus relay is commanded ON CAN_LostComm_FltN_BusB_NOxSnsr_B Sensor supply in range Sensor dewpoint is reached (Sensor heater raw resistance - sensor heater target resistance) / sensor heater target resistence	TRUE > 11.00 V TRUE FALSE > 10.8V TRUE < 0.03 % >- 0.03 %	Time counter: 20 fails out of 40 samples Task=25ms	Type B, 2 Trips

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
NOx Sensor 2 O2 Signal Circuit High Voltage	P11D2	This diagnosis verifies Downstream NOx gen3 sensor linear lambda circuit pin for Short to Battery	Check if there is a short circuit to power supply on NOx Sensor 2 O2 Linear pin (P-)	powershort on P- pin	NOx sensor is Gen3.0 Powertrain relay voltage NOx Sensor Bus relay is commanded ON CAN_LostComm_FltN_BusB_NOxSnsr_B Sensor supply in range Sensor dewpoint is reached (Sensor heater raw resistance - sensor heater target resistance) / sensor heater target resistence	TRUE > 11.00 V TRUE FALSE > 10.8V TRUE < 0.03 % >- 0.03 %	Time counter: 20 fails out of 40 samples Task=25ms	Type B, 2 Trips

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
NOx Sensor 2 O2 Pump Current Control Circuit	P11D8	This diagnosis verifies Downstream NOx gen3 sensor O2 reference circuit pin for Open Load Circuit	Check if there is an open circuit on NOx Sensor 2 O2 Reference pin (M1, auxiliary pumping current)	open circuit on M1 pin	NOx sensor is Gen3.0 Powertrain relay voltage NOx Sensor Bus relay is commanded ON CAN_LostComm_FltN_BusB_NOxSnsr_B Sensor supply in range Sensor dewpoint is reached (Sensor heater raw resistance - sensor heater target resistance) / sensor heater target resistence	TRUE > 11.00 V TRUE FALSE > 10.8V TRUE < 0.03 % >- 0.03 %	Time counter: 20 fails out of 40 samples Task=25ms	Type A, 1 Trips

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Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
NOx Sensor 2 O2 Pump Current Control Circuit Low Voltage	P11D9	This diagnosis verifies Downstream NOx gen3 sensor O2 reference circuit pin for Short to Ground	Check if there is a short circuit to ground on NOx Sensor 2 O2 Reference pin (M1, auxiliary pumping current)	groundshort on M1 pin	NOx sensor is Gen3.0 Powertrain relay voltage NOx Sensor Bus relay is commanded ON CAN_LostComm_FltN_BusB_NOxSnsr_B Sensor supply in range Sensor dewpoint is reached (Sensor heater raw resistance - sensor heater target resistance) / sensor heater target resistence	TRUE > 11.00 V TRUE FALSE > 10.8V TRUE < 0.03 % >- 0.03 %	Time counter: 20 fails out of 40 samples Task=25ms	Type B, 2 Trips

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
NOx Sensor 2 O2 Pump Current Control Circuit High Voltage	P11DA	This diagnosis verifies Downstream NOx gen3 sensor O2 reference circuit pin for Short to Battery	Check if there is a short circuit to power supply on NOx Sensor 2 O2 Reference pin (M1, auxiliary pumping current)	powershort on M1 pin	NOx sensor is Gen3.0 Powertrain relay voltage NOx Sensor Bus relay is commanded ON CAN_LostComm_FltN_BusB_NOxSnsr_B Sensor supply in range Sensor dewpoint is reached (Sensor heater raw resistance - sensor heater target resistance) / sensor heater target resistence	TRUE > 11.00 V TRUE FALSE > 10.8V TRUE < 0.03 % >- 0.03 %	Time counter: 20 fails out of 40 samples Task=25ms	Type B, 2 Trips

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
NOx Sensor Current Range/ Performance - Bank 1 Sensor 1	P11DB	This diagnosis verifies that Upstream NOx sensor embedded current control circuit status is healthy	Check if the NOx1 sensor embedded stability criteria of Nox/Lambda current control circuit are violated NOx stability flag: (OFF_Time/TOTAL_time) Lambda stability flag: (OFF_Time/TOTAL_time) Note: TOTAL_time= ON_time +OFF_Time	Stability flag for NOx signal is set to OFF if one of the following condition is not fulfilled: a) V2 within an interval of 40mV around its set point b) Delta Ip2 < 426nA/10msec c) Ip1 within the interval of -40 uA... 19 uA d) Delta Ip1 < 2.4 uA aorund its set point Stability flag for NOx signal is set to OFF if one of the following condition is not fulfilled: a) Ip1 within the interval of -40uA... 19uA b) Delta Ip0 < 300 uA /10 msec c) Delta Ip1 z 2.4 uA around its set point > 1 % > 1 %	Powertrain relay voltage NOx Sensor Bus relay is commanded ON CAN_LostComm_FltN_BusB_NOxSnsr_A Sensor supply in range Sensor dewpoint is reached Sensor heater is in range: a) (Sensor heater raw resistance - sensor heater target resistance) / sensor heater target resistence b) condition a) is fulfilled for time Engine is running No electrical failure on NOx1 sensor Combustion mode dependent enabling flag	> 11.00 V TRUE FALSE > 10.8V TRUE < 0.03 % >- 0.03 % > 10.00 sec TRUE NOX_Snsr1_ElecFA ==FALSE **NOX_S1_StBitChkEnblCmbMode**	NOx stability flag time counter: 1 fails out of 1 samples Lambda stability flag time counter: 1 fails out of 1 samples Task=25ms	Type B, 2 Trips

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
NOx Sensor Current Range/ Performance - Bank 1 Sensor 2	P11DC	This diagnosis verifies that Downstream NOx sensor embedded current control circuit status is healthy	Check if the NOx2 sensor embedded stability criteria of Nox/Lambda current control circuit are violated NOx stability flag: (OFF_Time/TOTAL_time) Lambda stability flag: (OFF_Time/TOTAL_time) Note:	Stability flag for NOx signal is set to OFF if one of the following condition is not fulfilled: a) V2 within an interval of 40mV around its set point b) Delta Ip2 < 426nA/10msec c) Ip1 within the interval of -40 uA... 19 uA d) Delta Ip1 < 2.4 uA aorund its set point Stability flag for NOx signal is set to OFF if one of the following condition is not fulfilled: a) Ip1 within the interval of -40uA... 19uA b) Delta Ip0 < 300 uA /10 msec c) Delta Ip1 z 2.4 uA around its set point > 1 % > 1 %	Powertrain relay voltage NOx Sensor Bus relay is commanded ON CAN_LostComm_FltN_BusB_NOxSnsr_B Sensor supply in range Sensor dewpoint is reached Sensor heater is in range: a) (Sensor heater raw resistance - sensor heater target resistance) / sensor heater target resistence b) condition a) is fulfilled for time Engine is running No electrical failure on NOx2 sensor Combustion mode dependent enabling flag	> 11.00 V TRUE FALSE > 10.8V TRUE < 0.03 % >- 0.03 % > 10.00 sec TRUE NOX_Snsr2_ElecFA ==FALSE **NOX_S2_StBitChkEnblCmbMode**	NOx stability flag time counter: 1 fails out of 1 samples Lambda stability flag time counter: 1 fails out of 1 samples Task=25ms	Type B, 2 Trips

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
			TOTAL_time= ON_time +OFF_Time					

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
NOx Sensor 2 O2 Low Reference Circuit	P11FC	This diagnosis verifies Dowstream NOx gen3 sensor Low Reference Circuit for Open Load Circuit	Check if there is an open circuit on NOx Sensor 2 Low Reference pin (Ref)	open circuit on Ref pin	NOx sensor is Gen3.0 Powertrain relay voltage NOx Sensor Bus relay is commanded ON CAN_LostComm_FltN_BusB_NOxSnsr_B Sensor supply in range Sensor dewpoint is reached (Sensor heater raw resistance - sensor heater target resistance) / sensor heater target resistence	TRUE > 11.00 V TRUE FALSE > 10.8V TRUE < 0.03 % >- 0.03 %	Time counter: 20 fails out of 40 samples Task=25ms	Type A, 1 Trips

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
NOx Sensor 2 O2 Low Reference Circuit Low Voltage	P11FD	This diagnosis verifies Downstream NOx gen3 sensor Low Reference Circuit for Short to Ground	Check if there is a short circuit to ground on NOx Sensor 2 Low Reference pin (Ref)	groundshort on Ref pin	NOx sensor is Gen3.0 Powertrain relay voltage NOx Sensor Bus relay is commanded ON CAN_LostComm_FltN_BusB_NOxSnsr_B Sensor supply in range Sensor dewpoint is reached (Sensor heater raw resistance - sensor heater target resistance) / sensor heater target resistence	TRUE > 11.00 V TRUE FALSE > 10.8V TRUE < 0.03 % >- 0.03 %	Time counter: 20 fails out of 40 samples Task=25ms	Type B, 2 Trips

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
NOx Sensor 2 O2 Low Reference Circuit High Voltage	P11FE	This diagnosis verifies Downstream NOx gen3 sensor Low Reference Circuit for Short to Battery	Check if there is a short circuit to power supply on NOx Sensor 2 Low Reference pin (Ref)	powershort on Ref pin	NOx sensor is Gen3.0 Powertrain relay voltage NOx Sensor Bus relay is commanded ON CAN_LostComm_FltN_BusB_NOxSnsr_B Sensor supply in range Sensor dewpoint is reached (Sensor heater raw resistance - sensor heater target resistance) / sensor heater target resistence	TRUE > 11.00 V TRUE FALSE > 10.8V TRUE < 0.03 % >- 0.03 %	Time counter: 20 fails out of 40 samples Task=25ms	Type B, 2 Trips

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
Diesel Intake Air Flow Control Positive Voltage Circuit	P122B	This monitor checks if the Throttle DC-Motor is correctly supplied	Error interface provided by HWIO	Error interface provided by HWIO == TRUE	Test enabled by calibration (TRUE --> enable System out of the cranking phase PT relay supply voltage in range Error interface provided by HWIO != INDETERMINATE	1.00 ==TRUE > 11.00 [V]	96.00 fail counts out of 120.00 sample counts Function task: 12.5 ms	Type B, 2 Trips

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
Diesel Intake Air Flow Control Circuit Shorted	P122C	This monitor checks if the Throttle commands are shorted one other	Error interface provided by HWIO	Error interface provided by HWIO == TRUE	Test enabled by calibration System out of the cranking phase PT relay supply voltage in range Error interface provided by HWIO != INDETERMINATE	1.00 ==TRUE > 11.00 [V]	96.00 fail counts out of 120.00 sample counts Function task: 12.5 ms	Type B, 2 Trips

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
Diesel Intake Air Flow Position Sensor Exceeded Learning Limit	P122D	This monitor checks if the Throttle position analog or SENT sensor has an offset with respect to the nominal position where the valve does the learning procedure (fully closed)	analog position raw voltage when the valve is in fully closed position < low threshold OR analog position raw voltage when the valve is in fully closed position > high threshold	< 81.75 %5V OR > 95.75 %5V	Test enabled by calibration Key signal is off Learning procedure at key off in fully closed position has been successfully completed (no faults present on Throttle position sensor, Throttle valve, Throttle position deviation) End Of Trip event has elapsed	1.00 ==TRUE TPS_PstnShtOffReq== FALSE	1.00 fail counts out of 1.00 sample counts Function task: at key off	Type B, 2 Trips
			SENT position raw voltage when the valve is in fully closed position < low threshold OR SENT position raw voltage when the valve is in fully closed position > highthreshold	< 81.75 %5V OR > 95.75 %5V	Test enabled by calibration Key signal is off Learning procedure at key off in fully closed position has been successfully completed (no faults present on Throttle position sensor, Throttle valve, Throttle position deviation) End Of Trip event has elapsed	1.00 ==TRUE TPS_PstnShtOffReq== FALSE	1.00 fail counts out of 1.00 sample counts Function task: at key off	

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
Injector 1 Positive Voltage Control Circuit Shorted to Control Circuit	P1248	This DTC detects a shorted load on Injector 1	Voltage high across low side and High side drivers during on state indicates low side shorted to high side	the time to reach the 2 A threshold of the injector current is shorter than 2 us	Test enabled by calibration; and Battery voltage and Key ON and Engine is not cranking and Engine Running and FUL_OutEnblCyl_CiEPSR_CylinderA	== 1 [Boolean] > 11.00 [V] - - >= 1.00 [s] == 0 [Boolean]	5 failures out of 10 samples 100 ms/sample Continuous	Type A, 1 Trips

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
Injector 2 Positive Voltage Control Circuit Shorted to Control Circuit	P1249	This DTC detects a shorted load on Injector 2	Voltage high across low side and High side drivers during on state indicates low side shorted to high side	the time to reach the 2 A threshold of the injector current is shorter than 2 us	Test enabled by calibration; and Battery voltage and Key ON and Engine is not cranking and Engine Running and FUL_OutEnblCyl_CiEPSR_CylinderD	== 1 [Boolean] > 11.00 [V] - - >= 1.00 [s] == 0 [Boolean]	5 failures out of 10 samples 100 ms/sample Continuous	Type A, 1 Trips

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
Injector 3 Positive Voltage Control Circuit Shorted to Control Circuit	P124A	This DTC detects a shorted load on Injector 3	Voltage high across low side and High side drivers during on state indicates low side shorted to high side	the time to reach the 2 A threshold of the injector current is shorter than 2 us	Test enabled by calibration; and Battery voltage and Key ON and Engine is not cranking and Engine Running and FUL_OutEnblCyl_CiEPSR_CylinderB	== 1 [Boolean] > 11.00 [V] - - >= 1.00 [s] == 0 [Boolean]	5 failures out of 10 samples 100 ms/sample Continuous	Type A, 1 Trips

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
Injector 4 Positive Voltage Control Circuit Shorted to Control Circuit	P124B	This DTC detects a shorted load on Injector 4	Voltage high across low side and High side drivers during on state indicates low side shorted to high side	the time to reach the 2 A threshold of the injector current is shorter than 2 us	Test enabled by calibration; and Battery voltage and Key ON and Engine is not cranking and Engine Running and FUL_OutEnblCyl_CiEPSR_CylinderC	== 1 [Boolean] > 11.00 [V] - - >= 1.00 [s] == 0 [Boolean]	5 failures out of 10 samples 100 ms/sample Continuous	Type A, 1 Trips

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
Cylinder 1 electrical resistance rationality check	P1307	Test aim is to detect when individual glow plug no longer operates within the manufacturer's specified limits for normal operation. Glow plug electrical resistance is calculated as a ratio between voltage measure and current measure.	An error shall be detected when glow plug 1 electrical resistance is outside a calibratable range	0.20 < NaGLOD_R_GlowPlug < 2.50	Test enabled by calibration; Diagnostic system is not disabled; Key on and engine running (cranking excluded); Battery voltage in range; Glow plug is commanded on for a calibratable time (Glow Plug system is enabled, no electrical fault on individual glow plug); No fault on glow plugs voltage feedback circuitry;	1.00 VeDRER_b_DiagSystemDsbl = FALSE; VePMDR_b_RunCrankActive = TRUE; VeEMDR_b_EngModeCrank = FALSE; VeLVTR_b_RunCrankIgnInRange = TRUE; VaGLOD_b_GlowPlugOn = TRUE; 3.00 VeGLOD_b_RunCrankVoltRec = FALSE;	10.00 fail samples over 20.00 samples Time task: 100 [ms]	Type B, 2 Trips

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
Cylinder 2 electrical resistance rationality check	P1308	Test aim is to detect when individual glow plug no longer operates within the manufacturer's specified limits for normal operation. Glow plug electrical resistance is calculated as a ratio between voltage measure and current measure.	An error shall be detected when glow plug 2 electrical resistance is outside a calibratable range	0.20 < NaGLOD_R_GlowPlug < 2.50	Test enabled by calibration; Diagnostic system is not disabled; Key on and engine running (cranking excluded); Battery voltage in range; Glow plug is commanded on for a calibratable time (Glow Plug system is enabled, no electrical fault on individual glow plug); No fault on glow plugs voltage feedback circuitry;	1.00 VeDRER_b_DiagSystem Dsbl = FALSE; VePMDR_b_RunCrankAc tive = TRUE; VeEMDR_b_EngModeCra nk = FALSE; VeLVTR_b_RunCrankIgnI nRange = TRUE; VaGLOD_b_GlowPlugOn = TRUE; 3.00 VeGLOD_b_RunCrankVol tRec= FALSE;	10.00 fail samples over 20.00 samples Time task: 100 [ms]	Type B, 2 Trips

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
Cylinder 3 electrical resistance rationality check	P1309	Test aim is to detect when individual glow plug no longer operates within the manufacturer's specified limits for normal operation. Glow plug electrical resistance is calculated as a ratio between voltage measure and current measure.	An error shall be detected when glow plug 3 electrical resistance is outside a calibratable range	0.20 < NaGLOD_R_GlowPlug < 2.50	Test enabled by calibration; Diagnostic system is not disabled; Key on and engine running (cranking excluded); Battery voltage in range; Glow plug is commanded on for a calibratable time (Glow Plug system is enabled, no electrical fault on individual glow plug); No fault on glow plugs voltage feedback circuitry;	1.00 VeDRER_b_DiagSystemDsbl = FALSE; VePMDR_b_RunCrankActive = TRUE; VeEMDR_b_EngModeCrank = FALSE; VeLVTR_b_RunCrankIgnInRange = TRUE; VaGLOD_b_GlowPlugOn = TRUE; 3.00 VeGLOD_b_RunCrankVoltRec = FALSE;	10.00 fail samples over 20.00 samples Time task: 100 [ms]	Type B, 2 Trips

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
Cylinder 4 electrical resistance rationality check	P130A	Test aim is to detect when individual glow plug no longer operates within the manufacturer's specified limits for normal operation. Glow plug electrical resistance is calculated as a ratio between voltage measure and current measure.	An error shall be detected when glow plug 4 electrical resistance is outside a calibratable range	0.20 < NaGLOD_R_GlowPlug < 2.50	Test enabled by calibration; Diagnostic system is not disabled; Key on and engine running (cranking excluded); Battery voltage in range; Glow plug is commanded on for a calibratable time (Glow Plug system is enabled, no electrical fault on individual glow plug); No fault on glow plugs voltage feedback circuitry;	1.00 VeDRER_b_DiagSystemDsbl = FALSE; VePMDR_b_RunCrankActive = TRUE; VeEMDR_b_EngModeCrank = FALSE; VeLVTR_b_RunCrankIgnInRange = TRUE; VaGLOD_b_GlowPlugOn = TRUE; 3.00 VeGLOD_b_RunCrankVoltRec = FALSE;	10.00 fail samples over 20.00 samples Time task: 100 [ms]	Type B, 2 Trips

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
Exhaust Gas Recirculation (EGR) Motor Positive Voltage Circuit	P1402	This monitor checks if the HP EGR DC-Motor is correctly supplied	Error interface provided by HWIO	Error interface provided by HWIO == TRUE	Test enabled by calibration System out of the cranking phase PT relay supply voltage in range Error interface provided by HWIO != INDETERMINATE	1.00 ==TRUE > 11.00 [V]	96.00 fail counts out of 120.00 sample counts Function task: 12.5 ms	Type B, 2 Trips

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
Exhaust Gas Recirculation (EGR) Motor Control Circuit Shorted	P1407	This monitor checks if the HP EGR commands are shorted one other	Error interface provided by HWIO	Error interface provided by HWIO == TRUE	Test enabled by calibration	1.00 ==TRUE	96.00 fail counts out of 120.00 sample counts Function task: 12.5 ms	Type B, 2 Trips
					System out of the cranking phase			
					PT relay supply voltage in range	> 11.00 [V]		
					Error interface provided by HWIO != INDETERMINATE			

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
Exhaust Gas Recirculation (EGR) Motor Current Performance	P140F	This monitor checks if an excessive current flows through the HP EGR DC-Motor (e.g. shunt circuit between load, HP EGR DC-Motor internal faults, etc).	Error interface provided by HWIO	Error interface provided by HWIO == TRUE	Test enabled by calibration System out of the cranking phase PT relay supply voltage in range No faults present on HP EGR DC Motor current range/performance	1.00 ==TRUE > 11.00 [V] EGR_MtrCurrLimTFTKO == FALSE	96.00 fail counts out of 120.00 sample counts Function task: 12.5 ms	Type B, 2 Trips

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
Exhaust Gas Recirculation 1 (EGR) Motor Overtemperature	P1424	This monitor checks if the temperature of the HP EGR DC-Motor increases too much (e.g. HP EGR DC-Motor internal faults, etc).	Error interface provided by HWIO	Error interface provided by HWIO == TRUE	Test enabled by calibration System out of the cranking phase PT relay supply voltage in range Error interface provided by HWIO != INDETERMINATE	1.00 ==TRUE > 11.00 [V]	96.00 fail counts out of 120.00 sample counts Function task: 12.5 ms	Type B, 2 Trips

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
Air Flow Valve (Diesel Throttle) DC - Motor Overtemperature	P1425	This monitor checks if the temperature of the Throttle DC-Motor increases too much (e.g. Throttle DC-Motor internal faults, etc).	Error interface provided by HWIO	Error interface provided by HWIO == TRUE	Test enabled by calibration	1.00 ==TRUE	96.00 fail counts out of 120.00 sample counts Function task: 12.5 ms	Type B, 2 Trips
					System out of the cranking phase			
					PT relay supply voltage in range	> 11.00 [V]		
					Error interface provided by HWIO != INDETERMINATE			

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
EGR Temperature Sensor1 IAT Not Plausible	P1428	The power up temperatue varies too much from reference sensor after long soak	if the power up initial value of the temp sensor varies more than allowed from the reference temp sensor	Temperature Delta from MAT. at powerup > 20 C	Engine soak (not run) time No P codes	>= 28,800.00 Sec P262B P0111 P0114 P010B P00E9 P117D P017C P017D P017B P117B P117F P117E P117C P0116 P0117 P0118 P111E P0128 P0119	NA	Type B, 2 Trips

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
EGR Temperature Sensor2 IAT Not Plausible	P142A	The power up temperatue varies too much from reference sensor after long soak	if the power up initial value of the temp sensor varies more than allowed from the reference temp sensor	Temperature Delta from MAT. at powerup > 20 C	Engine soak (not run) time No P codes	>= 28,800.00 Sec P262B P0111 P0114 P010B P00E9 P117D P017C P017D P017B P117B P117F P117E P117C P0116 P0117 P0118 P111E P0128 P0119	NA	Type B, 2 Trips

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
Particulate Matter Sensor Control Module High Temperature	P142B	This diagnosis detects a soot sensor control unit overtemperature caused by an aged solder joint inside soot sensor control unit	Soot Sensor Control Unit Temperature 1 OR Soot Sensor Control Unit Temperature 2	> 135.00 °C > 130.00 °C	Key is turned on Ignition voltage in range Soot Sensor bus relay is commanded on No electrical fault active on Soot Sensor bus relay No faults of CAN communication loss with Soot Sensor Engine not in cranking mode Fault not detected on undervoltage for Soot Sensor Control Unit supply No Electrical faults present on Soot Sensor	 NOT(SBR_RlyFA) NOT(U02A3) NOT(P24D0) NOT(SOT_EleclFault)	Time counter: 20.00 failures out of 40.00 samples 100 ms/sample	Type B, 2 Trips

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
Particulate Matter Sensor Control Module Temperature Sensor A Circuit Low	P142C	This diagnosis detects a short circuit to ground on soot sensor control unit temperature 1 signal line	Diagnosis executed in Soot Sensor Control Unit: Soot Sensor Control Unit Temperature 1 Circuit Signal	< 0,3 V	Soot Sensor Control Unit conditions: no conditions ECU conditions: Ignition voltage in range Soot Sensor bus relay is commanded on No electrical fault active on Soot Sensor bus relay No faults of CAN communication loss with Soot Sensor Key is turned on Engine not in cranking mode Fault not active on undervoltage for Soot Sensor Control Unit supply	NOT(SBR_RlyFA) NOT(U02A3) NOT(P24D0)	Soot Sensor Control Unit time: debouncing 1000 ms no healing ECU time counter: 30.00 failures out of 60.00 samples 100 ms/sample	Type B, 2 Trips

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
Particulate Matter Sensor Control Module Temperature Sensor A Circuit High	P142D	This diagnosis detects an open circuit on soot sensor control unit temperature 1 signal	Diagnosis executed in Soot Sensor Control Unit: Soot Sensor Control Unit Temperature 1 Circuit Signal	 > 4,97 V	Soot Sensor Control Unit conditions: no conditions ECU conditions: Ignition voltage in range Soot Sensor bus relay is commanded on No electrical fault active on Soot Sensor bus relay No faults of CAN communication loss with Soot Sensor Key is turned on Engine not in cranking mode Fault not active on undervoltage for Soot Sensor Control Unit supply	NOT(SBR_RlyFA) NOT(U02A3) NOT(P24D0)	Soot Sensor Control Unit time: debouncing 1000 ms no healing ECU time counter: 30.00 failures out of 60.00 samples 100 ms/sample	Type B, 2 Trips

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
Particulate Matter Sensor Control Module Temperature Sensor B Circuit Low	P142E	This diagnosis detects a short circuit to ground on soot sensor control unit temperature 2 signal	Diagnosis executed in Soot Sensor Control Unit: Soot Sensor Control Unit Temperature 2 Circuit Signal	< 0,03V	Soot Sensor Control Unit conditions: no conditions ECU conditions: Ignition voltage in range Soot Sensor bus relay is commanded on No electrical fault active on Soot Sensor bus relay No faults of CAN communication loss with Soot Sensor Key is turned on Engine not in cranking mode Fault not active on undervoltage for Soot Sensor Control Unit supply	NOT(SBR_RlyFA) NOT(U02A3) NOT(P24D0)	Soot Sensor Control Unit time: debouncing 1000 ms no healing ECU time counter: 30.00 failures out of 60.00 samples 100 ms/sample	Type B, 2 Trips

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
Particulate Matter Sensor Control Module Temperature Sensor B Circuit High	P142F	This diagnosis detects an open circuit on soot sensor control unit temperature 2 signal	Diagnosis executed in Soot Sensor Control Unit: Soot Sensor Control Unit Temperature 2 Circuit Signal	> 4,7 V	Soot Sensor Control Unit conditions: no conditions ECU conditions: Ignition voltage in range Soot Sensor bus relay is commanded on No electrical fault active on Soot Sensor bus relay No faults of CAN communication loss with Soot Sensor Key is turned on Engine not in cranking mode Fault not active on undervoltage for Soot Sensor Control Unit supply	NOT(SBR_RlyFA) NOT(U02A3) NOT(P24D0)	Soot Sensor Control Unit time: debouncing 1000 ms no healing ECU time counter: 30.00 failures out of 60.00 samples 100 ms/sample	Type B, 2 Trips

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
Particulate Matter Sensor Control Module Temperature Sensor A/B Correlation	P1435	This diagnosis detects a drifted soot sensor control unit temperature sensor 1 or drifted soot sensor control unit temperature sensor 2	Absolute value of the difference between Soot Sensor Control Unit Temperature Sensor 1 and Soot sensor Control Unit Temperature Sensor 2	> 20.00 °C	Key is turned on		Time counter:	Type B, 2 Trips
					Ignition voltage in range		15.00 failures out of 30.00 samples	
					Soot Sensor bus relay is commanded on		100 ms/sample	
					No electrical fault active on Soot Sensor bus relay	NOT(SBR_RlyFA)		
					No faults of CAN communication loss with Soot Sensor	NOT(U02A3)		
					Engine not in cranking mode			
					Fault not detected on undervoltage for Soot Sensor Control Unit supply	NOT(P24D0)		
					No Electrical faults present on Soot Sensor	NOT(SOT_EleclFault)		

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
Particulate Matter Sensor Control Module Temperature Signal Message Counter Incorrect	P1436	This diagnosis detects a soot sensor control unit failure	Soot Sensor Control Unit Information Alive Rolling Counter OR Soot Sensor Control Unit Information Checksum is failing		Key is turned on Ignition voltage in range Soot Sensor bus relay is commanded on No electrical fault active on Soot Sensor bus relay No faults of CAN communication loss with Soot Sensor Engine not in cranking mode Fault not detected on undervoltage for Soot Sensor Control Unit supply	 NOT(SBR_RlyFA) NOT(U02A3) NOT(P24D0)	Time counter: 30.00 failures out of 50.00 samples 100 ms/sample	Type B, 2 Trips

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
Closed Loop Particulate Filter Regeneration Control At Limit - Stage 2 Temperature Too Low	P144E	DPF Control Temperature Deviation diagnostic monitorsthe exhaust gas temperature Downstream the 1st ccDOC (EGT2) to determine whether the temperature deviation between the control setpoint and the temperature read by the sensor is within a prescribed deviation range. Temperature deviation diagnostic shall diagnose a too low temperature, that means a Positive temperature deviation temperature. The diagnosis runs during regeneration mode and when the temperature closed loop is actived. The monitoring is divided into 2 logics, in particular the DPF warm up state logic and the DPF steady state logic	**LowTemperature monitoring (Positive Deviation):** Temperature ccDOC Downstream control setpoint - ccDOC Downstream sensor reading (EGT2)	 > 100.00	Test shall be enabled by calibratable flag Regeneration state in warm up DPF Mode DPF temperature closed loop control shall be enabled Battery voltage No fault on exhaust mass flow No fault on vehicle speed No Fault on DOC downstream temperature sensor Temperature deviation monitoring shall be enabled by a boolean flag. The boolean flag shall be the output of a map function of engine speed and fuel request Vehicle speed Exhaust mass flow AND Exhaust mass flow	1.00 [Boolean] DPF_DPF_St== Warm_Up EGT_DsblCL== Enable temperature Closed loop control [Boolean] > 11.00 [V] EXM_TurbFlowNotValid [Boolean] VehicleSpeedSensor_FA [Boolean] EGT_SnsrCatDwnFlt [Boolean] **EnginePointEnable_DPF_TempDeviation** [Boolean] > 3.00 [kph] < 120.00 [g/s] > 8.00 [g/s]	600.00 fail samples out of 1,000.00 samples Function task: 100ms	Type B, 2 Trips

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
					Filtered Exhaust mass flow variation (absolute value)	< 100.00 [g/s]		
					The system shall not be in cut off for a calibratable timer.	< 30.00 [sec]		
					All the above enabling conditions met for at least a calibratable timer	> 20.00 [sec]		
			Low Temperature monitoring (Positive Deviation): Temperature ccDOC Downstream control setpoint - ccDOC Downstream sensor reading (EGT2)	> 100.00	Test shall be enabled by calibratable flag	1.00 [Boolean]	600.00 fail samples out of 1,000.00 samples Function task: 100ms	
					Regeneration state in Steday state DPF Mode	DPF_DPF_St== Steady state		
					DPF temperature closed loop control shall be enabled	EGT_DsblCL == Enable temperature Closed loop control [Boolean]		
					Battery voltage	> 11.00 [V]		
					No fault on exhaust mass flow	EXM_TurbFlowNotValid [Boolean]		
					No fault on vehicle speed	VehicleSpeedSensor_FA [Boolean]		
					No Fault on ccDOC Downstream temperature sensor	EGT_SnsrCatDwnFlt [Boolean]		
					Temperature deviation monitoring shall be enabled by a boolean flag. The boolean flag	**EnginePointEnable_DPF_TempDeviation** [Boolean]		

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
					shall be the output of a map function of engine speed and fuel request			
					Vehicle speed	> 3.00 [kph]		
					Exhaust mass flow AND Exhaust mass flow	< 120.00 [g/s] > 8.00 [g/s]		
					Filtered Exhaust mass flow variation (absolute value)	< 100.00 [g/s]		
					The system shall not be in cut off for a calibratable timer.	< 30.00 [sec]		
					All the above enabling conditions met for at least a calibratable timer	> 15.00 [sec]		

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
Particulate Matter Sensor Electrode Supply Circuit Open	P1474	This diagnosis detects an open circuit on the soot sensor electrode supply line	Diagnosis executed in Soot Sensor Control Unit: Soot Sensor Electode supply voltage signal (i.e. measured ADC voltage for electrode current)	< 0.3 V	Soot Sensor Control Unit conditions: Battery Voltage Soot Sensor Electrode Supply Voltage ECU conditions: Ignition voltage in range Soot Sensor bus relay is commanded on No electrical fault active on Soot Sensor bus relay No faults of CAN communication loss with Soot Sensor Key is turned on Engine not in cranking mode Fault not active on undervoltage for Soot Sensor Control Unit supply	> 9 V = 45,6V NOT(SBR_RlyFA) NOT(U02A3) NOT(P24D0)	Soot Sensor Control Unit time: debouncing 600 ms no healing ECU time counter: 30.00 failures out of 60.00 samples 100 ms/sample	Type B, 2 Trips

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
Particulate Matter Sensor Electrode Supply Circuit Low	P1475	This diagnosis detects a short to ground on the soot sensor electrode supply line	Diagnosis executed in Soot Sensor Control Unit: Soot Sensor Electrode supply voltage	U < 41.55 V OR U > 49.72 V	Soot Sensor Control Unit conditions: Battery voltage Soot Sensor Electrode High Voltage Enabled ECU conditions; Ignition voltage in range Soot Sensor bus relay is commanded on No electrical fault active on Soot Sensor bus relay No faults of CAN communication loss with Soot Sensor Key is turned on Engine not in cranking mode Fault not active on undervoltage for Soot Sensor Control Unit supply	> 9 V NOT(SBR_RlyFA) NOT(U02A3) NOT(P24D0)	Soot Sensor Control Unit time: debouncing 2100 ms no healing ECU time counter: 30.00 failures out of 60.00 samples 100 ms/sample	Type B, 2 Trips

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
Particulate Matter Sensor Electrode Supply Circuit High	P1476	This diagnosis detects a short to power on the soot sensor electrode supply line	Diagnosis executed in Soot Sensor Control Unit: Soot Sensor Electrode voltage signal (measured ADC voltage for electrode current)	> 4.7 V	Soot Sensor Control Unit conditions: no conditions ECU conditions: Ignition voltage in range Soot Sensor bus relay is commanded on No electrical fault active on Soot Sensor bus relay No faults of CAN communication loss with Soot Sensor Key is turned on Engine not in cranking mode Fault not active on undervoltage for Soot Sensor Control Unit supply	NOT(SBR_RlyFA) NOT(U02A3) NOT(P24D0)	Soot Sensor Control Unit time: debouncing 600 ms healing 600 ms ECU time counter: 30.00 failures out of 60.00 samples 100 ms/sample	Type B, 2 Trips
			Diagnosis executed in Soot Sensor Control Unit: Soot Sensor Electrode supply voltage	> 2 V	Soot Sensor Control Unit conditions: Soot Sensor Electrode Voltage Disabled ECU conditions: Ignition voltage in range		Soot Sensor Control Unit time: no debouncing no healing ECU time counter:	

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
					Soot Sensor bus relay is commanded on		30.00 failures out of 60.00 samples 100 ms/sample	
					No electrical fault active on Soot Sensor bus relay	NOT(SBR_RlyFA)		
					No faults of CAN communication loss with Soot Sensor	NOT(U02A3)		
					Key is turned on			
					Engine not in cranking mode			
					Fault not active on undervoltage for Soot Sensor Control Unit supply	NOT(P24D0)		

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
Particulate Matter Sensor Temperature Circuit Low Input	P1477	This diagnosis detects a short to ground on the soot sensor temperature signal	Diagnosis executed in Soot Sensor Control Unit:		Soot Sensor Control Unit conditions:		Soot Sensor Control Unit time:	Type B, 2 Trips
			Voltage of Soot Sensor temperature meander (TM) signal	< 0.3 V	no conditions		debouncing 1000 ms healing 3000 ms	
					ECU conditions:		ECU time counter:	
					Ignition voltage in range		2.00 failures out of 2.00 samples	
					Soot Sensor bus relay is commanded on		100 ms/sample	
					No electrical fault active on Soot Sensor bus relay	NOT(SBR_RlyFA)		
					No faults of CAN communication loss with Soot Sensor	NOT(U02A3)		
					Key is turned on			
					Engine not in cranking mode			
					Fault not active on undervoltage for Soot Sensor Control Unit supply	NOT(P24D0)		

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
Particulate Matter Sensor Temperature Circuit High Input	P1478	This diagnosis detects a short to power or an open circuit on the soot sensor temperature signal	Diagnosis executed in Soot Sensor Control Unit: Voltage of Soot Sensor temperature meander (TM) signal	> 3 V	Soot Sensor Control Unit conditions: no conditions ECU conditions: Ignition voltage in range Soot Sensor bus relay is commanded on No electrical fault active on Soot Sensor bus relay No faults of CAN communication loss with Soot Sensor Key is turned on Engine not in cranking mode Fault not active on undervoltage for Soot Sensor Control Unit supply	NOT(SBR_RlyFA) NOT(U02A3) NOT(P24D0)	Soot Sensor Control Unit time: debouncing 1000 ms healing 3000 ms ECU time counter: 2.00 failures out of 2.00 samples 100 ms/sample	Type B, 2 Trips

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
Particulate Matter Sensor Sensitivity Factor Performance	P1479	This diagnosis detects a soot sensor memory corruption	Soot sensor sensitivity factor is	-1.00 <= K <= 1.00	Key is turned on		Time counter: 30.00 failures out of 60.00 samples 1000 ms/sample	Type B, 2 Trips
					Ignition voltage in range			
					Soot Sensor bus relay is commanded on			
					No electrical fault active on Soot Sensor bus relay	NOT(SBR_RlyFA)		
					No faults of CAN communication loss with Soot Sensor	NOT(U02A3)		
					No electrical fault detected on Soot Sensor	NOT(SOT_EleclFault)		
					Fault not active on undervoltage for Soot Sensor Control Unit supply	NOT(P24D0)		

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
Particulate Matter Sensor Shunt Circuit High Current	P147B	This diagnosis detects a no more efficient soot sensor	Soot Sensor Electrode raw current	> 5.00 A	Key is turned on Ignition voltage in range Soot Sensor bus relay is commanded on No electrical fault active on Soot Sensor bus relay No Soot Sensor supply undervoltage detected No faults of CAN communication loss with Soot Sensor No electrical fault detected on Soot Sensor Soot Sensor is in measurement phase Soot Sensor Electrode supply voltage Soot Sensor temperature Soot Sensor Electrode current measurement enabled	 NOT(SBR_RlyFA) NOT(P24D0) NOT(U02A3) NOT(SOT_EleclFault) 41.00 V < U < 50.00 V 200.00 °C < T < 420.00 °C	No time debouce	Type B, 2 Trips

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
Particulate Matter Sensor Protection Tube Performance	P1488	This diagnosis detects a soot sensor that has been removed from exhaust line or is clogged	Integrated derivative of corrected volumetric flow AND Integrated derivative of effective soot sensor heater voltage (i,e, cumulated heater voltage change)	> 4,800.00 < 15.00 V	Key is turned on Ignition voltage in range Engine in running mode Soot Sensor bus relay is commanded on No electrical fault active on Soot Sensor bus relay No faults of CAN communication loss with Soot Sensor No Soot Sensor supply undervoltage detected No electrical fault detected on Soot Sensor No fault on exhaust gas pressure estimation at sensor location No fault on exhaust gas temperature estimation at sensor location No fault on gas mass flow estimation at sensor location Soot Sensor in protection heating operating state Derivative in volumetric flow is	 NOT(SBR_RlyFA) (U02A3) NOT(P24D0) NOT(SOT_EleclFault) SOT_ExhPresSootSnsrVld SOT_ExhTempSootSnsrVld SOT_TotExhSootSnsrVld 1.00 < d2V < 300.00	No debounce time	Type B, 2 Trips

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
					for a time At InitCntrlr time since engine off At InitCntrlr time since engine off is valid Soot Sensor Heater is controlled in closed loop As soon as Soot Sensor is supplied the time since PM sensor heating off (module off plus heating off) is Exhaust gas temperature at Soot Sensor	>= 1.00 s > 14,400.00 s NOT EngineModeNotRunTimer Error > 14,400.00 s 0.00 < T < 300.00 °C		

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
Glow Plug Positive Voltage Circuit	P161E	This DTC checks the circuit for electrical integrity during operation. Glow plugs supply pin open circuit or shorted to ground.	Voltage feedback under a calibratable threshold	Voltage_feedback < 6.00	Test enabled by calibration; Key on and engine running (cranking excluded); Battery voltage in range; Enable_On interface is true; Diagnostic system is not disabled;	1.00 [boolean] VePMDR_b_RunCrankActive = TRUE; VeEMDR_b_EngModeCrank = FALSE; VeLVTR_b_RunCrankIgnInRange = TRUE; VeGLOO_b_GlowPlugEnbld = TRUE; VeDRER_DiagSystemDsbl = FALSE;	5.00 fail samples over 10.00 samples Time task: 100 [ms]	Type B, 2 Trips

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
Turbocharger/ Supercharger DC Motor A Under voltage on supply	P169E	This monitor checks if the VGT DC-Motor is correctly supplied	Error interface provided by HWIO	== TRUE	Test enabled by calibration System out of the cranking phase PT relay supply voltage in range Error interface provided by HWIO != INDETERMINATE	1.00 ==TRUE > 11.00 [V]	24.00 fail counts out of 30.00 sample counts Function task: 100 ms	Type A, 1 Trips

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
Turbocharger/ Supercharger Boost Control A Circuit Shorted	P169F	This monitor checks if the VGT commands are shorted one other	Error interface provided by HWIO	== TRUE	Test enabled by calibration System out of the cranking phase PT relay supply voltage in range Error interface provided by HWIO != INDETERMINATE	1.00 ==TRUE > 11.00 [V]	24.00 fail counts out of sample counts 30.00 Function task: 100 ms	Type A, 1 Trips

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
Sensor/ Switch Communication Circuit A Low (Diesel)	P16A0	This monitor checks if the Throttle position SENT sensor protocol is out of range low	HWIO counter of valid Throttle SENT position indications no longer updated > threshold (age error = TRUE) AND HWIO Throttle SENT position protocol status	> 6.25 [ms] AND == LOW	Test enabled by calibration System out of the cranking phase PT relay supply voltage in range	1.00 ==TRUE > 11.00 [V]	192.00 fail counts out of 240.00 sample counts Function task: 6.25 ms	Type B, 2 Trips

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
Sensor/ Switch Communication Circuit A High (Diesel)	P16A1	This monitor checks if the Throttle position SENT sensor protocol is out of range high	HWIO time counter since last valid Throttle SENT position was transmitted > threshold (age error = TRUE) AND HWIO Throttle SENT position protocol status	> 6.25 [ms] AND == HIGH	Test enabled by calibration System out of the cranking phase PT relay supply voltage in range	1.00 ==TRUE > 11.00 [V]	192.00 fail counts out of 240.00 sample counts Function task: 6.25 ms	Type B, 2 Trips

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
Sensor/ Switch Communication Circuit A Performance (Diesel)	P16A2	This monitor checks if the Throttle position SENT sensor protocol has performance problems	HWIO message fault on Throttle SENT position == TRUE OR (number of Throttle SENT position counters has been updated AND HWIO time counter since last valid Throttle SENT position was transmitted > threshold (age error = TRUE))	message error == TRUE OR (------------- AND > 6.25 [ms])	Test enabled by calibration System out of the cranking phase PT relay supply voltage in range No faults present on Throttle SENT out of range	1.00 ==TRUE > 11.00 [V] TPS_SENT_OOR_Flt == FALSE	192.00 fail counts out of 240.00 sample counts Function task: 6.25 ms	Type B, 2 Trips

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
Sensor/ Switch Communication Circuit B Low	P16B0	This monitor checks if the VGT position SENT sensor protocol is out of range low	HWIO counter of valid VGT SENT position indications no longer updated > threshold (age error = TRUE) AND HWIO VGT SENT position protocol status	> 2.50 [s] AND == FALSE	Test enabled by calibration System out of the cranking phase Run Crank relay supply voltage in range Run crank active	1.00 ==TRUE > 11.00 [V]	200.00 fail counts out of 250.00 sample counts Function task: 6.25 ms	Type B, 2 Trips

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
Sensor/ Switch Communication on Circuit B High	P16B1	This monitor checks if the VGT position SENT sensor protocol is out of range high	HWIO time counter since last valid VGT SENT position was transmitted > threshold (age error = TRUE) AND HWIO VGT SENT position protocol status	> 2.50 [s] AND == TRUE	Test enabled by calibration System out of the cranking phase Run Crank relay supply voltage in range Run crank active	1.00 ==TRUE > 11.00 [V]	200.00 fail counts out of sample counts 250.00 Function task: 6.25 ms	Type B, 2 Trips

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
Sensor/ Switch Communication on Circuit B Performance	P16B2	This monitor checks if the VGT position SENT sensor protocol has performance problems	HWIO message fault on VGTSENT position == TRUE OR (number of VGT SENT position counters has been updated AND HWIO time counter since last valid VGTSENT position was transmitted > threshold (age error = TRUE))	message error == TRUE OR (----------- AND > 2.50 [s])	Test enabled by calibration System out of the cranking phase Run Crank relay supply voltage in range Run crank active No faults present on VGT SENT out of range	1.00 ==TRUE > 11.00 [V] VGT_SENT_PerfFlt	200.00 fail counts out of 250.00 sample counts Function task: 6.25 ms	Type B, 2 Trips

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
Turbocharger Boost Control Motor High Current	P16FA	This monitor checks if an excessive current flows through the VGT DC-Motor (e.g. shunt circuit between load, VGTDC-Motor internal faults, etc).	Error interface provided by HWIO	== TRUE	Test enabled by calibration System out of the cranking phase PT relay supply voltage in range Error interface provided by HWIO != INDETERMINATE	1.00 ==TRUE > 11.00 [V]	24.00 fail counts out of sample counts 30.00 Function task: 100 ms	Type A, 1 Trips

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
Diesel Particulate Filter Efficiency Below Threshold Bank 1	P2002	This diagnosis detects a cracked Diesel Particulate FIlter	The expected sensor regeneration time interval, i.e. the level of soot calculated by a prediction model during a time averaged over a number of different diagnostic runs is	> 1.00 * 0,00625 s < 1.30	Test enabled by calibration (TRUE--> enable FALSE --> disable)	1.00	The number of runs to perform the diagnostic test >= 1.00	Type B, 2 Trips
					Ignition voltage in range for a time	> 5.00 s		
					Engine running or engine cranking or in auto-stop phase			
					No faults on soot sensor	NOT (SOT_SootSnsrFlt)		
					DPF soot loading (ranked model)	> 0.00 %		
					Engine out soot model realiable Note: the not reliability shall be verified for 1 s before to be declared	NOT EXM_PM_TurbFlowNotRl b		
					No faults on downstream DPF temperature sensor or model	NOT (DPF_TempDPF_DwnFlt)		
					No faults on downstream DPF mass airflow	SOT_TotExhSootSnsrVld		
					No faults on engine out soot model	SOT_PM_DPF_UpVld		
					Ambient temperature	> -7.00 °C		
					During sensor measurement phase, Number of Autostop events	< 20.00		
					During sensor			

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
					measurement phase, Duration of Autostop phase	< 200.00 s		

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
Diesel Particulate Filter Over Temperature Bank 1	P200C	This diagnosis verify if the exahust gas temperature on either DPF Upstream (EGT_DPF_Up) or DPF Downstream (EGT_DPF_Dwn) is above its maximum allowed temperature	Exahust gas temperature on DPF Upstream (EGT4)	In Regeneration mode: > 900.00 [°C] In Normal mode : > 900.00 [°C]	Test enabled by calibration (TRUE--> enable FALSE --> disable) and with Battery voltage and with Engine running and with No fault on DPF Upstream Temperature sensor	1.00 [Boolean] > 11.00 [V] == TRUE [Boolean] EGT_SnsrDPF_UpFlt [Boolean]	**In Normal mode:** 60.00 fail samples out of 75.00 samples **In Regeneration mode :** 60.00 fail samples out of 75.00 samples Function task: 100ms	Type A, 1 Trips
			Exahust gas temperature on DPF Downstream (EGT5)	In Regeneration mode: > 900.00 [°C] In Normal mode : > 900.00 [°C]	Test enabled by calibration (TRUE--> enable FALSE --> disable) and with Battery voltage and with Engine running and with No fault on DPF Downstream Temperature sensor	1.00 [Boolean] > 11.00 [V] == TRUE [Boolean] EGT_SnsrDPF_DwnFlt [Boolean]	**In Normal mode:** 60.00 fail samples out of 75.00 samples **In Regeneration mode:** 60.00 fail samples out of 75.00 samples Function task: 100ms	

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
Catalyst System Over Temperature Bank 1	P200E	This diagnosis verify if the exahust gas temperature on ccDOC Downstream (EGT_DOC1_Dwn) is above its maximum allowed temperature	Exahust gas temperature on ccDOC Downstream (EGT2)	In Regeneration mode: > 900.00 [°C] In Normal mode : > 900.00 [°C]	Test enabled by calibration (TRUE--> enable FALSE --> disable) and with Battery voltage and with Engine running and with No fault on ccDOC Downstream Temperature sensor (EGT2)	1.00 > 11.00 == TRUE EGT_SnsrCatDwnFlt	**In Normal mode:** 100.00 fail samples out of 125.00 samples **In Regeneration mode :** 100.00 fail samples out of 125.00 samples Function task: 100ms	Type A, 1 Trips

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
Exhaust Gas Temperature Sensor Circuit Low Bank 1 Sensor 2	P2032	This diagnosis verify if the exhaust gas temperature 2 (EGT2) sensor signal is shorted to GND	EGT2 output resistance value	< 160.00 [Ohm]	Test enabled by calibration (TRUE--> enable FALSE --> disable) and with Engine cranking and with Battery voltage and with key on	1 [Boolean] == FALSE > 11.00 [V] == TRUE	10 fail samples over 20 samples Function task: 100ms	Type B, 2 Trips

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
Exhaust Gas Temperature Sensor Circuit High Bank 1 Sensor 2	P2033	This diagnosis verify if the exhaust gas temperature 2 (EGT2) signal is shorted to power supply or it is in open circuit	EGT2 output resistance value	> 900.00 [Ohm]	Test enabled by calibration (TRUE--> enable FALSE --> disable) and with Engine cranking and with Battery voltage and with key on	1 [Boolean] == FALSE > 11.00 [V] ==TRUE	10 fail samples over 20 samples Function task: 100ms	Type B, 2 Trips

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
Reductant Level Sensor Circuit Low Voltage	P203C	This diagnosis verifies if an short to ground or open circuit occurred in the DEF level sensor	DEF level sensor raw signal is below a calibrated threshold	VeSCRR_Pct_DEF_LevelRaw < 2.00	Test enabled by calibration	1.00 == TRUE	40.00 failures out of 50.00 samples Time basis = 100ms	Type A, 1 Trips
					Key on (OR engine running)	VePMDR_b_RunCrankActive==TRUE		
					Engine is not cranking	VeEMDR_b_EngModeCrank == FALSE		
					Battery voltage	> 11.00 [V] (VeLVTR_b_PT_RelayInRange== TRUE)		
					No loss of CAN comunication	U010E, Lost Communication With Reductant Control Module (SCR) (GetCANR_b_LostComm_FltN= FALSE)		

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
Reductant Level Sensor Circuit High Voltage	P203D	This diagnosis verifies that the short to battery occurred in the DEF level sensor	DEF level sensor raw signal is above a calibrated threshold	VeSCRR_Pct_DEF_LevelRaw > 95.00	Test enabled by calibration Key on (OR engine running) Engine is not cranking Battery voltage No loss of CAN comunication	1.00 == TRUE VePMDR_b_RunCrankActive==TRUE VeEMDR_b_EngModeCrank == FALSE > 11.00 [V] (VeLVTR_b_PT_RelayInRange== TRUE) U010E, Lost Communication With Reductant Control Module (SCR) (GetCANR_b_LostComm_FltN= FALSE)	40.00 failures out of 50.00 samples Time basis = 100ms	Type B, 2 Trips

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
Reductant Injector Circuit / Open Bank 1 Unit 1	P2047	This diagnosis verifies if a DEF dosing valve open circuit occurred	HWIO interface DEFMV_OPEN = Fault	VeHWIO_e_DEFMV_Open == CeSCRR_e_Fault	Test enabled by calibration Key on (OR engine running) Engine is not cranking Battery voltage HWIO interface DEFMV_OPEN different from INDETERMINATE	1.00 VePMDR_b_RunCrankActive==TRUE VeEMDR_b_EngModeCrank == FALSE > 11.00 [V] (VeLVTR_b_PT_RelayInRange== TRUE) VeHWIO_e_DEFMV_Open != CeSCRR_e_Indeterminate	30.00 failures out of 60.00 samples Time basis = 100ms	Type A, 1 Trips

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
Reductant Injector Circuit Low Bank 1 Unit 1	P2048	This diagnosis verifies if a DEF dosing valve low side short to ground occurred	HWIO interface DEFMV_GROUND_SHORT = Fault	VeHWIO_e_DEFMV_Gsht == CeSCRR_e_Fault	Test enabled by calibration Key on (OR engine running) Engine is not cranking Battery voltage HWIO interface DEFMV_GROUND_SHORT different from INDETERMINATE	1.00 VePMDR_b_RunCrankActive==TRUE VeEMDR_b_EngModeCrank == FALSE > 11.00 [V] (VeLVTR_b_PT_RelayInRange== TRUE) VeHWIO_e_DEFMV_Gsht != CeSCRR_e_Indeterminate	30.00 failures out of 60.00 samples Time basis = 100ms	Type A, 1 Trips

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
Reductant Injector Circuit High Bank 1 Unit 1	P2049	This diagnosis verifies if a DEF dosing valve low side short to battery occurred	HWIO interface DEFMV_POWER_SHORT = Fault	VeHWIO_e_DEFMV_Psht == CeSCRR_e_Fault	Test enabled by calibration Key on (OR engine running) Engine is not cranking Battery voltage HWIO interface DEFMV_ENABLE_POWER_SHORT different from INDETERMINATE	1.00 VePMDR_b_RunCrankActive==TRUE VeEMDR_b_EngModeCrank == FALSE > 11.00 [V] (VeLVTR_b_PT_RelayInRange== TRUE) VeHWIO_e_DEFMV_Psht != CeSCRR_e_Indeterminate	30.00 failures out of 60.00 samples Time basis = 100ms	Type A, 1 Trips

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
Reductant Pressure Sensor Performance	P204B	This diagnosis verifies if the DEF tank Pressure sensor is affected by rationality fault (offset)	At the end of driving cycle, with DEF line empty and pressure compensation phase done, DEF pressure sensor signal is not equal (with tolerance) to the ambient pressure	VeSCRI_Pct_p_DEF < 7.50 OR VeSCRI_Pct_p_DEF > 18.50	Test enabled by calibration	1.00	160.00 failures out of 200.00 samples Time basis = 25ms	Type A, 1 Trips
					DEF dosing valve not in fault	SCR_DEFMV_FA == FALSE		
					No electrical fault on pressure sensor	SCR_DEFPS_FA == FALSE		
					SCR System Stand-By recovery action not activated	VeSCRI_b_DEFPS_OfstDiagInhbt == FALSE		
					No DEF Pump Rotor Stall fault	SCR_DEFPM_FA == FALSE		
					No DEF Pressure Governor Deviation High fault	SCR_PresGovDvtnHiFA == FALSE		
					DEF temperature sensor higher than a calibrated threshold	VeSCRC_T_DEF_Tank > -9.00		
					End of trip process executed	VeDRER_b_ShutDownEnbl == TRUE		
					SCR pressure compensation performed during afterrun	VeSCRC_b_DEFPS_OffsetTestEnbl == TRUE		
					DEF metering valve HWIO interface provides INDETERMINATE OR NO-FAULT during After-Run state	VeSCRI_b_DEFPS_DiagEnblCond == TRUE		

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
Reductant Pressure Sensor Circuit Low Voltage	P204C	This diagnosis verifies that the DEF pressure sensor is affected by open circuit or short circuit to ground	DEF pressure sensor raw signal is below a calibrated threshold	VeSCRI_Pct_p_DEF < 5.00	Test enabled by calibration Battery voltage > 11V Key on Engine is not cranking	1.00 == TRUE > 11.00 [V] (VeLVTR_b_PT_RelayInRange== TRUE) VePMDR_b_RunCrankActive==TRUE VeEMDR_b_EngModeCrank == FALSE	100.00 failures out of 125.00 samples Time basis = 25ms	Type A, 1 Trips

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
Reductant Pressure Sensor Circuit High Voltage	P204D	This diagnosis verifies that the DEF pressure sensor is affected by short circuit to battery	DEF pressure sensor raw signal is above a calibrated threshold	VeSCRI_Pct_p_DEF > 98.00	Test enabled by calibration Battery voltage > 11V Key on Engine is not cranking	1.00 == TRUE > 11.00 [V] (VeLVTR_b_PT_RelayInRange== TRUE) VePMDR_b_RunCrankActive==TRUE VeEMDR_b_EngModeCrank == FALSE	100.00 failures out of 125.00 Time basis = 25ms	Type A, 1 Trips

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
Reductant Tank Temperature Sensor Performance	P205B	This diagnosis verifies that the DEF tank temperature sensor is affected by rationality fault (gain or offset)	Difference between temperature sensor signal and average temperature from EGTR is outside a calibrated range	abs(VeEGTR_T_Avg - VeSCRI_T_DEF_Tank Undfltd) > 40.00	Test enabled by calibration Battery voltage Key on (OR engine running) No loss of CAN comunication Average temperature calculated in EGTR is available Engine speed = 0 rpm No electrical fault on DEF temperature sensor Time elapsed since last key off > threshold Tank Refill is not detected	1.00 == TRUE > 11.00 [V] (VeLVTR_b_PT_RelayInRange== TRUE) VePMDR_b_RunCrankActive==TRUE U010E, Lost Communication With Reductant Control Module (SCR) (GetCANR_b_LostComm_FltN= FALSE) VeEGTR_b_PlTestEnbl == TRUE VeEPSR_b_EngMvmtDetected == FALSE SCR_DEFTS_FA == FALSE VeEMDR_t_EngModeNotRun > 28,800.00 AND VeEMDR_b_EngModeNotRunTmErr == FALSE VeSCRC_b_TankRefillIgnCycle ==FALSE OR VeSCRC_b_TankRefillDtctn == FALSE	8.00 failures out of 10.00 samples Time basis = 500ms	Type A, 1 Trips

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
					DEF temperature sensor signal is not equal to the DEF freezing temperature (with tollerance)	VeSCRC_T_DEF_Tank < (-90.00 + 1.00) AND VeSCRC_T_DEF_Tank > (-90.00 - 1.00)		

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
Reductant Tank Temperature Sensor Circuit Low Voltage	P205C	This diagnosis verifies that the DEF tank temperature sensor is affected by open circuit or short circuit to ground	DEF temperature sensor raw signal is below a calibrated threshold	VeSCRI_T_DEF_Tank Undfltd < 200.00	Test enabled by calibration Battery voltage Key on (OR engine running) Engine is not cranking No loss of CAN comunication DEF Tank heater not in fault	1.00 > 11.00 [V] (VeLVTR_b_PT_RelayInRange== TRUE) VePMDR_b_RunCrankActive==TRUE VeEMDR_b_EngModeCrank == FALSE U010E, Lost Communication With Reductant Control Module (SCR) (GetCANR_b_LostComm_FltN= FALSE) SCR_DEFTH_FA == FALSE	8.00 failures out of 10.00 samples Time basis = 500ms	Type A, 1 Trips

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
Reductant Tank Temperature Sensor Circuit High Voltage	P205D	This diagnosis verifies that the DEF tank temperature sensor is affected by short circuit to battery	DEF temperature sensor raw signal is above a calibrated threshold	VeSCRI_T_DEF_Tank Undfltd > 60,000.00	Test enabled by calibration Battery voltage Key on (OR engine running) Engine is not cranking No loss of CAN comunication DEF Tank heater not in fault Defrost phase complete	1.00 > 11.00 [V] (VeLVTR_b_PT_RelayInRange== TRUE) VePMDR_b_RunCrankActive==TRUE VeEMDR_b_EngModeCrank == FALSE U010E, Lost Communication With Reductant Control Module (SCR) (GetCANR_b_LostComm_FltN= FALSE) SCR_DEFTH_FA== FALSE VeSCRC_b_DefrostComplete == TRUE	8.00 failures out of 10.00 samples Time basis = 500ms	Type A, 1 Trips

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
DEF temperature sensor Self Correlated diagnostic	P205E	This diagnosis verifies that the DEF temperature sensor signal has not a plausible time evolution	DEF temperature sensor signal time evolution not plausible (intermittent signal)	VeSCRI_T_DEF_TankUndfltd > VeSCRI_T_DEFTS_SelfCorrHiTrhs OR VeSCRI_T_DEF_TankUndfltd < VeSCRI_T_DEFTS_SelfCorrLoTrhs	Test enabled by calibration Run Crank active Run Crank in range No loss of CAN comunication No electrical fault on tank Temperature sensor	1.00 VePMDR_b_RunCrankActive == TRUE VePMDR_b_RunCrankInRange == TRUE U010E, Lost Communication With Reductant Control Module (SCR) (GetCANR_b_LostComm_FltN= FALSE) SCR_DEFTS_ElecFltSt == FALSE	8.00 failures out of 10.00 samples Time basis = 500ms	

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
Exhaust Gas Temperature Sensor Circuit Intermittent Bank 1 Sensor 1	P2081	This diagnosis verify if the EGT1 temperature sensor signal (difference between two consecutive signal samples) variation is too big	|EGT4 output reistance - EGT4 output resistance old|	< 10.00 [Ohm]	Test enabled by calibration and with Engine running and with Engine cranking and with Battery voltage and with key on and with No electrical faults on EGT1 sensor in and logic	1 [Boolean] == TRUE == FALSE > 11.00 [V] == TRUE EGT_ExhGas1_TFTKO and with EGT_ExhGas1_FA	20 fail samples out of 40 samples Function task: 100ms	Type B, 2 Trips

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
Exhaust Gas Temperature Sensor Circuit Intermittent Bank 1 Sensor 2	P2085	This diagnosis verify if the EGT2 temperature sensor signal (difference between two consecutive signal samples) variation is too big	|EGT2 output reistance - EGT2 output resistance old|	< 10.00 [Ohm]	Test enabled by calibration and with Engine running and with Engine cranking and with key on and with Battery voltage and with No electrical faults on EGT2 sensor in and logic	1 [Boolean] == TRUE == FALSE ==TRUE > 11.00 [V] EGT_ExhGas2_TFTKO and with EGT_ExhGas2_FA	20 fail samples out of 40 samples Function task: 100ms	Type B, 2 Trips

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
Reductant Pump Control Circuit	P208A	This diagnosis verifies that the DEF pump phases are open	Motor Pump Phase Open Error status provided by DEF control module == FAULT	VeSCRR_e_PmpMtrOpen==FAULT	Test enabled by calibration	1.00	20.00 failures out of 25.00 samples Time basis = 100ms	Type A, 1 Trips
					Battery voltage	> 11.00 [V] (VeLVTR_b_PT_RelayInRange== TRUE)		
					Key on (OR engine running)	VePMDR_b_RunCrankActive==TRUE		
					Engine is not cranking	VeEMDR_b_EngModeCrank == FALSE		
					No loss of CAN comunication	U010E, Lost Communication With Reductant Control Module (SCR) (GetCANR_b_LostComm_FltN= FALSE)		
					Motor Pump Phase Open Error status provided by DEF control module different from indeterminate	VeSCRR_e_PmpMtrOpen != Indeterminate		

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
Reductant Pump Control Circuit Low Voltage	P208C	This diagnosis verifies that the DEF pump phases are shorted to ground	Motor Pump Phase Shorted To Ground Error status provided by DEF control module == FAULT	VeSCRR_e_PmpMtrShrtToGND==FAULT	Test enabled by calibration Battery voltage Key on (OR engine running) Engine is not cranking No loss of CAN comunication Motor Pump Phase Shorted To Ground Error status provided by DEF control module different from indeterminate	1.00 > 11.00 [V] (VeLVTR_b_PT_RelayInRange== TRUE) VePMDR_b_RunCrankActive==TRUE VeEMDR_b_EngModeCrank == FALSE U010E, Lost Communication With Reductant Control Module (SCR) (GetCANR_b_LostComm_FltN= FALSE) VeSCRR_e_PmpMtrShrtToGND != Indeterminate	20.00 failures out of 25.00 samples Time basis = 100ms	Type A, 1 Trips

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
Reductant Pump Control Circuit High Voltage	P208D	This diagnosis verifies that the DEF pump phases are shorted to battery	Motor Pump Phase Shorted To Battery Error status provided by DEF control module == FAULT	VeSCRR_e_PmpMtrShrtToBatt==FAULT	Test enabled by calibration	1.00	20.00 failures out of 25.00 samples Time basis = 100ms	Type A, 1 Trips
					Battery voltage	> 11.00 [V] (VeLVTR_b_PT_RelayInRange== TRUE)		
					Key on (OR engine running)	VePMDR_b_RunCrankActive==TRUE		
					Engine is not cranking	VeEMDR_b_EngModeCrank == FALSE		
					No loss of CAN comunication	U010E, Lost Communication With Reductant Control Module (SCR) (GetCANR_b_LostComm_FltN= FALSE)		
					Motor Pump Phase Shorted To Battery Error status provided by DEF control module different from indeterminate	VeSCRR_e_PmpMtrShrtToBatt != Indeterminate		

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
Reductant Heater 1 Control Circuit	P20B9	This diagnosis verifies if the DEF tank heater is affected by open circuit	Tank Heater Open circuit status == FAULT	VeSCRR_e_HeatA_Open == FAULT	Test enabled by calibration	1.00	8.00 failures out ofon 10.00 samples Time basis = 500ms	Type A, 1 Trips
					Temperature used by the heating strategy to switch on the heaters < threshold	min (VeOATR_T_OutsideAirNonEmiss, VeSCRC_T_DEF_Tank) < 60.00		
					Battery voltage	> 11.00 [V] (VeLVTR_b_PT_RelayInRange== TRUE)		
					Key on (OR engine running)	VePMDR_b_RunCrankActive==TRUE		
					Engine is not cranking	VeEMDR_b_EngModeCrank == FALSE		
					No loss of CAN comunication	U010E, Lost Communication With Reductant Control Module (SCR) (GetCANR_b_LostComm_FltN= FALSE)		
					DEF Temperature sensor not in fault	SCR_DEFTS_FA== FALSE		
					Open circuit status provided by DEF control module different from indeterminate	VeSCRR_e_HeatA_Open != Indeterminate		

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
DEF tank heater plausibility check	P20BA	This diagnosis verify thet the DEF tank heater resistance value is not plausible	DEF tank heater resistance value not plausible (too different from the nominal one)	(Heater supply voltage/ Heater Current) > 1.93 OR (Heater supply voltage/ Heater Current) < 1.05	Test enabled by calibration	1.00	10.00 failures out of 12.00 samples Time basis = 500ms	
					Battery voltage	> 11.00 [V] (VeLVTR_b_PT_RelayInRange== TRUE)		
					Key on (OR engine running)	VePMDR_b_RunCrankActive==TRUE		
					Engine is not cranking	VeEMDR_b_EngModeCrank == FALSE		
					No SCR Power Module CAN loss of communication	U010E, Lost Communication With Reductant Control Module (SCR) (GetCANR_b_LostComm_FltN= FALSE)		
					No electrical faults affecting the tank heater	SCR_DEFTH_ElecFltSt == FALSE		
					Heating strategy is requesting the Heater to be activated			
					Time since heater activation > Minimum calibrateble threshold	Time since heater activation > 1.00		
					Tank heater supply under-voltage fault not present	SCR_TankHeatSplyVoltFA == FALSE		

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
Reductant Heater 1 Control Circuit Low Voltage	P20BB	This diagnosis verifies if the DEF tank heater is affected by short circuit to ground	Tank Heater Short to Ground Low Side / High Side status == FAULT	VeSCRR_e_HeatA_LS_ShortToGND == FAULT OR VeSCRR_e_HeatA_HS_ShortToGND == FAULT	Test enabled by calibration	1.00	8.00 failures out of 10.00 samples Time basis = 500ms	Type A, 1 Trips
					Temperature used by the heating strategy to switch on the heaters < threshold	min (VeOATR_T_OutsideAirNonEmiss, VeSCRC_T_DEF_Tank) < 60.00		
					Battery voltage	> 11.00 [V] (VeLVTR_b_PT_RelayInRange== TRUE)		
					Key on (OR engine running)	VePMDR_b_RunCrankActive==TRUE		
					Engine is not cranking	VeEMDR_b_EngModeCrank == FALSE		
					No loss of CAN comunication	U010E, Lost Communication With Reductant Control Module (SCR) (GetCANR_b_LostComm_FltN= FALSE)		
					DEF Temperature sensor not in fault	SCR_DEFTS_FA== FALSE		
					Short to Ground Low Side / High Side status provided by DEF control module different from indeterminate	VeSCRR_e_HeatA_LS_ShortToGND != Indeterminate OR VeSCRR_e_HeatA_HS_ShortToGND !=		

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
						Indeterminate		

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
Reductant Heater 1 Control Circuit High Voltage	P20BC	This diagnosis verifies if the DEF tank heater is affected by short circuit to battery	Tank Heater Short to Battery Low Side / High Side status == FAULT	VeSCRR_e_HeatA_LS_ShortToBatt == FAULT OR VeSCRR_e_HeatA_HS_ShortToBatt == FAULT	Test enabled by calibration	1.00	8.00 failures out of 10.00 samples Time basis = 500ms	Type A, 1 Trips
					Temperature used by the heating strategy to switch on the heaters < threshold	min (VeOATR_T_OutsideAirNonEmiss, VeSCRC_T_DEF_Tank) < 60.00		
					Battery voltage	> 11.00 [V] (VeLVTR_b_PT_RelayInRange== TRUE)		
					Key on (OR engine running)	VePMDR_b_RunCrankActive==TRUE		
					Engine is not cranking	VeEMDR_b_EngModeCrank == FALSE		
					No loss of CAN comunication	U010E, Lost Communication With Reductant Control Module (SCR) (GetCANR_b_LostComm_FltN= FALSE)		
					DEF Temperature sensor not in fault	SCR_DEFTS_FA== FALSE		
					Short to Battery Low Side / High Side status provided by DEF control module different from indeterminate	VeSCRR_e_HeatA_LS_ShortToBatt != Indeterminate OR VeSCRR_e_HeatA_HS_ShortToBatt != Indeterminate		

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Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
Reductant Heater 2 Control Circuit	P20BD	This diagnosis verifies if the DEF line heater is affected by open circuit	Line Heater Open circuit status == FAULT	VeSCRR_e_HeatB_Open == FAULT	Test enabled by calibration	1.00	8.00 failures out of 10.00 samples Time basis = 500ms	Type A, 1 Trips
					Temperature used by the heating strategy to switch on the heaters < threshold	min (VeOATR_T_OutsideAirNonEmiss, VeSCRC_T_DEF_Tank) < 60.00		
					Battery voltage	> 11.00 [V] (VeLVTR_b_PT_RelayInRange== TRUE)		
					Key on (OR engine running)	VePMDR_b_RunCrankActive==TRUE		
					Engine is not cranking	VeEMDR_b_EngModeCrank == FALSE		
					No loss of CAN comunication	U010E, Lost Communication With Reductant Control Module (SCR) (GetCANR_b_LostComm_FltN= FALSE)		
					Open circuit status provided by DEF control module different from indeterminate	VeSCRR_e_HeatB_Open != Indeterminate		

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
DEF line heater plausibility check	P20BE	This diagnosis verify thet the DEF line heater resistance value is not plausible	DEF line heater resistance value not plausible (too different from the nominal one)	(Heater supply voltage/ Heater Current) > KeSCRI_R_DEFLH_ResOfstHiThrsh OR (Heater supply voltage/ Heater Current) < KeSCRI_R_DEFLH_ResOfstLoThrsh	Test enabled by calibration	1.00	10.00 failures out of 12.00 samples Time basis = 500ms	
					Battery voltage	> 11.00 [V] (VeLVTR_b_PT_RelayInRange== TRUE)		
					Key on (OR engine running)	VePMDR_b_RunCrankActive==TRUE		
					Engine is not cranking	VeEMDR_b_EngModeCrank == FALSE		
					No loss of CAN comunication	U010E, Lost Communication With Reductant Control Module (SCR) (GetCANR_b_LostComm_FltN= FALSE)		
					No electrical faults affecting the line heater	SCR_DEFLH_ElecFltSt ==FALSE		
					Heating strategy is requesting the Heater to be activated	VeSCRR_b_HeatB_On == TRUE		
					Time since heater activation > Minimum calibrateble threshold	Time since heater activation > 1.00		
					Line heater supply under-voltage fault not present	SCR_LineHeatSplyVoltFA == FALSE		

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
Reductant Heater 2 Control Circuit Low Voltage	P20BF	This diagnosis verifies if the DEF line heater is affected by short circuit to ground	Line Heater Short to Ground Low Side / High Side status == FAULT	VeSCRR_e_HeatB_LS_ShortToGND == FAULT OR VeSCRR_e_HeatB_HS_ShortToGND == FAULT	Test enabled by calibration	1.00	8.00 failures out of 10.00 samples Time basis = 500ms	Type A, 1 Trips
					Temperature used by the heating strategy to switch on the heaters < threshold	min (VeOATR_T_OutsideAirNonEmiss, VeSCRC_T_DEF_Tank) < 60.00		
					Battery voltage	> 11.00 [V] (VeLVTR_b_PT_RelayInRange== TRUE)		
					Key on (OR engine running)	VePMDR_b_RunCrankActive==TRUE		
					Engine is not cranking	VeEMDR_b_EngModeCrank == FALSE		
					No loss of CAN comunication	U010E, Lost Communication With Reductant Control Module (SCR) (GetCANR_b_LostComm_FltN= FALSE)		
					Short to Ground Low Side / High Side status provided by DEF control module different from indeterminate	VeSCRR_e_HeatB_LS_ShortToGND != Indeterminate OR VeSCRR_e_HeatB_HS_ShortToGND != Indeterminate		

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
Reductant Heater 2 Control Circuit High Voltage	P20C0	This diagnosis verifies if the DEF line heater is affected by short circuit to battery	Line Heater Short to Battery Low Side / High Side status == FAULT	VeSCRR_e_HeatB_LS_ShortToBatt == FAULT OR VeSCRR_e_HeatB_HS_ShortToBatt == FAULT	Test enabled by calibration Temperature used by the heating strategy to switch on the heaters < threshold Battery voltage Key on (OR engine running) Engine is not cranking No loss of CAN comunication Short to Battery Low Side / High Side status provided by DEF control module different from indeterminate	1.00 min (VeOATR_T_OutsideAirNonEmiss, VeSCRC_T_DEF_Tank) < 60.00 > 11.00 [V] (VeLVTR_b_PT_RelayInRange== TRUE) VePMDR_b_RunCrankActive==TRUE VeEMDR_b_EngModeCrank == FALSE U010E, Lost Communication With Reductant Control Module (SCR) (GetCANR_b_LostComm_FltN= FALSE) VeSCRR_e_HeatB_LS_ShortToBatt != Indeterminate OR VeSCRR_e_HeatB_HS_ShortToBatt != Indeterminate	8.00 failures out of 10.00 samples Time basis = 500ms	Type A, 1 Trips

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
Exhaust Aftertreatment Fuel Injector A Control Circuit/Open	P20CB	This diagnosis detects a HC Injector Command pin /wire in open circuit	HC injector HWIO Open interface fault	=TRUE (i.e. If the voltage at the AUXINJ output in the OFF state stays below Volt (1.95 to 2.175V) and Volt (2.9 V to 3.2 V) for a time longer than tdiag (40µs to 70µs)	Shared High Side Driver 2 commanded ON (i.e. closed) Powertrain relay voltage in range;		48.00 failures over 60.00 samples 100 ms/sample	Type B, 2 Trips

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
Exhaust Aftertreatment Fuel Injector A Control Circuit Low	P20CD	This diagnosis detects a HC Injector Command pin /wire shortcut to ground	HC injector HWIO Short To Ground interface fault	=TRUE (i.e If the voltage at the AUXINJ output in the OFF state stays below Vltvt (1,95V to 2,175V) for a time longer than tdiag (40µs to 70µs)	Shared High Side Driver 2 commanded ON (i.e. closed) Powertrain relay voltage in range;		10.00 failures over 30.00 samples 100 ms/samples	Type B, 2 Trips

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
Exhaust Aftertreatment Fuel Injector A Control Circuit High	P20CE	This diagnosis detects a HC Injector Command pin /wire shortcut to power supply	HC injector HWIO Short To Power Supply interface fault	=TRUE (i.e. If the current through the AUXINJ output in the ON state is higher than Ioc1 (8A to 11A) for a time longer than toc1 = 36µs OR If the current through the AUXINJ output in ON state is higher than Ioc2 (16 A to 22A)	Powertrain relay voltage in range;		48.00 failures over 60.00 100 ms/samples	Type B, 2 Trips

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
Reductant Pressure Too Low	P20E8	This diagnosis verifies that the DEF pressure is lower than the target value set by the control	(Test 1) Too attemps of pressure build up (Test 2) DEF pressure setpoint - DEF measured pressure > calibrateable threshold	(Test 1) VeSCRC_b_PBU_Fail == TRUE (VeSCRC_Cnt_Defrost_NumOfCyc > 2.00) (Test 2) VeSCRC_p_DEF_PresCntrlrErr > 166.00	Test enabled by calibration	1.00	8.00 failures out of 10.00 samples Time basis = 500ms	Type A, 1 Trips
					Battery voltage	> 11.00 [V] (VeLVTR_b_PT_RelayInRange== TRUE)		
					Key on (OR engine running)	VeEMDR_b_EngModeCrank == FALSE		
					Defrost complete	VeSCRC_b_DefrostComplete == TRUE		
					Motor pump rotor stall fault not present	SCR_PmpRtrStlFA == FALSE		
					No fault on DEF pressure sensor	SCR_DEFPS_FA== FALSE		
					No fault on PWM command	SCR_DEF_PumpCmdFA == FALSE		
					No electrical fault on DEF pump	SCR_DEFPM_FA == FALSE		
					No electrical fault on DEF dosing valve	SCR_DEFMV_FA == FALSE		
					Motor pump is no more green (some build pressure attempts already performed since the beginning of vehicle life)	VeSCRD_b_DEF_PmpDegreenDiagEnbl == TRUE (EeSCRD_t_DEF_HydSysPrimingTm > 1,200.00)		

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
					(Test 1) Pressure Build-Up state is released for the first time during the driving cycle AND Test-Pass OR Test-Fail has not been reported for this test (Test 2) DEF pressure control is in pressure closed loop	(Test 1) VeSCRC_b_BuildUpReleased == TRUE AND VeSCRD_b_PBU_ReportTestFailEnbl == TRUE AND VeSCRC_e_SCR_PresState != CeSCRC_e_PresCntrlCLC (Test 2) VeSCRC_e_SCR_PresState == CeSCRC_e_PresCntrlCLC		

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
Reductant Pressure Too High	P20E9	This diagnosis verifies that the DEF pressure in the dosing line is too high	Difference between "DEF line pressure" and "DEF line pressure set point" > Threshold AND Pump rotor speed < Threshold	VeSCRC_p_DEF_PresCntrlrErr * (-1) > 150.00 AND VeSCRR_n_PmpMtrSpd < 3,200.00	Test enabled by calibration Battery voltage Battery voltage Key on (OR engine running) DEF pressure sensor not in fault PWM_pump_command not in fault DEF pressure control status equal to “Closed loop control” DEF motor pump not in fault Pump motor speed signal valid on CAN	1.00 VePMDR_b_RunCrankActive==TRUE > 11.00 [V] (VeLVTR_b_PT_RelayInRange== TRUE) VeEMDR_b_EngModeCrank == FALSE SCR_DEFPS_FA== FALSE SCR_DEF_PumpCmdFA == FALSE VeSCRC_e_SCR_PresState == CeSCRC_e_PresCntrlCLC VeSCRI_b_DEFPM_FltSt == FALSE VeSCRR_b_PumpMotorProtectErr==FALSE VeSCRR_b_PumpMotorRollCntErr==FALSE	100.00 failures out of 125.00 samples Time basis = 25ms	Type A, 1 Trips

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
Injector Positive Voltage Control Circuit Group 1 Low Voltage	P2147	This DTC detects a short circuit to ground of the high side driver circuit of the Bank 1 (injector 1 and 4)	Voltage high across High Side Driver of bank 1 (injector 1 and 4) during On state indicates short to ground	impedence between HS pin of injector 1 and controller ground <= 0.5 [Ohm] OR impedence between HS pin of injector 4 and controller ground <= 0.5 [Ohm]	Test enabled by calibration; and Battery voltage and Key ON and Engine is not cranking and Engine Running and FUL_OutEnblCyl_CiEPS (R_CylinderA OR FUL_OutEnblCyl_CiEPS R_CylinderC)	== 1 [Boolean] > 11.00 [V] - - >= 1.00 [s] == 0 [Boolean] == 0 [Boolean]	5 failures out of 10 samples 100 ms/sample Continuous	Type A, 1 Trips

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
Injector Positive Voltage Control Circuit Group 1 High Voltage	P2148	This DTC detects a short circuit to high voltage of high side driver circuit of the Bank 1 (injector 1 and 4)	Voltage low across High side drive of bank 1 (injector 1 and 4) during off state indicates short to power	impedence between HS pin of injector 1 and controller power <= 0.5 [Ohm] OR impedence between HS pin of injector 4 and controller power <= 0.5 [Ohm]	Test enabled by calibration; and Battery voltage and Key ON and Engine is not cranking and Engine Running and (FUL_OutEnblCyl_CiEPSR_CylinderA OR FUL_OutEnblCyl_CiEPSR_CylinderC)	== 1 [Boolean] > 11.00 [V] - - >= 1.00 [s] == 0 [Boolean] == 0 [Boolean]	5 failures out of 10 samples 100 ms/sample Continuous	Type A, 1 Trips

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
Reductant Pump A Current Too High	P214E	This diagnosis verifies that the DEF pump current flow is too high	Motor High Current Error status provided by DEF control module == FAULT OR Motor Current Limit Error status provided by DEF control module == FAULT	VeSCRR_e_PmpMtrHiCurrErr==FAULT OR VeSCRR_e_PmpMtrCurrLim=ACTIVE	Test enabled by calibration Battery voltage Key on (OR engine running) Engine is not cranking No loss of CAN comunication Motor High Current Error status provided by DEF control module different from indeterminate	1.00 > 11.00 [V] (VeLVTR_b_PT_RelayInRange== TRUE) VePMDR_b_RunCrankActive==TRUE VeEMDR_b_EngModeCrank == FALSE U010E, Lost Communication With Reductant Control Module (SCR) (GetCANR_b_LostComm_FltN= FALSE) VeSCRR_e_PmpMtrHiCurrErr != Indeterminate	20.00 failures out of 25.00 samples OR 20.00 failures out of 25.00 samples Time basis = 100ms	Type A, 1 Trips

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
Injector Positive Voltage Control Circuit Group 2 Low Voltage	P2150	This DTC detects a short circuit to ground of the high side driver circuit of the Bank 2 (injector 2 and 3)	Voltage high across High Side Driver of bank 2 (injector 2 and 3) during On state indicates short to ground	impedence between HS pin of injector 2 and controller ground <= 0.5 [Ohm] OR impedence between HS pin of injector 3 and controller ground <= 0.5 [Ohm]	Test enabled by calibration; and Battery voltage and Key ON and Engine is not cranking and Engine Running and (FUL_OutEnblCyl_CiEPSR_CylinderD OR FUL_OutEnblCyl_CiEPSR_CylinderB)	= 1 [Boolean] > 11.00 [V] - - >= 1.00 [s] == 0 [Boolean] == 0 [Boolean]	5 failures out of 10 samples 100 ms/sample Continuous	Type A, 1 Trips

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
Injector Positive Voltage Control Circuit Group 2 High Voltage	P2151	This DTC detects a short circuit to high voltage of high side driver circuit of the Bank 2 (injector 2 and 3)	Voltage low across High side drive of bank 2 (injector 2 and 3) during off state indicates short to power	impedence between HS pin of injector 2 and controller power <= 0.5 [Ohm] OR impedence between HS pin of injector 3 and controller power <= 0.5 [Ohm]	Test enabled by calibration; and Battery voltage and Key ON and Engine is not cranking and Engine Running and (FUL_OutEnblCyl_CiEPSR_CylinderD OR FUL_OutEnblCyl_CiEPSR_CylinderB)	= 1 [Boolean] > 11.00 [V] - - >= 1.00 [s] == 0 [Boolean] == 0 [Boolean]	5 failures out of 10 samples 100 ms/sample Continuous	Type A, 1 Trips

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
SCRPM supply under-voltage monitoring	P21CB	This diagnosis verifues that the SCRPM supply voltage is under the threshold of correct functioning	SCRPM supply under-voltage	(System Battery Voltage - SCRPM Supply Voltage value) > KeSCRI_U_DEFC_SplyVoltDiagThrs	Test enabled by calibration Powertrain relay in range Run Crank Active Cranking phase excluded No SCR Power Module CAN loss of communication	1.00 VePMDR_b_RunCrankInRange == TRUE VePMDR_b_RunCrankActive== TRUE VeEMDR_b_EngModeCrank== FALSE U010E, Lost Communication With Reductant Control Module (SCR) (GetCANR_b_LostComm_FltN= FALSE)	40.00 failures out of 50.00 samples Time basis = 100ms	

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
NOx Sensor Circuit Low Bank 1 Sensor 1	P2202	This diagnosis verifies Upstream NOx sensor read out of range low	Check if the NOx1 sensor NOx concentration raw read is out of lower range:		Fuel injection quantity request	> 10 mm^3	Time counter: 100 fails out of 200 samples Task=25ms	Type B, 2 Trips
					Powertrain relay voltage	> 11.00 V		
			NOx raw read	< -90 ppm				
					NOx Sensor Bus relay is commanded ON	TRUE		
					No failure on NOx1 CAN communication	CAN_LostComm_FltN_BusB_NOxSnsr_A		
					Sensor supply in range	> 10.8V		
					Sensor dewpoint is reached	TRUE		
					No current control failure on NOx1 sensor	NOX_NOx1_StBitChkFlt ==FALSE		
					Engine is running	TRUE		
					No electrical failure on NOx1 sensor	NOX_Snsr1_ElecFA ==FALSE		
					Combustion mode dependent enabling flag	**NOX_S1_OutRngMinCmbMode**		

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
NOx Sensor Circuit High Bank 1 Sensor 1	P2203	This diagnosis verifies Upstream NOx sensor read out of range high	Check if the NOx1 sensor NOx concentration raw read is out of higher range:		Powertrain relay voltage	> 11.00 V	Time counter: 100 fails out of 200 samples	Type B, 2 Trips
					NOx Sensor Bus relay is commanded ON	TRUE		
			NOx raw read	> 2,500 ppm	No failure on NOx1 CAN communication	CAN_LostComm_FltN_BusB_NOxSnsr_A	Task=25ms	
					Sensor supply in range	> 10.8V		
					Sensor dewpoint is reached	TRUE		
					No current control failure on NOx1 sensor	NOX_NOx1_StBitChkFlt ==FALSE		
					Engine is running	TRUE		
					No electrical failure on NOx1 sensor	NOX_Snsr1_ElecFA ==FALSE		
					Combustion mode dependent enabling flag	**NOX_S1_OutRngMaxCmbMode**		

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
NOx Sensor 1 Heater Control Circuit	P2205	This diagnosis verifies Upstream NOx gen3 sensor Heater Supply pin Open Load Circuit	Check if there is an open circuit on NOx Sensor 1 Heater Supply pin (H+)	open circuit on H+ pin	NOx sensor is Gen3.0 Powertrain relay voltage NOx Sensor Bus relay is commanded ON CAN_LostComm_FltN_BusB_NOxSnsr_A Sensor supply in range	TRUE > 11.00 V TRUE FALSE > 10.8V	Time counter: 20 fails out of 40 samples Task=25ms	

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
NOx Sensor 1 Heater Control Circuit Low Voltage	P2206	This diagnosis verifies Upstream NOx gen3 sensor Heater Supply pin for Short to Ground	Check if there is an short circuit to ground on NOx Sensor 1 Heater Supply pin (H+)	groundshort on H+ pin	NOx sensor is Gen3.0 Powertrain relay voltage NOx Sensor Bus relay is commanded ON CAN_LostComm_FltN_BusB_NOxSnsr_A Sensor supply in range Sensor dewpoint is reached (Sensor heater raw resistance - sensor heater target resistance) / sensor heater target resistence	TRUE > 11.00 V TRUE FALSE > 10.8V TRUE < 0.03 % >- 0.03 %	Time counter: 20 fails out of 40 samples Task=25ms	Type B, 2 Trips

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
NOx Sensor 1 Heater Control Circuit High Voltage	P2207	This diagnosis verifies Upstream NOx gen3 sensor Heater Supply pin for Short to Battery	Check if there is an short circuit to power supply on NOx Sensor 1 Heater Supply pin (H+)	powershort on H+ pin	NOx sensor is Gen3.0	TRUE	Time counter: 20 fails out of 40 samples Task=25ms	Type B, 2 Trips
					Powertrain relay voltage	> 11.00 V		
					NOx Sensor Bus relay is commanded ON	TRUE		
					CAN_LostComm_FltN_BusB_NOxSnsr_A	FALSE		
					Sensor supply in range	> 10.8V		
					Sensor dewpoint is reached	TRUE		
					(Sensor heater raw resistance - sensor heater target resistance) / sensor heater target resistence	< 0.03 % >- 0.03 %		

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
NOx Sensor 1 Heater Sense Circuit	P2208	This diagnosis verifies Upstream NOx gen3 sensor Heater sense resistance measurement pin for Open Load Circuit	Check if there is an open circuit on NOx Sensor 1 Heater Sense pin (HTemp)	open circuit on HTemp pin	NOx sensor is Gen3.0 Powertrain relay voltage NOx Sensor Bus relay is commanded ON CAN_LostComm_FltN_BusB_NOxSnsr_A Sensor supply in range	TRUE > 11.00 V TRUE FALSE > 10.8V	Time counter: 20 fails out of 40 samples Task=25ms	Type A, 1 Trips

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
NOx Sensor Heater Sense Circuit Range/ Performance Bank 1 Sensor 1	P2209	This diagnosis verifies if the Upstream NOx sensor Heater raw resistance is in range	This diagnosis verifies if the Upstream NOx sensor Heater raw resistance is out of speficied range: (Sensor heater raw resistance - sensor heater target resistance) / sensor heater target resistence	< 0.03 % >- 0.03 %	Powertrain relay voltage CAN_LostComm_FltN_BusB_NOxSnsr_A NOx Sensor Bus relay is commanded ON Delay timer once sensor supply is in range (> 10.8 V) Delay timer once sensor dewpoint is reached Delay timer once engine is overrun Delay timer once DPF combustion mode is not active	> 11.00 V FALSE TRUE > 45 sec > 45 sec > 5 sec 30 sec	Time counter: 50 fails out of 100 samples Task=25ms	Type B, 2 Trips

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
NOx Sensor Supply Voltage Circuit Bank 1 Sensor 1	P220A	This diagnosis verifies if the supply voltage of the Upstream Nox sensor is out of range	Check if NOx Sensor 1 supply voltage status is out of range	Sensor supply voltage < 10.8 V	NOx sensor is Gen3.0	TRUE	Time counter: 120 fails out of 240 samples Task=25ms	Type B, 2 Trips
					Powertrain relay voltage	> 11.00 V		
					NOx Sensor Bus relay is commanded ON	TRUE		
					CAN_LostComm_FltN_BusB_NOxSnsr_A	FALSE		

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
NOx Sensor Supply Voltage Circuit Bank 1 Sensor 2	P220B	This diagnosis verifies if the supply voltage of the Downstream Nox sensor is out of range	Check if NOxSensor 2 supply voltage status is out of range	Sensor supply voltage < 10.8 V	NOx sensor is Gen3.0 Powertrain relay voltage NOx Sensor Bus relay is commanded ON CAN_LostComm_FltN_BusB_NOxSnsr_B	TRUE > 11.00 V TRUE FALSE	Time counter: 120 fails out of 240 samples Task=25ms	Type B, 2 Trips

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
NOx Sensor 1 Heater Sense Circuit Low Voltage	P2210	This diagnosis verifies Upstream NOx gen3 sensor Heater sense resistance measurement pin for Short to Ground	Check if there is a short circuit to ground on NOx Sensor 1 Heater Sense pin (HTemp)	groundshort on HTemp pin	NOx sensor is Gen3.0	TRUE	Time counter: 20 fails out of 40 samples Task=25ms	Type B, 2 Trips
					Powertrain relay voltage	> 11.00 V		
					NOx Sensor Bus relay is commanded ON	TRUE		
					CAN_LostComm_FltN_BusB_NOxSnsr_A	FALSE		
					Sensor supply in range	> 10.8V		
					Sensor dewpoint is reached	TRUE		
					(Sensor heater raw resistance - sensor heater target resistance) / sensor heater target resistence	< 0.03 % >- 0.03 %		

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
NOx Sensor 1 Heater Sense Circuit High Voltage	P2211	This diagnosis verifies Upstream NOx gen3 sensor Heater sense resistance measurement pin for Short to Battery	Check if there is a short circuit to power supply NOx Sensor 1 Heater Sense pin (HTemp)	powershort on HTemp pin	NOx sensor is Gen3.0 Powertrain relay voltage NOx Sensor Bus relay is commanded ON CAN_LostComm_FltN_BusB_NOxSnsr_A Sensor supply in range Sensor dewpoint is reached (Sensor heater raw resistance - sensor heater target resistance) / sensor heater target resistence	TRUE > 11.00 V TRUE FALSE > 10.8V TRUE < 0.03 % >- 0.03 %	Time counter: 20 fails out of 40 samples Task=25ms	Type B, 2 Trips

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
O2 Sensor Out of Range During Deceleration Bank 1 Sensor 1	P2297	This DTC aims to detect a drift of measured O2 value (A) from an estimated concentration (B) when the latter can be considered stable during fuel cut-off condition.	EWMA filtered error (A - B) in overrun condition is out of plausible range	> 3.50 [%] < -2.81 [%]	Engine running System voltage in range Sensor is fully operative No SQA learning is active Enabled in combustion mode No After injection release No Exhaust Brake active i.e. intake manifold pressure No pending or confirmed DTCs	> 11.00 [V] OXY_NOx1_O2_RawNotRlb == FALSE FAD_SQA_LrnET_Enbl == FALSE **KaOXYD_b_NOx1OvrnChkCmbModeEnbl** < 1,000.00 [kPa] NOX_Snsr1_NotVld NOX_Snsr1_PresFlt OXY_O2_NOx1PlausMdlFlt OXY_NOx1SignRngChkFlt FHP_InjLeakageFA EGR_PstnShtOffReqFA (MAF_MAF_SnsrFA AND MAF_MAF_SnsrTFTKO) (MAP_SensorFA AND MAP_SensorTFTKO)	Once per trip Note: if EWMA Fast Initial Response is active OR EWMA Rapid Response is active than multiple tests per trip are allowed.	Type B, 2 Trips

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
					Stable fuel cut-off condition has been reached i.e. following conditions are met for a calibrateable time:	> 5.00 [s]		
					a. Engine speed in operating range	> 1,000 [rpm] < 3,000 [rpm]		
					b. EGR position	< 10.00 [%]		
					c. No fuel injected			
					d. Air mass per cylinder in operating range	> 500.00 [mg] < 1,500.00 [mg]		
					Estimated O2 concentration stable i.e. difference between initial and actual value	< 5.00 [%]		
					Air mass flown since fuel cut-off condition	> 20.00 [g]		

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
NOx Sensor Circuit Low Bank 1 Sensor 2	P22A0	This diagnosis verifies Downstream NOx sensor read out of range low	Check if the NOx2 sensor NOx concentration raw read is out of lower range: NOx raw read	 < -90 ppm	Fuel injection quantity request Powertrain relay voltage NOx Sensor Bus relay is commanded ON No failure on NOx2 CAN communication Sensor supply in range Sensor dewpoint is reached No current control failure on NOx2 sensor Engine is running No electrical failure on NOx2 sensor Combustion mode dependent enabling flag	> 10 mm^3 > 11.00 V TRUE CAN_LostComm_FltN_BusB_NOxSnsr_B > 10.8V TRUE NOX_NOx2_StBitChkFlt ==FALSE TRUE NOX_Snsr2_ElecFA ==FALSE **NOX_S2_OutRngMinCmbMode**	Time counter: 100 fails out of 200 samples Task=25ms	Type B, 2 Trips

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
NOx Sensor Circuit High Bank 1 Sensor 2	P22A1	This diagnosis verifies Downstream NOx sensor read out of range high	Check if the NOx1 sensor NOx concentration raw read is out of higher range: NOx raw read	 > 2,500 ppm	Powertrain relay voltage NOx Sensor Bus relay is commanded ON No failure on NOx2 CAN communication Sensor supply in range Sensor dewpoint is reached No current control failure on NOx2 sensor Engine is running No electrical failure on NOx2 sensor Combustion mode dependent enabling flag	> 11.00 V TRUE CAN_LostComm_FltN_BusB_NOxSnsr_B > 10.8V TRUE NOX_NOx2_StBitChkFlt ==FALSE TRUE NOX_Snsr2_ElecFA ==FALSE **NOX_S2_OutRngMaxCmbMode**	Time counter: 100 fails out of 200 samples Task=25ms	Type B, 2 Trips

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
NOx Sensor 2 Heater Control Circuit	P22A3	This diagnosis verifies Downstream NOx gen3 sensor Heater Supply pin Open Load Circuit	Check if there is an open circuit on NOx Sensor 2 Heater Supply pin (H+)	open circuit on H+ pin	NOx sensor is Gen3.0 Powertrain relay voltage NOx Sensor Bus relay is commanded ON CAN_LostComm_FltN_BusB_NOxSnsr_B Sensor supply in range	TRUE > 11.00 V TRUE FALSE > 10.8V	Time counter: 20 fails out of 40 samples Task=25ms	

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
NOx Sensor 2 Heater Control Circuit Low Voltage	P22A4	This diagnosis verifies Downstream NOx gen3 sensor Heater Supply pin for Short to Ground	Check if there is a short circuit to ground on NOx Sensor 2 Heater Supply pin (H+)	groundshort on H+ pin	NOx sensor is Gen3.0 Powertrain relay voltage NOx Sensor Bus relay is commanded ON CAN_LostComm_FltN_BusB_NOxSnsr_B Sensor supply in range Sensor dewpoint is reached (Sensor heater raw resistance - sensor heater target resistance) / sensor heater target resistence	TRUE > 11.00 V TRUE FALSE > 10.8V TRUE < 0.03 % >- 0.03 %	Time counter: 20 fails out of 40 samples Task=25ms	Type B, 2 Trips

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
NOx Sensor 2 Heater Control Circuit High Voltage	P22A5	This diagnosis verifies Downstream NOx gen3 sensor Heater Supply pin for Short to Battery	Check if there is a short circuit to power supply on NOx Sensor 2 Heater Supply pin (H+)	powershort on H+ pin	NOx sensor is Gen3.0 Powertrain relay voltage NOx Sensor Bus relay is commanded ON CAN_LostComm_FltN_BusB_NOxSnsr_B Sensor supply in range Sensor dewpoint is reached (Sensor heater raw resistance - sensor heater target resistance) / sensor heater target resistence	TRUE > 11.00 V TRUE FALSE > 10.8V TRUE < 0.03 % >- 0.03 %	Time counter: 20 fails out of 40 samples Task=25ms	Type B, 2 Trips

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
NOx Sensor 2 Heater Sense Circuit	P22A6	This diagnosis verifies Downstream NOx gen3 sensor Heater sense resistance measurement pin for Open Load Circuit	Check if there is an open circuit on NOx Sensor 2 Heater Sense pin (HTemp)	open circuit on HTemp pin	NOx sensor is Gen3.0 Powertrain relay voltage NOx Sensor Bus relay is commanded ON CAN_LostComm_FltN_BusB_NOxSnsr_B Sensor supply in range	TRUE > 11.00 V TRUE FALSE > 10.8V	Time counter: 20 fails out of 40 samples Task=25ms	Type A, 1 Trips

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
NOx Sensor Heater Sense Circuit Range/ Performance Bank 1 Sensor 2	P22A7	This diagnosis verifies if the Downstream NOx sensor Heate rraw resistance is in range	This diagnosis verifies if the Downstream NOx sensor Heater raw resistance is out of speficied range: (Sensor heater raw resistance - sensor heater target resistance) / sensor heater target resistence	 < 0.03 % >- 0.03 %	Powertrain relay voltage CAN_LostComm_FltN_BusB_NOxSnsr_B NOx Sensor Bus relay is commanded ON Delay timer once sensor supplyisin range (> 10.8 V) Delay timer once sensor dewpoint is reached Delay timer once engine is overrun Delay timer once DPF combustion mode is not active	> 11.00 V FALSE TRUE > 45 sec > 45 sec > 5 sec 30 sec	Time counter: 50 fails out of 100 samples Task=25ms	Type B, 2 Trips

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
NOx Sensor 2 Heater Sense Low Voltage	P22A8	This diagnosis verifies Downstream NOx gen3 sensor Heater sense resistance measurement pin for Short to Ground	Check if there is a short circuit to ground on NOx Sensor 2 Heater Sense pin (HTemp)	groundshort on HTemp	NOx sensor is Gen3.0 Powertrain relay voltage NOx Sensor Bus relay is commanded ON CAN_LostComm_FltN_BusB_NOxSnsr_B Sensor supply in range Sensor dewpoint is reached (Sensor heater raw resistance - sensor heater target resistance) / sensor heater target resistence	TRUE > 11.00 V TRUE FALSE > 10.8V TRUE < 0.03 % >- 0.03 %	Time counter: 20 fails out of 40 samples Task=25ms	Type B, 2 Trips

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
NOx Sensor 2 Heater Sense High Voltage	P22A9	This diagnosis verifies Downstream NOx gen3 sensor Heater sense resistance measurement pin for Short to Battery	Check if there is a short circuit to power supply on NOx Sensor 2 Heater Sense (HTemp)	powershort on HTemp pin	NOx sensor is Gen3.0 Powertrain relay voltage NOx Sensor Bus relay is commanded ON CAN_LostComm_FltN_BusB_NOxSnsr_B Sensor supply in range Sensor dewpoint is reached (Sensor heater raw resistance - sensor heater target resistance) / sensor heater target resistence	TRUE > 11.00 V TRUE FALSE > 10.8V TRUE < 0.03 % >- 0.03 %	Time counter: 20 fails out of 40 samples Task=25ms	Type B, 2 Trips

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
O2 Sensor Pumping Current Trim Circuit Low Bank 1 Sensor 2	P22B6	This DTC detects if O2 signal is lower than physical minimum value.	O2 signal lower than a minimum value	< -4.00 [%]	Engine running System voltage in range Sensor is fully operative Enabled in combustion mode No After injection release No pending or confirmed DTC	 > 11.00 [V] OXY_NOx2_O2_RawNotRlb == FALSE **KaOXYD_b_NOx2SigRngEnblCmbMode** NOX_Snsr2_NotVld	Time counter: 200 failures out of 250 samples. Time task 25[ms]	Type B, 2 Trips

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
O2 Sensor Pumping Current Trim Circuit High Bank 1 Sensor 2	P22B7	This DTC detects if O2 signal is higher than physical maximum value.	O2 signal higher than a maximum value	> 24.00 [%]	Engine running System voltage in range Sensor is fully operative Exhaust gas pressure No Exhaust Brake active i.e. intake manifold pressure No pending or confirmed DTCs	> 11.00 [V] OXY_NOx2_O2_RawNotRlb == FALSE < 300.00 [kPa] < 299.00 [kPa] NOX_Snsr2_NotVld NOX_Snsr2_PresFlt (MAP_SensorFA AND MAP_SensorTFTKO)	Time counter: 100 failures out of 200 samples. Time task 25[ms]	Type B, 2 Trips

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
NOx Sensor Performance - Slow Response Low to High Bank 1 Sensor 1	P22F9	This diagnosis verifies the dynamic behaviour of Upstream NOx sensor during increasing NOx concentration transient	Check if there is a slow dynamic behaviour of Upstream NOx sensor raw signal read during increasing NOx concentration maneuver (load increase)	Delay_Timer_NOx_Raw and Relative_timer are processed with First Order Lag Filter Logic:	Engine is running	TRUE	More test per tripare allowed with First Order Lag Filter Logic. Total_Timer NOx sensor dynamic observation maximum time is 30 sec. Once reached the diagnostic provides a result.	Type B, 2 Trips
					Powertrain relay voltage	> 11.00 V		
					Combustion mode dependent enabling flag	**NOX_NOx1_IncrDynCmbMode**		
					NOx Sensor Bus relay is commanded ON	TRUE		
			Delay_Timer_NOx_Raw Delay time starts once NOx model concentration reaches 50 ppm and completes once NOx1 sensor raw reaches 50 ppm.	> 20 sec	No failure on NOx1 CAN communication - No electrical failure on NOx1 sensor - No failure on NOx1 plausibility	NOX_Snsr1_FA ==FALSE		
				OR	No out of range low failure on NOx1 sensor	NOX_NOx1_OutOfRngLoFlt ==FALSE		
			Relative_timer= (Timer_NOx_Raw-Timer_NOx_Model) / Timer_NOx_Model	> 10,000 %	No out of range high failure on NOx1 sensor	NOX_NOx1_OutOfRngHiFlt ==FALSE		
					No current control failure on NOx1 sensor	NOX_NOx1_StBitChkFlt ==FALSE		
			Timer_NOx_Raw Time starts once NOx1 raw signal reaches 50 ppm and completes once the raw signal reaches 200 ppm.		Sensor dewpoint is reached	TRUE		
					Injection small quantity adjustment (SQA) learning is not active	FAD_SQA_LrnET_Enbl ==FALSE		
			Timer_NOx_Model Time starts once NOx model concentration reaches 50 ppm and completes once the raw signal reaches 200 ppm.		No failure on high pressure fuel rail system	FHP_InjLeakage ==FALSE		
					No failure on injectors	FUL_GenericInjSysFlt ==FALSE		
					No failure on intake manifold absolute pressure sensor	MAP_SensorFA==FALSE		

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
				Short and Long timer are processed with First Order Lag Filter Logic:	No failure on mass air flow sensor No failure on EGR valve actuator No failure on any input used by the Upstream NOx model No failure on NOX1 decreasing dynamic check Intake manifold absolute pressure Upstream NOx sensor raw concentration Engine working point stability conditions: a) Modeled Upstream NOx concentration b) Engine speed c) Injection fuel quantity requested d) condition a) b) c) are fulfilled for time Once all condition above are fulfilled diagnostic run whenever all the following condition are verified (fuel stepdetection logicwithin a time window): e) Injected fuel quantity	MAF_MAF_SnsrFA ==FALSE EGR_PstnShtOffReqFA ==FALSE EXM_NOxMdl_ExhMnfdNotVld ==FALSE NOX_NOx1_DecrDynChkFlt ==FALSE < 950 kPa < 10 ppm < 10 ppm > 1,000 rpm < 3,000 rpm > 5 mm^3 > 1 sec > 40 mm^3		

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
					request f) condition e) is fulfilled for time	 <(2 sec+ 2 sec)		

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
NOx Sensor Performance - Slow Response High to Low Bank 1 Sensor 1	P22FA	This diagnosis verifies the dynamic behaviour of Upstream NOx sensor during decreasing NOx concentration transient	Check if there is a slow dynamic behaviour of Upstream NOx sensor raw signal read during decreasing NOx concentration maneuver (load to overrun)	Short and Long timer are processed with First Order Lag Filter Logic:	Engine is running	TRUE	More test per trip are allowed with First Order Lag Filter Logic	Type B, 2 Trips
					Powertrain relay voltage	> 11.00 V		
					Combustion mode dependent enabling flag	**NOX_NOx1_DecrDynCmbMode**		
					NOx Sensor Bus relay is commanded ON	TRUE		
			Short Timer: time between % to % of NOx raw signal reduction	> 4 sec OR	No failure on NOx1 CAN communication	CAN_LostComm_FltN_BusB_NOxSnsr_A		
					No electrical failure on NOx1 sensor	NOX_Snsr1_ElecFA ==FALSE		
			Long Timer: time between % to % of NOx raw signal reduction	> 8 sec	No out of range low failure on NOx1 sensor	NOX_NOx1_OutOfRngLoFlt ==FALSE		
					No out of range high failure on NOx1 sensor	NOX_NOx1_OutOfRngHiFlt ==FALSE		
					No current control failure on NOx1 sensor	NOX_NOx1_StBitChkFlt ==FALSE		
					Sensor dewpoint is reached	TRUE		
					Injection small quantity adjustment (SQA) learning is not active	FAD_SQA_LrnET_Enbl ==FALSE		
					No failure on high pressure fuel rail system	FHP_InjLeakage ==FALSE		
					No failure on injectors	FUL_GenericInjSysFlt ==FALSE		
					No failure on intake	MAP_SensorFA==FALSE		

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
					manifold absolute pressure sensor			
					No failure on mass air flow sensor	MAF_MAF_SnsrFA ==FALSE		
					No failure on EGR valve actuator	EGR_PstnShtOffReqFA ==FALSE		
					No failure on any input used by the Upstream NOx model	EXM_NOxMdl_ExhMnfdNotVld ==FALSE		
					No fault on any exhaust mass flow model input	EXM_TurbFlowNotValid ==FALSE		
					Intake manifold absolute pressure	< 950 kPa		
					Modeled Upstream NOx concentration	> 100 ppm		
					Engine speed	> 1,000 rpm < 3,000 rpm		
					Injection fuel quantity requested	> 15 mm^3 < 80 mm^3		
					exhaust mass flow	> 20 g/s		
					Injection fuel quantity requested steady state: a) injection fuel variation within a stability window	> 0.90 % < 1.50 %		
					b) condition a) is fulfilled for time	> 0 sec		
					Once all condition above are fulfilled diagnostic run whenever all the following condition are verified			

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
					(overrun detection logic): a) injected fuel quantity b) overrun timer c) EGR measured position	 < 2 mm^3 < 2 sec < 60 %		

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
NOx Sensor Performance - Sensing Element Bank 1 Sensor 2	P22FE	This diagnosis verifies the Downstream NOx sensor sensing cells integrity during afterrun	Check if there is any clogging in the Downstream NOx sensor measurement cavities that could result in reduced NOx-sensitivity. The sensor internal operating current set-points are changed such way, that the O2 concentration in 2nd sensor cavity is around 1000ppm. One test result is measured in fresh sensor state (at supplier plant) and stored in the sensor E2prom as diagnosis reference value. The diagnosis result is the ratio of current diagnosis value/reference value. The diagnosis result is processed with EWMA logic.	> 200 % OR < 20 %	No electrical failure on NOx2 sensor	NOX_Snsr2_FltSt ==FALSE	Test per trip: 1 If Fast Initial Response EWMA is active then 10 test per trip are allowed If Fast Initial Response EWMA is active then 10 test per trip are allowed	Type B, 2 Trips
					No out of range low failure on NOx2 sensor	NOX_NOx2_OutOfRngLoFlt ==FALSE		
					No out of range high failure on NOx2 sensor	NOX_NOx2_OutOfRngHiFlt ==FALSE		
					No failure on NOx2 CAN communication	CAN_LostComm_FltN_BusB_NOxSnsr_B ==FALSE		
					No electrical failure on NOx1 sensor	NOX_Snsr1_ElecFA ==FALSE		
					No failure on O2 from NOx1 plausibility diagnostics	OXY_NOx1_O2_Flt ==FALSE		
					No failure on SCR system	EXF_TotExhSCR_UpFlt ==FALSE		
					No failure on downstream SCR HC model inputs	SCR_HC_SCR_DwnFlt ==FALSE		
					No failure on crank sensor	CrankSensor_FA ==FALSE		
					No failure on exhaust temperature sensor (downstream SCR)	EGT_TempSCR_DwnFlt ==FALSE		
					No failure on HC injector	HCI_GenericShtOffReq ==FALSE		
					No failure on Vehicle Speed sensor	VehicleSpeedSensor_FA ==FALSE		

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
					No failure on NOx2 dynamic check	NOX_NOx2_DynChkFlt ==FALSE		
					No failure on any input of SCR chemical model	SCR_ChemicalMdlFlt ==FALSE		
					No current control failure on NOx2 sensor	NOX_NOx2_StBitChkFlt ==FALSE		
					Powertrain relay voltage	> 11.00 V		
					NOx2 sensor supply in range	> 10.8V		
					NOx2 sensor dewpoint is reached	TRUE		
					(NOx2 Sensor heater raw resistance - NOx2 sensor heater target resistance) / NOx2 sensor heater target resistence	< 0.03 % >- 0.03 %		
					a)combustion mode dependent enabling flag	**NOX_NOx2SelfTstEnblCmbMode**		
					b) condition a) is fulfilled for time	> 60 sec		
					c) engine speed	> 0 rpm < 1,500 rpm		
					d) condition c) is fulfilled for time	> 1 sec		
					e) After injection pulse is not used for time	> 60 sec		
					f) exhaust temperature sensor (downstream SCR)	> -7 °C < 400 °C		

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
					g) exhaust mass flow	< 20 g/s		
					h) NH3 concentration	< 20 ppm		
					j) conditions f) g) h) are fulfilled for time	> 5 sec		
					k) O2 concentration from NOx1	> 10 %		
					i) NOx concentration from NOx1	< 200 ppm		
					l) conditions k) i) are fulfilled for time	> 0 sec		
					m) duty cycle applied to the HC injector driver	< 1 %		
					n) condition m) is fulfilled for time	> 5 sec		
					o) time between key off and last overrun	> 15 sec		
					p) time between key off and last DPF regen	> 15 sec		
					q) engine speed in idle range	< 1,100 rpm		
					r) fuel request in idle range	< 20 mm^3		
					s) conditions q) r) is fulfillled for time	< 1,800 sec		
					t) timer of condition s) is reset if one of the following condition is fulfilled (idle off			

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
					recognition - t) conditions):			
					t.1) exhaust temperature (downstream SCR)	> 200 °C		
					t.2) condition t.1) is fulfilled for time (once idle has been detected)	> 5 sec		
					t.3) vehicle speed	> 5 mph		
					t.4) condition t.3) is fulfilled for time (once idle has been detected)	> 5 sec		
					t.5) exhaust mass flow	> 20 g/sec		
					t.6) condition t.5) is fulfilled for time (once idle has been detected)	> 5 sec		
					u) HC mass flow (SCR downstream)	< 1 g/s		
					Once u) condition is fulfilled the following additional u.x) conditions shall be fulfilled to enable the monitor (AND logic)			
					u.1) exhaust temperature (downstream SCR)	> 200 g/s		
					u.2) condition u.1) is fulfilled for time (once condition u) has been detected)	> 5 sec		
					u.3) vehicle speed	> 5 mph		

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
					u.4) condition u.3) is fulfilled for time (once condition u) has been detected) u.5) exhaust mass flow u.6) condition u.5) is fulfilled for time (once condition u) has been detected) Once all conditions above are fulfilled during the driving cycle, ECM requires diagnostic test execution at key off	> 10 sec > 20 g/s > 5 sec		

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
Exhaust Gas Temperature Sensor Circuit Low Bank 1 Sensor 3	P242C	This diagnosis verify if the exhaust gas temperature 3 (EGT3) sensor signal is shorted to GND	EGT3 output resistance value	< 160.00 [Ohm]	Test enabled by calibration (TRUE--> enable FALSE --> disable) and with Engine cranking and with Battery voltage and with key on	1 [Boolean] == FALSE > 11.00 [V] ==TRUE	10 fail samples over 20 samples Function task: 100ms	Type B, 2 Trips

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
Exhaust Gas Temperature Sensor Circuit High Bank 1 Sensor 3	P242D	This diagnosis verify if the exhaust gas temperature 3 (EGT3) signal is shorted to power supply or it is in open circuit	EGT3 output resistance value	> 900.00 [Ohm]	Test enabled by calibration (TRUE--> enable FALSE --> disable)	1 [Boolean]	10 fail samples over 20 samples Function task: 100ms	Type B, 2 Trips
					and with			
					Engine cranking	== FALSE		
					and with			
					Battery voltage	> 11.00 [V]		
					and with			
					key on	==TRUE		

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
Exhaust Gas Temperature Sensor Circuit Intermittent/ Erratic Bank 1 Sensor 3	P242E	This diagnosis verify if the EGT3 temperature sensor signal (difference between two consecutive signal samples) variation is too big	|EGT3 output reistance - EGT3 output resistance old|	< 10.00 [Ohm]	Test enabled by calibration and with Engine running and with Engine cranking and with key on and with Battery voltage and with No electrical faults on EGT2 sensorin and logic	1 [Boolean] == TRUE == FALSE ==TRUE > 11.00 [V] EGT_ExhGas3_TFTKO and with EGT_ExhGas3_FA	20 fail samples out of 40 samples Function task: 100ms	Type B, 2 Trips

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
Diesel Particulate Filter Differential Pressure Too Low	P244A	This diagnostic detects a DPF pressure sensor pipe disconnected or clogged or blocked or a removed Diesel Particulate Filter	measured DPF absolute pressure	< **Exhaust Gas Pressure Too Low Threshold**	Test enabled by calibration (TRUE--> enable FALSE --> disable) No error on relative to ambient pressure sensor (electrical, rationality and offset) No error on upstream DPF temperature sensor (electrical and rationality) No error on air flow meter No error on atmospheric pressure sensor Exhaust gas volume flow Engine speed (Engine coolant temperature OR Engine Coolant temperature has reached the target temperature as regulated by thermostat)	0.00 EGP_DiffPresSnsrRatFlt EGT_SnsrDPF_UpFlt MAF_MAF_SnsrFA OR MAF_MAF_SnsrTFTKO AmbPresDfltdStatus= CeAAPR_e_AmbPresNotDfltd > 40.00 l/s > 800.00 rpm > 40.00 °C OR Refer to free form tab "OBD Coolant Enable Criteria" (ECTR_b_OBD_GlobalCoolTmpEnbl)	10.00 failures over 20.00 samples function task: 100 ms	Type X, No MIL

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
Catalyst Temperature Too Low During Regeneratio n	P244C	This diagnosis detects an Injector or a catalyst that is malfunctioning or losses in the exhaust gas system	The DTC is set when: Counter of subsequent Interrupted regeneration The interrupted regeneration counter increases only when the interruption is caused by: - Regeneration process interrupted due to maximum regeneration time elapsed. Maximum time allowed to complete DPF regeneration expired (according to regeneration mission profile) OR - Post injection pulses not enabled in time.Time to release POST injection is expired (according to regeneration mission profile) OR - Regeneration Steady phase not entered in time Time to reach DPF regeneration steady state condition is expired (according to regeneration mission profile) The counter is reset when a successful DPF	> 0.00 > **Maximum allowed time to complete regeneration** > **Maximum allowed time to release post injections for regeneration** > **Maximum allowed time to reach steady state for regeneration**	Test enabled by calibration (TRUE--> enable FALSE --> disable)	1.00	No debounce function task: 100 ms	Type B, 2 Trips

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
			regeneration occurs					

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
Diesel Particulate Filter Pressure Sensor A Circuit	P2452	This diagnosis verify if the pressure at the DPF inlet measured at the beginning of the driving cycle (when engine is not running), is too big (sensor offset too big)	|Average DPF pressure @beginning of driving cycle|	10 [%]	Test enabled by calibration and with key on and with minimum engine-off time and with No fault on engine off Timer and with No fault on exhaust gas pressure sensor (electrical, quick change and stuck in range in and logic)	1 [Boolean] ==TRUE > 10.00 [sec] **EMD_EngModeNotRunTmErr** EGP_DiffPresQckChgFlt and with EGP_DiffPresSnsrCktFlt and with EGP_DiffPresSnsrRatFlt	No debounce Function task: 12.5 ms	Type B, 2 Trips

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
Diesel Particulate Filter Pressure Sensor A Circuit Range/ Performance	P2453	Case1: This diagnosis verify if the current value of the flow resistace is almost equal to the average value of the flow resistance Case2: This diagnosis verify if the pressure at the DPF inlet doesn't change when it is supposed to change (when moving from one engine operating point to another)	|Flow resistance filtered – Average flow resistance|>	> 0.01 [KPa*s/m^3]	Test enabled by calibration and with Engine running and with Engine cranking and with key on and with Battery voltage and with No fault on exhaust gas pressure sensor (electrical, offset, quick change and stuck in range in and logic) and with No fault on air flow meter in and logic and with No fault on DPF Upstream temperature sensor (electrical, rationality, quick change	1 [Boolean] == TRUE == FALSE ==TRUE > 11.00 [V] EGP_DiffPresOfstTFTKO and with EGP_DiffPresQckChgFlt and with EGP_DiffPresSnsrCktFlt and with EGP_DiffPresStkFltPresent MAF_SensorFA and with MAF_SensorTFTKO EGT_SnsrDPF_UpFA and with	30 fail samples out of 50 samples Function task: 12.5 ms	Type B, 2 Trips

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
					and stuck in range in and logic) and with **System in stationary conditions:** - Fuel request and with - Engine speed and with - Air mass quantity per cylinder and with - Air mass quantity per cylinder and with - Deactivation of Flow resistance calculation	EGT_SnsrDPF_UpTFTKO <= 1.00 [mm^3] <= 10.00 [rpm] <= 10.00 [mg] > 0.00 [mg] == FALSE		
			DPF pressure variation <	<= 0.09 [%]	Test enabled by calibration and with Engine running and with No fault on exhaust gas pressure sensor (electrical, plausibility, offset and quick change in and logic) and with Engine speed variation	1 == TRUE EGP_DiffPresOfstTFTKO and with EGP_DiffPresQckChgFlt and with EGP_DiffPresSnsrCktFlt and with EGP_DiffPresStkFltPresent > 20.00 [rpm/s]	10 fail samples out of 16 samples Function task: 12.5 ms	

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
					greater and with Fuel quantity variation greater	 > 5.00 [l/s]		

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
Diesel Particulate Filter Pressure Sensor A Circuit Low	P2454	This diagnosis verify if the relative to ambient pressure sensor signal is shorted to GND	DPF pressure raw value (Unfiltered)	< 3.00 [%]	Test enabled by calibration and with Engine running and with Engine cranking and with key on and with Battery voltage	1 [Boolean] == TRUE == FALSE ==TRUE > 11.00 [V]	170 fail samples out of 250 samples Function task: 12.5 ms	Type B, 2 Trips

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
Diesel Particulate Filter Pressure Sensor A Circuit High	P2455	This diagnosis verify if the relative to ambient pressure sensor signal is shorted to power supply or it is in open circuit	DPF pressure raw value (Unfiltered)	> 97.00	Test enabled by calibration and with Engine running and with Engine cranking and with key on and with Battery voltage	1 [Boolean] == TRUE == FALSE ==TRUE > 11.00 [V]	170 fail samples out of 250 samples Function task: 12.5 ms	Type B, 2 Trips

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
Diesel Particulate Filter Pressure Sensor A Circuit Intermittent/ Erratic	P2456	This diagnosis verify if the signal (difference between two consecutive signal samples) variation is too big	|DPF pressure raw signal - DPFpressure raw signal old|	> 20.00	Test enabled by calibration and with Engine running and with Engine cranking and with key on and with Battery voltage and with No electrical fault on exhaust gas pressure sensor	1 [Boolean] == TRUE == FALSE == TRUE > 11.00 [V] EGP_DiffPresSnsrCktFlt	36 fail samples out of 240 samples Function task: 12.5 ms	Type B, 2 Trips

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
Exhaust Gas Recirculation Cooling System Performance	P2457	This monitor check the EGR Cooler efficiency deterioration respect to manufacture's specified cooling performance that would cause a vehicle's NHMC, CO; NOx or PM emissions to exceed specific emission levels	Egr Cooler efficiency (averaged over a calibrate-able cumulative transient time) is compared with a threshold	< 73.60 [%]	diagnosis enabled by calibration	1.00 ==TRUE	Test executed after a counter of 1,000.00 samples functional task 100 ms	Type B, 2 Trips
					PT relay in range	> 11.00 [V]		
					EGR upstream temperature	> 300.00 [°C] < 800.00 [°C]		
					Ambient Temperature	>= -7.00 [°C]		
					Ambient pressure	>= 70.00 [kPa]		
					Air Control is Active	AIC_AirCntrlShtOffAction ==Ce_AICR_e_CntrlActv		
					Engine Coolant Temperature OR OBD Coolant Enable Criteria, AND Engine Coolant Temperature	> 70.00 [°C] ==TRUE < 117.00 [°C]		
					EGR Cooler bypass not active, time need to pass when there is the transition form EGR cooler bypass to not bypass	> 5.00 [s]		
					EGR flow	< 100.00 [mg/s] > 6.00 [mg/s]		

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
					for a calibratable time	2.00 [s]		
					EGR flow estimation validity true	EGR_VlvTotFlowNotValid ==FALSE		
					engine speed in range	< 3,000.00 [rpm] > 1,400.00 [rpm]		
					No fault on upstream temperature	CET_UPSS_FA==FALSE		
					No fault on Downstream Temperature	CET_DNSS_FA==FALSE		
					No fault on Ambient Temperature	OAT_PtEstFiltFA ==FALSE		
					No fault on ambient pressure	AAP_AmbientAirPresDfltd ==FALSE		
					No fault on engine coolant temperature	ECT_Sensor_FA ==FALSE		
					No fault on engine speed	CrankSensor_FA ==FALSE		
					No fault on EGR Cooler Bypass	CEB_ActrCktLoFA ==FALSE		

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
Diesel Particulate Filter Regeneratio n Frequency	P2459	This diagnosis detects a dirty combustion or a leak in the exhaust or in the intake line or a not efficient DPF	Nominal Engine Out Soot Model is used, i.e. AND Configurable Correction Block is used, i.e. AND Ratio between Soot Model based on Delta Pressure measure + Configurable Correction Block and Engine Out Soot Model AND (many kilometers spent after the previous regeneration OR lots of time spent after the previous regeneration OR many fuel consumed after the previous regeneration)	1.00 = true 1.00 = true >= 4.00	Test enabled by calibration (TRUE--> enable FALSE --> disable) At least one successful regeneration occurs Δp model is always valid before start of regeneration for a time The Nominal Engine out soot model shall be valid for a time Soot model based on Delta Pressure plus configurable correction block (CCB) is valid for a time Ignition voltage in range Successful Regeneration shall be made in the previous regeneration Regeneration starts No Transient driving cycle is present, i.e. the delta fuel request during the soot loading time is DPF regeneration is not requested at service. (Soot percentage evaluated by Δp model plus Configurable	1.00 >= 0.00 s > 0.00 % of the soot loading time > 0.00 % of the soot loading time < 10.00 mm3/s > 60.00 %	No debounce function task: 100 ms	Type B, 2 Trips

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
					Correction Block (CCB) OR Many kilometers spent after the previous regeneration OR lots of time spent after the previous regeneration OR many fuel consumed after the previous regeneration)			
			Nominal Engine Out Soot Model is used, i.e. AND Configurable Correction Block is not used, i.e. AND Ratio between Soot Model (based on Delta Pressure measure) and Engine Out Soot Model is AND (many kilometers spent after the previous regeneration OR	1.00 = true 1.00 = false >= 4.00	At least one successful regeneration occurs Soot model based on Delta Pressure is valid for a time Δp model is always valid before start of regeneration for a time the Nominal Engine out soot model is valid for a time Ignition voltage in range Successful Regeneration shall be made in the previous regeneration Regeneration starts	> 0.00 % of the soot loading time >= 0.00 s > 0.00 % of the soot loading time	no time required, i.e. as soon as the malfunction criteria is satisfied	

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
			lots of time spent after the previous regeneration OR many fuel consumed after the previous regeneration)		No Transient driving cycle is present, i.e. the delta fuel request during the soot loading time is DPF regeneration is not requested at service (Soot percentage evaluated by Δp model OR Many kilometers spent after the previous regeneration OR lots of time spent after the previous regeneration OR many fuel consumed after the previous regeneration)	< 10.00 mm3/s > 60.00 %		
			Statistical Soot Model is used, i.e. AND Configurable Correction Block is used, i.e. AND Ratio between Soot Model (based on Delta Pressure measure + Configurable Correction Block) and Statistical Soot	1.00 = false 1.00 = true	At least one successful regeneration occurs soot model based on Delta Pressure plus configurable correction block (CCB) is valid for a time Δp model is always valid before start of regeneration for a time Statistical model is valid for a time	> 0.00 % of the soot loading time. >= 0.00 s > 0.00 % of the soot loading time	no time required, i.e. as soon as the malfunction criteria is satisfied	

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
			Model is AND (many kilometers spent after the previous regeneration OR lots of time spent after the previous regeneration OR many fuel consumed after the previous regeneration)	>= 4.00	Ignition voltage in range Successful Regeneration shall be made in the previous regeneration Regeneration starts No Transient driving cycle is present, i.e. the delta fuel request during the soot loading time is DPF regeneration is not requested at service (Soot percentage evaluated by Δp model plus Configurable Correction Block (CCB) OR Many kilometers spent after the previous regeneration OR lots of time spent after the previous regeneration OR many fuel consumed after the previous regeneration)	< 10.00 mm3/s > 60.00 %		
			Statistical Soot Model is used, i.e. AND	1.00 = false	At least one successful regeneration occurs soot model based on		no time required, i.e. as soon as the malfunction criteria is	

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
			Configurable Correction Block is not used, i.e. AND Ratio between Soot Model based on Delta Pressure measure Statistical Soot Model is AND (many kilometers spent after the previous regeneration OR lots of time spent after the previous regeneration OR many fuel consumed after the previous regeneration)	1.00 = false >= 4.00	Delta Pressure is valid for a time Δp model is always valid before start of regeneration for a time Statistical model is valid for a time Ignition voltage in range Successful Regeneration shall be made in the previous regeneration Regeneration starts No Transient driving cycle is present, i.e. the delta fuel request during the soot loading time is DPF regeneration is not requested at service (Soot percentage evaluated by Δp model is OR Many kilometers spent after the previous regeneration OR lots of time spent after the previous regeneration	> 0.00 % of the soot loading time >= 0.00 s > 0.00 % of the soot loading time < 10.00 mm3/s > 60.00 %	satisfied	

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
					OR many fuel consumed after the previous regeneration)			

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
Exhaust Gas Recirculation Cooler Bypass Control Circuit/Open	P245A	This monitor checks if the HP EGR cooler bypass valve command is in open circuit	Error interface provided by HWIO	Error interface provided by HWIO == TRUE	Test enabled by calibration	1.00	24.00 fail counts out of 30.00 sample counts Function task: 100 ms	Type B, 2 Trips
					System out of the cranking phase			
					PT relay supply voltage in range	> 11.00		
					Error interface provided by HWIO != INDETERMINATE (valve is driven in COOLING mode)			
					Run Crank active			
					Shared High Side driver driven closed			

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
Exhaust Gas Recirculation Cooler Bypass Control Circuit Low	P245C	This monitor checks if the HP EGR cooler bypass valve command is shorted to ground	Error interface provided by HWIO	Error interface provided by HWIO == TRUE	Test enabled by calibration System out of the cranking phase PT relay supply voltage in range Error interface provided by HWIO != INDETERMINATE (valve is driven in COOLING mode) Run Crank active Shared High Side driver driven closed	1.00 > 11.00	24.00 fail counts out of 30.00 sample counts Function task: 100 ms	Type B, 2 Trips

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
Exhaust Gas Recirculation Cooler Bypass Control Circuit High	P245D	This monitor checks if the HP EGR cooler bypass valve command is shorted to power supply	Error interface provided by HWIO	Error interface provided by HWIO == TRUE	Test enabled by calibration System out of the cranking phase PT relay supply voltage in range Error interface provided by HWIO != INDETERMINATE (valve is driven in BYPASS mode) Run Crank active Shared High Side driver driven closed	1.00 > 11.00	24.00 fail counts out of 30.00 sample counts Function task: 100 ms	Type B, 2 Trips

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
Diesel Particulate Filter Soot Accumulatio n	P2463	This diagnostic detects that DPF is almost clogged and has to be regenerated	Filtered flow resistance (DPF_ResistFlowFltd)	> **Flow Resistance High Threshold**	Test enabled by calibration (TRUE--> enable FALSE --> disable)	1.00	10.00 failures over 20.00 samples function task: 100 ms	Type A, 1 Trips
					No fault on DPF pressure sensor (electrical, rationality and offset)	EGP_DiffPresSnsrFlt		
					No fault on upstream DPF temperature sensor (electrical and rationality)	EGT_SnsrDPF_UpFlt		
					No fault on air flow meter	MAF_MAF_SnsrFAOR MAF_MAF_SnsrTFTKO		
					No fault on atmospheric pressure sensor	AmbPresDfltdStatus = CeAAPR_e_AmbPresNot Dfltd		
					DPF status insootloading phase (no regeneration ongoing)	DPF_DPF_St== CeDPFR_e_SootLoading		
					Engine speed	> 800.00 [rpm]		
					No fault on exhaust mass flow estimation	EXF_TotExhDPF_UpFA		
					Flow Resistance calculation enable	DPF_ResistFlowCalcOff == False		
					Exhaust gas volume flow greater than a calibrateable threshold for more than a calibratable time	> 40.00 [l/s] for > 10.00 [s]		
					Soot trapped in the DPF	> -1.00 [Pct]		

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
					Exhaust gas temperature at DPF inlet is between two thresholds for a minimum calibrateable time Engine Coolant Temperature Ambient Temperature	100.00 [DegC] < Temperature < 400.00 [DegC] for > 0.00 [s] > 40.00 [DegC] > -40.00 [DegC		

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
Exhaust Gas Temperature Sensor Circuit Low Bank 1 Sensor 4	P2470	This diagnosis verify if the exhaust gas temperature 4 (EGT4) sensor signal is shorted to GND	EGT4 output resistance value	< 160 [Ohm]	Test enabled by calibration (TRUE--> enable FALSE --> disable) and with Engine cranking and with Battery voltage and with key on	1 [Boolean] == FALSE > 11.00 [V] == TRUE	10 fail samples over 20 samples Function task: 100ms	Type B, 2 Trips

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
Exhaust Gas Temperature Sensor Circuit High Bank 1 Sensor 4	P2471	This diagnosis verify if the exhaust gas temperature 4 (EGT4) signal is shorted to power supply or it is in open circuit	EGT4 output resistance value	> 900 [Ohm]	Test enabled by calibration (TRUE--> enable FALSE --> disable) and with Engine cranking and with Battery voltage and with key on	1 [Boolean] == FALSE > 11.00 [V] == TRUE	10 fail samples over 20 samples Function task: 100ms	Type B, 2 Trips

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
Exhaust Gas Temperature Sensor Circuit Intermittent/ Erratic Bank 1 Sensor 4	P2472	This diagnosis verify if the EGT4 temperature sensor signal (difference between two consecutive signal samples) variation is too big	|EGT1output reistance - EGT1 output resistance old|	< 10.00 [Ohm]	Test enabled by calibration and with Engine running and with Engine cranking and with Battery voltage and with key on and with No electrical faults on EGT1sensorin and logic	1 [Boolean] == TRUE == FALSE > 11.00 [V] == TRUE EGT_ExhGas4_TFTKO and with EGT_ExhGas4_FA	20 fail samples out of 40 samples Function task: 100ms	Type B, 2 Trips

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
Exhaust Gas Temperature Sensor Circuit Low Bank 1 Sensor 5	P2481	This diagnosis verify if the exhaust gas temperature 5 (EGT5) sensor signal is shorted to GND	EGT5 output resistance value	< 160 [Ohm]	Test enabled by calibration (TRUE--> enable FALSE --> disable) and with Engine cranking and with Battery voltage and with key on	1 [Boolean] == FALSE > 11.00 [V] == TRUE	10 fail samples over 20 samples Function task: 100ms	Type B, 2 Trips

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
Exhaust Gas Temperature Sensor Circuit High Bank 1 Sensor 5	P2482	This diagnosis verify if the exhaust gas temperature 4(EGT4) signal is shorted to power supply or it is in open circuit	EGT5 output resistance value	> 900 [Ohm]	Test enabled by calibration (TRUE--> enable FALSE --> disable) and with Engine cranking and with Battery voltage and with key on	1 [Boolean] == FALSE > 11.00 [V] == TRUE	10 fail samples over 20 samples Function task: 100ms	Type B, 2 Trips

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
Exhaust Gas Temperature Sensor Circuit Intermittent/ Erratic Bank 1 Sensor 5	P2484	This diagnosis verify if the EGT5 temperature sensor signal (difference between two consecutive signal samples) variation is too big	|EGT5 output reistance - EGT5 output resistance old|	< 10.00 [Ohm]	Test enabled by calibration and with Engine running and with Engine cranking and with Battery voltage and with key on and with No electrical faults on EGT1sensorin and logic	1 [Boolean] == TRUE == FALSE > 11.00 [V] == TRUE EGT_ExhGas5_TFTKO and with EGT_ExhGas5_FA	20 fail samples out of 40 samples Function task: 100ms	Type B, 2 Trips

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
DEF tank heater supply undervoltage monitoring	P248A	This diagnosis verifues that the tank heater supply voltage is under the threshold of correct functioning	Tank heater supply under-voltage	(System Battery voltage -Tank heater Supply Voltage value) > KeSCRI_U_DEFTHSplyVoltDiagThrs	Test enabled by calibration	1.00	10.00 failures out of 12.00 samples Time basis = 500ms	
					Powertrain relay in range	VePMDR_b_RunCrankInRange == TRUE		
					Run Crank Active	VePMDR_b_RunCrankActive== TRUE		
					Cranking phase excluded	VeEMDR_b_EngModeCrank == FALSE		
					No SCR Power Module CAN loss of communication	U010E, Lost Communication With Reductant Control Module (SCR) (GetCANR_b_LostComm_FltN= FALSE)		
					Heating strategy is requesting the Heater to be activated	VeSCRR_b_HeatA_On == TRUE		

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
DEF line heater supply undervoltage monitoring	P248C	This diagnosis verifues that the line heater supply voltage is under the threshold of correct functioning	Line heater supply under-voltage	(System Battery voltage -Line heater Supply Voltage value) > KeSCRI_U_DEFLHSplyVoltDiagThrs	Test enabled by calibration	1.00	10.00 failures out of 12.00 samples Time basis = 500ms	
					Powertrain relay in range	VePMDR_b_RunCrankInRange == TRUE		
					Run Crank Active	VePMDR_b_RunCrankActive== TRUE		
					Cranking phase excluded	VeEMDR_b_EngModeCrank== FALSE		
					No SCR Power Module CAN loss of communication	U010E, Lost Communication With Reductant Control Module (SCR) (GetCANR_b_LostComm_FltN= FALSE)		
					Heating strategy is requesting the Heater to be activated	VeSCRR_b_HeatB_On == TRUE		

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
Closed Loop DPF Regeneration Control At Limit - Temperature Too Low	P24A0	HC Injector Control Temperature Deviation diagnostic monitors the exhaust gas temperature Upstream the DPF (EGT4) to determine whether the temperature deviation between the control setpoint and the temperature read by the sensor is within a prescribed deviation range. Temperature deviation diagnostic shall diagnose a too low temperature, that means a Positive temperature deviation temperature. The diagnosis runs during regeneration mode and when the temperature closed loop is actived. The monitoring is divided into 2 logics, in particular the DPF warm up state logic, that has only the Positive deviation monitoring, and the DPF steady state logic, that has both deviation monitoring.	**Low Temperature monitoring (Positive Deviation):** Temperature DPF Upstream control setpoint - DPF upstream sensor reading (EGT4)	> 100.00	Test shall be enabled by calibratable flag Regeneration state in warm up DPF Mode HCI temperature closed loop control shall be enabled Battery voltage No fault on exhaust mass flow No fault on vehicle speed No Fault on DPF upstream temperature sensor Temperature deviation monitoring shall be enabled by a boolean flag. The boolean flag shall be the output of a map function of engine speed and fuel request Vehicle speed Exhaust mass flow AND Exhaust mass flow Filtered Exhaust mass flow variation (absolute value)	1.00 [Boolean] DPF_DPF_St == Warm_Up EGT_HC_CL_Enbl [Boolean] > 11.00 [V] EXM_TurbFlowNotValid [Boolean] VehicleSpeedSensor_FA [Boolean] EGT_SnsrDPF_UpFlt [Boolean] **EnginePointEnable_HC_TempDeviation** [Boolean] > 3.00 [kph] < 120.00 [g/s] > 8.00 [g/s] < 100.00 [g/s] < 30.00 [sec]	1,200.00 fail samples out of 1,500.00 samples Function task: 100 ms	Type B, 2 Trips

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
					The system shall not be in cut off for a calibratable timer. All the above enabling conditions met for at least a calibratable timer	> 10.00 [sec]		
			Low Temperature monitoring (Positive Deviation): Temperature DPF Upstream control setpoint - DPF upstream sensor reading (EGT4)	> 100.00	Test shall be enabled by calibratable flag Regeneration state in Steady state DPF Mode HCI temperature closed loop control shall be enabled Battery voltage No fault on exhaust mass flow No fault on vehicle speed No Fault on DPF upstream temperature sensor Temperature deviation monitoring shall be enabled by a boolean flag. The boolean flag shall be the output of a map function of engine speed and fuel request Vehicle speed Exhaust mass flow	1.00 [Boolean] DPF_DPF_St== Steady_state EGT_HC_CL_Enbl [Boolean] > 11.00 [V] EXM_TurbFlowNotValid [Boolean] VehicleSpeedSensor_FA [Boolean] EGT_SnsrDPF_UpFlt [Boolean] **EnginePointEnable_HC_TempDeviation** [Boolean] > 3.00 [kph] < 120.00 [g/s]	1,200.00 fail samples out of 1,500.00 samples Function task: 100ms	

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
					AND Exhaust mass flow	> 8.00 [g/s]		
					Filtered Exhaust mass flow variation (absolute value)	< 100.00 [g/s]		
					The system shall not be in cut off for a calibratable timer.	< 30.00 [sec]		
					All the above enabling conditions met for at least a calibratable timer	> 10.00 [sec]		

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
Closed Loop DPF Regeneration Control At Limit - Temperature Too High	P24A1	HC Injector Control Temperature Deviation diagnostic monitors the exhaust gas temperature Upstream the DPF (EGT4) to determine whether the temperature deviation between the control setpoint and the temperature read by the sensoris within a prescribed deviation range. Temperature deviation diagnostic shall diagnose a too high temperature, that means a Negative temperature deviation temperature. The diagnosis runs during regeneration mode and when the temperature closed loop is actived. The monitoring runs only in DPF steady state logic	**High Temperature monitoring (Negative Deviation):** Temperature DPF Upstream control setpoint - DPF upstream sensor reading (EGT4)	< -100.00	Test shall be enabled by calibratable flag Regeneration state in Steady state DPF Mode HCI temperature closed loop control shall be enabled Battery voltage No fault on exhaust mass flow No fault on vehicle speed No Fault on DPF upstream temperature sensor Temperature deviation monitoring shall be enabled by a boolean flag. The boolean flag shall be the output of a map function of engine speed and fuel request Vehicle speed Exhaust mass flow AND Exhaust mass flow Filtered Exhaust mass flow variation (absolute value) The system shall not be in	1.00 [Boolean] DPF_DPF_St== Steady_state EGT_HC_CL_Enbl [Boolean] > 11.00 [V] EXM_TurbFlowNotValid [Boolean] VehicleSpeedSensor_FA [Boolean] EGT_SnsrDPF_UpFlt [Boolean] **EnginePointEnable_HC_TempDeviation** [Boolean] > 3.00 [kph] < 120.00 [g/s] > 8.00 [g/s] < 100.00 [g/s] < 30.00 [sec]	1,200.00 fail samples out of 1,500.00 samples Function task: 100ms	Type B, 2 Trips

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
					cut off for a calibratable timer. All the above enabling conditions met for at least a calibratable timer	 > 10.00 [sec]		

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
Diesel Particulate Filter Restriction - Ash Accumulation	P24A4	This diagnostic detects a clogged Diesel Particulate Filter	Filtered flow resistance (DPF_ResistFlowFltd)	> **Flow Resistance Too High Threshold**	Test enabled by calibration (TRUE--> enable FALSE --> disable)	1.00	5.00 failures over 10.00 samples function task: 100 ms	Type A, 1 Trips
					No fault on DPF pressure sensor (electrical, rationality and offset)	EGP_DiffPresSnsrFlt		
					No fault on upstream DPF temperature sensor (electrical and rationality)	EGT_SnsrDPF_UpFlt		
					No fault on air flow meter	MAF_MAF_SnsrFAOR MAF_MAF_SnsrTFTKO		
					No fault on atmospheric pressure sensor	AmbPresDfltdStatus = CeAAPR_e_AmbPresNotDfltd		
					DPF status in soot loading phase (no regeneration ongoing)	DPF_DPF_St== CeDPFR_e_SootLoading		
					Engine speed	> 800.00 [rpm]		
					No fault on exhaust mass flow estimation	EXF_TotExhDPF_UpFA		
					Flow Resistance calculation enable	DPF_ResistFlowCalcOff == False		
					Exhaust gas volume flow greater than a calibrateable threshold for more than a calibratable time	> 40.00 [l/s] for > 10.00 [s]		

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
					Soot trapped in the DPF Exhaust gas temperature at DPF inlet is between two thresholds for a minimum calibrateable time Engine Coolant Temperature Ambient Temperature	> -1.00 [Pct] 100.00 [DegC] < Temperature < 400.00 [DegC] for > 0.00 [s] > 40.00 [DegC] > -40.00 [DegC]		

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
Exhaust Gas Recirculation Cooler Bypass Valve Stuck	P24A5	This monitor check if the bypass sytem is stuck in cooling or bypass mode	The HP EGR Cooler Bypass valve shall be monitored to detect mechanical malfunctionings: the actuator correct movement shall be checked against obstructions or sticking problems using an intrusive test. The test is performed in idle and the valve is comanded in bypass and in cooling mode and the downstream temperature variation is calculated. At the end the gradient temperature is compared with a calibratable value. The DTC is set if the gradient temperature is higher than a threshold.	> **P24A5: Gradient Temperature Threshold** [°C]	Diagnosis is enabled by a calibration engine speed vehicle speed EGR valve total flow Air Control Active Engine Coolant Temperature OR OBD Coolant Enable Criteria Combustion Mode==C2,C3, SCR_Temp1,SCR_Temp, SCR_Temp3 fuel value fuel gradient gradient filtered upstream EGR cooler temperature,	1.00 ==TRUE >= 680.00 [rpm] < 950.00 [rpm] < 2.00 [kph] >= 4.00 [mg/s] < 100.00 [mg/s] AIC_AirCntrlShtOffAction ==Ce_AICR_e_CntrlActv >= 70.00 [°C] < 117.00 [°C] ==TRUE >= 10.00 [mm^3] < 40.00 [mm^3] >= -100.00 [mm^3] < 100.00 [mm^3] < 1.50 [°C/s] (TRUE) > 2.50 [°C/s] (FALSE)	Test is executed after 5.00 sample counter Function task: 100 ms	Type B, 2 Trips

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
					with hysteresis EGR upstream temperature No fault on vehicle speed No fault on engine coolant temperature No fault on downstream temperature No fault on upstream temperature No fault on egr cooler bypass actuator No fault on EGR valve	 >= 160.00 [°C] < 800.00 [°C] VehicleSpeedSensor_FA ==FALSE ECT_Sensor_FA=FALSE CET_DNSS_FA==FALSE CET_UPSS_FA==FALSE CEB_ActrCktFA==FALSE EGR_PstnDvtnFA ==FALSE		

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
Particulate Matter Sensor Circuit Low	P24B0	This diagnosis detects an open circuit on the soot sensor electrode signal or a cracked electrode	Soot Sensor Electrode raw current 1 AND Soot Soot Electrode raw current measured at setpoint temperature 1 - Soot Soot Electrode raw current measured at setpoint temperature 2	< 2.00 A < 0.09 A	Ignition voltage in range Soot Sensor bus relay is commanded on No electrical fault active on Soot Sensor bus relay No faults of CAN communication loss with Soot Sensor Key is turned on Fault not active on undervoltage for Soot Sensor Control Unit supply No Electrical faults present on Soot Sensor Soot Sensor is in regeneration phase Soot Sensor temperature Soot Sensor Electrode current measurement enabled	 NOT(SBR_RlyFA) NOT(U02A3) NOT(P24D0) NOT(SOT_EleclFault) 600.00 < T < 820.00 °C	No time debounce	Type B, 2 Trips

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
Particulate Matter Sensor Circuit High	P24B1	This diagnosis detects a short to power the soot sensor electrode signal	Diagnosis executed in Soot Sensor Control Unit: Soot Sensor Electrode supply voltage (measured ADC voltage for electrode current)	 > 4.1 V	Soot Sensor Control Unit conditions: no conditions ECU conditions: Ignition voltage in range Soot Sensor bus relay is commanded on No electrical fault active on Soot Sensor bus relay No faults of CAN communication loss with Soot Sensor Key is turned on Engine not in cranking mode Fault not active on undervoltage for Soot Sensor Control Unit supply	 NOT(SBR_RlyFA) NOT(U02A3) NOT(P24D0)	Soot Sensor Control Unit time: debouncing 2000 ms healing 100 ms ECU time counter: 30.00 failures out of 60.00 samples 100 ms/sample	Type B, 2 Trips

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
Particulate Matter Sensor Heater Control Circuit/Open	P24B3	This diagnosis detects an open circuit on the soot sensor heater line	Diagnosis executed in Soot Sensor Control Unit:		Soot Sensor Control Unit conditions:		Soot Sensor Control Unit time:	Type B, 2 Trips
			Soot Sensor Heater current	I < 0.5 A OR I > 15 A	Soot Sensor Heater Commanded on, i.e., heater duty cycle	> 0 %	debouncing 1000 ms no healing	
					No Heater failures detected in the Sensor Control Unit		ECU time counter:	
					ECU conditions:		30.00 failures out of 60.00 samples	
					Ignition voltage in range			
					Soot Sensor bus relay is commanded on		100 ms/sample	
					No electrical fault active on Soot Sensor bus relay	NOT(SBR_RlyFA)		
					No faults of CAN communication loss with Soot Sensor	NOT(U02A3)		
					Key is turned on			
					Engine not in cranking mode			
					Fault not active on undervoltage for Soot Sensor Control Unit supply	NOT(P24D0)		

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
Diesel Particulate Matter Sensor Heater Control Circuit Performance	P24B4	This diagnosis detects a soot sensor heater damaged or a possible parassitic resistance on the wiring harness between the soot sensor heater and the soot sensor control unit	Time to reach soot sensor regeneration setpoint temperature	> ((750.00 - Soot Sensor Electrode Temperature)*6,25)/ 17.75 s	Key is turned on		No time debounce	Type X, No MIL
					Ignition voltage in range			
					Soot Sensor bus relay is commanded on			
					No electrical fault active on Soot Sensor bus relay	NOT(SBR_RlyFA)		
					No faults of CAN communication loss with Soot Sensor	NOT(U02A3)		
					Fault not active on undervoltage for Soot Sensor Control Unit supply	NOT(P24D0)		
					No electrical fault detected on Soot Sensor	NOT(SOT_EleclFault)		
					Ambient air temperature	> -40.00 °C		
					Ambient air temperature sensor is not faulty	NOT(OAT_PtEstFiltFA)		
					Soot Sensor regeneration time	> ((750.00 -Soot Sensor Electrode Temperature) *6,25)/ 17.75 s		
					Soot sensor status is exit from its regeneration phase			

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
Particulate Matter Sensor Heater Control Circuit Low	P24B5	This diagnosis detects a short to ground on the soot sensor heater line	Diagnosis executed in Sensor Control Unit: Soot Sensor Heater current	I < 0.5 A OR I > 15 A	Soot Sensor Control Unit conditions: Soot Sensor Heater Commanded on, i.e., heater duty cycle No Soot Sensor Heater failures detected in the Sensor Control Unit ECU conditions: Ignition voltage in range Soot Sensor bus relay is commanded on No electrical fault active on Soot Sensor bus relay No faults of CAN communication loss with Soot Sensor Key is turned on Engine not in cranking mode Fault not active on undervoltage for Soot Sensor Control Unit supply	> 0 % NOT(SBR_RlyFA) NOT(U02A3) NOT(P24D0)	Soot Sensor Control Unit time: debouncing 1000 ms no healing ECU ime counter: 30.00 failures out of 60.00 samples 100 ms/sample	Type B, 2 Trips

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
Particulate Matter Sensor Heater Control Circuit High	P24B6	This diagnosis detects a short to power on the soot sensor heater line	Diagnosis executed in Soot Sensor Control Unit: Soot Sensor Heater current OR Soot Sensor Heater switch output (off state) OR Soot Sensor Heater switch input (off state)	 > 0.2 A = 1 (for one of the last 5 measurements) = 1 (for one of the last 5 measurements)	Soot Sensor Control Unit conditions: Soot Sensor Heater Off ECU conditions: Ignition voltage in range Soot Sensor bus relay is commanded on No electrical fault active on Soot Sensor bus relay No faults of CAN communication loss with Soot Sensor Key is turned on Engine not in cranking mode Fault not active on undervoltage for Soot Sensor Control Unit supply	 NOT(SBR_RlyFA) NOT(U02A3) NOT(P24D0)	Soot Sensor Control Unit time: debouncing 1000 ms healing 3000 ms ECU time counter: 30.00 failures out of 60.00 samples 100 ms/sample	Type B, 2 Trips

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
Diesel Particulate Matter Sensor Temperature Circuit Performance	P24C7	This diagnosis detects a soot sensor temperature sensor damaged or a possible parassitic resistance on the wiring harness between the soot sensor heater and the soot sensor control unit.	The absolute value of the difference between the Soot Sensor Electrode and the electrode temperature model	> 100.00 °C	Key is turned on Ignition voltage in range Soot Sensor bus relay is commanded on No electrical fault active on Soot Sensor bus relay No faults of CAN communication loss with Soot Sensor Engine in running mode No Soot Sensor supply undervoltage detected No electrical fault detected on Soot Sensor Soot Sensor heater is not commanded Soot Sensor is in measurement operating status Exhaust gas temperature model is valid	 NOT(SBR_RlyFA) NOT(U02A3) NOT(P24D0) NOT(SOT_EleclFault) SOT_ExhTempSootSnsrVld AND SOT_TotExhSootSnsrVld AND NOT(OAT_PtEstFiltFA) AND AmbPresDfltdStatus =	Time counter: 200.00 failures out of 255.00 samples 100 ms/sample	Type B, 2 Trips

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
						CeAAPR_e_AmbPresNotDfltd		
					Exhaust gas temperature model is reliable, i.e.:			
					(			
					Ambient air pressure	> 0.00 kPa		
					Ambient air temperature	> -40.00 °C		
					Exhaust gas volumetric flow at soot sensor	> 50.00 mg/s		
					Time after sensor regeneration	> 360.00 s		
					Soot Sensor Dew Point has been reached			
					)			

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
Particulate Matter Sensor Supply Voltage Circuit Low	P24D0	This diagnosis detects a short to ground of the soot sensor voltage supply line	Soot Sensor Control Unit supply voltage	< 9.00 V	Ignition voltage in range Soot Sensor bus relay is commanded on No electrical fault active on Soot Sensor bus relay No faults of CAN communication loss with Soot Sensor Key is turned on Engine not in cranking mode	 NOT(SBR_RlyFA) NOT(U02A3)	Time counter: 30.00 failures out of 60.00 samples 100 ms/sample	Type B, 2 Trips

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
Particulate Matter Sensor Regeneratio n Incomplete	P24D1	This diagnosis detects a degradation of the soot sensor heater	the Soot Sensor Electrode Temperature is during the steady state soot sensor regeneration, for a consecutively time	<= (785.00 - 10.00)°C >= 43.00 s	Key is turned on Ignition voltage in range Soot Sensor bus relay is commanded on No electrical fault active on Soot Sensor bus relay No faults of CAN communication loss with Soot Sensor Volumetric flow estimation is valid The power ratio timer the power ratio timer increments during the steady state of soot sensor regeneration, when the ratio between power demand and power available is (Soot sensor transitioned from regeneration to measurement status	 NOT(SBR_RlyFA) NOT(U02A3) SOT_TotExhSootSnsrVld AND SOT_ExhTempSootSnsrVld AND SOT_ExhPresSootSnsrVld < 5.00 s 0.00 <= r <= 1.00	no debouncing time	Type B, 2 Trips

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
					OR the time of soot sensor steady state regeneration is)	>= 150.00 s		

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
Turbocharger Boost Control Position Sensor Circuit Low Voltage	P2564	This monitor checks if the VGT position analogor SENT sensor is out of electrical range low	analog position raw voltage < low threshold	< 3.00 [%]	Test enabled by calibration System out of the cranking phase Run Crank relay supply voltage in range Run crank active	1.00 ==TRUE > 11.00 [V]	200.00 fail counts out of 250.00 sample counts Function task: 6.25 ms	Type B, 2 Trips
			SENTposition raw voltage < low threshold	< 3.00 [%]	Test enabled by calibration System out of the cranking phase Run Crank relay supply voltage in range Run crank active No faults present on VGT SENT out of range and SENT performance	1.00 ==TRUE > 11.00 [V] VGT_SENT_OOR_Flt ==FALSE VGT_SENT_PerfFlt ==FALSE	200.00 fail counts out of 250.00 sample counts Function task: 6.25 ms	

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
Turbocharger Boost Control Position Sensor Circuit High Voltage	P2565	This monitor checks if the VGTposition analogor SENT sensor is out of electrical range high	analog position raw voltage > high threshold	> 97.00 [%]	Test enabled by calibration System out of the cranking phase Run Crank relay supply voltage in range Run crank active	1.00 ==TRUE > 11.00 [V]	200.00 fail counts out of 250.00 sample counts Function task: 6.25 ms	Type B, 2 Trips
			SENTposition raw voltage > high threshold	> 97.00 [%]	Test enabled by calibration System out of the cranking phase Run Crank relay supply voltage in range Run crank active No faults present on VGT SENT out of range and SENT performance	1.00 ==TRUE > 11.00 [V] VGT_SENT_OOR_Flt AND VGT_SENT_PerfFlt ==FALSE	200.00 fail counts out of 250.00 sample counts Function task: 6.25 ms	

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
Turbocharger Boost Control Position Performance - Low Position	P2598	This monitor checks if the VGT vanes got mechanically stuck in a position more open than what is required by the control	position tracking error (setpoint position - measured position) > positive threshold	> **P2598: Positive Position Tracking Error Threshold** [%]	Test enabled by calibration	1.00 ==TRUE	640.00 fail counts out of 800.00 sample counts Function task: 6.25 ms	Type A, 1 Trips
					System out of the cranking phase			
					Run Crank relay supply voltage in range	> 11.00 [V]		
					Position control in closed loop (no faults present on VGT position sensor, VGT vanes, position deviation)	VGT_PstnSnsrFA== FALSE VGT_ActCktFA == FALSE VGT_PstnCntrlFA == FALSE		
					Position setpoint is in steady state conditions	< 40.00 [%/s] > -40.00 [%/s]		
					Engine speed > threshold	>= 1,500.00 [rpm]		
					Engine coolant temperature > threshold	>= -7.00 [°C]		
					Intake manifold temperature > threshold	>= -7.00 [°C]		
					All previous conditions must be verified for a minimum calibratable time	> 0.50 [s]		

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
Turbocharger Boost Control Position Performance - High Position	P2599	This monitor checks if the VGT vanes got mechanically stuck in a position more closed than what is required by the control	position tracking error (setpoint position - measured position) < negative threshold	< **P2599: Negative Position Tracking Error Threshold** [%]	Test enabled by calibration	1.00 ==TRUE	640.00 fail count out of 800.00 sample counts Function task: 6.25 ms	Type A, 1 Trips
					System out of the cranking phase			
					Run Crank relay supply voltage in range	> 11.00 [V]		
					Position control in closed loop (no faults present on VGT position sensor, VGTvanes, position deviation)	VGT_PstnSnsrFA== FALSE VGT_ActCktFA == FALSE VGT_PstnCntrlFA == FALSE		
					Position setpoint is in steady state conditions	< 40.00 [%/s] > -40.00 [%/s]		
					Engine speed > threshold	> 1,500.00 [rpm]		
					Engine coolant temperature > threshold	> -7.00 [°C]		
					Intake manifold temperature > threshold	> -7.00 [°C]		
					All previous conditions must be verified for a minimum calibratable time	> 0.50 [s]		

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
O2 Sensor Pumping Current Trim Circuit Low Bank 1 Sensor 1	P2627	This DTC detects if O2 signal is lower than physical minimum value or a Trim Resistance pin open load.	O2 signal lower than a minimum value	< -4.00 [%]	Engine running System voltage in range Sensor is fully operative Enabled in combustion mode No After injection release No pending or confirmed DTC	 > 11.00 [V] OXY_NOx1_O2_RawNotRlb == FALSE **KaOXYD_b_NOx1SigRngEnblCmbMode** NOX_Snsr1_NotVld	Time counter: 200 failures out of 250 samples. Time task 25[ms]	Type B, 2 Trips

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
O2 Sensor Pumping Current Trim Circuit High Bank 1 Sensor 1	P2628	This DTC detects if O2 signal is higher than physical maximum value or a Trim Resistance pin open load.	O2 signal higher than a maximum value	> 24.00 [%]	Engine running System voltage in range Sensor is fully operative Exhaust gas pressure No Exhaust Brake active i.e. intake manifold pressure No pending or confirmed DTCs	 > 11.00 [V] OXY_NOx1_O2_RawNotRlb == FALSE < 300.00 [kPa] < 1,000.00 [kPa] NOX_Snsr1_NotVld NOX_Snsr1_PresFlt (MAP_SensorFA AND MAP_SensorTFTKO)	Time counter: 100 failures out of 200 samples. Time task 25[ms]	Type B, 2 Trips

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
Cylinder 1 Injector Data Incompatible	P268C	This DTC detects if the EIA (End of line Injector Adjustment) code for cylinder 1 has not been programmed. The diagnostic shall report test pass if the EIA code has been succesfully programmed, otherwise only report test fail if the MEC (Manufacturing Enable Counter) is zero.	Cylinder 1 EIA code not written via DID (DID $60).	N/A	Ignition ON Diagnosis enabled via calibration Manufacturer Enable Counter (MEC) == 0	 1.00 [Boolean]	N/A	Type A, 1 Trips

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
Cylinder 2 Injector Data Incompatible	P268D	This DTC detects if the EIA (End of line Injector Adjustment) code for cylinder 2 has not been programmed. The diagnostic shall report test pass if the EIA code has been succesfully programmed, otherwise only report test fail if the MEC (Manufacturing Enable Counter) is zero.	Cylinder 2 EIA code not written via DID (DID $61).	N/A	Ignition ON Diagnosis enabled via calibration Manufacturer Enable Counter (MEC) == 0	 1.00 [Boolean]	N/A	Type A, 1 Trips

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
Cylinder 3 Injector Data Incompatible	P268E	This DTC detects if the EIA (End of line Injector Adjustment) code for cylinder 3 has not been programmed. The diagnostic shall report test pass if the EIA code has been succesfully programmed, otherwise only report test fail if the MEC (Manufacturing Enable Counter) is zero.	Cylinder 3 EIA code not written via DID (DID $62).	N/A	Ignition ON Diagnosis enabled via calibration Manufacturer Enable Counter (MEC) == 0	 1.00 [Boolean]	N/A	Type A, 1 Trips

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
Cylinder 4 Injector Data Incompatible	P268F	This DTC detects if the EIA (End of line Injector Adjustment) code for cylinder 4 has not been programmed. The diagnostic shall report test pass if the EIA code has been succesfully programmed, otherwise only report test fail if the MEC (Manufacturing Enable Counter) is zero.	Cylinder 4 EIA code not written via DID (DID $63).	N/A	Ignition ON Diagnosis enabled via calibration Manufacturer Enable Counter (MEC) == 0	 1.00 [Boolean]	N/A	Type A, 1 Trips

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
O2S Circuit Range/ Performance Bank 1 Sensor 1	P2A00	This DTC aims to detect a drift of measured O2 value (A) from an estimated concentration (B) when the latter can be considered stable during full load condition.	EWMA filtered error (A - B) in full load condition is out of plausible range	> 1.40 [%] < -1.50 [%]	Engine running		Once per trip Note: if EWMA Fast Initial Response is active OR EWMA Rapid Response is active than multiple tests per trip are allowed.	Type B, 2 Trips
					System voltage in range	> 11.00 [V]		
					Sensor is fully operative	OXY_NOx1_O2_RawNotRlb == FALSE		
					Enabled in combustion mode	**KaOXYD_b_NOx1LoadChkCmbModeEnbl**		
					(No After injection release AND Boolean Flag used to enable After injection status is TRUE)	1 [boolean]		
					No pending or confirmed DTCs	NOX_Snsr1_NotVld NOX_Snsr1_PresFlt OXY_NOx1SignRngChkFlt OXY_O2_NOx1PlausMdlFlt FHP_InjLeakageFA (MAF_MAF_SnsrFA AND MAF_MAF_SnsrTFTKO) EGR_VlvTotFlowNotValid		
					Stable fuel cut-off condition has been reached i.e. following conditions are met for a calibrateable time:	> 5.00 [s]		

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
					a. Engine speed in operating range	> 1,500 [rpm] < 3,000 [rpm]		
					b. EGR mass flow	< 1,000.00 [mg]		
					c. Injected fuel quantity in operating range	> 40.00 [mm^3] < 80.00 [mm^3]		
					d. Air mass per cylinder in operating range	> 500.00 [mg] < 1,500.00 [mg]		
					Estimated O2 concentration stable i.e. difference between initial and actual value	< 5.00 [%]		
					Air mass flown since fuel cut-off condition	> 20.00 [g]		

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
O2S Circuit Range/ Performance Bank 1 Sensor 2	P2A01	This DTC aims to detect a drift of Sensor 2 O2 measured value (A) from Sensor 1 O2 measured value (B) when the latter can be considered stable during full load condition.	EWMA filtered error (A - B) in full load condition is out of plausible range	> 1.40 [%] < -1.70 [%]	Engine running System voltage in range Sensor is fully operative Sensor 1 is fully operative No pending or confirmed DTCs DTC P2A00 is running Air mass flown since P2A00 is enabled	 > 11.00 [V] OXY_O2_NOx2_PresCmpNotRlb == FALSE OXY_O2_NOx1_PresCmpNotRlb == FALSE NOX_Snsr2_NotVld NOX_Snsr2_PresFlt OXY_NOx2SignRngChkFlt OXY_NOx1_O2_Flt (MAF_SensorFA AND MAF_SensorTFTKO) (see P2A00 Fault code) > 30.00 [g]	EWMA filtering: multiple tests per trip are allowed.	Type B, 2 Trips

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
Reductant Delivery Performance - Hydrualic Monitoring	P2BAA	This diagnostic checks the DEF hydraulic system for faults that can lead to diminished DEF delivery.	**Non-EWMA** Measured DEF pressure drop less than threshold. **EWMA**	< 40.00	Test enabled by calibration (TRUE->Enable False -> Disable)	1.00	Function Task: 25ms	Type A, 1 Trips
					Diag System Disable	== FALSE		
					Ambient Air Temperature (degC)	> -20.00		
					Barometric Pressure (kPa)	> 70.00		
					DEF Injector Component Management Ready	== TRUE		
					DEF Injector Cooling Request	== FALSE		
					DPF Regeneration Active	== FALSE		
					DEF Injector Temperature (degC)	> 225.00		
					DEF Injector Temperature (degC)	< 500.00		
					Gradient temperature of DEF Injector (degC) within a time period of (ms)	< 3.00 = 100ms * 100.00		
					Integrated DEF Injected Mass (mg)	> 7,000.00		
					Integrated DEF Injected Mass (mg)	< 10,000,000.00		
					Integrated Upstream NOx Flow (mg)	>= 3,000.00		

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
					Upstream SCR Exhaust Flow (g/s)	> 8.00		
					DEF System Hydraulic System Shutoff	== FALSE		
					No DEF Mass Flow less than calibratable mass (mg/s) for calibratable time (ms).	< 100.00 >= 100ms * 10.00		
					DEF Tank Status	== NOT FROZEN		
					Upstream DEF Injector Temperature Signal Fault	== FALSE		
					Outside Air Temperature Signal Fault	[OAT_PtEstFiltFA or OAT_OAT_SnsrNonEmissFA] == FALSE		
					Upstream SCR Exhaust Flow Signal Fault	EXF_TotExhSCR_UpFlt == FALSE		
					Barometric Pressure Signal Fault	AAP_AmbientAirPresDfltd == FALSE		
					Upstream NOx Sensor Concentration Signal Fault	== FALSE		
					Vehicle Speed Signal Fault	VehicleSpeedSensor_FA == FALSE		
					Vehicle Speed below calibratable threshold (kph) for calibratable time (ms).	<= 0.00 >= 100ms * 30.00		

Component/ System	Fault Code	Monitor Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
					DEF Metering Valve Tip Stuck Fault Engine Mode	SCR_TipStuckFltSt == FALSE == RUNNING		

OBD Coolant enable
Starting in 11.15A software GM has created a coordinated signal within the ECM that serves as a master enable for diagnostics/controls that use coolant as an enable condition. Controls and diagnostics may choose to enable prior to this calculated signal, but calibrating beyond the OBD limit will not function because of this signal. This enable condition is also put on the CAN bus for other modules to consume as well.

KeTHMG_b_elecstatequipd = 0 for this application

For mechanical thermostat applications (KeTHMG_b_elecstatequipd = 0)
OBD Coolant Enable Temp = P0128 Primary target temp – Calibratable offset (0-32) – 1
OBD Coolant Enable Temp = 69 - 0.0 – 1
OBD Coolant Enable Temp = 68.0

For E-stat applications (KeTHMG_b_elecstatequipd = 1)

OBD Coolant Enable Temp = Max(Min(ECT Control Temp) – Primary Warm up delta, Min primary P0128 target) – Calibratable offset (0-32) – 1
OBD Coolant Enable Temp = Max(Min(KaTHMC_T_TMS_EngCoolReq) - KaECTR_T_CTR_WrmUpDeltaTemp[0], KaECTR_T_CTR_WrmUpTargetMin[0]) - KeECTR_T_CTR_GlblMinOffst – 1
OBD Coolant Enable Temp = Max(90.5 - 19 , 69) - 0.0 – 1
OBD Coolant Enable Temp = 70.5

MEMR FNA Matched Flag GM software maintains a flag that indicates when an ECU has been programmed. When the controller is powered on, the logic compares the application software and calibration data file part numbers and design level suffixes (DLS) that are programmed into ECU flash memory to the part number and DLS data stored in ECU non-volatile memory. If any difference in the part number or DLS values are found, the MEMR_FNA_Matched flag is set to FALSE, otherwise the flag is set to TRUE.

RAIL PRESSURE CONTROL
==

Rail pressure is governed by Metering Unit when:
FHP_PresGovnSt = CeFHPC_e_PresGovnOL_MU_St
OR
FHP_PresGovnSt = CeFHPC_e_PresGovnCL_MU_St
OR
FHP_PresGovnSt = CeFHPC_e_PresGovnPR_ToMU_2St

Metering Unit controlled in closed loop when:
FHP_PresGovnSt = CeFHPC_e_PresGovnCL_MU_St
OR
FHP_PresGovnSt = CeFHPC_e_PresGovnPR_ToMU_2St
OR
FHP_PresGovnSt is changing to CeFHPC_e_PresGovnMU_ToPR_St

Rail pressure is governed by Pressure Regulator when:
FHP_PresGovnSt = CeFHPC_e_PresGovnOL_PR_St
OR
FHP_PresGovnSt = CeFHPC_e_PresGovnCL_PR_St
OR
FHP_PresGovnSt = CeFHPC_e_PresGovnPR_ToMU_1St
OR
FHP_PresGovnSt = CeFHPC_e_PresGovnMU_ToPR_St

Pressure Regulator controlled in closed loop when:
FHP_PresGovnSt = CeFHPC_e_PresGovnPR_ToMU_1St
OR
FHP_PresGovnSt = CeFHPC_e_PresGovnCL_PR_St
OR
FHP_PresGovnSt = CeFHPC_e_PresGovnMU_ToPR_St
OR
FHP_PresGovnSt is changing to CeFHPC_e_PresGovnPR_ToMU_2St

RAIL PRESSURE CONTROL STATES (FHP_PresGovnSt)
==

CeFHPC_e_PresGovnOL_MU_St:
(FHP_PresGovnSt = CeFHPC_e_PresGovnInitSt AND
Engine is not required to shut off AND
FHP_PresGovnSelSt = CeFHPC_e_MU_ModeSel AND
Metering Unit Valve present = 1)
OR
(FHP_PresGovnSt = CeFHPC_e_PresGovnCL_MU_St AND
Rail Pressure < 20 MPa AND
Engine speed < 100 rpm AND
Engine is not required to shut off)

****

CeFHPC_e_PresGovnCL_MU_St:
(FHP_PresGovnSt = CeFHPC_e_PresGovnOL_MU_St AND
Rail Pressure < 20 MPa AND
Engine speed < 50 rpm A ND
Engine is not required to shut off = FALSE)
OR
(FHP_PresGovnSt = CeFHPC_e_PresGovnPR_ToMU_2St AND
Pressure Regulator command ramped to completely closed position AND
Engine is not required to shut off)

****

CeFHPC_e_PresGovnMU_ToPR_St:
(FHP_PresGovnSt = CeFHPC_e_PresGovnCL_MU_St AND
FHP_PresGovnSelSt = CeFHPC_e_PR_ModeSel AND
Engine is not required to shut off AND
Pressure Regulator Valve present = 1)

****

CeFHPC_e_PresGovnOL_PR_St:
(FHP_PresGovnSt = CeFHPC_e_PresGovnInitSt AND
Engine is not required to shut off AND
FHP_PresGovnSelSt = CeFHPC_e_PR_ModeSel AND
Pressure Regulator Valve present = 1)
OR
[FHP_PresGovnSt = CeFHPC_e_PresGovnCL_PR_St AND

(Rail Pressure < 20 MPa AND
Engine speed < 100 rpm AND
Engine is not required to shut off)
OR
FHP_RPS_Flt = TRUE]

****
CeFHPC_e_PresGovnCL_PR_St:
(FHP_PresGovnSt = CeFHPC_e_PresGovnOL_PR_St AND
Rail Pressure > 20 MPa AND
Engine speed > 50 rpm AND
Engine is not required to shut off AND
FHP_RPS_Flt = FALSE)
OR
(FHP_PresGovnSt = CeFHPC_e_PresGovnMU_ToPR_St AND
Metering Unit command ramped to completely opened position AND
Engine is not required to shut off)

****
CeFHPC_e_PresGovnPR_ToMU_1St:
(FHP_PresGovnSt = CeFHPC_e_PresGovnCL_PR_St AND
FHP_PresGovnSelSt= CeFHPC_e_MU_ModeSel AND
Engine is not required to shut off AND
Metering Unit Valve present = 1)

****
CeFHPC_e_PresGovnPR_ToMU_2St:
(FHP_PresGovnSt = CeFHPC_e_PresGovnPR_ToMU_1St AND
Timer for transitioning ≥ 2 * 6.25 ms AND
Engine is not required to shut off)

****
CeFHPC_e_PresGovnInitSt:
ECM reset

****
CeFHPC_e_ESO:

Engine is required to shut off

RAIL PRESSURE CONTROL SELECTOR (FHP_PresGovnSelSt)
==

CeFHPC_e_MU_ModeSel:
(FHP_PresGovnSelSt = CeFHPG_e_MU_ModeSel)
OR
{ FHP_PresGovnSelSt = CeFHPG_e_PR_ModeSel AND
Pressure Control Configuration = CeFHPG_e_MU_And_PR_ModeSel AND
FHP_MU_CtrlModeInhb = FALSE AND
[FHP_PR_CtrlModeInhb = TRUE OR
(Engine speed > 511 rpm AND
(Fuel temperature > -20 °C OR
FHP_PR_FuelTempLimEnbl = TRUE) AND
FHP_PresStdySt = TRUE AND
Powertrain relay requested on AND
FHP_NoRailDischarge = TRUE)] }

CeFHPC_e_PR_ModeSel:
(FHP_PresGovnSelSt = CeFHPG_e_PR_ModeSel)
OR
{ FHP_PresGovnSelSt = CeFHPG_e_MU_ModeSel AND
Pressure Control Configuration = CeFHPG_e_MU_And_PR_ModeSel AND
FHP_PR_CtrlModeInhb = FALSE AND
[FHP_MU_CtrlModeInhb = TRUE OR
(FHP_PresOfst = TRUE AND
ZeroTorqPrdtdActv = TRUE AND
ZeroTorq = TRUE p) OR
(Powertrain relay requested on AND
FHP_PR_FuelTempLimEnbl = FALSE AND
(Fuel temperature < -25 °C OR
Engine speed < 481 rpm))] }

RAIL PRESSURE VARIABLES

==

Maximum fuel flow deliverable by high pressure pump (mm^3/str) =

635.5 * (1.00 * Engine speed) * (**High Pressure Pump efficiency** / 100)

* **High Pressure Pump efficiency correction** / 60

Acronyms:
SQA: Small quantity adjustment
(x)SQA: Extrapolated SQA or Target Small Quantity Adjustment
SQO: Small Quantity adjustment Oxygen Based
SSQA: Suspicious Small Quantity Adjustment
VSQA: Validation Small Quantity Adjustment
SQL: Small Quantity Learning
IIL: Idle Injection Learning
CB: Cylinder Balancing
FSA: Fuel Setpoint Adaptation
CWA: Crank-Wheel Adaptation
EIA: End Of Line Injector Adjustment.
MEC: Manufacturer Enable Counter. This counter becomes zero when the vehicle exit the assembly plant.
LoresC Task: 1 sample every cylinder firing event (e.g. 180 deg of angular rotation on a 4 cylinders engine).

Low Fuel Condition Diagnostic flag

Flag set to TRUE if the fuel level < 10.0 % AND

No Active DTCs: FuelLevelDataFault, P0462, P0463 for at least 30.0 seconds

Transfer Pump is Commanded On Flag

Fuel Volume in Primary Fuel Tank < 0.0 liters AND

Fuel Volume in Secondary Fuel Tank ≥ 0.0 liters AND

Transfer Pump on Time < P0461, P2066, P2636: Transfer Pump Enable (see supporting table for numeric value) AND

Transfer Pump had been Off for at least 0.0 seconds AND

Evap Diagnostic (Purge Valve Leak Test, Large Leak Test, and Waiting for Purge) is not running AND

Engine Running

LDT_DifficultLaunchActive is triggered in case Launch is not completed, Difficult Launch is enabled and the Accelerator Pedal is depressed for more than 20.00 percent when in Wait for Launch State. If a regular launch is performed the Difficult Launch enable flag must set to trigger LDT_DifficultLaunchActive.

Launch is deemed as complete in case the vehicle speed is above the hysteresis pair 20.00 and 10.00 , Clutch slip is not above 40.00 and 10.00 as well as desired engine speed is above current engine speed, Clutch Pedal Position is higher than 70.00 and 3.00 + 20.00 or launch state was held for longer than 4.00 .

Difficult Launch is enabled if CMS_DeltaTorqueMargin is false or Fuel System Type is not FPM_CIDI, vehicle speed is below 10.00 and engine speed is higher than 1,350.00 .

Initial Supporting table - 1st_FireAftrMisfr_Acel

Description: Multiplier for establishing the expected acceleration of the cylinder after the misfire

Notes: Used for P0300 - P0308, Cal Name: KtMSFD_K_dt_CylAftMsfr

y/x	650	900	1,100	1,300	1,400	1,700	2,400	2,700	3,000	3,100	3,300	3,500	3,700	3,900	4,100	4,400	4,700
8	0.95	0.95	0.84	0.53	0.41	0.63	1.00	1.22	1.67	1.85	2.00	2.38	2.50	2.63	2.78	3.13	4.17
12	0.98	0.88	0.76	0.51	0.37	0.59	0.91	1.19	1.43	1.72	1.92	2.17	2.27	2.38	2.63	2.94	3.85
16	1.17	0.80	0.57	0.43	0.30	0.45	0.71	1.06	1.16	1.19	1.43	1.67	1.72	2.17	2.17	2.63	2.94
20	1.25	0.80	0.42	0.37	0.26	0.33	0.53	0.77	0.88	0.88	1.11	1.32	1.43	1.92	1.79	2.27	2.63
24	1.25	0.59	0.31	0.31	0.25	0.25	0.40	0.59	0.67	0.71	0.89	1.04	1.22	1.52	1.47	2.00	2.27
30	1.03	0.47	0.26	0.28	0.24	0.21	0.33	0.45	0.57	0.61	0.75	0.87	1.04	1.16	1.25	1.79	1.92
40	0.90	0.42	0.22	0.25	0.24	0.19	0.31	0.38	0.50	0.53	0.65	0.75	0.93	1.02	1.09	1.52	1.67
60	0.61	0.28	0.16	0.18	0.19	0.14	0.24	0.25	0.35	0.36	0.43	0.50	0.67	0.70	0.77	1.00	1.11
100	0.42	0.19	0.11	0.13	0.13	0.10	0.16	0.17	0.24	0.24	0.30	0.33	0.48	0.50	0.54	0.70	0.78

Initial Supporting table - 1st_FireAftrMisfr_Jerk

Description: Multiplier for establishing the expected Jerk of the cylinder after the misfire

Notes: Used for P0300 - P0308, Cal Name: KtMSFD_K_ddt_CylAftMsfr

y/x	650	900	1,100	1,300	1,400	1,700	2,400	2,700	3,000	3,100	3,300	3,500	3,700	3,900	4,100	4,400	4,700
8	-0.98	-0.76	-0.57	-0.71	-0.53	-0.50	-0.55	-0.55	-0.57	-0.69	-0.77	-0.87	-0.91	-0.95	-1.05	-0.88	-0.94
12	-0.75	-0.75	-0.57	-0.71	-0.53	-0.50	-0.55	-0.55	-0.57	-0.57	-0.69	-0.67	-0.69	-0.87	-0.87	-0.79	-0.83
16	-0.75	-0.75	-0.87	-1.10	-0.95	-0.91	-0.91	-0.91	-0.88	-0.71	-0.75	-0.67	-0.63	-0.77	-0.71	-0.68	-0.75
20	-0.87	-1.04	-1.00	-1.00	-0.93	-0.86	-0.80	-0.80	-0.80	-0.79	-0.89	-0.79	-0.64	-0.69	-0.65	-0.65	-0.68
24	-0.71	-1.13	-0.89	-0.89	-0.80	-0.80	-0.67	-0.67	-0.69	-0.73	-0.90	-0.96	-0.89	-0.79	-0.74	-0.80	-0.87
30	-0.60	-1.15	-1.20	-1.05	-0.81	-0.71	-0.67	-0.67	-0.69	-0.73	-0.83	-0.90	-1.00	-0.81	-0.86	-0.89	-0.93
40	-0.53	-1.02	-1.13	-0.92	-0.90	-0.71	-0.70	-0.72	-0.80	-0.84	-1.02	-0.90	-1.11	-1.00	-0.87	-0.97	-1.03
60	-0.29	-0.54	-0.59	-0.48	-0.56	-0.33	-0.33	-0.38	-0.48	-0.49	-0.60	-0.67	-0.95	-0.99	-1.08	-1.41	-1.47
100	-0.19	-0.34	-0.37	-0.30	-0.35	-0.10	-0.10	-0.24	-0.31	-0.31	-0.37	-0.42	-0.61	-0.63	-0.68	-0.91	-0.95

Initial Supporting table - 1stFireAfterMisJerkAFM

Description: Multiplier for establishing the expected jerk of the cylinder after the misfire if Active Fuel Management cylinder deact mode is active

Notes: Used for P0300 - P0308, Cal Name: KtMSFD_K_ddt_AFM_CylAftMsfr

y/x	800	1,000	1,200	1,600	2,000	2,400	2,600	3,000	3,500
8	1	1	1	1	1	1	1	1	1
12	1	1	1	1	1	1	1	1	1
16	1	1	1	1	1	1	1	1	1
20	1	1	1	1	1	1	1	1	1
24	1	1	1	1	1	1	1	1	1
30	1	1	1	1	1	1	1	1	1
40	1	1	1	1	1	1	1	1	1
60	1	1	1	1	1	1	1	1	1
100	1	1	1	1	1	1	1	1	1

Initial Supporting table - 1stFireAftrMisAcelAFM

Description: Multiplier for establishing the expected acceleration of the cylinder after the misfire if Active Fuel Management cylinder deact mode is active

Notes: Used for P0300 - P0308, Cal Name: KtMSFD_K_dt_AFM_CylAftMsfr

y/x	800	1,000	1,200	1,600	2,000	2,400	2,600	3,000	3,500
8	1	1	1	1	1	1	1	1	1
12	1	1	1	1	1	1	1	1	1
16	1	1	1	1	1	1	1	1	1
20	1	1	1	1	1	1	1	1	1
24	1	1	1	1	1	1	1	1	1
30	1	1	1	1	1	1	1	1	1
40	1	1	1	1	1	1	1	1	1
60	1	1	1	1	1	1	1	1	1
100	1	1	1	1	1	1	1	1	1

Initial Supporting table - Abnormal Cyl Mode

Description: Number of consecutive number of decelerating cylinders after the misfire that would be considered abnormal. (Cylinder Mode Equation)

Notes: Used for P0300-P0308. Cal Name: KaMSFD_Cnt_CylAbnormal

y/x	0	1	2	3	4	5	6	7	8
1	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00

Initial Supporting table - Abnormal Rev Mode

Description: Abnormal Rev Mode   Number of consecutive number of decelerating cylinders after the misfire that would be considered abnormal.   (Rev Mode Equation)

Notes: Used for P0300-P0308. Cal Name: KaMSFD_Cnt_RevAbnormal

y/x	0	1	2	3	4	5	6	7	8
1	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00

Initial Supporting table - Abnormal SCD Mode

Description: Number of consecutive number of decelerating cylinders after the misfire that would be considered abnormal. (SCD Mode Equation)

Notes: Used for P0300-P0308. Cal Name: KaMSFD_Cnt_SCD_CylAbnormal

y/x	0	1	2	3	4	5	6	7	8
1	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00

Initial Supporting table - Bank_SCD_Decel

Description: Mulitplier to SCD decel to account for different pattern of Paired cylinder misfire. Multipliers are a function of engine rpm and % engine Load.

Notes: Used for P0300 - P0308, Cal Name: KtMSFD_K_dt_MEDRES_Bank

y/x	400	550	700	800	900	1,000	1,200	1,400	1,600
5	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00
10	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00
20	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00
30	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00
40	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00
50	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00
60	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00
80	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00
100	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00

Initial Supporting table - Bank_SCD_Jerk

Description: Mulitplier to Medres SCD jerk to account for different pattern of Paired cylinder misfire. Multipliers are a function of engine rpm and % engine Load.

Notes: Used for P0300 - P0308, Cal Name: KtMSFD_K_ddt_MEDRES_Bank

y/x	400	550	700	800	900	1,000	1,200	1,400	1,600
5	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00
10	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00
20	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00
30	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00
40	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00
50	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00
60	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00
80	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00
100	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00

Initial Supporting table - BankCylModeDecel

Description: Mulitplier to Lores Decel to account for different pattern of Paired cylinder misfire. Multipliers are a function of engine rpm and % engine Load.

Notes: Used for P0300 - P0308, Cal Name: KtMSFD_K_dt_LORES_Bank

y/x	650	900	1,100	1,300	1,400	1,700	2,400	2,700	3,000	3,100	3,300	3,500	3,700	3,900	4,100	4,400	4,700
5	8.00	8.00	8.00	8.00	8.00	8.00	8.00	8.00	8.00	8.00	8.00	8.00	8.00	8.00	8.00	8.00	8.00
10	8.00	8.00	8.00	8.00	8.00	8.00	8.00	8.00	8.00	8.00	8.00	8.00	8.00	8.00	8.00	8.00	8.00
20	8.00	8.00	8.00	8.00	8.00	8.00	8.00	8.00	8.00	8.00	8.00	8.00	8.00	8.00	8.00	8.00	8.00
30	8.00	8.00	8.00	8.00	8.00	8.00	8.00	8.00	8.00	8.00	8.00	8.00	8.00	8.00	8.00	8.00	8.00
40	8.00	8.00	8.00	8.00	8.00	8.00	8.00	8.00	8.00	8.00	8.00	8.00	8.00	8.00	8.00	8.00	8.00
50	8.00	8.00	8.00	8.00	8.00	8.00	8.00	8.00	8.00	8.00	8.00	8.00	8.00	8.00	8.00	8.00	8.00
60	8.00	8.00	8.00	8.00	8.00	8.00	8.00	8.00	8.00	8.00	8.00	8.00	8.00	8.00	8.00	8.00	8.00
80	8.00	8.00	8.00	8.00	8.00	8.00	8.00	8.00	8.00	8.00	8.00	8.00	8.00	8.00	8.00	8.00	8.00
100	8.00	8.00	8.00	8.00	8.00	8.00	8.00	8.00	8.00	8.00	8.00	8.00	8.00	8.00	8.00	8.00	8.00

Initial Supporting table - BankCylModeJerk

Description: Mulitplier to Lores Jerk to account for different pattern of Paired cylinder misfire. Multipliers are a function of engine rpm and % engine Load.

Notes: Used for P0300 - P0308, Cal Name: KtMSFD_K_ddt_LORES_Bank

y/x	650	900	1,100	1,300	1,400	1,700	2,400	2,700	3,000	3,100	3,300	3,500	3,700	3,900	4,100	4,400	4,700
5	10.00	10.00	10.00	10.00	10.00	10.00	10.00	10.00	10.00	10.00	10.00	10.00	10.00	10.00	10.00	10.00	10.00
10	10.00	10.00	10.00	10.00	10.00	10.00	10.00	10.00	10.00	10.00	10.00	10.00	10.00	10.00	10.00	10.00	10.00
20	10.00	10.00	10.00	10.00	10.00	10.00	10.00	10.00	10.00	10.00	10.00	10.00	10.00	10.00	10.00	10.00	10.00
30	10.00	10.00	10.00	10.00	10.00	10.00	10.00	10.00	10.00	10.00	10.00	10.00	10.00	10.00	10.00	10.00	10.00
40	10.00	10.00	10.00	10.00	10.00	10.00	10.00	10.00	10.00	10.00	10.00	10.00	10.00	10.00	10.00	10.00	10.00
50	10.00	10.00	10.00	10.00	10.00	10.00	10.00	10.00	10.00	10.00	10.00	10.00	10.00	10.00	10.00	10.00	10.00
60	10.00	10.00	10.00	10.00	10.00	10.00	10.00	10.00	10.00	10.00	10.00	10.00	10.00	10.00	10.00	10.00	10.00
80	10.00	10.00	10.00	10.00	10.00	10.00	10.00	10.00	10.00	10.00	10.00	10.00	10.00	10.00	10.00	10.00	10.00
100	10.00	10.00	10.00	10.00	10.00	10.00	10.00	10.00	10.00	10.00	10.00	10.00	10.00	10.00	10.00	10.00	10.00

Initial Supporting table - Cat2_CrtdEffThrsh

Description: Minimum Second Catalyst (UF DOC) conversion efficiency threshold (fault threshold) as function of ambient temperature [K]

Notes:

y/x	250	266	282	298	314	330
1	20	20	20	20	20	20

Initial Supporting table - Cat2_CrtdMaxFuel

Description: Maximum integrated exhaust injected fuel quantity (by HCI) threshold [g], as function of ambient temperature [K], needed to stop Second Catalyst integrators (heat and injected fuel) and calculate the Aging Index

Notes:

y/x	250	266	282	298	314	330
1	120	120	120	120	120	120

Initial Supporting table - Cat2CrtdEffRepEWMA

Description: Minimum Second Catalyst (UF DOC) conversion efficiency threshold (repass fault threshold) as function of ambient temperature [K] in case of Second Catalyst EWMA filter enabled and Second Catalyst conversion inefficiency previously detected (Second Catalyst FA = TRUE)

Notes:

y/x	250	266	282	298	314	330
1	1	1	1	1	1	1

Initial Supporting table - Catalyst_Damage_Misfire_Percentage

Description: Catalyst Damaging Misfire Percentage" Table whenever secondary conditions are met.

Notes: Used for P0300-P0308. Cal Name: KtMSFD_Pct_CatalystMisfire

y/x	0	1,000	2,000	3,000	4,000	5,000	6,000	7,000
0	512.0	512.0	512.0	512.0	512.0	512.0	512.0	512.0
10	512.0	512.0	512.0	512.0	512.0	512.0	512.0	512.0
20	512.0	512.0	512.0	512.0	512.0	512.0	512.0	512.0
30	512.0	512.0	512.0	512.0	512.0	512.0	512.0	512.0
40	512.0	512.0	512.0	512.0	512.0	512.0	512.0	512.0
50	512.0	512.0	512.0	512.0	512.0	512.0	512.0	512.0
60	512.0	512.0	512.0	512.0	512.0	512.0	512.0	512.0
70	512.0	512.0	512.0	512.0	512.0	512.0	512.0	512.0
80	512.0	512.0	512.0	512.0	512.0	512.0	512.0	512.0
90	512.0	512.0	512.0	512.0	512.0	512.0	512.0	512.0
100	512.0	512.0	512.0	512.0	512.0	512.0	512.0	512.0

Initial Supporting table - CatCrtdEffRepEWMA

Description: Minimum Catalyst (CC DOC) conversion efficiency threshold (repass fault threshold) as function of ambient temperature [K] in case of Catalyst EWMA filter enabled and Catalyst conversion inefficiency previously detected (Catalyst FA = TRUE)

Notes:

y/x	250	266	282	298	314	330
1	1	1	1	1	1	1

Initial Supporting table - CatCrtdEffThrsh

Description: Minimum Catalyst (CC DOC) conversion efficiency threshold (fault threshold) as function of ambient temperature [K]

Notes:

y/x	250	266	282	298	314	330
1	70	70	70	70	70	70

Initial Supporting table - CatCrtdMaxFuel

Description: Maximum integrated post injected fuel quantity threshold [g], as function of ambient temperature [K], needed to stop Catalyst integrators (heat and injected fuel) and calculate the Aging Index

Notes:

y/x	250	266	282	298	314	330
1	40	40	40	40	40	40

Initial Supporting table - ClyAfterAFM_Decel

Description: Mulitplier to Lores decel to account for different pattern of misfire after a deactivated cylider. Similar to the second cylinder of consecutive cylinder misfire. Multipliers are a function of engine rpm and % engine Load.

Notes: Used for P0300 - P0308, Cal Name: KtMSFD_K_dt_LORES_PostDeac

y/x	800	1,000	1,200	1,600	2,000	2,400	2,600	3,000	3,500
5	8.00	8.00	8.00	8.00	8.00	8.00	8.00	8.00	8.00
10	8.00	8.00	8.00	8.00	8.00	8.00	8.00	8.00	8.00
20	8.00	8.00	8.00	8.00	8.00	8.00	8.00	8.00	8.00
30	8.00	8.00	8.00	8.00	8.00	8.00	8.00	8.00	8.00
40	8.00	8.00	8.00	8.00	8.00	8.00	8.00	8.00	8.00
50	8.00	8.00	8.00	8.00	8.00	8.00	8.00	8.00	8.00
60	8.00	8.00	8.00	8.00	8.00	8.00	8.00	8.00	8.00
80	8.00	8.00	8.00	8.00	8.00	8.00	8.00	8.00	8.00
100	8.00	8.00	8.00	8.00	8.00	8.00	8.00	8.00	8.00

Initial Supporting table - ClyBeforeAFM_Jerk

Description: Mulitplier to Lores decel to account for different pattern of misfire before a deactivated cylider, but after an active cylinder that follows an deactive cylinder on engine that supports cylinder deactivation in non even fire patterns.. Multipliers are a function of engine rpm and % engine Load.

Notes: KtMSFD_K_ddt_LORES_PreDeac KtMSFD_K_ddt_LORES_PreDeac

y/x	800	1,000	1,200	1,600	2,000	2,400	2,600	3,000	3,500
5	8.00	8.00	8.00	8.00	8.00	8.00	8.00	8.00	8.00
10	8.00	8.00	8.00	8.00	8.00	8.00	8.00	8.00	8.00
20	8.00	8.00	8.00	8.00	8.00	8.00	8.00	8.00	8.00
30	8.00	8.00	8.00	8.00	8.00	8.00	8.00	8.00	8.00
40	8.00	8.00	8.00	8.00	8.00	8.00	8.00	8.00	8.00
50	8.00	8.00	8.00	8.00	8.00	8.00	8.00	8.00	8.00
60	8.00	8.00	8.00	8.00	8.00	8.00	8.00	8.00	8.00
80	8.00	8.00	8.00	8.00	8.00	8.00	8.00	8.00	8.00
100	8.00	8.00	8.00	8.00	8.00	8.00	8.00	8.00	8.00

Initial Supporting table - CombustModeIdleTbl

Description: Combustion modes that will force use of Idle table.   A value of CeCMBR_i_CombModesMax means not selected.

Notes: Used for P0300 - P0308, Cal Name: KaMSFD_e_IdleTblDieselCM_Only

CombustModeIdleTbl - Part 1

y/x	0	1	2	3	4	5
1	CeCMBR_i_CombModesMax	CeCMBR_i_CombModesMax	CeCMBR_i_CombModesMax	CeCMBR_i_CombModesMax	CeCMBR_i_CombModesMax	CeCMBR_i_CombModesMax

CombustModeIdleTbl - Part 2

y/x	6	7	8	9	10	11
1	CeCMBR_i_CombModesMax	CeCMBR_i_CombModesMax	CeCMBR_i_CombModesMax	CeCMBR_i_CombModesMax	CeCMBR_i_CombModesMax	CeCMBR_i_CombModesMax

CombustModeIdleTbl - Part 3

y/x	12	13	14	15	16	
1	CeCMBR_i_CombModesMax	CeCMBR_i_CombModesMax	CeCMBR_i_CombModesMax	CeCMBR_i_CombModesMax	CeCMBR_i_CombModesMax	

Initial Supporting table - ConsecCylModDecel

Description: Mulitplier to Lores decel to account for different pattern of the second cylinder of consecutive misfire. Multipliers are a function of engine rpm and % engine Load.

Notes: Used for P0300 - P0308, Cal Name: KtMSFD_K_dt_LORES_Consec

y/x	650	900	1,100	1,300	1,400	1,700	2,400	2,700	3,000	3,100	3,300	3,500	3,700	3,900	4,100	4,400	4,700
2	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
8	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
12	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
16	1.00	1.00	1.00	1.00	0.93	0.93	0.96	0.96	1.00	0.91	1.00	1.00	1.00	1.00	1.00	1.00	1.00
20	1.00	1.00	1.00	1.00	1.00	0.98	0.96	0.96	0.99	0.91	0.96	0.92	1.00	1.00	1.00	1.00	1.00
24	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.95	0.96	0.92	1.00	1.00	1.00	1.00	1.00
30	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
60	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
100	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Initial Supporting table - ConsecCylModeJerk

Description: Mulitplier to Lores Jerk to account for different pattern of the second cylinder of consecutive misfire. Multipliers are a function of engine rpm and % engine Load.

Notes: Used for P0300 - P0308, Cal Name: KtMSFD_K_ddt_LORES_Consec

y/x	650	900	1,100	1,300	1,400	1,700	2,400	2,700	3,000	3,100	3,300	3,500	3,700	3,900	4,100	4,400	4,700
2	-1	-1	-1	-1	0	-1	-1	-1	-1	-2	-2	-2	0	0	0	0	0
8	0	-1	-1	-1	0	-1	-1	-1	-1	-1	-1	-2	0	0	0	0	0
12	0	0	-1	-1	0	0	-1	-1	-1	-1	-1	-1	0	0	0	0	0
16	0	0	0	-1	0	0	0	-1	-1	-1	-1	-1	0	0	0	0	0
20	0	0	0	0	0	0	0	-1	-1	-1	-1	-1	0	0	0	0	0
24	0	0	0	0	0	0	0	0	-1	-1	-1	-1	0	0	0	0	0
30	0	0	0	0	0	0	0	0	-1	-1	-1	-1	0	0	0	0	0
60	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
100	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

Initial Supporting table - ConsecSCD_Decel

Description: Mulitplier to medres decel to account for different pattern of the second cylinder of consecutive misfire. Multipliers are a function of engine rpm and % engine Load.

Notes: Used for P0300 - P0308, Cal Name: KtMSFD_K_dt_MEDRES_Consec

y/x	400	550	700	800	900	1,000	1,200	1,400	1,600
2	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00
8	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00
12	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00
16	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00
20	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00
24	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00
30	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00
60	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00
100	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00

Initial Supporting table - ConsecSCD_Jerk

Description: Mulitplier to medres Jerk to account for different pattern of the second cylinder of consecutive misfire. Multipliers are a function of engine rpm and % engine Load.

Notes: Used for P0300 - P0308, Cal Name: KtMSFD_K_ddt_MEDRES_Consec

y/x	400	550	700	800	900	1,000	1,200	1,400	1,600
2	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00
8	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00
12	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00
16	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00
20	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00
24	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00
30	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00
60	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00
100	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00

Initial Supporting table - CylAfterAFM_Jerk

Description: Mulitplier to Lores Jerkl to account for different pattern of misfire after a deactivated cylider.   Similar to the second cylinder of consecutive cylinder misfire. Multipliers are a function of engine rpm and % engine Load.

Notes: Used for P0300 - P0308, Cal Name: KtMSFD_K_ddt_LORES_PostDeac

y/x	800	1,000	1,200	1,600	2,000	2,400	2,600	3,000	3,500
5	8	8	8	8	8	8	8	8	8
10	8	8	8	8	8	8	8	8	8
20	8	8	8	8	8	8	8	8	8
30	8	8	8	8	8	8	8	8	8
40	8	8	8	8	8	8	8	8	8
50	8	8	8	8	8	8	8	8	8
60	8	8	8	8	8	8	8	8	8
80	8	8	8	8	8	8	8	8	8
100	8	8	8	8	8	8	8	8	8

Initial Supporting table - CylBeforeAFM_Decel

Description: Mulitplier to Lores decel to account for different pattern of misfire before a deactivated cylider, but after an active cylinder that follows an deactive cylinder on engine that supports cylinder deactivation in non even fire patterns.. Multipliers are a function of engine rpm and % engine Load.

Notes: Used for P0300 - P0308, Cal Name: KtMSFD_K_dt_LORES_PreDeac

y/x	800	1,000	1,200	1,600	2,000	2,400	2,600	3,000	3,500
5	8.00	8.00	8.00	8.00	8.00	8.00	8.00	8.00	8.00
10	8.00	8.00	8.00	8.00	8.00	8.00	8.00	8.00	8.00
20	8.00	8.00	8.00	8.00	8.00	8.00	8.00	8.00	8.00
30	8.00	8.00	8.00	8.00	8.00	8.00	8.00	8.00	8.00
40	8.00	8.00	8.00	8.00	8.00	8.00	8.00	8.00	8.00
50	8.00	8.00	8.00	8.00	8.00	8.00	8.00	8.00	8.00
60	8.00	8.00	8.00	8.00	8.00	8.00	8.00	8.00	8.00
80	8.00	8.00	8.00	8.00	8.00	8.00	8.00	8.00	8.00
100	8.00	8.00	8.00	8.00	8.00	8.00	8.00	8.00	8.00

Initial Supporting table - CylModeDecel

Description: Crankshaft decel threshold. Thresholds are a function of rpm and % engine Load.

Notes: Used for P0300-P0308. Cal Name: KtMISF_CylinderMode

CylModeDecel - Part 1

y/x	580	650	730	800	900	1,000	1,100	1,200	1,400	1,600	1,800	2,000	2,200
3	3,000	2,425	2,090	1,875	1,650	1,425	1,200	1,065	875	760	715	680	655
6	2,050	1,725	1,475	1,135	835	655	525	425	275	190	150	110	85
8	2,600	2,275	1,675	1,300	975	750	575	475	325	250	180	130	95
10	3,200	2,775	2,200	1,600	1,205	915	700	555	375	285	210	150	110
12	3,850	3,325	2,580	1,900	1,425	1,050	825	625	425	340	245	170	127
14	4,400	3,750	3,000	2,250	1,675	1,275	950	725	485	385	275	200	150
16	5,050	4,300	3,425	2,650	1,925	1,400	1,100	850	575	430	305	225	175
18	5,750	4,800	3,875	3,075	2,225	1,600	1,275	1,000	650	475	340	255	200
20	6,375	5,375	4,375	3,525	2,550	1,815	1,455	1,125	725	527	375	285	225
22	7,050	5,850	4,725	3,850	2,780	1,960	1,565	1,245	800	575	410	310	242
24	7,750	6,225	5,075	4,075	2,950	2,135	1,710	1,345	895	620	450	335	260
26	8,400	6,650	5,425	4,330	3,175	2,295	1,825	1,435	950	665	485	355	280
30	9,500	7,500	6,100	4,900	3,600	2,665	2,065	1,635	1,085	750	550	400	320
40	12,000	9,850	7,825	6,400	4,670	3,460	2,675	2,120	1,410	970	715	510	420
60	17,000	14,350	11,300	9,275	6,800	5,095	3,900	3,120	2,065	1,420	1,035	740	610
78	21,400	18,200	14,250	11,875	8,660	6,500	4,955	3,975	2,645	1,815	1,325	945	775
97	26,875	22,660	17,700	14,795	10,850	8,080	6,195	4,955	3,310	2,260	1,635	1,175	975

CylModeDecel - Part 2

y/x	2,400	2,600	2,800	3,000	3,113	3,300	3,500	3,700	3,900	4,100	4,400	4,600	4,800
3	635	630	625	620	615	610	605	600	595	590	585	580	575
6	60	55	42	35	29	26	23	22	21	19	17	16	13
8	65	60	43	39	35	29	26	26	22	21	18	17	15
10	80	70	47	43	42	35	30	29	23	23	19	18	17
12	100	80	55	50	50	40	34	32	24	25	20	19	18
14	120	95	65	57	57	45	38	35	26	28	22	20	19
16	140	110	75	65	63	50	43	39	29	31	23	22	21
18	155	125	85	75	70	56	48	41	33	34	25	23	22
20	170	138	98	81	75	61	52	45	38	37	26	25	24
22	185	150	110	87	82	67	58	48	43	40	28	27	26
24	200	162	122	93	89	72	63	50	46	43	31	29	28
26	215	171	132	100	95	77	67	54	49	46	33	31	30
30	245	194	152	110	110	88	77	60	55	51	38	37	35

Initial Supporting table - CylModeDecel

40	315	252	200	143	140	115	101	75	71	65	50	47	45
60	465	365	300	207	205	168	150	105	101	93	71	68	64
78	590	465	385	262	261	215	190	133	128	119	89	85	80
97	735	585	485	325	325	270	237	165	160	148	110	105	100

Initial Supporting table - CylModeJerk

Description: Crankshaft jerk threshold. Thresholds are a function of rpm and % engine Load.

Notes: Used for P0300-P0308. Cal Name: KtMISF_ddt_CylinderMode

CylModeJerk - Part 1

y/x	580	650	730	800	900	1,000	1,100	1,200	1,400	1,600	1,800	2,000	2,200
3	3,000	2,425	2,090	1,875	1,650	1,425	1,200	1,065	875	760	715	680	655
6	2,650	2,325	1,965	1,550	1,150	875	675	530	345	235	175	141	95
8	2,950	2,550	2,235	1,750	1,318	985	765	615	386	280	215	166	115
10	3,350	3,000	2,550	2,050	1,525	1,150	900	715	465	345	245	191	135
12	3,920	3,400	2,900	2,350	1,725	1,300	1,000	785	530	407	271	212	150
14	4,425	3,800	3,175	2,650	1,925	1,465	1,115	875	595	450	306	240	175
16	5,065	4,325	3,560	2,950	2,145	1,625	1,225	975	650	485	335	260	195
18	5,750	4,800	3,975	3,225	2,350	1,750	1,350	1,075	725	535	363	280	210
20	6,375	5,375	4,375	3,525	2,550	1,925	1,450	1,175	800	575	398	300	230
22	6,875	5,850	4,725	3,850	2,780	2,075	1,585	1,275	850	621	429	325	250
24	7,450	6,225	5,075	4,050	2,975	2,250	1,700	1,350	915	656	461	345	270
26	8,025	6,650	5,425	4,365	3,200	2,425	1,825	1,450	975	700	492	370	285
30	9,050	7,500	6,100	4,875	3,625	2,700	2,075	1,625	1,100	784	561	415	325
40	11,700	9,815	7,825	6,315	4,660	3,465	2,675	2,100	1,415	1,000	715	525	415
60	17,100	14,125	11,300	9,150	6,685	5,050	3,825	3,075	2,045	1,415	1,035	750	615
78	21,575	18,200	14,250	11,750	8,500	6,400	4,925	3,900	2,600	1,792	1,315	945	775
97	26,875	22,660	17,700	14,535	10,550	7,865	6,035	4,875	3,250	2,215	1,635	1,175	965

CylModeJerk - Part 2

y/x	2,400	2,600	2,800	3,000	3,113	3,300	3,500	3,700	3,900	4,100	4,400	4,600	4,800
3	635	630	625	620	615	610	605	600	595	590	585	580	575
6	70	57	40	37	35	34	31	32	20	19	18	16	13
8	85	69	45	44	41	39	37	35	23	21	19	18	16
10	100	81	56	50	46	40	38	37	26	24	20	19	18
12	115	94	65	55	52	43	40	39	29	26	22	21	20
14	125	104	75	62	57	48	45	44	32	29	24	23	22
16	140	115	83	68	63	54	51	47	36	32	26	25	24
18	155	126	95	75	70	59	55	50	38	35	28	27	26
20	175	138	105	81	75	64	60	52	41	38	31	30	29
22	186	150	114	87	83	69	64	55	44	41	35	34	32
24	200	160	125	95	89	75	69	57	47	44	38	37	35
26	215	175	135	100	95	80	73	60	50	46	41	40	37
30	245	195	155	113	110	91	82	66	57	52	46	45	41

Initial Supporting table - CylModeJerk

40	315	255	205	145	142	115	105	80	71	66	60	57	53
60	465	365	300	207	205	169	150	108	101	95	86	82	77
78	590	465	385	260	262	215	190	134	128	120	110	105	97
97	735	585	485	325	325	270	235	162	160	148	136	130	120

Initial Supporting table - DeacCylInversionDecel

Description: Negative Torque can cause crank readings to invert (active cylinders appear weak & deactivated cylinders appear "strong"   If deactivated cylinders don't decelerate at least this amount then the crank signal is inverting. Function of speed and load.

Notes: Used for P0300 - P0308, Cal Name: KtMSFD_dt_AFM_Inversion

y/x	800	1,000	1,200	1,600	2,000	2,400	2,600	3,000	3,500
5	-16,384	-16,384	-16,384	-16,384	-16,384	-16,384	-16,384	-16,384	-16,384
10	-16,384	-16,384	-16,384	-16,384	-16,384	-16,384	-16,384	-16,384	-16,384
20	-16,384	-16,384	-16,384	-16,384	-16,384	-16,384	-16,384	-16,384	-16,384
30	-16,384	-16,384	-16,384	-16,384	-16,384	-16,384	-16,384	-16,384	-16,384
40	-16,384	-16,384	-16,384	-16,384	-16,384	-16,384	-16,384	-16,384	-16,384
50	-16,384	-16,384	-16,384	-16,384	-16,384	-16,384	-16,384	-16,384	-16,384
60	-16,384	-16,384	-16,384	-16,384	-16,384	-16,384	-16,384	-16,384	-16,384
80	-16,384	-16,384	-16,384	-16,384	-16,384	-16,384	-16,384	-16,384	-16,384
100	-16,384	-16,384	-16,384	-16,384	-16,384	-16,384	-16,384	-16,384	-16,384

Initial Supporting table - DeacCylInversionJerk

Description: Negative Torque can cause crank readings to invert (active cylinders appear weak & deactivated cylinders appear "strong"   If deactivated cylinders don't jerk at least this amount then the crank signal is inverting. Function of speed and load.

Notes: Used for P0300 - P0308, Cal Name: KtMSFD_ddt_AFM_Inversion

y/x	800	1,000	1,200	1,600	2,000	2,400	2,600	3,000	3,500
5	-16,384	-16,384	-16,384	-16,384	-16,384	-16,384	-16,384	-16,384	-16,384
10	-16,384	-16,384	-16,384	-16,384	-16,384	-16,384	-16,384	-16,384	-16,384
20	-16,384	-16,384	-16,384	-16,384	-16,384	-16,384	-16,384	-16,384	-16,384
30	-16,384	-16,384	-16,384	-16,384	-16,384	-16,384	-16,384	-16,384	-16,384
40	-16,384	-16,384	-16,384	-16,384	-16,384	-16,384	-16,384	-16,384	-16,384
50	-16,384	-16,384	-16,384	-16,384	-16,384	-16,384	-16,384	-16,384	-16,384
60	-16,384	-16,384	-16,384	-16,384	-16,384	-16,384	-16,384	-16,384	-16,384
80	-16,384	-16,384	-16,384	-16,384	-16,384	-16,384	-16,384	-16,384	-16,384
100	-16,384	-16,384	-16,384	-16,384	-16,384	-16,384	-16,384	-16,384	-16,384

Initial Supporting table - EGT1 DynChk EngPtEnbl

Description: Contains the engine speed and fuel rate enablments for EGT1 Dynamic Check.

Notes:

y/x	0.0	10.0	20.0	40.0	60.0	80.0	120.0
800.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1,000.0	0.0	1.0	1.0	1.0	1.0	1.0	0.0
2,000.0	0.0	1.0	1.0	1.0	1.0	1.0	0.0
3,000.0	0.0	1.0	1.0	1.0	1.0	1.0	0.0
4,000.0	0.0	1.0	1.0	1.0	1.0	1.0	0.0
4,200.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

Initial Supporting table - EGT2 DynChk EngPtEnbl

Description: Contains the engine speed and fuel rate enablments for EGT2 Dynamic Check.

Notes:

y/x	0.0	10.0	20.0	40.0	60.0	80.0	120.0
800.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1,000.0	0.0	1.0	1.0	1.0	1.0	1.0	0.0
2,000.0	0.0	1.0	1.0	1.0	1.0	1.0	0.0
3,000.0	0.0	1.0	1.0	1.0	1.0	1.0	0.0
4,000.0	0.0	1.0	1.0	1.0	1.0	1.0	0.0
4,200.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

Initial Supporting table - EGT3 DynChk EngPtEnbl

Description: Contains the engine speed and fuel rate enablments for EGT3 Dynamic Check.

Notes:

y/x	0.0	10.0	20.0	40.0	60.0	80.0	120.0
800.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1,000.0	0.0	1.0	1.0	1.0	1.0	1.0	0.0
1,999.0	0.0	1.0	1.0	1.0	1.0	1.0	0.0
3,000.0	0.0	1.0	1.0	1.0	1.0	1.0	0.0
4,000.0	0.0	1.0	1.0	1.0	1.0	1.0	0.0
4,200.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

Initial Supporting table - EGT4 DynChk EngPtEnbl

Description: Contains the engine speed and fuel rate enablments for EGT4 Dynamic Check.

Notes:

y/x	0.0	15.0	20.0	40.0	60.0	80.0	120.0
800.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1,000.0	0.0	0.0	1.0	1.0	1.0	1.0	0.0
1,500.0	0.0	0.0	1.0	1.0	1.0	1.0	0.0
2,000.0	0.0	0.0	1.0	1.0	1.0	1.0	0.0
2,500.0	0.0	0.0	1.0	1.0	1.0	1.0	0.0
3,200.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

Initial Supporting table - EGT5 DynChk EngPtEnbl

Description: Contains the engine speed and fuel rate enablments for EGT5 Dynamic Check.

Notes:

y/x	0.0	15.0	20.0	40.0	60.0	80.0	120.0
800.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1,000.0	0.0	0.0	1.0	1.0	1.0	1.0	0.0
1,500.0	0.0	0.0	1.0	1.0	1.0	1.0	0.0
2,000.0	0.0	0.0	1.0	1.0	1.0	1.0	0.0
2,500.0	0.0	0.0	1.0	1.0	1.0	1.0	0.0
3,200.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

Initial Supporting table - EngineOverSpeedLimit

Description: Engine OverSpeed Limit versus gear

Notes: Used for P0300-P0308. Cal Name: KaEOSC_n_EngOvrspdLimitGear

EngineOverSpeedLimit - Part 1

y/x	CeTGRR_e_TransGr1	CeTGRR_e_TransGr2	CeTGRR_e_TransGr3	CeTGRR_e_TransGr4	CeTGRR_e_TransGr5	CeTGRR_e_TransGr6	CeTGRR_e_TransGrEVT1
1	4,800	4,800	4,800	4,800	4,800	4,800	4,800

EngineOverSpeedLimit - Part 2

y/x	CeTGRR_e_TransGrEVT2	CeTGRR_e_TransGrNeut	CeTGRR_e_TransGrRvrs	CeTGRR_e_TransGrPark	CeTGRR_e_TransGr7	CeTGRR_e_TransGr8	
1	4,800	4,800	4,800	4,800	4,800	4,800	

Initial Supporting table - EnginePointEnable_DPF_TempDeviation

Description:

Notes:

y/x	980	1,000	2,000	2,500	3,000	3,010	4,000	4,200
0	0	0	0	0	0	0	0	0
5	0	1	1	1	1	0	0	0
10	0	1	1	1	1	0	0	0
15	0	1	1	1	1	0	0	0
20	0	1	1	1	1	0	0	0
30	0	1	1	1	1	0	0	0
40	0	1	1	1	1	0	0	0
60	0	1	1	1	1	0	0	0
61	0	0	0	0	0	0	0	0

Initial Supporting table - EnginePointEnable_HC_TempDeviation

Description:

Notes:

y/x	980	1,000	1,100	1,200	1,800	2,000	2,800	3,500
0	0	0	0	0	0	0	0	0
8	0	1	1	1	1	1	1	1
10	0	1	1	1	1	1	1	1
15	0	1	1	1	1	1	1	1
20	0	1	1	1	1	1	1	1
50	0	1	1	1	1	1	1	1
80	0	1	1	1	1	1	1	1
120	0	1	1	1	1	1	1	1
140	0	1	1	1	1	1	1	1

Initial Supporting table - Exhaust Gas Pressure Too Low Threshold

Description: Diagnostic threshold for the exhaust gas pressure too low monitoring. This threshold is function of the exhaust gas flow and of the soot trapped in the DPF

Notes:

y/x	10	20	60	100	140	200	200	200
40	0	0	0	0	0	0	0	0
60	0	0	0	0	0	0	0	0
120	1	1	1	1	1	1	1	1
160	3	3	3	3	3	3	3	3
200	3	3	3	3	3	3	3	3
240	4	4	4	4	4	4	4	4
280	5	5	5	5	5	5	5	5
320	6	6	6	6	6	6	6	6

Initial Supporting table - Flow Resistance High Threshold

Description: Diagnostic threshold for the flow resistance high monitoring. This threshold is function of the soot trapped in the DPF

Notes:

y/x	10	20	60	100	140	200	200	200
1	0	0	0	0	0	0	0	0

Initial Supporting table - Flow Resistance Too High Threshold

Description: Diagnostic threshold for the flow resistance too high monitoring. This threshold is function of the soot trapped in the DPF

Notes:

y/x	10	20	60	100	140	200	200	200
1	0	0	0	0	0	0	0	0

Initial Supporting table - IdleCyl_Decel

Description: Crankshaft decel threshold. Thresholds are a function of rpm and % engine Load.

Notes: Used for P0300-P0308. Cal Name: KtMSFD_dt_IdleCylinderMode

y/x	400	500	600	700	800	900	1,000	1,100	1,200	1,400	1,600	1,800	2,000
3	3,639	3,153	2,790	2,062	1,153	704	643	595	388	219	158	122	115
6	4,245	3,639	2,911	2,123	1,213	776	643	595	388	219	158	122	115
8	4,851	4,245	3,032	2,183	1,213	776	649	607	388	219	158	122	122
10	5,458	4,851	3,881	2,304	1,274	776	655	557	360	323	192	146	128
12	6,064	5,458	4,124	2,547	1,334	776	668	568	371	364	279	158	134
14	6,064	5,700	4,245	2,729	1,456	789	692	643	388	326	243	172	140
16	6,064	6,064	4,566	2,911	1,577	849	728	655	398	330	243	213	146
18	6,064	6,064	5,136	3,396	1,698	970	849	728	408	340	243	221	164
20	6,064	6,064	5,707	3,639	1,819	1,153	1,031	849	418	359	243	246	174
22	6,064	6,064	5,943	3,821	2,062	1,456	1,213	946	400	351	316	271	182
24	6,064	6,064	6,064	4,002	2,426	1,819	1,395	1,128	537	364	340	291	195
26	6,064	6,064	6,064	4,245	3,032	2,183	1,577	1,261	710	410	364	328	200
30	6,064	6,064	6,064	4,851	3,153	2,426	1,819	1,456	855	546	485	364	243
40	6,064	6,064	6,064	5,094	3,517	3,032	2,426	1,819	1,456	837	728	485	364
60	6,064	6,064	6,064	5,336	4,124	3,639	3,032	2,426	1,819	1,153	946	728	546
78	6,064	6,064	6,064	5,579	4,851	4,245	3,639	3,032	2,183	1,456	1,213	970	728
97	6,064	6,064	6,064	6,064	5,336	4,851	4,245	3,639	2,668	1,819	1,456	1,213	910

Initial Supporting table - IdleCyl_Jerk

Description: Crankshaft jerk threshold. Thresholds are a function of rpm and % engine Load.

Notes: Used for P0300-P0308. Cal Name: KtMSFD_ddt_IdleCylinderMode

y/x	400	500	600	700	800	900	1,000	1,100	1,200	1,400	1,600	1,800	2,000
3	6,792	6,185	5,700	3,153	2,062	1,092	776	619	522	195	182	158	152
6	6,792	6,185	5,700	3,396	2,183	1,456	805	631	546	219	182	158	152
8	6,913	6,307	5,821	3,881	2,547	1,698	1,073	789	546	219	207	158	152
10	8,368	7,762	7,155	4,366	3,032	1,481	1,213	775	503	340	223	158	164
12	9,702	9,096	8,490	4,851	3,275	1,661	1,334	873	524	364	304	212	170
14	9,702	9,702	9,702	5,585	3,760	1,746	1,456	1,068	607	395	340	243	174
16	9,702	9,702	9,702	6,064	4,245	2,426	1,698	1,201	510	337	333	255	180
18	9,702	9,702	9,702	6,670	4,851	2,790	1,941	1,334	637	428	404	304	195
20	9,702	9,702	9,702	7,277	5,458	3,153	2,304	1,577	801	519	478	364	207
22	9,702	9,702	9,702	7,883	5,943	3,760	2,668	1,759	885	577	702	415	267
24	9,702	9,702	9,702	8,490	6,670	4,487	3,219	2,062	1,104	680	765	485	291
26	9,702	9,702	9,702	9,096	7,641	5,094	3,396	2,426	1,316	807	781	578	328
30	9,702	9,702	9,702	9,702	8,490	5,700	3,881	2,911	1,457	934	957	668	400
40	9,702	9,702	9,702	9,702	9,460	6,307	4,730	3,639	2,668	1,698	1,275	728	607
60	9,702	9,702	9,702	9,702	9,702	7,277	5,821	4,609	3,396	2,304	1,638	970	825
78	9,702	9,702	9,702	9,702	9,702	8,247	7,034	5,458	4,245	2,911	2,365	1,723	1,092
97	9,702	9,702	9,702	9,702	9,702	9,217	8,004	6,307	5,094	4,002	3,109	2,169	1,456

Initial Supporting table - IdleSCD_Decel

Description: Crankshaft decel threshold while in SCD mode. SCD mode uses smaller windows near TDC. Thresholds are a function of rpm and % engine Load.

Notes: Used for P0300-P0308. Cal Name: KtMISF_dt_SCD_IdleMode
Note: Misfire's Load term is %, but not PID$04. PID $04 is not robust to temperature and alititude shifts. (especially decel and jerk thresholds since they track actual air trapped in cylinder)

y/x	400	500	600	700	800	900	1,000	1,100	1,200	1,400	1,600	1,800	2,000
3	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767
6	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767
8	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767
10	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767
12	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767
14	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767
16	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767
18	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767
20	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767
22	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767
24	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767
26	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767
30	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767
40	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767
60	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767
78	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767
97	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767

Initial Supporting table - IdleSCD_Jerk

Description: Crankshaft jerk threshold while in SCD mode. SCD mode uses smaller windows near TDC. Thresholds are a function of rpm and % engine Load.

Notes: Used for P0300-P0308. Cal Name: KtMISF_ddt_SCD_IdleMode

y/x	400	500	600	700	800	900	1,000	1,100	1,200	1,400	1,600	1,800	2,000
3	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767
6	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767
8	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767
10	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767
12	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767
14	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767
16	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767
18	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767
20	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767
22	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767
24	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767
26	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767
30	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767
40	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767
60	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767
78	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767
97	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767

Initial Supporting table - InfrequentRegen

Description: Initiates a misfire delay when the current combustion mode matchs a selection in the table. Diesel only. A value of CeCMBR_i_CombModesMax means not selected.

Notes: Used for P0300-P0308. Cal Name: KaMSFD_e_InfrqntRegenDelayCM

InfrequentRegen - Part 1

y/x	0	1	2	3	4	5
1	CeCMBR_i_CombModes Max	CeCMBR_i_CombModes Max	CeCMBR_i_CombModes Max	CeCMBR_i_CombModes Max	CeCMBR_i_CombModes Max	CeCMBR_i_CombModes Max

InfrequentRegen - Part 2

y/x	6	7	8	9	10	11
1	CeCMBR_i_CombModes Max	CeCMBR_i_CombModes Max	CeCMBR_i_CombModes Max	CeCMBR_i_CombModes Max	CeCMBR_i_CombModes Max	CeCMBR_i_CombModes Max

InfrequentRegen - Part 3

y/x	12	13	14	15	16	
1	CeCMBR_i_CombModes Max	CeCMBR_i_CombModes Max	CeCMBR_i_CombModes Max	CeCMBR_i_CombModes Max	CeCMBR_i_CombModes Max	

Initial Supporting table - KaFADC_p_SQA_LrnDelt

Description: Delta Rail Pressure allowed to enable SQA learning.

Notes:

y/x	0	1	2	3	4
1	3	3	3	3	3

Initial Supporting table - KaFADC_t_SQA_MaxAdptDeltET[us]

Description: Upper Energizing time limit for SQA max authority.

Notes: This limits applies on the values coming from LPF used to filter SQA learned value before write it in the map.

y/x	0	1	2	3	4
1	143	110	102	91	100

Initial Supporting table - KaFADC_t_SQA_MinAdptDeltET[us]

Description: Lower Energizing time limit for SQA max authority.

Notes: This limits applies on the values coming from LPF used to filter SQA learned value before write it in the map.

y/x	0	1	2	3	4
1	-143	-110	-102	-91	-100

Initial Supporting table - KaOXYD_b_NOx1_DecrDynChkCmbEnbl

Description: This array indicates what are the combustion mode in which Decreasing Dynamic Check Diagnosis is enabled

Notes: X values represent allowed combustion modes, Y values represent enabling flag:
1 - enabled
0 - not enabled

KaOXYD_b_NOx1_DecrDynChkCmbEnbl - Part 1

y/x	CeCMBR_e_Normal	CeCMBR_e_DPF_HiO2	CeCMBR_e_DPF_LoO2	CeCMBR_e_C2	CeCMBR_e_LNT_DeNOx
1	1	0	0	0	0

KaOXYD_b_NOx1_DecrDynChkCmbEnbl - Part 2

y/x	CeCMBR_e_LNT_DeSOx_Lean	CeCMBR_e_LNT_DeSOx_Rich	CeCMBR_e_C3	CeCMBR_e_SCR_Temp1	CeCMBR_e_SCR_Temp2
1	0	0	0	0	0

KaOXYD_b_NOx1_DecrDynChkCmbEnbl - Part 3

y/x	CeCMBR_e_DPF_PN	CeCMBR_e_DPF_RichIdle	CeCMBR_e_DPF_EngPrtct_HiO2	CeCMBR_e_DPF_EngPrtct_LoO2	CeCMBR_e_LNT_EngPrtct
1	0	0	0	0	0

KaOXYD_b_NOx1_DecrDynChkCmbEnbl - Part 4

y/x	CeCMBR_e_SCR_Temp3	CeCMBR_e_FAD_IdleInjLrn	CeCMBR_e_HCS_DeHC_Drive	CeCMBR_e_HCS_DeHC_Park	CeCMBR_e_SCR_ServWarmUp
1	0	0	0	0	0

KaOXYD_b_NOx1_DecrDynChkCmbEnbl - Part 5

y/x	CeCMBR_e_SCR_ServCheck	CeCMBR_e_SCR_DeSOx			
1	0	0			

Initial Supporting table - KaOXYD_b_NOx1_IncrDynChkCmbEnbl

Description: This array indicates what are the combustion mode in which Increasing Dynamic Check Diagnosis is enabled

Notes: X values represent allowed combustion modes, Y values represent enabling flag:
1 - enabled
0 - not enabled

KaOXYD_b_NOx1_IncrDynChkCmbEnbl - Part 1

y/x	CeCMBR_e_Normal	CeCMBR_e_DPF_HiO2	CeCMBR_e_DPF_LoO2	CeCMBR_e_C2	CeCMBR_e_LNT_DeNOx
1	1	0	0	0	0

KaOXYD_b_NOx1_IncrDynChkCmbEnbl - Part 2

y/x	CeCMBR_e_LNT_DeSOx_Lean	CeCMBR_e_LNT_DeSOx_Rich	CeCMBR_e_C3	CeCMBR_e_SCR_Temp1	CeCMBR_e_SCR_Temp2
1	0	0	0	0	0

KaOXYD_b_NOx1_IncrDynChkCmbEnbl - Part 3

y/x	CeCMBR_e_DPF_PN	CeCMBR_e_DPF_RichIdle	CeCMBR_e_DPF_EngPrtct_HiO2	CeCMBR_e_DPF_EngPrtct_LoO2	CeCMBR_e_LNT_EngPrtct
1	0	0	0	0	0

KaOXYD_b_NOx1_IncrDynChkCmbEnbl - Part 4

y/x	CeCMBR_e_SCR_Temp3	CeCMBR_e_FAD_IdleInjLrn	CeCMBR_e_HCS_DeHC_Drive	CeCMBR_e_HCS_DeHC_Park	CeCMBR_e_SCR_ServWarmUp
1	0	0	0	0	0

KaOXYD_b_NOx1_IncrDynChkCmbEnbl - Part 5

y/x	CeCMBR_e_SCR_ServCheck	CeCMBR_e_SCR_DeSOx			
1	0	0			

Initial Supporting table - KaOXYD_b_NOx1LoadChkCmbModeEnbl

Description: This array indicates what are the combustion mode in which Plausibility Diagnosis in Full Load condition is enabled

Notes: X values represent allowed combustion modes, Y values represent enabling flag:
1 - enabled
0 - not enabled

KaOXYD_b_NOx1LoadChkCmbModeEnbl - Part 1

y/x	CeCMBR_e_Normal	CeCMBR_e_DPF_HiO2	CeCMBR_e_DPF_LoO2	CeCMBR_e_C2	CeCMBR_e_LNT_DeNOx
1	1	0	0	0	0

KaOXYD_b_NOx1LoadChkCmbModeEnbl - Part 2

y/x	CeCMBR_e_LNT_DeSOx_Lean	CeCMBR_e_LNT_DeSOx_Rich	CeCMBR_e_C3	CeCMBR_e_SCR_Temp1	CeCMBR_e_SCR_Temp2
1	0	0	0	0	0

KaOXYD_b_NOx1LoadChkCmbModeEnbl - Part 3

y/x	CeCMBR_e_DPF_PN	CeCMBR_e_DPF_RichIdle	CeCMBR_e_DPF_EngPrtct_HiO2	CeCMBR_e_DPF_EngPrtct_LoO2	CeCMBR_e_LNT_EngPrtct
1	0	0	0	0	0

KaOXYD_b_NOx1LoadChkCmbModeEnbl - Part 4

y/x	CeCMBR_e_SCR_Temp3	CeCMBR_e_FAD_IdleInjLrn	CeCMBR_e_HCS_DeHC_Drive	CeCMBR_e_HCS_DeHC_Park	CeCMBR_e_SCR_ServWarmUp
1	0	0	0	0	0

KaOXYD_b_NOx1LoadChkCmbModeEnbl - Part 5

y/x	CeCMBR_e_SCR_ServCheck	CeCMBR_e_SCR_DeSOx			
1	0	0			

Initial Supporting table - KaOXYD_b_NOx1OvrnChkCmbModeEnbl

Description: This array indicates what are the combustion mode in which Plausibility Diagnosis in Overrun condition is enabled

Notes: X values represent allowed combustion modes, Y values represent enabling flag:
1 - enabled
0 - not enabled

KaOXYD_b_NOx1OvrnChkCmbModeEnbl - Part 1

y/x	CeCMBR_e_Normal	CeCMBR_e_DPF_HiO2	CeCMBR_e_DPF_LoO2	CeCMBR_e_C2	CeCMBR_e_LNT_DeNOx
1	1	0	0	0	0

KaOXYD_b_NOx1OvrnChkCmbModeEnbl - Part 2

y/x	CeCMBR_e_LNT_DeSOx_Lean	CeCMBR_e_LNT_DeSOx_Rich	CeCMBR_e_C3	CeCMBR_e_SCR_Temp1	CeCMBR_e_SCR_Temp2
1	0	0	0	0	0

KaOXYD_b_NOx1OvrnChkCmbModeEnbl - Part 3

y/x	CeCMBR_e_DPF_PN	CeCMBR_e_DPF_RichIdle	CeCMBR_e_DPF_EngPrtct_HiO2	CeCMBR_e_DPF_EngPrtct_LoO2	CeCMBR_e_LNT_EngPrtct
1	0	0	0	0	0

KaOXYD_b_NOx1OvrnChkCmbModeEnbl - Part 4

y/x	CeCMBR_e_SCR_Temp3	CeCMBR_e_FAD_IdleInjLrn	CeCMBR_e_HCS_DeHC_Drive	CeCMBR_e_HCS_DeHC_Park	CeCMBR_e_SCR_ServWarmUp
1	0	0	0	0	0

KaOXYD_b_NOx1OvrnChkCmbModeEnbl - Part 5

y/x	CeCMBR_e_SCR_ServCheck	CeCMBR_e_SCR_DeSOx			
1	0	0			

Initial Supporting table - KaOXYD_b_NOx1SigRngEnblCmbMode

Description: This array indicates what are the combustion mode in which Signal Range Diagnosis is enabled

Notes: X values represent allowed combustion modes, Y values represent enabling flag:
1 - enabled
0 - not enabled

KaOXYD_b_NOx1SigRngEnblCmbMode - Part 1

y/x	CeCMBR_e_Normal	CeCMBR_e_DPF_HiO2	CeCMBR_e_DPF_LoO2	CeCMBR_e_C2	CeCMBR_e_LNT_DeNOx
1	1	0	0	0	0

KaOXYD_b_NOx1SigRngEnblCmbMode - Part 2

y/x	CeCMBR_e_LNT_DeSOx_Lean	CeCMBR_e_LNT_DeSOx_Rich	CeCMBR_e_C3	CeCMBR_e_SCR_Temp1	CeCMBR_e_SCR_Temp2
1	0	0	0	0	0

KaOXYD_b_NOx1SigRngEnblCmbMode - Part 3

y/x	CeCMBR_e_DPF_PN	CeCMBR_e_DPF_RichIdle	CeCMBR_e_DPF_EngPrtct_HiO2	CeCMBR_e_DPF_EngPrtct_LoO2	CeCMBR_e_LNT_EngPrtct
1	0	0	0	0	0

KaOXYD_b_NOx1SigRngEnblCmbMode - Part 4

y/x	CeCMBR_e_SCR_Temp3	CeCMBR_e_FAD_IdleInjLrn	CeCMBR_e_HCS_DeHC_Drive	CeCMBR_e_HCS_DeHC_Park	CeCMBR_e_SCR_ServWarmUp
1	0	0	0	0	0

KaOXYD_b_NOx1SigRngEnblCmbMode - Part 5

y/x	CeCMBR_e_SCR_ServCheck	CeCMBR_e_SCR_DeSOx			
1	0	0			

Initial Supporting table - KaOXYD_b_NOx2_DecrDynChkCmbEnbl

Description: This array indicates what are the combustion mode in which Decreasing Dynamic Check Diagnosis is enabled

Notes: X values represent allowed combustion modes, Y values represent enabling flag:
1 - enabled
0 - not enabled

KaOXYD_b_NOx2_DecrDynChkCmbEnbl - Part 1

y/x	CeCMBR_e_Normal	CeCMBR_e_DPF_HiO2	CeCMBR_e_DPF_LoO2	CeCMBR_e_C2	CeCMBR_e_LNT_DeNOx
1	1	0	0	0	0

KaOXYD_b_NOx2_DecrDynChkCmbEnbl - Part 2

y/x	CeCMBR_e_LNT_DeSOx_Lean	CeCMBR_e_LNT_DeSOx_Rich	CeCMBR_e_C3	CeCMBR_e_SCR_Temp1	CeCMBR_e_SCR_Temp2
1	0	0	0	0	0

KaOXYD_b_NOx2_DecrDynChkCmbEnbl - Part 3

y/x	CeCMBR_e_DPF_PN	CeCMBR_e_DPF_RichIdle	CeCMBR_e_DPF_EngPrtct_HiO2	CeCMBR_e_DPF_EngPrtct_LoO2	CeCMBR_e_LNT_EngPrtct
1	0	0	0	0	0

KaOXYD_b_NOx2_DecrDynChkCmbEnbl - Part 4

y/x	CeCMBR_e_SCR_Temp3	CeCMBR_e_FAD_IdleInjLrn	CeCMBR_e_HCS_DeHC_Drive	CeCMBR_e_HCS_DeHC_Park	CeCMBR_e_SCR_ServWarmUp
1	0	0	0	0	0

KaOXYD_b_NOx2_DecrDynChkCmbEnbl - Part 5

y/x	CeCMBR_e_SCR_ServCheck	CeCMBR_e_SCR_DeSOx			
1	0	0			

Initial Supporting table - KaOXYD_b_NOx2_IncrDynChkCmbEnbl

Description: This array indicates what are the combustion mode in which Increasing Dynamic Check Diagnosis is enabled

Notes: X values represent allowed combustion modes, Y values represent enabling flag:
1 - enabled
0 - not enabled

KaOXYD_b_NOx2_IncrDynChkCmbEnbl - Part 1

y/x	CeCMBR_e_Normal	CeCMBR_e_DPF_HiO2	CeCMBR_e_DPF_LoO2	CeCMBR_e_C2	CeCMBR_e_LNT_DeNOx
1	1	0	0	0	0

KaOXYD_b_NOx2_IncrDynChkCmbEnbl - Part 2

y/x	CeCMBR_e_LNT_DeSOx_Lean	CeCMBR_e_LNT_DeSOx_Rich	CeCMBR_e_C3	CeCMBR_e_SCR_Temp1	CeCMBR_e_SCR_Temp2
1	0	0	0	0	0

KaOXYD_b_NOx2_IncrDynChkCmbEnbl - Part 3

y/x	CeCMBR_e_DPF_PN	CeCMBR_e_DPF_RichIdle	CeCMBR_e_DPF_EngPrtct_HiO2	CeCMBR_e_DPF_EngPrtct_LoO2	CeCMBR_e_LNT_EngPrtct
1	0	0	0	0	0

KaOXYD_b_NOx2_IncrDynChkCmbEnbl - Part 4

y/x	CeCMBR_e_SCR_Temp3	CeCMBR_e_FAD_IdleInjLrn	CeCMBR_e_HCS_DeHC_Drive	CeCMBR_e_HCS_DeHC_Park	CeCMBR_e_SCR_ServWarmUp
1	0	0	0	0	0

KaOXYD_b_NOx2_IncrDynChkCmbEnbl - Part 5

y/x	CeCMBR_e_SCR_ServCheck	CeCMBR_e_SCR_DeSOx			
1	0	0			

Initial Supporting table - KaOXYD_b_NOx2SigRngEnblCmbMode

Description: This array indicates what are the combustion mode in which Signal Range Diagnosis is enabled

Notes: X values represent allowed combustion modes, Y values represent enabling flag:
1 - enabled
0 - not enabled

KaOXYD_b_NOx2SigRngEnblCmbMode - Part 1

y/x	CeCMBR_e_Normal	CeCMBR_e_DPF_HiO2	CeCMBR_e_DPF_LoO2	CeCMBR_e_C2	CeCMBR_e_LNT_DeNOx
1	1	0	0	0	0

KaOXYD_b_NOx2SigRngEnblCmbMode - Part 2

y/x	CeCMBR_e_LNT_DeSOx_Lean	CeCMBR_e_LNT_DeSOx_Rich	CeCMBR_e_C3	CeCMBR_e_SCR_Temp1	CeCMBR_e_SCR_Temp2
1	0	0	0	0	0

KaOXYD_b_NOx2SigRngEnblCmbMode - Part 3

y/x	CeCMBR_e_DPF_PN	CeCMBR_e_DPF_RichIdle	CeCMBR_e_DPF_EngPrtct_HiO2	CeCMBR_e_DPF_EngPrtct_LoO2	CeCMBR_e_LNT_EngPrtct
1	0	0	0	0	0

KaOXYD_b_NOx2SigRngEnblCmbMode - Part 4

y/x	CeCMBR_e_SCR_Temp3	CeCMBR_e_FAD_IdleInjLrn	CeCMBR_e_HCS_DeHC_Drive	CeCMBR_e_HCS_DeHC_Park	CeCMBR_e_SCR_ServWarmUp
1	0	0	0	0	0

KaOXYD_b_NOx2SigRngEnblCmbMode - Part 5

y/x	CeCMBR_e_SCR_ServCheck	CeCMBR_e_SCR_DeSOx			
1	0	0			

Initial Supporting table - KtFADC_V_FSA_FuelMax

Description: Map used to define FSA maximum authority

Notes: Map is function of injected fuel quantity [mm^3] and intake air mass flow [mg]

y/x	10	20	30	40	50	60	70	80	90	100
400	11	12	14	17	20	23	24	26	27	29
600	12	13	15	17	20	23	24	26	27	29
800	13	14	16	18	21	24	24	26	27	29
1,000	13	15	17	19	22	24	25	27	28	30
1,200	13	15	17	20	23	25	26	28	29	31
1,400	13	15	17	20	23	26	27	29	30	31
1,600	13	15	17	20	23	26	28	30	31	32
1,800	13	15	17	20	23	26	28	30	31	33

Initial Supporting table - KtFADC_V_FSA_FuelMin

Description: Map used to define FSA minimum authority

Notes: Map is function of injected fuel quantity [mm^3] and intake air mass flow [mg]

y/x	10	20	30	40	50	60	70	80	90	100
400	-11	-12	-14	-17	-20	-23	-24	-26	-27	-29
600	-12	-13	-15	-17	-20	-23	-24	-26	-27	-29
800	-13	-14	-16	-18	-21	-24	-24	-26	-27	-29
1,000	-13	-15	-17	-19	-22	-24	-25	-27	-28	-30
1,200	-13	-15	-17	-20	-23	-25	-26	-28	-29	-31
1,400	-13	-15	-17	-20	-23	-26	-27	-29	-30	-31
1,600	-13	-15	-17	-20	-23	-26	-28	-30	-31	-32
1,800	-13	-15	-17	-20	-23	-26	-28	-30	-31	-33

Initial Supporting table - KtFADD_Pct_SSQA_InjSuspConfLvl

Description: Calibration table to define the suspicious confidence level (function of current last raw DeltET and previous one).

Notes:

y/x	-100	-70	-51	-50	-20	0	20	50	51	70	100
-100	0	0	0	100	100	100	100	100	0	0	0
-70	0	0	0	100	100	100	100	100	0	0	0
-51	0	0	0	100	100	100	100	100	0	0	0
-50	0	0	0	100	100	100	100	100	0	0	0
0	0	0	0	100	100	100	100	100	0	0	0
50	0	0	0	100	100	100	100	100	0	0	0
51	0	0	0	100	100	100	100	100	0	0	0
70	0	0	0	100	100	100	100	100	0	0	0
100	0	0	0	100	100	100	100	100	0	0	0

Initial Supporting table - KtFADD_V_FSA_ECM_HiThrsh

Description: Map used to define FSA emission correlated maximum threshold

Notes: Map is function of injected fuel quantity [mm^3] and intake air mass flow [mg]

y/x	4	6	8	10	11	12	17	18	20	24
350	5	5	5	5	5	5	6	6	6	6
375	5	5	5	5	5	5	6	6	6	6
400	5	5	5	5	5	5	6	6	6	6
450	5	5	5	5	5	5	6	6	6	6
500	5	5	5	5	5	5	6	6	6	6
550	5	5	5	5	5	5	6	6	6	6
600	5	5	5	5	5	5	6	6	6	6
800	5	5	5	5	5	5	7	7	7	7

Initial Supporting table - KtFADD_V_FSA_ECM_LoThrsh

Description: Map used to define FSA emission correlated minimum threshold

Notes: Map is function of injected fuel quantity [mm^3] and intake air mass flow [mg]

y/x	4	6	8	10	11	12	17	18	20	24
350	-5	-5	-5	-5	-5	-5	-5	-5	-5	-5
375	-5	-5	-5	-5	-5	-5	-5	-5	-5	-5
400	-5	-5	-5	-5	-5	-5	-5	-5	-5	-5
450	-5	-5	-5	-5	-5	-5	-5	-5	-5	-5
500	-5	-5	-5	-5	-5	-5	-5	-5	-5	-5
550	-5	-5	-5	-5	-5	-5	-5	-5	-5	-5
600	-5	-5	-5	-5	-5	-5	-5	-5	-5	-5
800	-5	-5	-5	-5	-5	-5	-5	-5	-5	-5

Initial Supporting table - Maximum allowed time to complete regeneration

Description:

Notes:

Maximum allowed time to complete regeneration - Part 1

y/x	CeDPFR_e_MisProf0	CeDPFR_e_MisProf1	CeDPFR_e_MisProf2	CeDPFR_e_MisProf3	CeDPFR_e_MisProf4	CeDPFR_e_MisProf5	CeDPFR_e_MisProf6
1	1,800	3,600	3,600	3,600	3,600	3,600	3,600

Maximum allowed time to complete regeneration - Part 2

y/x	CeDPFR_e_MisProf7	CeDPFR_e_MisProf8	CeDPFR_e_MisProf9	CeDPFR_e_MisProf10	CeDPFR_e_MisProf11	CeDPFR_e_MisProf12	CeDPFR_e_MisProf13
1	3,600	3,600	3,600	3,600	3,600	3,600	7,200

Maximum allowed time to complete regeneration - Part 3

y/x	CeDPFR_e_MisProf14	CeDPFR_e_MisProf15	CeDPFR_e_MisProf16	CeDPFR_e_MisProf17Srv	CeDPFR_e_MisProf18Rec		
1	3,600	3,600	3,600	3,600	3,600		

Initial Supporting table - Maximum allowed time to reach steady state for regeneration

Description:

Notes:

Maximum allowed time to reach steady state for regeneration - Part 1

y/x	CeDPFR_e_MisProf0	CeDPFR_e_MisProf1	CeDPFR_e_MisProf2	CeDPFR_e_MisProf3	CeDPFR_e_MisProf4	CeDPFR_e_MisProf5	CeDPFR_e_MisProf6
1	2,700	2,700	2,700	2,700	2,700	2,700	2,700

Maximum allowed time to reach steady state for regeneration - Part 2

y/x	CeDPFR_e_MisProf7	CeDPFR_e_MisProf8	CeDPFR_e_MisProf9	CeDPFR_e_MisProf10	CeDPFR_e_MisProf11	CeDPFR_e_MisProf12	CeDPFR_e_MisProf13
1	2,700	2,700	2,700	2,700	2,700	2,700	2,700

Maximum allowed time to reach steady state for regeneration - Part 3

y/x	CeDPFR_e_MisProf14	CeDPFR_e_MisProf15	CeDPFR_e_MisProf16	CeDPFR_e_MisProf17 Srv	CeDPFR_e_MisProf18 Rec		
1	2,700	2,700	2,700	2,700	2,700		

Initial Supporting table - Maximum allowed time to release post injections for regeneration

Description:

Notes:

Maximum allowed time to release post injections for regeneration - Part 1

y/x	CeDPFR_e_MisProf0	CeDPFR_e_MisProf1	CeDPFR_e_MisProf2	CeDPFR_e_MisProf3	CeDPFR_e_MisProf4	CeDPFR_e_MisProf5	CeDPFR_e_MisProf6
1	5,000	5,000	5,000	5,000	5,000	5,000	5,000

Maximum allowed time to release post injections for regeneration - Part 2

y/x	CeDPFR_e_MisProf7	CeDPFR_e_MisProf8	CeDPFR_e_MisProf9	CeDPFR_e_MisProf10	CeDPFR_e_MisProf11	CeDPFR_e_MisProf12	CeDPFR_e_MisProf13
1	5,000	5,000	5,000	5,000	5,000	5,000	5,000

Maximum allowed time to release post injections for regeneration - Part 3

y/x	CeDPFR_e_MisProf14	CeDPFR_e_MisProf15	CeDPFR_e_MisProf16	CeDPFR_e_MisProf17 Srv	CeDPFR_e_MisProf18 Rec		
1	5,000	5,000	5,000	5,000	5,000		

Initial Supporting table - Metering Unit Valve present

Description: Define whether Metering Unit Valve is present (value equal to 1) in Fuel Injection System

Notes:

y/x	1
1	1

Initial Supporting table - NOX_NOx1_DecrDynCmbMode

Description: Combustion mode dependent diag enable for Upstream NOx sensor dynamic check in decreasing direction

Notes:

NOX_NOx1_DecrDynCmbMode - Part 1

y/x	CeCMBR_e_Normal	CeCMBR_e_DPF_HiO2	CeCMBR_e_DPF_LoO2	CeCMBR_e_C2	CeCMBR_e_LNT_DeNOx	CeCMBR_e_LNT_DeSOx_Lean
1	1	0	0	0	0	0

NOX_NOx1_DecrDynCmbMode - Part 2

y/x	CeCMBR_e_LNT_DeSOx_Rich	CeCMBR_e_C3	CeCMBR_e_SCR_Temp1	CeCMBR_e_SCR_Temp2	CeCMBR_e_DPF_PN	CeCMBR_e_DPF_RichIdle
1	0	0	0	0	0	0

NOX_NOx1_DecrDynCmbMode - Part 3

y/x	CeCMBR_e_DPF_EngPrtct_HiO2	CeCMBR_e_DPF_EngPrtct_LoO2	CeCMBR_e_LNT_EngPrtct	CeCMBR_e_SCR_Temp3	CeCMBR_e_FAD_IdleInjLrn	CeCMBR_e_HCS_DeHC_Drive
1	0	0	0	0	0	0

NOX_NOx1_DecrDynCmbMode - Part 4

y/x	CeCMBR_e_HCS_DeHC_Park	CeCMBR_e_SCR_ServWarmUp	CeCMBR_e_SCR_ServCheck	CeCMBR_e_SCR_DeSOx		
1	0	0	0	0		

Initial Supporting table - NOX_NOx1_IncrDynCmbMode

Description: Combustion mode dependent diag enable for Upstream NOx sensor dynamic check in increasing direction

Notes:

NOX_NOx1_IncrDynCmbMode - Part 1

y/x	CeCMBR_e_Normal	CeCMBR_e_DPF_HiO2	CeCMBR_e_DPF_LoO2	CeCMBR_e_C2	CeCMBR_e_LNT_DeNOx	CeCMBR_e_LNT_DeSOx_Lean
1	1	0	0	0	0	0

NOX_NOx1_IncrDynCmbMode - Part 2

y/x	CeCMBR_e_LNT_DeSOx_Rich	CeCMBR_e_C3	CeCMBR_e_SCR_Temp1	CeCMBR_e_SCR_Temp2	CeCMBR_e_DPF_PN	CeCMBR_e_DPF_RichIdle
1	0	0	0	0	0	0

NOX_NOx1_IncrDynCmbMode - Part 3

y/x	CeCMBR_e_DPF_EngPrtct_HiO2	CeCMBR_e_DPF_EngPrtct_LoO2	CeCMBR_e_LNT_EngPrtct	CeCMBR_e_SCR_Temp3	CeCMBR_e_FAD_IdleInjLrn	CeCMBR_e_HCS_DeHC_Drive
1	0	0	0	0	0	0

NOX_NOx1_IncrDynCmbMode - Part 4

y/x	CeCMBR_e_HCS_DeHC_Park	CeCMBR_e_SCR_ServWarmUp	CeCMBR_e_SCR_ServCheck	CeCMBR_e_SCR_DeSOx		
1	0	0	0	0		

Initial Supporting table - NOX_NOx2SelfTstEnblCmbMode

Description: Combustion mode dependent diag enable for Downstream NOx sensor selt-test monitoring

Notes:

NOX_NOx2SelfTstEnblCmbMode - Part 1

y/x	CeCMBR_e_Normal	CeCMBR_e_DPF_HiO2	CeCMBR_e_DPF_LoO2	CeCMBR_e_C2	CeCMBR_e_LNT_DeNOx	CeCMBR_e_LNT_DeSOx_Lean
1	1	0	0	0	0	0

NOX_NOx2SelfTstEnblCmbMode - Part 2

y/x	CeCMBR_e_LNT_DeSOx_Rich	CeCMBR_e_C3	CeCMBR_e_SCR_Temp1	CeCMBR_e_SCR_Temp2	CeCMBR_e_DPF_PN	CeCMBR_e_DPF_RichIdle
1	0	0	0	0	0	0

NOX_NOx2SelfTstEnblCmbMode - Part 3

y/x	CeCMBR_e_DPF_EngPrtct_HiO2	CeCMBR_e_DPF_EngPrtct_LoO2	CeCMBR_e_LNT_EngPrtct	CeCMBR_e_SCR_Temp3	CeCMBR_e_FAD_IdleInjLrn	CeCMBR_e_HCS_DeHC_Drive
1	0	0	0	0	0	0

NOX_NOx2SelfTstEnblCmbMode - Part 4

y/x	CeCMBR_e_HCS_DeHC_Park	CeCMBR_e_SCR_ServWarmUp	CeCMBR_e_SCR_ServCheck	CeCMBR_e_SCR_DeSOx		
1	0	0	0	0		

Initial Supporting table - NOX_S1_OutRngMaxCmbMode

Description: Combustion mode dependent diag enable for Upstream NOx sensor OOR high monitor

Notes:

NOX_S1_OutRngMaxCmbMode - Part 1

y/x	CeCMBR_e_Normal	CeCMBR_e_DPF_HiO2	CeCMBR_e_DPF_LoO2	CeCMBR_e_C2	CeCMBR_e_LNT_DeNOx	CeCMBR_e_LNT_DeSOx_Lean
1	1	1	0	0	0	0

NOX_S1_OutRngMaxCmbMode - Part 2

y/x	CeCMBR_e_LNT_DeSOx_Rich	CeCMBR_e_C3	CeCMBR_e_SCR_Temp1	CeCMBR_e_SCR_Temp2	CeCMBR_e_DPF_PN	CeCMBR_e_DPF_RichIdle
1	0	0	0	0	1	1

NOX_S1_OutRngMaxCmbMode - Part 3

y/x	CeCMBR_e_DPF_EngPrtct_HiO2	CeCMBR_e_DPF_EngPrtct_LoO2	CeCMBR_e_LNT_EngPrtct	CeCMBR_e_SCR_Temp3	CeCMBR_e_FAD_IdleInjLrn	CeCMBR_e_HCS_DeHC_Drive
1	1	0	0	0	0	1

NOX_S1_OutRngMaxCmbMode - Part 4

y/x	CeCMBR_e_HCS_DeHC_Park	CeCMBR_e_SCR_ServWarmUp	CeCMBR_e_SCR_ServCheck	CeCMBR_e_SCR_DeSOx		
1	1	1	1	0		

Initial Supporting table - NOX_S1_OutRngMinCmbMode

Description: Combustion mode dependent diag enable for Upstream NOx sensor OOR low monitor

Notes:

NOX_S1_OutRngMinCmbMode - Part 1

y/x	CeCMBR_e_Normal	CeCMBR_e_DPF_HiO2	CeCMBR_e_DPF_LoO2	CeCMBR_e_C2	CeCMBR_e_LNT_DeNOx	CeCMBR_e_LNT_DeSOx_Lean
1	1	1	0	0	0	0

NOX_S1_OutRngMinCmbMode - Part 2

y/x	CeCMBR_e_LNT_DeSOx_Rich	CeCMBR_e_C3	CeCMBR_e_SCR_Temp1	CeCMBR_e_SCR_Temp2	CeCMBR_e_DPF_PN	CeCMBR_e_DPF_RichIdle
1	0	0	0	0	1	1

NOX_S1_OutRngMinCmbMode - Part 3

y/x	CeCMBR_e_DPF_EngPrtct_HiO2	CeCMBR_e_DPF_EngPrtct_LoO2	CeCMBR_e_LNT_EngPrtct	CeCMBR_e_SCR_Temp3	CeCMBR_e_FAD_IdleInjLrn	CeCMBR_e_HCS_DeHC_Drive
1	1	0	0	0	0	1

NOX_S1_OutRngMinCmbMode - Part 4

y/x	CeCMBR_e_HCS_DeHC_Park	CeCMBR_e_SCR_ServWarmUp	CeCMBR_e_SCR_ServCheck	CeCMBR_e_SCR_DeSOx		
1	1	1	1	0		

Initial Supporting table - NOX_S1_PlausChkEnblCmbMode

Description: Combustion mode dependent diag enable for Upstream NOx sensor plausibility

Notes:

NOX_S1_PlausChkEnblCmbMode - Part 1

y/x	CeCMBR_e_Normal	CeCMBR_e_DPF_HiO2	CeCMBR_e_DPF_LoO2	CeCMBR_e_C2	CeCMBR_e_LNT_DeNOx	CeCMBR_e_LNT_DeSOx_Lean
1	1	0	0	0	0	0

NOX_S1_PlausChkEnblCmbMode - Part 2

y/x	CeCMBR_e_LNT_DeSOx_Rich	CeCMBR_e_C3	CeCMBR_e_SCR_Temp1	CeCMBR_e_SCR_Temp2	CeCMBR_e_DPF_PN	CeCMBR_e_DPF_RichIdle
1	0	0	0	0	0	0

NOX_S1_PlausChkEnblCmbMode - Part 3

y/x	CeCMBR_e_DPF_EngPrtct_HiO2	CeCMBR_e_DPF_EngPrtct_LoO2	CeCMBR_e_LNT_EngPrtct	CeCMBR_e_SCR_Temp3	CeCMBR_e_FAD_IdleInjLrn	CeCMBR_e_HCS_DeHC_Drive
1	0	0	0	0	0	0

NOX_S1_PlausChkEnblCmbMode - Part 4

y/x	CeCMBR_e_HCS_DeHC_Park	CeCMBR_e_SCR_ServWarmUp	CeCMBR_e_SCR_ServCheck	CeCMBR_e_SCR_DeSOx		
1	0	0	0	0		

Initial Supporting table - NOX_S1_StBitChkEnblCmbMode

Description: Combustion mode dependent diag enable for Upstream NOx sensor stability monitor

Notes:

NOX_S1_StBitChkEnblCmbMode - Part 1

y/x	CeCMBR_e_Normal	CeCMBR_e_DPF_HiO2	CeCMBR_e_DPF_LoO2	CeCMBR_e_C2	CeCMBR_e_LNT_DeNOx	CeCMBR_e_LNT_DeSOx_Lean
1	1	1	0	0	0	0

NOX_S1_StBitChkEnblCmbMode - Part 2

y/x	CeCMBR_e_LNT_DeSOx_Rich	CeCMBR_e_C3	CeCMBR_e_SCR_Temp1	CeCMBR_e_SCR_Temp2	CeCMBR_e_DPF_PN	CeCMBR_e_DPF_RichIdle
1	0	0	0	0	1	1

NOX_S1_StBitChkEnblCmbMode - Part 3

y/x	CeCMBR_e_DPF_EngPrtct_HiO2	CeCMBR_e_DPF_EngPrtct_LoO2	CeCMBR_e_LNT_EngPrtct	CeCMBR_e_SCR_Temp3	CeCMBR_e_FAD_IdleInjLrn	CeCMBR_e_HCS_DeHC_Drive
1	1	0	0	0	0	1

NOX_S1_StBitChkEnblCmbMode - Part 4

y/x	CeCMBR_e_HCS_DeHC_Park	CeCMBR_e_SCR_ServWarmUp	CeCMBR_e_SCR_ServCheck	CeCMBR_e_SCR_DeSOx		
1	1	1	1	0		

Initial Supporting table - NOX_S2_OutRngMaxCmbMode

Description: Combustion mode dependent diag enable for Downstream NOx sensor OOR high monitor

Notes:

NOX_S2_OutRngMaxCmbMode - Part 1

y/x	CeCMBR_e_Normal	CeCMBR_e_DPF_HiO2	CeCMBR_e_DPF_LoO2	CeCMBR_e_C2	CeCMBR_e_LNT_DeNOx	CeCMBR_e_LNT_DeSOx_Lean
1	1	1	0	0	0	0

NOX_S2_OutRngMaxCmbMode - Part 2

y/x	CeCMBR_e_LNT_DeSOx_Rich	CeCMBR_e_C3	CeCMBR_e_SCR_Temp1	CeCMBR_e_SCR_Temp2	CeCMBR_e_DPF_PN	CeCMBR_e_DPF_RichIdle
1	0	0	0	0	1	1

NOX_S2_OutRngMaxCmbMode - Part 3

y/x	CeCMBR_e_DPF_EngPrtct_HiO2	CeCMBR_e_DPF_EngPrtct_LoO2	CeCMBR_e_LNT_EngPrtct	CeCMBR_e_SCR_Temp3	CeCMBR_e_FAD_IdleInjLrn	CeCMBR_e_HCS_DeHC_Drive
1	1	0	0	0	0	1

NOX_S2_OutRngMaxCmbMode - Part 4

y/x	CeCMBR_e_HCS_DeHC_Park	CeCMBR_e_SCR_ServWarmUp	CeCMBR_e_SCR_ServCheck	CeCMBR_e_SCR_DeSOx		
1	1	1	1	0		

Initial Supporting table - NOX_S2_OutRngMinCmbMode

Description: Combustion mode dependent diag enable for Downstream NOx sensor OOR low monitor

Notes:

NOX_S2_OutRngMinCmbMode - Part 1

y/x	CeCMBR_e_Normal	CeCMBR_e_DPF_HiO2	CeCMBR_e_DPF_LoO2	CeCMBR_e_C2	CeCMBR_e_LNT_DeNOx	CeCMBR_e_LNT_DeSOx_Lean
1	1	1	0	0	0	0

NOX_S2_OutRngMinCmbMode - Part 2

y/x	CeCMBR_e_LNT_DeSOx_Rich	CeCMBR_e_C3	CeCMBR_e_SCR_Temp1	CeCMBR_e_SCR_Temp2	CeCMBR_e_DPF_PN	CeCMBR_e_DPF_RichIdle
1	0	0	0	0	1	1

NOX_S2_OutRngMinCmbMode - Part 3

y/x	CeCMBR_e_DPF_EngPrtct_HiO2	CeCMBR_e_DPF_EngPrtct_LoO2	CeCMBR_e_LNT_EngPrtct	CeCMBR_e_SCR_Temp3	CeCMBR_e_FAD_IdleInjLrn	CeCMBR_e_HCS_DeHC_Drive
1	1	0	0	0	0	1

NOX_S2_OutRngMinCmbMode - Part 4

y/x	CeCMBR_e_HCS_DeHC_Park	CeCMBR_e_SCR_ServWarmUp	CeCMBR_e_SCR_ServCheck	CeCMBR_e_SCR_DeSOx		
1	1	1	1	0		

Initial Supporting table - NOX_S2_StBitChkEnblCmbMode

Description: Combustion mode dependent diag enable for Downstream NOx sensor stability monitor

Notes:

NOX_S2_StBitChkEnblCmbMode - Part 1

y/x	CeCMBR_e_Normal	CeCMBR_e_DPF_HiO2	CeCMBR_e_DPF_LoO2	CeCMBR_e_C2	CeCMBR_e_LNT_DeNOx	CeCMBR_e_LNT_DeSOx_Lean
1	1	1	0	0	0	0

NOX_S2_StBitChkEnblCmbMode - Part 2

y/x	CeCMBR_e_LNT_DeSOx_Rich	CeCMBR_e_C3	CeCMBR_e_SCR_Temp1	CeCMBR_e_SCR_Temp2	CeCMBR_e_DPF_PN	CeCMBR_e_DPF_RichIdle
1	0	0	0	0	1	1

NOX_S2_StBitChkEnblCmbMode - Part 3

y/x	CeCMBR_e_DPF_EngPrtct_HiO2	CeCMBR_e_DPF_EngPrtct_LoO2	CeCMBR_e_LNT_EngPrtct	CeCMBR_e_SCR_Temp3	CeCMBR_e_FAD_IdleInjLrn	CeCMBR_e_HCS_DeHC_Drive
1	1	0	0	0	0	1

NOX_S2_StBitChkEnblCmbMode - Part 4

y/x	CeCMBR_e_HCS_DeHC_Park	CeCMBR_e_SCR_ServWarmUp	CeCMBR_e_SCR_ServCheck	CeCMBR_e_SCR_DeSOx		
1	1	1	1	0		

Initial Supporting table - Number of Normals

Description: Number of Normals for the Driveline Ring Filter
After a low level misfire, another misfire may not be detectable until driveline ringing ceases. If no ringing seen, stop filter early.

Notes: Used for P0300-P0308. Cal Name: KaMSFD_Cnt_NumOfNormalsFil

y/x	0	1	2	3	4	5	6	7	8
1	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00

Initial Supporting table - P0087 Minimum rail pressure

Description: Minimum rail pressure threshold (MPa) as function of engine speed (rpm).

Notes:

y/x	199	510	511	800	1,000	1,200	1,400	1,600	2,000	2,400	2,800	3,200	3,600	4,200	4,800	5,400
1	0	0	13	13	13	13	13	13	13	13	13	13	13	13	13	13

Initial Supporting table - P0089 Maximum rail pressure with MU

Description: Maximum rail pressure threshold (MPa) when pressure is governed by Metering Unit as function of engine speed (rpm).

Notes:

y/x	0	1,500	4,250	5,250
1	67	217	217	117

Initial Supporting table - P0101: Pulsation Map

Description: Adjustment of the air mass flow measured by the HSMAF sensor for flow distribution and pulsations. It is function of engine speed (in [rpm]) and fuel request (in [mm^3])

Notes: [-]

y/x	600	800	1,000	1,250	1,500	1,750	2,000	2,250	2,500	2,750	3,000	3,200	3,400	3,600	3,800	4,200
0	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
5	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
10	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
15	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
20	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
25	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
30	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
40	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
50	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
60	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
70	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
80	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
90	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
100	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
120	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1

Initial Supporting table - P0106, P2227, P227B, P00C7: Maximum pressure difference

Description: Maximum delta pressure allowed between the three pressure sensors without setting the fault. It is function of the measured air flow (in [g/s]).

Notes: [kPa]

y/x	3	10	15	20	25	30	35	40
1	10	10	16	16	25	30	30	40

Initial Supporting table - P0181 Fuel Temperature Plausibility

Description: Minimum temperature deviation (°C) as function of engine off time (s) in order to consider not plausible fuel temperature sensor.

Notes:

y/x	5	7	9	11	13	15	17	19
1	20	20	20	20	20	20	20	20

Initial Supporting table - P0181 Fuel Temperature Sensor Reference

Description: Define which sensor is used as reference for check plausibility of fuel temperature sensor.
(CeFTSR_e_ECT_Snsr = Engine coolant temperature, CeFTSR_e_IAT_Snsr = Intake air temperature, CeFTSR_e_IAT_2_Snsr = Manifold air temperature, CeFTSR_e_MainCatTempSnsr = Upstream DPF temperature)

Notes:

y/x	1
1	CeFTSR_e_IAT_2_Snsr

Initial Supporting table - P0191 Rail Pressure Sensor Configuration

Description:

Notes:

y/x	1
1	CeFHPG_e_RPS_DoubleTrack

Initial Supporting table - P0234, P0299: Boost pressure control deviation enabling

Description: Calibration map for the enabling of boost pressure control deviation monitoring, function of combustion mode.

Notes: [boolean]

P0234, P0299: Boost pressure control deviation enabling - Part 1

y/x	CeCMBR_e_Normal	CeCMBR_e_DPF_HiO2	CeCMBR_e_DPF_LoO2	CeCMBR_e_C2	CeCMBR_e_LNT_DeNOx	CeCMBR_e_LNT_DeSOx_Lean
1	1	1	0	0	0	0

P0234, P0299: Boost pressure control deviation enabling - Part 2

y/x	CeCMBR_e_LNT_DeSOx_Rich	CeCMBR_e_C3	CeCMBR_e_SCR_Temp1	CeCMBR_e_SCR_Temp2	CeCMBR_e_DPF_PN	CeCMBR_e_DPF_RichIdle
1	0	0	0	0	0	0

P0234, P0299: Boost pressure control deviation enabling - Part 3

y/x	CeCMBR_e_DPF_EngPrtct_HiO2	CeCMBR_e_DPF_EngPrtct_LoO2	CeCMBR_e_LNT_EngPrtct	CeCMBR_e_SCR_Temp3	CeCMBR_e_FAD_IdleInjLrn	CeCMBR_e_HCS_DeHC_Drive
1	0	0	0	0	0	0

P0234, P0299: Boost pressure control deviation enabling - Part 4

y/x	CeCMBR_e_HCS_DeHC_Park	CeCMBR_e_SCR_ServWarmUp	CeCMBR_e_SCR_ServCheck	CeCMBR_e_SCR_DeSOx		
1	0	0	0	0		

Initial Supporting table - P0234, P2263: Overboost barometric correction

Description: Ambient air pressure multiplicative correction to the base threshold for overboost monitoring. It is function of ambient air pressure (in [kPa]) and desired boost pressure (in [kPa]).

Notes: [-8, 8]

y/x	85	100	115	130	145	160	175	190	205	220	235	250	265	280	295
75	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
83	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
97	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
110	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1

Initial Supporting table - P0234: Maximum boost pressure for overboost monitor enabling

Description: Maximum desired boost pressure below which the overboost deviation monitoring is enabled. This map is function of ambient air pressure (in [kPa]).

Notes: [kPa]

y/x	75	83	97	110
1	200	200	200	200

Initial Supporting table - P0234: Minimum boost pressure for overboost monitor enabling

Description: Minimum desired boost pressure above which the overboost deviation monitoring is enabled. This map is function of ambient air pressure (in [kPa]).

Notes: [kPa]

y/x	75	83	97	110
1	146	146	120	120

Initial Supporting table - P0234: Negative boost deviation threshold (throttle control active)

Description: Boost pressure deviation threshold for the negative boost pressure control deviation monitor when the throttle control is active. It identifies an overboost faulty condition. It is function of engine speed (in [rpm]) and desired boost pressure (in [kPa]).

Notes: [kPa]

y/x	85	100	115	130	145	160	175	190	205	220	235	250	265	280	295
750	-28	-28	-28	-28	-28	-28	-28	-28	-28	-28	-28	-28	-28	-28	-28
1,000	-28	-28	-23	-23	-23	-23	-23	-23	-23	-23	-23	-23	-23	-23	-23
1,250	-28	-28	-23	-23	-23	-23	-23	-18	-18	-18	-18	-18	-18	-18	-18
1,500	-28	-28	-28	-15	-15	-15	-16	-18	-18	-18	-18	-18	-18	-18	-18
1,750	-28	-28	-28	-13	-13	-13	-15	-16	-16	-16	-16	-16	-16	-16	-16
2,000	-28	-28	-28	-13	-13	-13	-15	-16	-16	-16	-16	-16	-16	-16	-16
2,250	-28	-28	-28	-13	-13	-13	-15	-16	-16	-16	-16	-16	-16	-16	-16
2,500	-28	-28	-28	-13	-13	-13	-15	-16	-16	-16	-16	-16	-16	-16	-16
3,000	-20	-20	-20	-20	-20	-20	-20	-20	-20	-20	-20	-20	-20	-30	-40
4,200	-30	-30	-20	-20	-20	-20	-20	-20	-20	-20	-20	-30	-40	-50	-50

Initial Supporting table - P0234: Negative boost deviation threshold (throttle control not active)

Description: Boost pressure deviation threshold for the negative boost pressure control deviation monitor when the throttle control is not active. It identifies an overboost faulty condition. It is function of engine speed (in [rpm]) and desired boost pressure (in [kPa]).

Notes: [kPa]

y/x	85	100	115	130	145	160	175	190	205	220	235	250	265	280	295
750	-28	-28	-28	-28	-28	-28	-28	-28	-28	-28	-28	-28	-28	-28	-28
1,000	-28	-28	-23	-23	-23	-23	-23	-23	-23	-23	-23	-23	-23	-23	-23
1,250	-28	-28	-23	-23	-23	-23	-23	-18	-18	-18	-18	-18	-18	-18	-18
1,500	-28	-28	-28	-15	-15	-15	-16	-18	-18	-18	-18	-18	-18	-18	-18
1,750	-28	-28	-28	-13	-13	-13	-15	-16	-16	-16	-16	-16	-16	-16	-16
2,000	-28	-28	-28	-13	-13	-13	-15	-16	-16	-16	-16	-16	-16	-16	-16
2,250	-28	-28	-28	-13	-13	-13	-15	-16	-16	-16	-16	-16	-16	-16	-16
2,500	-28	-28	-28	-13	-13	-13	-15	-16	-16	-16	-16	-16	-16	-16	-16
3,000	-28	-28	-28	-13	-13	-13	-15	-16	-16	-16	-16	-16	-16	-16	-16
4,200	-28	-28	-28	-13	-13	-13	-15	-16	-16	-16	-16	-16	-16	-16	-16

Initial Supporting table - P0234: Overboost monitor delay timer

Description: Delay timer before enabling the overboost deviation monitoring once all entry conditions are fulfilled. This map is function of engine speed (in [rpm]).

Notes: [s]

y/x	750	1,000	1,250	1,500	1,750	2,000	2,250	2,500	3,000	4,200
1	2	2	2	2	2	2	2	2	2	2

Initial Supporting table - P0299, P2263: Underboost barometric correction

Description: Ambient air pressure multiplicative correction to the base threshold for underboost monitoring. It is function of ambient air pressure (in [kPa]) and desired boost pressure (in [kPa]).

Notes: [-8, 8]

y/x	85	100	115	130	145	160	175	190	205	220	235	250	265	280	295
75	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
83	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
97	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
110	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1

Initial Supporting table - P0299: Maximum boost pressure for underboost monitor enabling

Description: Maximum desired boost pressure below which the underboost deviation monitoring is enabled. This map is function of ambient air pressure (in [kPa]).

Notes: [kPa]

y/x	75	83	97	110
1	250	250	250	250

Initial Supporting table - P0299: Minimum boost pressure for underboost monitor enabling

Description: Minimum desired boost pressure above which the underboost deviation monitoring is enabled. This map is function of ambient air pressure (in [kPa]).

Notes: [kPa]

y/x	75	83	97	110
1	170	170	170	170

Initial Supporting table - P0299: Positive boost deviation threshold (throttle control active)

Description: Boost pressure deviation threshold for the positive boost pressure control deviation monitor when the throttle control is active. It identifies an underboost faulty condition. It is function of engine speed (in [rpm]) and desired boost pressure (in [kPa]).

Notes: [kPa]

y/x	85	100	115	130	145	160	175	190	205	220	235	250	265	280	295
750	47	47	47	47	47	47	47	47	47	47	47	47	47	37	37
1,000	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42
1,250	42	42	37	37	37	37	37	37	37	32	32	32	32	32	32
1,500	42	42	37	37	37	37	37	37	37	32	32	32	32	32	32
1,750	42	42	37	37	37	37	37	37	37	30	30	30	30	30	30
2,000	42	42	37	37	32	32	30	30	30	30	30	30	30	30	30
2,250	42	42	37	37	32	32	30	30	30	30	30	30	30	30	30
2,500	42	42	37	37	32	32	30	30	30	30	30	30	30	30	30
3,000	37	37	37	37	37	37	37	37	37	37	37	37	37	47	57
4,200	47	47	37	37	37	37	37	37	37	37	37	47	57	67	67

Initial Supporting table - P0299: Positive boost deviation threshold (throttle control not active)

Description: Boost pressure deviation threshold for the positive boost pressure control deviation monitor when the throttle control is not active. It identifies an underboost faulty condition. It is function of engine speed (in [rpm]) and desired boost pressure (in [kPa]).

Notes: [kPa]

y/x	85	100	115	130	145	160	175	190	205	220	235	250	265	280	295
750	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42
1,000	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42
1,250	42	42	37	37	37	37	37	37	37	32	32	32	32	32	32
1,500	42	42	37	37	37	37	37	37	37	32	32	32	32	32	32
1,750	42	42	37	37	37	37	37	37	37	30	30	30	30	30	30
2,000	42	42	37	37	32	32	30	30	30	30	30	30	30	30	30
2,250	42	42	37	37	32	32	30	30	30	30	30	30	30	30	30
2,500	42	42	37	37	32	32	30	30	30	30	30	30	30	30	30
3,000	42	42	37	37	32	32	32	32	32	32	32	32	32	32	32
4,200	42	42	37	37	35	35	35	35	35	35	35	35	35	35	35

Initial Supporting table - P0299: Underboost monitor delay timer

Description: Delay timer before enabling the underboost deviation monitoring once all entry conditions are fulfilled. This map is function of engine speed (in [rpm]).

Notes: [s]

y/x	750	1,000	1,250	1,500	1,750	2,000	2,250	2,500	3,000	4,200
1	2	2	2	2	2	2	2	2	2	2

Initial Supporting table - P0400: EGR flow performance threshold (air flow tracking error)

Description: Air mass flow threshold for OBDII EGR flow performance monitor when EGR controller is tracking a flow error. It is function of engine speed (in [rpm]) and total EGR flow request (in [mg]).

Notes: [mg]

y/x	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
1	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000
2	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000
3	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000
4	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000
5	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000
6	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000
7	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000
8	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000
9	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000
10	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000
11	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000
12	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000
13	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000
14	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000
15	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000

Initial Supporting table - P0400: EGR flow performance threshold (air mass tracking error)

Description: Air mass flow threshold for OBDII EGR flow performance monitor when EGR controller is tracking a fresh air mass error. It is function of engine speed (in [rpm]) and desired fresh air mass (in [mg]).

Notes: [mg]

y/x	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
1	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000
2	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000
3	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000
4	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000
5	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000
6	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000
7	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000
8	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000
9	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000
10	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000
11	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000
12	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000
13	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000
14	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000
15	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000

Initial Supporting table - P0401, P0402: EGR flow monitor enabling

Description: Calibration map to choose if the excessive/insufficient EGR flow monitor is enabled or not for each combustion mode.

Notes: [boolean]

P0401, P0402: EGR flow monitor enabling - Part 1

y/x	CeCMBR_e_Normal	CeCMBR_e_DPF_HiO2	CeCMBR_e_DPF_LoO2	CeCMBR_e_C2	CeCMBR_e_LNT_DeNOx	CeCMBR_e_LNT_DeSOx_Lean
1	1	0	0	0	0	0

P0401, P0402: EGR flow monitor enabling - Part 2

y/x	CeCMBR_e_LNT_DeSOx_Rich	CeCMBR_e_C3	CeCMBR_e_SCR_Temp1	CeCMBR_e_SCR_Temp2	CeCMBR_e_DPF_PN	CeCMBR_e_DPF_RichIdle
1	0	0	0	0	0	0

P0401, P0402: EGR flow monitor enabling - Part 3

y/x	CeCMBR_e_DPF_EngPrtct_HiO2	CeCMBR_e_DPF_EngPrtct_LoO2	CeCMBR_e_LNT_EngPrtct	CeCMBR_e_SCR_Temp3	CeCMBR_e_FAD_IdleInjLrn	CeCMBR_e_HCS_DeHC_Drive
1	0	0	0	0	0	0

P0401, P0402: EGR flow monitor enabling - Part 4

y/x	CeCMBR_e_HCS_DeHC_Park	CeCMBR_e_SCR_ServWarmUp	CeCMBR_e_SCR_ServCheck	CeCMBR_e_SCR_DeSOx		
1	0	0	0	0		

Initial Supporting table - P0401: Insufficient EGR flow barometric correction (low level)

Description: Air Temperature correction at low barometric level for OBDII insufficient EGR flow monitor. It is function of air temperature (in [°C]).

Notes: [-1, 1]

y/x	-7	-5	0	5	10	15	20	25	30	35
1	1	1	1	1	1	1	1	1	1	1

Initial Supporting table - P0401: Insufficient EGR flow barometric correction (mid level)

Description: Air Temperature correction at mid barometric level for OBDII insufficient EGR flow monitor. It is function of air temperature (in [°C]).

Notes: [-1, 1]

y/x	-7	-5	0	5	10	15	20	25	30	35
1	1	1	1	1	1	1	1	1	1	1

Initial Supporting table - P0401: Insufficient EGR flow barometric correction (sea level)

Description: Air Temperature correction at sea barometric level for OBDII insufficient EGR flow monitor. It is function of air temperature (in [°C]).

Notes: [-1,1]

y/x	-7	-5	0	5	10	15	20	25	30	35
1	1	1	1	1	1	1	1	1	1	1

Initial Supporting table - P0401: Insufficient EGR flow barometric table A (low level)

Description: Barometric (low level) calibration table for defining a OBDII threshold for insufficient EGR flow deviation monitoring. It is function of engine speed (in [rpm]) and load (in [composite]), which can be either fuel air request or predicted torque request.

Notes: [mg]

y/x	730	1,250	1,500	1,750	2,000	2,500	3,000	4,200
0	0	0	0	0	0	0	0	0
5	0	0	0	0	0	0	0	0
15	0	0	0	0	0	0	0	0
25	0	0	0	0	0	0	0	0
30	0	0	0	0	0	0	0	0
45	0	0	0	0	0	0	0	0
50	0	0	0	0	0	0	0	0
55	0	0	0	0	0	0	0	0
60	0	0	0	0	0	0	0	0

Initial Supporting table - P0401: Insufficient EGR flow barometric table A (mid level)

Description: Barometric (mid level) calibration table for defining a OBDII threshold for insufficient EGR flow deviation monitoring. It is function of engine speed (in [rpm]) and load (in [composite]), which can be either fuel air request or predicted torque request.

Notes: [mg]

y/x	730	1,250	1,500	1,750	2,000	2,500	3,000	4,200
0	0	0	0	0	0	0	0	0
5	0	0	0	0	0	0	0	0
15	0	0	0	0	0	0	0	0
25	0	0	0	0	0	0	0	0
30	0	0	0	0	0	0	0	0
45	0	0	0	0	0	0	0	0
50	0	0	0	0	0	0	0	0
55	0	0	0	0	0	0	0	0
60	0	0	0	0	0	0	0	0

Initial Supporting table - P0401: Insufficient EGR flow barometric table A (sea level)

Description: Barometric (sea level) calibration table for defining a OBDII threshold for insufficient EGR flow deviation monitoring. It is function of engine speed (in [rpm]) and load (in [composite]), which can be either fuel air request or predicted torque request.

Notes: [mg]

y/x	730	1,250	1,500	1,750	2,000	2,500	3,000	4,200
0	0	0	0	0	0	0	0	0
5	0	0	0	0	0	0	0	0
15	0	0	0	0	0	0	0	0
25	0	0	0	0	0	0	0	0
30	0	0	0	0	0	0	0	0
45	0	0	0	0	0	0	0	0
50	0	0	0	0	0	0	0	0
55	0	0	0	0	0	0	0	0
60	0	0	0	0	0	0	0	0

Initial Supporting table - P0401: Insufficient EGR flow barometric table B (low level)

Description: Barometric (low level) calibration table for defining a OBDII threshold for insufficient EGR flow deviation monitoring. It is function of engine speed (in [rpm]) and load (in [composite]), which can be either fuel air request or predicted torque request.

Notes: [mg]

y/x	730	1,250	1,500	1,750	2,000	2,500	3,000	4,200
0	-120	-120	-504	-504	-504	-504	-504	-504
5	-160	-64	-64	-64	-64	-504	-504	-504
15	-208	-64	-64	-64	-64	-504	-504	-504
25	-248	-64	-64	-64	-64	-504	-504	-504
30	-264	-64	-64	-64	-64	-504	-504	-504
45	-296	-192	-152	-224	-504	-504	-504	-504
50	-368	-208	-184	-152	-504	-504	-504	-504
55	-432	-368	-368	-368	-504	-504	-504	-504
60	-504	-504	-504	-504	-504	-504	-504	-504

Initial Supporting table - P0401: Insufficient EGR flow barometric table B (mid level)

Description: Barometric (mid level) calibration table for defining a OBDII threshold for insufficient EGR flow deviation monitoring. It is function of engine speed (in [rpm]) and load (in [composite]), which can be either fuel air request or predicted torque request.

Notes: [mg]

y/x	730	1,250	1,500	1,750	2,000	2,500	3,000	4,200
0	-120	-120	-504	-504	-504	-504	-504	-504
5	-160	-152	-152	-152	-152	-504	-504	-504
15	-208	-152	-152	-152	-152	-504	-504	-504
25	-248	-152	-152	-152	-152	-504	-504	-504
30	-264	-224	-224	-200	-200	-504	-504	-504
45	-296	-192	-152	-224	-504	-504	-504	-504
50	-368	-208	-184	-152	-504	-504	-504	-504
55	-432	-368	-368	-368	-504	-504	-504	-504
60	-504	-504	-504	-504	-504	-504	-504	-504

Initial Supporting table - P0401: Insufficient EGR flow barometric table B (sea level)

Description: Barometric (sea level) calibration table for defining a OBDII threshold for insufficient EGR flow deviation monitoring. It is function of engine speed (in [rpm]) and load (in [composite]), which can be either fuel air request or predicted torque request.

Notes: [mg]

y/x	730	1,250	1,500	1,750	2,000	2,500	3,000	4,200
0	-120	-120	-504	-504	-504	-504	-504	-504
5	-160	-144	-152	-152	-200	-504	-504	-504
15	-208	-152	-152	-152	-200	-504	-504	-504
25	-248	-200	-176	-176	-200	-504	-504	-504
30	-264	-224	-224	-200	-200	-504	-504	-504
45	-296	-192	-152	-224	-504	-504	-504	-504
50	-368	-208	-184	-152	-504	-504	-504	-504
55	-432	-368	-368	-368	-504	-504	-504	-504
60	-504	-504	-504	-504	-504	-504	-504	-504

Initial Supporting table - P0401: Minimum desired EGR flow

Description: Minimum desired EGR flow above which the insufficient EGR flow is enabled. It is function of barometric pressure (in [kPa]).

Notes: [mg]

y/x	70	74	81	100
1	252	252	276	300

Initial Supporting table - P0402: Excessive EGR flow barometric correction (low level)

Description: Air Temperature correction at low barometric level for OBDII excessive EGR flow monitor. It is function of air temperature (in [°C]).

Notes: [-1, 1]

y/x	-7	-5	0	5	10	15	20	25	30	35
1	0	0	0	0	0	0	0	0	0	0

Initial Supporting table - P0402: Excessive EGR flow barometric correction (mid level)

Description: Air Temperature correction at mid barometric level for OBDII excessive EGR flow monitor. It is function of air temperature (in [°C]).

Notes: [-1, 1]

y/x	-7	-5	0	5	10	15	20	25	30	35
1	0	0	0	0	0	0	0	0	0	0

Initial Supporting table - P0402: Excessive EGR flow barometric correction (sea level)

Description: Air Temperature correction at sea barometric level for OBDII excessive EGR flow monitor. It is function of air temperature (in [°C]).

Notes: [-1, 1]

y/x	-7	-5	0	5	10	15	20	25	30	35
1	0	0	0	0	0	0	0	0	0	0

Initial Supporting table - P0402: Excessive EGR flow barometric table A (low level)

Description: Barometric (low level) calibration table for defining a OBDII threshold for excessive EGR flow deviation monitoring. It is function of engine speed (in [rpm]) and load (in [composite]), which can be either fuel air request or predicted torque request.

Notes: [mg]

y/x	600	1,000	1,500	1,750	2,000	2,500	3,000	4,200
0	0	0	0	0	0	0	0	0
10	0	0	0	0	0	0	0	0
20	0	0	0	0	0	0	0	0
35	0	0	0	0	0	0	0	0
45	0	0	0	0	0	0	0	0
65	0	0	0	0	0	0	0	0
80	0	0	0	0	0	0	0	0
100	0	0	0	0	0	0	0	0
120	0	0	0	0	0	0	0	0

Initial Supporting table - P0402: Excessive EGR flow barometric table A (mid level)

Description: Barometric (mid level) calibration table for defining a OBDII threshold for excessive EGR flow deviation monitoring. It is function of engine speed (in [rpm]) and load (in [composite]), which can be either fuel air request or predicted torque request.

Notes: [mg]

y/x	600	1,000	1,500	1,750	2,000	2,500	3,000	4,200
0	0	0	0	0	0	0	0	0
10	0	0	0	0	0	0	0	0
20	0	0	0	0	0	0	0	0
35	0	0	0	0	0	0	0	0
45	0	0	0	0	0	0	0	0
65	0	0	0	0	0	0	0	0
80	0	0	0	0	0	0	0	0
100	0	0	0	0	0	0	0	0
120	0	0	0	0	0	0	0	0

Initial Supporting table - P0402: Excessive EGR flow barometric table A (sea level)

Description: Barometric (sea level) calibration table for defining a OBDII threshold for excessive EGR flow deviation monitoring. It is function of engine speed (in [rpm]) and load (in [composite]), which can be either fuel air request or predicted torque request.

Notes: [mg]

y/x	600	1,000	1,500	1,750	2,000	2,500	3,000	4,200
0	0	0	0	0	0	0	0	0
10	0	0	0	0	0	0	0	0
20	0	0	0	0	0	0	0	0
35	0	0	0	0	0	0	0	0
45	0	0	0	0	0	0	0	0
65	0	0	0	0	0	0	0	0
80	0	0	0	0	0	0	0	0
100	0	0	0	0	0	0	0	0
120	0	0	0	0	0	0	0	0

Initial Supporting table - P0402: Excessive EGR flow barometric table B (low level)

Description: Barometric (low level) calibration table for defining a OBDII threshold for excessive EGR flow deviation monitoring. It is function of engine speed (in [rpm]) and load (in [composite]), which can be either fuel air request or predicted torque request.

Notes: [mg]

y/x	600	1,000	1,500	1,750	2,000	2,500	3,000	4,200
0	120	120	120	120	120	208	296	504
10	120	120	120	120	120	208	296	504
20	152	152	152	152	152	232	312	504
35	192	352	200	176	192	264	336	504
45	224	352	200	176	224	288	352	504
65	296	352	200	200	296	344	392	504
80	368	368	368	368	368	400	432	504
100	432	432	432	432	432	448	464	504
120	504	504	504	504	504	504	504	504

Initial Supporting table - P0402: Excessive EGR flow barometric table B (mid level)

Description: Barometric (mid level) calibration table for defining a OBDII threshold for excessive EGR flow deviation monitoring. It is function of engine speed (in [rpm]) and load (in [composite]), which can be either fuel air request or predicted torque request.

Notes: [mg]

y/x	600	1,000	1,500	1,750	2,000	2,500	3,000	4,200
0	120	120	120	120	120	208	296	504
10	120	120	120	120	120	208	296	504
20	152	152	152	152	152	232	312	504
35	192	352	152	152	152	264	336	504
45	224	352	144	144	144	288	352	504
65	296	352	120	120	120	344	392	504
80	368	368	200	200	200	400	432	504
100	432	432	432	432	432	448	464	504
120	504	504	504	504	504	504	504	504

Initial Supporting table - P0402: Excessive EGR flow barometric table B (sea level)

Description: Barometric (sea level) calibration table for defining a OBDII threshold for excessive EGR flow deviation monitoring. It is function of engine speed (in [rpm]) and load (in [composite]), which can be either fuel air request or predicted torque request.

Notes: [mg]

y/x	600	1,000	1,500	1,750	2,000	2,500	3,000	4,200
0	120	120	120	120	120	208	296	504
10	120	120	120	120	120	208	296	504
20	152	152	152	152	152	232	312	504
35	192	200	152	176	192	264	336	504
45	224	200	152	176	192	288	352	504
65	296	200	152	176	192	344	392	504
80	368	368	368	368	368	400	432	504
100	432	432	432	432	432	448	464	504
120	504	504	504	504	504	504	504	504

Initial Supporting table - P0402: Maximum desired EGR flow

Description: Maximum desired EGR flow below which the excessive EGR flow is enabled. It is function of barometric pressure (in [kPa]).

Notes: [mg]

y/x	70	74	81	100
1	252	252	300	352

Initial Supporting table - P140B, P140C: EGR slow response enabling

Description: Calibration map for the enabling of EGR slow response monitoring, function of combustion mode.

Notes: [boolean]

P140B, P140C: EGR slow response enabling - Part 1

y/x	CeCMBR_e_Normal	CeCMBR_e_DPF_HiO2	CeCMBR_e_DPF_LoO2	CeCMBR_e_C2	CeCMBR_e_LNT_DeNOx	CeCMBR_e_LNT_DeSOx_Lean
1	1	1	0	0	0	0

P140B, P140C: EGR slow response enabling - Part 2

y/x	CeCMBR_e_LNT_DeSOx_Rich	CeCMBR_e_C3	CeCMBR_e_SCR_Temp1	CeCMBR_e_SCR_Temp2	CeCMBR_e_DPF_PN	CeCMBR_e_DPF_RichIdle
1	0	0	0	0	0	0

P140B, P140C: EGR slow response enabling - Part 3

y/x	CeCMBR_e_DPF_EngPrtct_HiO2	CeCMBR_e_DPF_EngPrtct_LoO2	CeCMBR_e_LNT_EngPrtct	CeCMBR_e_SCR_Temp3	CeCMBR_e_FAD_IdleInjLrn	CeCMBR_e_HCS_DeHC_Drive
1	0	0	0	0	0	0

P140B, P140C: EGR slow response enabling - Part 4

y/x	CeCMBR_e_HCS_DeHC_Park	CeCMBR_e_SCR_ServWarmUp	CeCMBR_e_SCR_ServCheck	CeCMBR_e_SCR_DeSOx		
1	0	0	0	0		

Initial Supporting table - P140B: Increasing EGR slow response threshold

Description: Threshold for increasing EGR flow slow response monitoring. It is function of ambient air pressure (in [kPa]).

Notes: [%]

y/x	75	84	97
1	4	6	10

Initial Supporting table - P140C: Decreasing EGR slow response threshold

Description: Threshold for decreasing EGR flow slow response monitoring. It is function of ambient air pressure (in [kPa]).

Notes: [%]

y/x	75	84	97
1	3	5	8

Initial Supporting table - P168A, P168B: Boost pressure slow response enabling

Description: Calibration map for the enabling of boost pressure slow response monitoring, function of combustion mode.

Notes: [boolean]

P168A, P168B: Boost pressure slow response enabling - Part 1

y/x	CeCMBR_e_Normal	CeCMBR_e_DPF_HiO2	CeCMBR_e_DPF_LoO2	CeCMBR_e_C2	CeCMBR_e_LNT_DeNOx	CeCMBR_e_LNT_DeSOx_Lean
1	0	0	0	0	0	0

P168A, P168B: Boost pressure slow response enabling - Part 2

y/x	CeCMBR_e_LNT_DeSOx_Rich	CeCMBR_e_C3	CeCMBR_e_SCR_Temp1	CeCMBR_e_SCR_Temp2	CeCMBR_e_DPF_PN	CeCMBR_e_DPF_RichIdle
1	0	0	0	0	0	0

P168A, P168B: Boost pressure slow response enabling - Part 3

y/x	CeCMBR_e_DPF_EngPrtct_HiO2	CeCMBR_e_DPF_EngPrtct_LoO2	CeCMBR_e_LNT_EngPrtct	CeCMBR_e_SCR_Temp3	CeCMBR_e_FAD_IdleInjLrn	CeCMBR_e_HCS_DeHC_Drive
1	0	0	0	0	0	0

P168A, P168B: Boost pressure slow response enabling - Part 4

y/x	CeCMBR_e_HCS_DeHC_Park	CeCMBR_e_SCR_ServWarmUp	CeCMBR_e_SCR_ServCheck	CeCMBR_e_SCR_DeSOx		
1	0	0	0	0		

Initial Supporting table - P168A: Positive boost slow response threshold

Description: Averaged cumulative boost pressure deviation threshold for the positive boost pressure slow response monitor. The map is function of ambient air pressure (in [kPa]).

Notes: [kPa]

y/x	75	83	97
1	29	29	29

Initial Supporting table - P168B: Negative boost slow response threshold

Description: Averaged cumulative boost pressure deviation threshold for the negative boost pressure slow response monitor. The map is function of ambient air pressure (in [kPa]).

Notes: [kPa]

y/x	75	83	97
1	10	10	10

Initial Supporting table - P16F3_CB safety deadband threshold f(Fuel Rail Pressure)

Description: Maximum allowable safety deadband on CB Energizing Time compensation (for each torque forming pulse) as a function of Fuel Rail Pressure.

Notes: P16F3, KtETMC_t_CB_ET_Max

y/x	16	28	39	51	62	74	85	97	108	120	131	143	154	166	177	189	200
1	1,633	738	535	425	361	320	292	268	251	237	223	211	201	194	186	177	170

Initial Supporting table - P16F3_EIA safety deadband threshold f(Fuel Rail Pressure)

Description: Maximum allowable safety deadband on EIA Energizing Time compensation (for each torque forming pulse) as function of Fuel Rail Pressure.

Notes: P16F3, KtETMC_t_EIA_Max

y/x	16	28	39	51	62	74	85	97	108	120	131	143	154	166	177	189	200
1	1,633	738	535	425	361	320	292	268	251	237	223	211	201	194	186	177	170

Initial Supporting table - P16F3_FTD safety deadband threshold f(Fuel Rail Pressure)

Description: Maximum allowable safety deadband on FTD Energizing Time compensation as function of Fuel Rail Pressure.

Notes: P16F3, KtETMC_t_FTD_Max

y/x	16	28	39	51	62	74	85	97	108	120	131	143	154	166	177	189	200
1	1,633	738	535	425	361	320	292	268	251	237	223	211	201	194	186	177	170

Initial Supporting table - P16F3_Rail Pressure Wave Compensation f(Fuel Rail Pressure, Fuel Quantity)

Description: Safety treshold for the Rail Pressure Wave Compensation on each torque forming pulse as a function of Fuel Rail Pressure and Fuel Quantity

Notes: P16F3, KtFULC_p_RPWC_RailPosDeltSfty

y/x	0	1	2	3	5	7	10	15	25	35	40	50
20	1	1	1	1	1	1	1	1	1	1	1	1
40	1	1	1	1	1	1	1	1	1	1	1	1
60	1	1	1	1	1	1	1	1	1	1	1	1
80	1	1	1	1	1	1	1	1	1	1	1	1
100	1	1	1	1	1	1	1	1	1	1	1	1
120	1	1	1	1	1	1	1	1	1	1	1	1
140	1	1	1	1	1	1	1	1	1	1	1	1
160	1	1	1	1	1	1	1	1	1	1	1	1
180	1	1	1	1	1	1	1	1	1	1	1	1
200	1	1	1	1	1	1	1	1	1	1	1	1

Initial Supporting table - P16F3_Speed Control External Load f(Oil Temp, RPM)

Description: Specifies the external load table for SPDR torque security as a function of engine oil temperature and engine RPM.

Notes: P16F3, KtSPDC_M_ExternalLoad

y/x	-40	-20	-10	0	50	90
530	358	315	290	264	222	215
630	358	315	290	254	212	205
730	355	312	287	240	193	186
750	353	310	285	235	189	182
800	348	305	280	222	180	173
900	338	295	272	197	157	150
1,000	321	287	268	187	147	140
1,100	288	255	237	190	150	144
1,200	258	225	208	192	153	148
1,400	258	225	208	192	153	148
1,600	169	136	119	103	64	59
2,000	-81	-85	-89	-92	-105	-110
2,500	-89	-94	-98	-101	-115	-121
3,000	-97	-102	-107	-110	-126	-132
3,500	-105	-111	-116	-120	-136	-143
4,000	-113	-119	-125	-129	-147	-154
5,000	-113	-119	-125	-129	-147	-154

Initial Supporting table - P16F3_SQA safety deadband threshold f(Fuel Rail Pressure)

Description: Maximum allowable safety deadband on SQA Energizing Time compensation (for each torque forming pulse) as function of Fuel Rail Pressure.

Notes: P16F3, KtETMC_t_SQA_Max

y/x	16	33	49	66	83	100	116	133	150	167	183	200
1	2,467	776	556	451	384	344	307	280	262	245	228	219

Initial Supporting table - P16F3_TSC safety deadband threshold f(Fuel Rail Pressure)

Description: Maximum allowable safety deadband on Energizing Time compensation for Temperature Specific Current (TSC) (for each torque forming pulse) as function of Fuel Rail Pressure

Notes: P16F3, KtETMC_t_TSC_Max

y/x	16	28	39	51	62	74	85	97	108	120	131	143	154	166	177	189	200
1	1,633	738	535	425	361	320	292	268	251	237	223	211	201	194	186	177	170

Initial Supporting table - P16F3_VCA safety max deadband threshold f(Fuel Rail Pressure)

Description: Maximum allowable safety deadband on VCA energizing time correction as function of Fuel Rail Pressure.

Notes: P16F3, KtETMC_t_VCA_Max

y/x	16	28	39	51	62	74	85	97	108	120	131	143	154	166	177	189	200
1	816	369	267	213	181	160	146	134	125	118	111	106	101	97	93	89	85

Initial Supporting table - P16F3_VCA safety min deadband threshold f(Fuel Rail Pressure)

Description: Minimum allowable safety deadband on VCA energizing time correction as function of Fuel Rail Pressure.

Notes: P16F3, KtETMC_t_VCA_Min

y/x	16	28	39	51	62	74	85	97	108	120	131	143	154	166	177	189	200
1	-816	-369	-267	-213	-181	-160	-146	-134	-125	-118	-111	-106	-101	-97	-93	-89	-85

Initial Supporting table - P2160 range change delay time

Description: Delay time when a transmission range change or transfer case range change occures before the fail time can update. Thresholds are a function of transmission fliud temperature. Table axis is transmission fliud temperature (DegC) and table output is delay time (seconds).

Notes:

y/x	-40.00	0.00	40.00
1	5.00	5.00	5.00

Initial Supporting table - P2161 range change delay time

Description: Delay time when a transmission range change or transfer case range change occures before the fail time can update. Thresholds are a function of transmission fliud temperature. Table axis is transmission fliud temperature (DegC) and table output is delay time (seconds).

Notes:

y/x	-40.00	-20.00	40.00
1	5.00	5.00	5.00

Initial Supporting table - P2263: Boost pressure system performance high threshold (throttle control active)

Description: Boost pressure deviation threshold for boost pressure system performance monitor when the throttle control is active. It identifies an overboost faulty condition. It is function of engine speed (in [rpm]) and desired boost pressure (in [kPa]).

Notes: [kPa]

y/x	100	150	175	200	225	250	275	300
1,500	-30	-30	-30	-25	-25	-25	-25	-25
2,000	-30	-30	-30	-25	-25	-25	-25	-25
2,500	-30	-30	-30	-25	-25	-25	-25	-25
3,000	-30	-30	-30	-25	-25	-25	-25	-25
3,500	-30	-30	-30	-25	-25	-25	-25	-25
4,000	-30	-30	-30	-25	-25	-25	-25	-25
4,500	-30	-30	-30	-25	-25	-25	-25	-25

Initial Supporting table - P2263: Boost pressure system performance high threshold (throttle control not active)

Description: Boost pressure deviation threshold for boost pressure system performance monitor when the throttle control is not active. It identifies an overboost faulty condition. It is function of engine speed (in [rpm]) and desired boost pressure (in [kPa]).

Notes: [kPa]

y/x	100	150	175	200	225	250	275	300
1,500	-40	-40	-40	-35	-35	-35	-35	-35
2,000	-40	-40	-40	-35	-35	-35	-35	-35
2,500	-40	-40	-40	-35	-35	-35	-35	-35
3,000	-40	-40	-40	-35	-35	-35	-35	-35
3,500	-40	-40	-40	-35	-35	-35	-35	-35
4,000	-40	-40	-40	-35	-35	-35	-35	-35
4,500	-40	-40	-40	-35	-35	-35	-35	-35

Initial Supporting table - P2263: Boost pressure system performance low threshold (throttle control active)

Description: Boost pressure deviation threshold for boost pressure system performance monitor when the throttle control is not active. It identifies an underboost faulty condition. It is function of engine speed (in [rpm]) and desired boost pressure (in [kPa]).

Notes: [kPa]

y/x	100	150	175	200	225	250	275	300
1,500	30	30	30	25	25	25	25	25
2,000	30	30	30	25	25	25	25	25
2,500	30	30	30	25	25	25	25	25
3,000	30	30	30	25	25	25	25	25
3,500	30	30	30	25	25	25	25	25
4,000	30	30	30	25	25	25	25	25
4,500	30	30	30	25	25	25	25	25

Initial Supporting table - P2263: Boost pressure system performance low threshold (throttle control not active)

Description: Boost pressure deviation threshold for boost pressure system performance monitor when the throttle control is not active. It identifies an underboost faulty condition. It is function of engine speed (in [rpm]) and desired boost pressure (in [kPa]).

Notes: [kPa]

y/x	100	150	175	200	225	250	275	300
1,500	40	40	40	35	35	35	35	35
2,000	40	40	40	35	35	35	35	35
2,500	40	40	40	35	35	35	35	35
3,000	40	40	40	35	35	35	35	35
3,500	40	40	40	35	35	35	35	35
4,000	40	40	40	35	35	35	35	35
4,500	40	40	40	35	35	35	35	35

Initial Supporting table - P2263: Boost pressure system performance monitor delay timer

Description: Delay timer before enabling the boost pressure system performance monitor once all entry conditions are fulfilled. This map is function of engine speed (in [rpm]).

Notes: [s]

y/x	1,500	2,000	2,500	3,000	3,500	4,000	4,500
1	2	2	1	1	1	1	1

Initial Supporting table - P228B Pressure Regulator completely closed command

Description: Command, in terms of pressure (MPa), to consider pressure regulator valve completely closed as function of rail pressure (MPa).

Notes:

y/x	0	100	190	250
1	30	30	30	30

Initial Supporting table - P228C P228D Air ambient pressure calibrated as enabling condition (MU)

Description: 0 = air ambient pressure is not considered as enabling condition, 1 = air ambient pressure is considered as enabling condition

Notes:

y/x	1
1	1

Initial Supporting table - P228C P228D Air ambient temperature calibrated as enabling condition (MU)

Description: 0 = air ambient temperature is not considered as enabling condition, 1 = air ambient temperature is considered as enabling condition

Notes:

y/x	1
1	1

Initial Supporting table - P228C P228D Low fuel level calibrated as enabling condition (MU)

Description: 0 = low fuel level is not considered as enabling condition, 1 = low fuel level is considered as enabling condition

Notes:

y/x	1
1	1

Initial Supporting table - P228C Positive rail pressure deviation (MU)

Description: Positive rail pressure deviation threshold (MPa) when metering unit is controlled in closed loop as function of engine speed (rpm).

Notes:

y/x	199	510	511	800	1,000	1,200	1,400	1,600	2,000	2,400	2,800	3,200	3,600	4,200	4,800	5,400
1	80	80	15	15	15	15	15	15	15	15	15	15	15	15	15	15

Initial Supporting table - P228D Negative rail pressure deviation (MU)

Description: Negative rail pressure deviation threshold (MPa) when metering unit is controlled in closed loop as function of engine speed (rpm).

Notes:

y/x	199	510	511	800	1,000	1,200	1,400	1,600	2,000	2,400	2,800	3,200	3,600	4,200	4,800	5,400
1	-80	-80	-15	-15	-15	-15	-15	-15	-15	-15	-15	-15	-15	-15	-15	-15

Initial Supporting table - P2293 Maximum rail pressure with PR

Description: Maximum rail pressure threshold (MPa) when pressure is governed by Pressure Regulator as function of engine speed (rpm).

Notes:

y/x	0	1,500	4,250	5,250
1	67	217	217	117

Initial Supporting table - P229A P229B Air ambient pressure calibrated as enabling condition (PR)

Description: 0 = air ambient pressure is not considered as enabling condition, 1 = air ambient pressure is considered as enabling condition

Notes:

y/x	1
1	1

Initial Supporting table - P229A P229B Air ambient temperature calibrated as enabling condition (PR)

Description: 0 = air ambient temperature is not considered as enabling condition, 1 = air ambient temperature is considered as enabling condition

Notes:

y/x	1
1	1

Initial Supporting table - P229A P229B Low fuel level calibrated as enabling condition (PR)

Description: 0 = low fuel level is not considered as enabling condition, 1 = low fuel level is considered as enabling condition

Notes:

y/x	1
1	1

Initial Supporting table - P229A Positive rail pressure deviation (PR)

Description: Positive rail pressure deviation threshold (MPa) when pressure regulator is controlled in closed loop as function of engine speed (rpm).

Notes:

y/x	199	510	511	800	1,000	1,200	1,400	1,600	2,000	2,400	2,800	3,200	3,600	4,200	4,800	5,400
1	80	80	15	15	15	15	15	15	15	15	15	15	15	15	15	15

Initial Supporting table - P24A5: Gradient Temperature Threshold

Description: EGR Cooler Bypass Stuck diagnosis gradient temperature threshold map to be applied at EGR Cooler Bypass Stuck diagnosis. It is function of the EGR valve total flow (in [g/s])

Notes: [°C]

y/x	0	1	2	3	4	6	8	10
1	0	0	1	1	2	2	2	2

Initial Supporting table - P2598: Positive Position Tracking Error Threshold

Description: Position tracking error above which the VGT vanes positive position control deviation can detect the vanes stuck in a position more closed than its target position. It is function of ambient pressure (in [kPa]).

Notes: [%]

y/x	60	70	80	90	100	110
1	15	15	15	15	15	15

Initial Supporting table - P2599: Negative Position Tracking Error Threshold

Description: Position tracking error below which the VGT vanes negative position control deviation can detect the vanes stuck in a position more open than its target position. It is function of ambient pressure (in [kPa]).

Notes: [%]

y/x	60	70	80	90	100	110
1	-15	-15	-15	-15	-15	-15

Initial table -P279A P279B P279C Transfer Case Control Module Transfer Case Command State Rationality (weighting factor)

Description: KtFWDD_Cnt_SampleWeigthting: Calibration table that defines the weighting factor used in a sample of the measured transfer case ratio for full range diagnostics, based on vehicle speed and axle torque.

KnFWDD_v_TCaseRatioMarginSpd
KnFWDD_M_TCaseRatioMarginTrq

Notes: KtFWDD_Cnt_SampleWeigthting

y/x	0.00	3.00	5.00	11.00	12.00	15.00	18.00	21.00	24.00
-200.00	0.0249	0.0249	0.0249	0.0249	0.0249	0.0249	0.0249	0.0249	0.0249
-150.00	0.0249	0.0249	0.0249	0.0249	0.0249	0.0249	0.0249	0.0249	0.0249
-100.00	0.0249	0.0249	0.0249	0.0249	0.0249	0.0249	0.0249	0.0249	0.0249
-50.00	0.0249	0.0249	0.0249	0.0249	0.0249	0.0249	0.0249	0.0249	0.0249
0.00	0.0249	0.0249	0.0249	0.0249	0.0249	0.0249	0.0249	0.0249	0.0249
50.00	0.0249	0.0249	0.0249	0.0249	0.0249	0.0249	0.0249	0.0249	0.0249
100.00	0.0249	0.0249	0.0249	0.0249	0.0249	0.0249	0.0249	0.0249	0.0249
150.00	0.0249	0.0249	0.0249	0.0249	0.0249	0.0249	0.0249	0.0249	0.0249
200.00	0.0249	0.0249	0.0249	0.0249	0.0249	0.0249	0.0249	0.0249	0.0249

Initial Supporting table - P279A Transfer Case Control Module Transfer Case Command State Rationality (margin of error high)

Description: LeFWDD_r_RatioHiBound_P279A = KeFWDD_r_TCaseHiRange + KtFWDD_r_TCaseHiRatioMargin

KnFWDD_v_TCaseRatioMarginSpd
KnFWDD_M_TCaseRatioMarginTrq

Notes: LeFWDD_r_RatioHiBound_P279A

y/x	1.00	2.00	3.00	4.00	5.00	6.00	7.00	8.00	9.00
1.00	8.9999	8.9999	8.9999	1.3000	1.2000	1.1000	1.1000	1.1000	1.1000
2.00	8.9999	8.9999	8.9999	1.3000	1.2000	1.1000	1.1000	1.1000	1.1000
3.00	8.9999	8.9999	8.9999	1.3000	1.2000	1.1000	1.1000	1.1000	1.1000
4.00	8.9999	8.9999	8.9999	1.3000	1.2000	1.1000	1.1000	1.1000	1.1000
5.00	8.9999	8.9999	8.9999	1.3000	1.2000	1.1000	1.1000	1.1000	1.1000
6.00	8.9999	8.9999	8.9999	1.3000	1.2000	1.1000	1.1000	1.1000	1.1000
7.00	8.9999	8.9999	8.9999	1.3000	1.2000	1.1000	1.1000	1.1000	1.1000
8.00	8.9999	8.9999	8.9999	1.3000	1.2000	1.1000	1.1000	1.1000	1.1000
9.00	8.9999	8.9999	8.9999	1.3000	1.2000	1.1000	1.1000	1.1000	1.1000

Initial Supporting table - P279A Transfer Case Control Module Transfer Case Command State Rationality (margin of error low)

Description: LeFWDD_r_RatioLoBound_P279A = KeFWDD_r_TCaseHiRange - KtFWDD_r_TCaseHiRatioMargin

KnFWDD_v_TCaseRatioMarginSpd
KnFWDD_M_TCaseRatioMarginTrq

Notes: LeFWDD_r_RatioLoBound_P279A

y/x	1.00	2.00	3.00	4.00	5.00	6.00	7.00	8.00	9.00
1.00	-6.9999	-6.9999	-6.9999	0.7000	0.8000	0.9000	0.9000	0.9000	0.9000
2.00	-6.9999	-6.9999	-6.9999	0.7000	0.8000	0.9000	0.9000	0.9000	0.9000
3.00	-6.9999	-6.9999	-6.9999	0.7000	0.8000	0.9000	0.9000	0.9000	0.9000
4.00	-6.9999	-6.9999	-6.9999	0.7000	0.8000	0.9000	0.9000	0.9000	0.9000
5.00	-6.9999	-6.9999	-6.9999	0.7000	0.8000	0.9000	0.9000	0.9000	0.9000
6.00	-6.9999	-6.9999	-6.9999	0.7000	0.8000	0.9000	0.9000	0.9000	0.9000
7.00	-6.9999	-6.9999	-6.9999	0.7000	0.8000	0.9000	0.9000	0.9000	0.9000
8.00	-6.9999	-6.9999	-6.9999	0.7000	0.8000	0.9000	0.9000	0.9000	0.9000
9.00	-6.9999	-6.9999	-6.9999	0.7000	0.8000	0.9000	0.9000	0.9000	0.9000

Initial Supporting table - P279B Transfer Case Control Module Transfer Case Command State Rationality (margin of error high)

Description: LeFWDD_r_RatioHiBound_P279B = KeFWDD_r_TCaseLoRange + KtFWDD_r_TCaseLoRatioMargin

KnFWDD_v_TCaseRatioMarginSpd
KnFWDD_M_TCaseRatioMarginTrq

Notes: LeFWDD_r_RatioHiBound_P279B

y/x	1.00	2.00	3.00	4.00	5.00	6.00	7.00	8.00	9.00
1.00	10.7098	10.7098	10.7098	3.0100	2.9099	2.8099	2.8099	2.8099	2.8099
2.00	10.7098	10.7098	10.7098	3.0100	2.9099	2.8099	2.8099	2.8099	2.8099
3.00	10.7098	10.7098	10.7098	3.0100	2.9099	2.8099	2.8099	2.8099	2.8099
4.00	10.7098	10.7098	10.7098	3.0100	2.9099	2.8099	2.8099	2.8099	2.8099
5.00	10.7098	10.7098	10.7098	3.0100	2.9099	2.8099	2.8099	2.8099	2.8099
6.00	10.7098	10.7098	10.7098	3.0100	2.9099	2.8099	2.8099	2.8099	2.8099
7.00	10.7098	10.7098	10.7098	3.0100	2.9099	2.8099	2.8099	2.8099	2.8099
8.00	10.7098	10.7098	10.7098	3.0100	2.9099	2.8099	2.8099	2.8099	2.8099
9.00	10.7098	10.7098	10.7098	3.0100	2.9099	2.8099	2.8099	2.8099	2.8099

Initial Supporting table - P279B Transfer Case Control Module Transfer Case Command State Rationality (margin of error low)

Description: LeFWDD_r_RatioLoBound_P279B = KeFWDD_r_TCaseLoRange - KtFWDD_r_TCaseLoRatioMargin

KnFWDD_v_TCaseRatioMarginSpd
KnFWDD_M_TCaseRatioMarginTrq

Notes: LeFWDD_r_RatioLoBound_P279B

y/x	1.00	2.00	3.00	4.00	5.00	6.00	7.00	8.00	9.00
1.00	-5.2899	-5.2899	-5.2899	2.4099	2.5100	2.6100	2.6100	2.6100	2.6100
2.00	-5.2899	-5.2899	-5.2899	2.4099	2.5100	2.6100	2.6100	2.6100	2.6100
3.00	-5.2899	-5.2899	-5.2899	2.4099	2.5100	2.6100	2.6100	2.6100	2.6100
4.00	-5.2899	-5.2899	-5.2899	2.4099	2.5100	2.6100	2.6100	2.6100	2.6100
5.00	-5.2899	-5.2899	-5.2899	2.4099	2.5100	2.6100	2.6100	2.6100	2.6100
6.00	-5.2899	-5.2899	-5.2899	2.4099	2.5100	2.6100	2.6100	2.6100	2.6100
7.00	-5.2899	-5.2899	-5.2899	2.4099	2.5100	2.6100	2.6100	2.6100	2.6100
8.00	-5.2899	-5.2899	-5.2899	2.4099	2.5100	2.6100	2.6100	2.6100	2.6100
9.00	-5.2899	-5.2899	-5.2899	2.4099	2.5100	2.6100	2.6100	2.6100	2.6100

Initial Supporting table - P279C Transfer Case Control Module Transfer Case Command State Rationality (margin of error high 1)

Description: LeFWDD_r_RatioHiBound1_P279C = KeFWDD_r_TCaseHiRange + KtFWDD_r_TCaseNeutRatioMargin

KnFWDD_v_TCaseRatioMarginSpd
KnFWDD_M_TCaseRatioMarginTrq

Notes: LeFWDD_r_RatioHiBound1_P279C

y/x	1.00	2.00	3.00	4.00	5.00	6.00	7.00	8.00	9.00
1.00	8.9999	8.9999	8.9999	2.0000	1.1000	1.1000	1.1000	1.1000	1.1000
2.00	8.9999	8.9999	8.9999	2.0000	2.0000	2.0000	1.5000	1.5000	1.5000
3.00	8.9999	8.9999	8.9999	3.0000	3.0000	3.0000	2.0000	2.0000	2.0000
4.00	8.9999	8.9999	8.9999	5.0000	5.0000	5.0000	3.0000	3.0000	3.0000
5.00	8.9999	8.9999	8.9999	8.9999	8.9999	8.9999	8.9999	8.9999	8.9999
6.00	8.9999	8.9999	8.9999	5.0000	5.0000	5.0000	3.0000	3.0000	3.0000
7.00	8.9999	8.9999	8.9999	3.0000	3.0000	3.0000	2.0000	2.0000	2.0000
8.00	8.9999	8.9999	8.9999	2.0000	2.0000	2.0000	1.5000	1.5000	1.5000
9.00	8.9999	8.9999	8.9999	2.0000	1.1000	1.1000	1.1000	1.1000	1.1000

Initial Supporting table - P279C Transfer Case Control Module Transfer Case Command State Rationality (margin of error high 2)

Description: LeFWDD_r_RatioHiBound2_P279C = KeFWDD_r_TCaseLoRange + KtFWDD_r_TCaseNeutRatioMargin

KnFWDD_v_TCaseRatioMarginSpd
KnFWDD_M_TCaseRatioMarginTrq

Notes: LeFWDD_r_RatioHiBound2_P279C

y/x	1.00	2.00	3.00	4.00	5.00	6.00	7.00	8.00	9.00
1.00	10.7098	10.7098	10.7098	3.7100	2.8099	2.8099	2.8099	2.8099	2.8099
2.00	10.7098	10.7098	10.7098	3.7100	3.7100	3.7100	3.2100	3.2100	3.2100
3.00	10.7098	10.7098	10.7098	4.7100	4.7100	4.7100	3.7100	3.7100	3.7100
4.00	10.7098	10.7098	10.7098	6.7100	6.7100	6.7100	4.7100	4.7100	4.7100
5.00	10.7098	10.7098	10.7098	10.7098	10.7098	10.7098	10.7098	10.7098	10.7098
6.00	10.7098	10.7098	10.7098	6.7100	6.7100	6.7100	4.7100	4.7100	4.7100
7.00	10.7098	10.7098	10.7098	4.7100	4.7100	4.7100	3.7100	3.7100	3.7100
8.00	10.7098	10.7098	10.7098	3.7100	3.7100	3.7100	3.2100	3.2100	3.2100
9.00	10.7098	10.7098	10.7098	3.7100	2.8099	2.8099	2.8099	2.8099	2.8099

Initial Supporting table - P279C Transfer Case Control Module Transfer Case Command State Rationality (margin of error low 1)

Description: LeFWDD_r_RatioLoBound1_P279C = KeFWDD_r_TCaseHiRange - KtFWDD_r_TCaseNeutRatioMargin

KnFWDD_v_TCaseRatioMarginSpd
KnFWDD_M_TCaseRatioMarginTrq

Notes: LeFWDD_r_RatioLoBound1_P279C

y/x	1.00	2.00	3.00	4.00	5.00	6.00	7.00	8.00	9.00
1.00	-6.9999	-6.9999	-6.9999	0.0000	0.9000	0.9000	0.9000	0.9000	0.9000
2.00	-6.9999	-6.9999	-6.9999	0.0000	0.0000	0.0000	0.5000	0.5000	0.5000
3.00	-6.9999	-6.9999	-6.9999	-1.0000	-1.0000	-1.0000	0.0000	0.0000	0.0000
4.00	-6.9999	-6.9999	-6.9999	-3.0000	-3.0000	-3.0000	-1.0000	-1.0000	-1.0000
5.00	-6.9999	-6.9999	-6.9999	-6.9999	-6.9999	-6.9999	-6.9999	-6.9999	-6.9999
6.00	-6.9999	-6.9999	-6.9999	-3.0000	-3.0000	-3.0000	-1.0000	-1.0000	-1.0000
7.00	-6.9999	-6.9999	-6.9999	-1.0000	-1.0000	-1.0000	0.0000	0.0000	0.0000
8.00	-6.9999	-6.9999	-6.9999	0.0000	0.0000	0.0000	0.5000	0.5000	0.5000
9.00	-6.9999	-6.9999	-6.9999	0.0000	0.9000	0.9000	0.9000	0.9000	0.9000

Initial Supporting table - P279C Transfer Case Control Module Transfer Case Command State Rationality (margin of error low 2)

Description: LeFWDD_r_RatioLoBound2_P279C = KeFWDD_r_TCaseLoRange - KtFWDD_r_TCaseNeutRatioMargin

KnFWDD_v_TCaseRatioMarginSpd
KnFWDD_M_TCaseRatioMarginTrq

Notes: LeFWDD_r_RatioLoBound2_P279C

y/x	1.00	2.00	3.00	4.00	5.00	6.00	7.00	8.00	9.00
1.00	-5.2899	-5.2899	-5.2899	1.7100	2.6100	2.6100	2.6100	2.6100	2.6100
2.00	-5.2899	-5.2899	-5.2899	1.7100	1.7100	1.7100	2.2100	2.2100	2.2100
3.00	-5.2899	-5.2899	-5.2899	0.7100	0.7100	0.7100	1.7100	1.7100	1.7100
4.00	-5.2899	-5.2899	-5.2899	-1.2900	-1.2900	-1.2900	0.7100	0.7100	0.7100
5.00	-5.2899	-5.2899	-5.2899	-5.2899	-5.2899	-5.2899	-5.2899	-5.2899	-5.2899
6.00	-5.2899	-5.2899	-5.2899	-1.2900	-1.2900	-1.2900	0.7100	0.7100	0.7100
7.00	-5.2899	-5.2899	-5.2899	0.7100	0.7100	0.7100	1.7100	1.7100	1.7100
8.00	-5.2899	-5.2899	-5.2899	1.7100	1.7100	1.7100	2.2100	2.2100	2.2100
9.00	-5.2899	-5.2899	-5.2899	1.7100	2.6100	2.6100	2.6100	2.6100	2.6100

Initial Supporting table - Pair_SCD_Decel

Description: Mulitplier to P0300_SCD_Decel to account for different pattern of Paired cylinder misfire. Multipliers are a function of engine rpm and % engine Load.

Notes: Used for P0300 - P0308, Cal Name: KtMSFD_K_dt_MEDRES_Opp

y/x	400	550	700	800	900	1,000	1,200	1,400	1,600
2	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00
8	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00
12	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00
16	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00
20	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00
24	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00
30	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00
60	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00
100	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00

Initial Supporting table - Pair_SCD_Jerk

Description: Mulitplier to P0300_SCD_Jerk to account for different pattern of Paired cylinder misfire. Multipliers are a function of engine rpm and % engine Load.

Notes: Used for P0300 - P0308, Cal Name: KtMSFD_K_ddt_MEDRES_Opp

y/x	400	550	700	800	900	1,000	1,200	1,400	1,600
2	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00
8	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00
12	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00
16	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00
20	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00
24	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00
30	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00
60	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00
100	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00

Initial Supporting table - PairCylModeDecel

Description: Mulitplier to Cyl Mode Deceleration to account for different pattern of Paired cylinder misfire. Multipliers are a function of engine rpm and % engine Load.

Notes: Used for P0300 - P0308, Cal Name: KtMSFD_K_dt_LORES_Opp

y/x	650	900	1,100	1,300	1,400	1,700	2,400	2,700	3,000	3,100	3,300	3,500	3,700	3,900	4,100	4,400	4,700
2	0.60	0.60	0.60	0.60	0.51	0.36	0.44	0.60	0.60	0.59	0.60	0.60	0.59	0.60	0.61	0.59	0.58
8	0.60	0.67	0.60	0.60	0.48	0.36	0.44	0.57	0.60	0.60	0.60	0.60	0.54	0.59	0.57	0.58	0.59
12	0.60	0.65	0.60	0.60	0.50	0.44	0.50	0.51	0.59	0.57	0.60	0.57	0.59	0.65	0.57	0.63	0.59
16	0.60	0.60	0.54	0.54	0.51	0.43	0.45	0.45	0.52	0.56	0.59	0.53	0.59	0.67	0.54	0.66	0.62
20	0.60	0.60	0.54	0.54	0.47	0.43	0.43	0.43	0.52	0.56	0.59	0.50	0.56	0.60	0.51	0.68	0.63
24	0.60	0.60	0.60	0.53	0.48	0.41	0.41	0.43	0.52	0.55	0.60	0.48	0.56	0.57	0.50	0.65	0.62
30	0.60	0.60	0.60	0.55	0.49	0.41	0.41	0.44	0.45	0.45	0.45	0.46	0.52	0.55	0.49	0.63	0.60
60	0.60	0.60	0.60	0.60	0.60	0.34	0.34	0.39	0.45	0.45	0.45	0.40	0.48	0.45	0.45	0.56	0.57
100	0.60	0.60	0.60	0.60	0.60	0.31	0.31	0.37	0.45	0.45	0.45	0.38	0.48	0.42	0.43	0.47	0.48

Initial Supporting table - PairCylModeJerk

Description: Mulitplier to P0300_CylModeJerk to account for different pattern of Paired cylinder misfire. Multipliers are a function of engine rpm and % engine Load.

Notes: Used for P0300 - P0308, Cal Name: KtMSFD_K_ddt_LORES_Opp

y/x	650	900	1,100	1,300	1,400	1,700	2,400	2,700	3,000	3,100	3,300	3,500	3,700	3,900	4,100	4,400	4,700
2	1.14	1.00	0.88	0.80	0.71	0.67	0.79	1.00	1.00	1.00	1.00	0.84	0.74	1.00	0.97	1.00	1.00
8	1.14	1.10	0.87	0.80	0.67	0.63	0.71	0.80	1.00	1.00	1.00	0.78	0.78	1.00	0.88	1.00	1.00
12	1.13	1.08	0.87	0.87	0.80	0.63	0.74	0.80	1.00	1.00	1.00	0.84	0.84	0.98	0.86	1.00	1.00
16	1.13	1.08	1.00	0.99	0.89	0.85	0.85	0.91	1.00	1.00	1.00	0.79	0.83	0.93	0.83	1.00	1.00
20	1.11	1.05	1.00	0.99	0.93	0.88	0.88	0.91	1.00	1.00	1.00	0.77	0.83	0.90	0.79	0.89	0.88
24	1.10	1.02	1.00	1.00	0.95	0.88	0.88	0.95	1.00	1.00	1.00	0.75	0.83	0.87	0.78	0.85	0.85
30	1.10	1.00	1.00	1.00	0.96	0.85	0.85	0.95	1.00	1.00	1.00	0.74	0.83	0.84	0.78	0.85	0.84
60	1.05	1.00	1.00	1.00	0.98	0.91	0.91	0.97	1.00	1.00	1.00	0.71	0.82	0.77	0.73	0.58	0.59
100	1.02	1.00	1.00	1.00	1.00	0.91	0.91	1.00	1.00	0.95	1.00	0.69	0.81	0.73	0.71	0.58	0.46

Initial Supporting table - Pressure Control Configuration

Description: CeFHPG_e_MU_And_PR_ModeSel = pressure control can be governed by both metering unit and pressure regulator
CeFHPG_e_MU = pressure control can be governed by metering unit only
CeFHPG_e_PR = pressure control can be governed by pressure regulator only

Notes:

y/x	1
1	CeFHPG_e_MU_And_PR_ModeSel

Initial Supporting table - Pressure Regulator Valve present

Description: Define whether Pressure Regulator Valve is present (value equal to 1) in Fuel Injection System

Notes:

y/x	1
1	1

Initial Supporting table - Random_SCD_Decel

Description: Mulitplier to SCD_Decel to account for different pattern of light level misfire. Multipliers are a function of engine rpm and % engine Load.

Notes: Used for P0300 - P0308, Cal Name: KtMSFD_K_dt_MEDRES_Emiss

y/x	400	550	700	800	900	1,000	1,200	1,400	1,600
2	1.20	1.20	1.20	1.20	1.20	1.20	1.20	1.20	1.20
8	1.20	1.20	1.20	1.20	1.20	1.20	1.20	1.20	1.20
12	1.20	1.20	1.20	1.20	1.20	1.20	1.20	1.20	1.20
16	1.20	1.20	1.20	1.20	1.20	1.20	1.20	1.20	1.20
20	1.20	1.20	1.20	1.20	1.20	1.20	1.20	1.20	1.20
24	1.20	1.20	1.20	1.20	1.20	1.20	1.20	1.20	1.20
30	1.20	1.20	1.20	1.20	1.20	1.20	1.20	1.20	1.20
60	1.20	1.20	1.20	1.20	1.20	1.20	1.20	1.20	1.20
100	1.20	1.20	1.20	1.20	1.20	1.20	1.20	1.20	1.20

Initial Supporting table - Random_SCD_Jerk

Description: Mulitplier to Random_SCD_Jerk to account for different pattern of light level misfire. Multipliers are a function of engine rpm and % engine Load.

Notes: Used for P0300 - P0308, Cal Name: KtMSFD_K_ddt_MEDRES_Emiss

y/x	400	550	700	800	900	1,000	1,200	1,400	1,600
2	1.20	1.20	1.20	1.20	1.20	1.20	1.20	1.20	1.20
8	1.20	1.20	1.20	1.20	1.20	1.20	1.20	1.20	1.20
12	1.20	1.20	1.20	1.20	1.20	1.20	1.20	1.20	1.20
16	1.20	1.20	1.20	1.20	1.20	1.20	1.20	1.20	1.20
20	1.20	1.20	1.20	1.20	1.20	1.20	1.20	1.20	1.20
24	1.20	1.20	1.20	1.20	1.20	1.20	1.20	1.20	1.20
30	1.20	1.20	1.20	1.20	1.20	1.20	1.20	1.20	1.20
60	1.20	1.20	1.20	1.20	1.20	1.20	1.20	1.20	1.20
100	1.20	1.20	1.20	1.20	1.20	1.20	1.20	1.20	1.20

Initial Supporting table - RandomAFM_Decl

Description: Mulitplier to Cylinder_Decel while in Cylnder Deactivation mode to account for different pattern of light level misfire. Multipliers are a function of engine rpm and % engine Load.

Notes: Used for P0300 - P0308, Cal Name: KtMSFD_K_dt_LORES_AFM_Emiss

y/x	800	1,000	1,200	1,600	2,000	2,400	2,600	3,000	3,500
5	8.00	8.00	8.00	8.00	8.00	8.00	8.00	8.00	8.00
10	8.00	8.00	8.00	8.00	8.00	8.00	8.00	8.00	8.00
20	8.00	8.00	8.00	8.00	8.00	8.00	8.00	8.00	8.00
30	8.00	8.00	8.00	8.00	8.00	8.00	8.00	8.00	8.00
40	8.00	8.00	8.00	8.00	8.00	8.00	8.00	8.00	8.00
50	8.00	8.00	8.00	8.00	8.00	8.00	8.00	8.00	8.00
60	8.00	8.00	8.00	8.00	8.00	8.00	8.00	8.00	8.00
80	8.00	8.00	8.00	8.00	8.00	8.00	8.00	8.00	8.00
100	8.00	8.00	8.00	8.00	8.00	8.00	8.00	8.00	8.00

Initial Supporting table - RandomAFM_Jerk

Description: Mulitplier to Cylinder_Jerk while in Cylnder Deactivation mode to account for different pattern of light level misfire. Multipliers are a function of engine rpm and % engine Load.

Notes: Used for P0300 - P0308, Cal Name: KtMSFD_K_ddt_LORES_AFM_Emiss

y/x	800	1,000	1,200	1,600	2,000	2,400	2,600	3,000	3,500
5	8.00	8.00	8.00	8.00	8.00	8.00	8.00	8.00	8.00
10	8.00	8.00	8.00	8.00	8.00	8.00	8.00	8.00	8.00
20	8.00	8.00	8.00	8.00	8.00	8.00	8.00	8.00	8.00
30	8.00	8.00	8.00	8.00	8.00	8.00	8.00	8.00	8.00
40	8.00	8.00	8.00	8.00	8.00	8.00	8.00	8.00	8.00
50	8.00	8.00	8.00	8.00	8.00	8.00	8.00	8.00	8.00
60	8.00	8.00	8.00	8.00	8.00	8.00	8.00	8.00	8.00
80	8.00	8.00	8.00	8.00	8.00	8.00	8.00	8.00	8.00
100	8.00	8.00	8.00	8.00	8.00	8.00	8.00	8.00	8.00

Initial Supporting table - RandomCylModDecel

Description: Multiplier to P0300_CylMode_Decel. account for different pattern of light level misfire. Multipliers are a function of engine rpm and % engine Load.

Notes: Used for P0300 - P0308. Cal Name: KtMSFD_K_dt_LORES_Emiss

y/x	650	900	1,100	1,300	1,400	1,700	2,400	2,700	3,000	3,100	3,300	3,500	3,700	3,900	4,100	4,400	4,700
2	1.10	1.10	1.10	1.10	1.10	1.10	1.10	1.10	1.10	1.07	1.10	1.09	1.09	1.10	1.11	1.09	1.08
8	1.10	1.10	1.03	1.10	1.10	1.10	1.10	1.10	1.10	1.10	1.10	1.09	1.09	1.09	1.10	1.09	1.09
12	1.10	1.10	1.10	1.10	1.00	1.00	1.10	1.10	1.10	1.10	1.10	1.10	1.06	1.10	1.00	1.09	1.09
16	1.10	1.10	1.10	1.10	1.10	1.10	1.10	1.10	1.10	1.10	1.10	1.10	1.09	1.10	1.00	1.09	1.09
20	1.10	1.10	1.10	1.10	1.10	1.10	1.10	1.10	1.10	1.10	1.10	1.10	1.10	1.10	1.08	1.10	1.09
24	1.10	1.10	1.10	1.10	1.04	1.04	1.10	1.10	1.10	1.10	1.10	1.10	1.10	1.10	1.10	1.10	1.09
30	1.10	1.10	1.10	1.10	1.04	1.04	1.10	1.10	1.10	1.10	1.10	1.10	1.10	1.10	1.10	1.11	1.09
60	1.10	1.10	1.10	1.10	1.10	1.10	1.10	1.10	1.10	1.10	1.10	1.10	1.10	1.10	1.10	1.10	1.10
100	1.10	1.10	1.10	1.10	1.10	1.10	1.10	1.10	1.10	1.10	1.10	1.10	1.10	1.10	1.10	1.10	1.10

Initial Supporting table - RandomCylModJerk

Description: Multiplier to P0300_CylMode_Jerk to account for different pattern of light level misfire. Multipliers are a function of engine rpm and % engine Load.

Notes: Used for P0300 - P0308, Cal Name: KtMSFD_K_ddt_LORES_Emiss

y/x	650	900	1,100	1,300	1,400	1,700	2,400	2,700	3,000	3,100	3,300	3,500	3,700	3,900	4,100	4,400	4,700
2	1.10	1.10	1.04	1.10	1.00	1.00	1.00	1.10	1.09	1.10	1.09	1.03	1.09	1.10	1.11	1.09	1.08
8	1.10	1.10	1.04	1.10	1.00	1.00	1.00	1.10	1.09	1.10	1.03	1.00	1.09	1.10	1.10	1.11	1.08
12	1.10	1.10	1.10	1.10	1.08	1.10	1.10	1.10	1.10	1.10	1.10	1.10	1.11	1.03	1.10	1.15	1.09
16	1.10	1.10	1.10	1.10	1.10	1.10	1.10	1.10	1.10	1.10	1.10	1.10	1.08	1.03	1.09	1.17	1.09
20	1.10	1.10	1.10	1.10	1.10	1.10	1.10	1.10	1.10	1.10	1.10	1.10	1.08	1.10	1.10	1.13	1.09
24	1.10	1.10	1.10	1.10	1.10	1.10	1.10	1.10	1.10	1.10	1.10	1.10	1.10	1.10	1.10	1.11	1.09
30	1.10	1.10	1.10	1.10	1.10	1.10	1.10	1.10	1.10	1.10	1.10	1.10	1.10	1.10	1.10	1.11	1.09
60	1.10	1.10	1.10	1.10	1.10	1.10	1.10	1.10	1.10	1.10	1.10	1.10	1.10	1.10	1.10	1.10	1.10
100	1.10	1.10	1.10	1.10	1.10	1.10	1.10	1.10	1.10	1.10	1.10	1.10	1.10	1.10	1.10	1.10	1.10

Initial Supporting table - RandomRevModDecl

Description: Mulitplier to P0300_RevMode_Decel to account for different pattern of light level misfire. Multipliers are a function of engine rpm and % engine Load.

Notes: Used for P0300 - P0308, Cal Name: KtMSFD_K_RevModeEmiss

y/x	3,000	3,500	4,000	4,500	5,000	5,500	6,000	7,000	8,000
2	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00
8	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00
12	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00
16	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00
20	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00
24	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00
30	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00
60	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00
100	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00

Initial Supporting table - RepetSnapDecayAdjst

Description: If misfire is present in consecutive engine cycles, this multiplier is applied to the misfire jerk threshold and compared to a crankshaft snap value after the misfire has taken place.. Table lookup as a function of engine rpm.

Notes: Used for P0300 - P0308, Cal Name:KtMSFD_K_dddt_PostCylCnscMsfr

y/x	700	900	1,200	1,600	2,000	2,400	2,800	4,000	6,500
1	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Initial Supporting table - RevMode_Decel

Description: Crankshaft decel threshold. Thresholds are a function of rpm and % engine Load.

Notes: Used for P0300-P0308. Cal Name: KtMISF_RevolutionMode

y/x	1,100	1,200	1,400	1,600	1,800	2,000	2,200	2,400	2,600	2,800	3,000	3,500	4,000	4,500	5,000	5,500	6,000	6,500	7,000
3	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767
6	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767
8	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767
10	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767
12	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767
14	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767
16	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767
18	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767
20	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767
22	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767
24	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767
26	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767
30	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767
40	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767
60	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767
78	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767
97	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767

Initial Supporting table - Ring Filter

Description: Driveline Ring Filter
After a low level misfire, another misfire may not be detectable until driveline ringing ceases. If no ringing seen, stop filter early.

Notes: Used for P0300-P0308. Cal Name: KaMSFD_Cnt_RingFilter

y/x	0	1	2	3	4	5	6	7	8
1	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00

Initial Supporting table - SCD_Decel

Description: Crankshaft decel threshold. SCD mode uses smaller windows near TDC. Thresholds are a function of rpm and % engine Load.

Notes: Used for P0300-P0308. Cal Name: KtMISF_dt_SCD_OffIdleMode

y/x	400	500	600	700	800	900	1,000	1,100	1,200	1,400	1,600	1,800	2,000
3	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767
6	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767
8	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767
10	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767
12	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767
14	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767
16	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767
18	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767
20	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767
22	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767
24	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767
26	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767
30	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767
40	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767
60	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767
78	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767
97	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767

Initial Supporting table - SCD_Jerk

Description: Crankshaft jerk threshold. SCD mode uses smaller windows near TDC. Thresholds are a function of rpm and % engine Load.

Notes: Used for P0300-P0308. Cal Name: KtMISF_ddt_SCD_OffIdleMode

y/x	400	500	600	700	800	900	1,000	1,100	1,200	1,400	1,600	1,800	2,000
3	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767
6	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767
8	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767
10	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767
12	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767
14	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767
16	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767
18	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767
20	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767
22	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767
24	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767
26	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767
30	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767
40	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767
60	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767
78	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767
97	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767	32,767

Initial Supporting table - SnapDecayAfterMisfire

Description: multiplier times the ddt_jerk value used used to detect misfire at that speed and load to see if size of disturbance has died down as expected of real misfire. Table lookup as a function of engine rpm and trans gear ratio.

Notes: Used for P0300 - P0308, Cal Name: KtMSFD_K_dddt_PostCylAft

y/x	700	900	1,200	1,600	2,000	2,400	2,800	4,000	6,500
1	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
1	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
1	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
1	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
2	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
2	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
3	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
5	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
5	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Initial Supporting table - TOSSRoughRoadThres

Description: Only used if Rough Road source = TOSS: dispersion value on Transmission Output Speed Sensor above which rough road is indicated present

Notes: Used for P0300-P0308. Cal Name: KtRRDI_a_RoughRoadThresh

y/x	600	800	1,000	1,200	1,400	1,600	1,800	2,000	2,200	2,400	2,600	2,800	3,000	3,500	4,000	4,500	5,000	5,500	6,000
100	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0
200	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0
300	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0
400	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0
500	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0
600	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0
700	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0
800	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0
900	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0
1,000	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0
1,100	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0
1,200	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0
1,300	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0
1,400	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0

Initial Supporting table - WaitToStart

Description: Number of engine cycles to delay if diesel engine is cranked before wait to start lamp is extinguished. This lookup table determines the delay length by taking into account the coolant temperature.

Notes: Used for P0300-P0308. Cal Name: KtMSFD_Cnt_GlowLampWarmupDly

y/x	-20	-10	0	10	20	30	40	50	60
1	0	0	0	0	0	0	0	0	0

Initial Supporting table - WSSRoughRoadThres

Description: Only used if Wheel speed from ABS is used. If difference between wheel speed readings is larger than this limit, rough road is present

Notes: Used for P0300-P0308. Cal Name: KtRRDI_a_WhlSpdRoughRoadLim

y/x	0	12	24	36	48	60	72	85	97	109	121	133	145	157	169	181	193
1	1.05	1.05	1.05	1.05	1.05	1.05	1.05	1.05	1.05	1.05	1.05	1.05	1.05	1.05	1.05	1.05	1.05

Initial Supporting table - ZeroTorqueAFM

Description: Zero torque engine load while in Active Fuel Management. %of Max Brake Torque along the Neutral rev line, as a function of RPM and Baro

Notes: Used for P0300-P0308. Cal Name: KtMSFD_ZeroTorqDoD

ZeroTorqueAFM - Part 1

y/x	580	650	730	800	900	1,000	1,100	1,200	1,400	1,600	1,800	2,000	2,200
65	-5.00	-5.00	-5.00	-5.00	-5.00	-5.00	-5.00	-5.00	-5.00	-5.00	-5.00	-5.00	-5.00
75	-5.00	-5.00	-5.00	-5.00	-5.00	-5.00	-5.00	-5.00	-5.00	-5.00	-5.00	-5.00	-5.00
85	-5.00	-5.00	-5.00	-5.00	-5.00	-5.00	-5.00	-5.00	-5.00	-5.00	-5.00	-5.00	-5.00
95	-5.00	-5.00	-5.00	-5.00	-5.00	-5.00	-5.00	-5.00	-5.00	-5.00	-5.00	-5.00	-5.00
105	-5.00	-5.00	-5.00	-5.00	-5.00	-5.00	-5.00	-5.00	-5.00	-5.00	-5.00	-5.00	-5.00

ZeroTorqueAFM - Part 2

y/x	2,400	2,600	2,800	3,000	3,113	3,300	3,500	3,700	3,900	4,100	4,400	4,600	4,800
65	-5.00	-5.00	-5.00	-5.00	-5.00	-5.00	-5.00	-5.00	-5.00	-5.00	-5.00	-5.00	-5.00
75	-5.00	-5.00	-5.00	-5.00	-5.00	-5.00	-5.00	-5.00	-5.00	-5.00	-5.00	-5.00	-5.00
85	-5.00	-5.00	-5.00	-5.00	-5.00	-5.00	-5.00	-5.00	-5.00	-5.00	-5.00	-5.00	-5.00
95	-5.00	-5.00	-5.00	-5.00	-5.00	-5.00	-5.00	-5.00	-5.00	-5.00	-5.00	-5.00	-5.00
105	-5.00	-5.00	-5.00	-5.00	-5.00	-5.00	-5.00	-5.00	-5.00	-5.00	-5.00	-5.00	-5.00

Initial Supporting table - ZeroTorqueEngLoad

Description: %of Max Brake Torque that represents Zero Brake torque along the Neutral rev line, as a function of RPM and Baro

Notes: Used for P0300-P0308. Cal Name: KtMISF_ZeroTorqSpd

ZeroTorqueEngLoad - Part 1

y/x	580	650	730	800	900	1,000	1,100	1,200	1,400	1,600	1,800	2,000	2,200
65	-3.00	-3.10	-3.20	-3.30	-3.40	-3.50	-3.60	-3.70	-3.80	-3.90	-4.00	-4.10	-4.20
75	-3.00	-3.10	-3.20	-3.30	-3.40	-3.50	-3.60	-3.70	-3.80	-3.90	-4.00	-4.10	-4.20
85	-3.00	-3.10	-3.20	-3.30	-3.40	-3.50	-3.60	-3.70	-3.80	-3.90	-4.00	-4.10	-4.20
95	-3.00	-3.10	-3.20	-3.30	-3.40	-3.50	-3.60	-3.70	-3.80	-3.90	-4.00	-4.10	-4.20
105	-3.00	-3.10	-3.20	-3.30	-3.40	-3.50	-3.60	-3.70	-3.80	-3.90	-4.00	-4.10	-4.20

ZeroTorqueEngLoad - Part 2

y/x	2,400	2,600	2,800	3,000	3,113	3,300	3,500	3,700	3,900	4,100	4,400	4,600	4,800
65	-4.30	-4.40	-4.50	-4.60	-5.00	-5.80	-6.40	-6.50	-5.80	-5.00	-4.00	-6.40	-6.50
75	-4.30	-4.40	-4.50	-4.60	-5.00	-5.80	-6.40	-6.50	-5.80	-5.00	-4.00	-6.40	-6.50
85	-4.30	-4.40	-4.50	-4.60	-5.00	-5.80	-6.40	-6.50	-5.80	-5.00	-4.00	-5.80	-5.00
95	-4.30	-4.40	-4.50	-4.60	-5.00	-5.80	-6.40	-6.50	-5.80	-5.00	-4.00	-5.00	-5.00
105	-4.30	-4.40	-4.50	-4.60	-5.00	-5.80	-6.40	-6.50	-5.80	-5.00	-4.00	-5.00	-5.00

Initial Supporting table - P0071: OAT Performance Drive Equilibrium Engine Off

Description: OAT Performance Diagnostic counter increment for determining OAT-IAT equilibrium for engine off (for hybrid applications)

Notes:

y/x	0.0	5.0	10.0	15.0	20.0	25.0	30.0	50.0	80.0
1.0	0.0	1.0	2.0	3.0	4.0	5.0	6.0	7.0	8.0

Initial Supporting table - P0071: OAT Performance Drive Equilibrium Engine Running

Description: OAT Performance Diagnostic counter increment for determining OAT-IAT equilibrium for engine running

Notes:

y/x	0.0	5.0	10.0	15.0	20.0	25.0	30.0	50.0	80.0
1.0	1.0	2.0	3.0	4.0	5.0	6.0	7.0	8.0	9.0
5.0	-5.0	-2.0	-1.0	0.0	1.0	2.0	3.0	4.0	5.0
10.0	-4.0	-1.0	0.0	0.0	1.0	2.0	3.0	4.0	5.0
20.0	-2.0	-1.0	0.0	0.0	1.0	2.0	3.0	4.0	5.0
30.0	-1.0	0.0	0.0	1.0	2.0	3.0	4.0	5.0	6.0
40.0	0.0	0.0	0.0	1.0	2.0	3.0	4.0	5.0	6.0
50.0	0.0	0.0	1.0	2.0	3.0	4.0	5.0	6.0	7.0
60.0	0.0	1.0	2.0	3.0	4.0	5.0	6.0	7.0	8.0
70.0	1.0	2.0	3.0	4.0	5.0	6.0	7.0	8.0	9.0

Initial Supporting table - K_EffExhFlowCond

Description: Enablement table, function of exhaust flow and SCR average temperature [boolean] for SCR NOx Catalyst Efficiency monitoring (P20EE)

Notes: x breakpoint is refered to SCR average temperature [°C]; y breakpoint is refered to exhaust mass flow [g/sec]

y/x	0	200	225	240	275	300	325	350	375	400	425	450	475	500	550
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
10	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
20	0	0	0	1	1	1	1	1	0	0	0	0	0	0	0
25	0	0	0	1	1	1	1	1	0	0	0	0	0	0	0
30	0	0	0	1	1	1	1	1	0	0	0	0	0	0	0
35	0	0	0	1	1	1	1	1	0	0	0	0	0	0	0
40	0	0	0	1	1	1	1	1	0	0	0	0	0	0	0
50	0	0	0	1	1	1	1	1	0	0	0	0	0	0	0
60	0	0	0	1	1	1	1	1	0	0	0	0	0	0	0
70	0	0	0	1	1	1	1	1	0	0	0	0	0	0	0
80	0	0	0	1	1	1	1	1	0	0	0	0	0	0	0
100	0	0	0	1	1	1	1	1	0	0	0	0	0	0	0
145	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
160	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
180	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
200	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

Initial Supporting table - m_NH3_StrgDevErrMaxThrsh

Description: Higher boundary of NH3 Storage Deviation Error [g] for SCR NOx Catalyst Efficiency monitoring (P20EE)

Notes: x breakpoint is refered to SCR average temperature [°C]

y/x	100	150	200	250	300	350	400	450
1	0	0	0	0	0	0	0	0

Initial Supporting table - m_NH3_StrgDevErrMinThrsh

Description: Lower boundary of NH3 Storage Deviation Error [g] for SCR NOx Catalyst Efficiency monitoring (P20EE)

Notes: x breakpoint is refered to SCR average temperature [°C]

y/x	100	150	200	250	300	350	400	450
1	0	0	0	0	0	0	0	0

Initial Supporting table - m_NH3_StrgMaxThrsh

Description: Higher boundary of estimated NH3 Storage [g] for SCR NOx Catalyst Efficiency monitoring (P20EE)

Notes: x breakpoint is refered to SCR average temperature [°C]

y/x	250	275	300	325	350	375	400	450
1	3	3	3	3	3	3	3	3

Initial Supporting table - m_NH3_StrgMinThrsh

Description: Lower boundary of estimated NH3 Storage [g] for SCR NOx Catalyst Efficiency monitoring (P20EE)

Notes: x breakpoint is refered to SCR average temperature [°C]

y/x	250	275	300	325	350	375	400	450
1	1	1	1	1	1	1	1	1

Initial Supporting table - m_SlipNOxIntglThrsh

Description: NOx integral threshold to enable Slip Condition based on SCR average Temperature [mg] for SCR NOx Catalyst Efficiency monitoring (P20EE)

Notes: x breakpoint is refered to SCR average temperature [°C]

y/x	250	300	350	425
1	500	500	500	500

Initial Supporting table - P054E_IFM_MinFuelIdleC1_G

Description: During Normal combustion mode, this error threshold map indicates the minimum fuel requested [mm3] in nominal condition and with transmission in gear. It's function of engine coolant temperature [°C] and engine speed [rpm]

Notes:

y/x	511.00	730.00	800.00	1,200.00	1,600.00
-20.04	30.18	30.18	30.18	30.18	30.18
-10.04	25.42	25.42	25.42	25.42	25.42
-0.04	21.98	21.98	21.98	23.94	21.98
19.96	19.75	19.75	19.75	19.75	19.75
39.96	16.38	16.38	18.55	16.38	16.38
69.96	13.01	13.01	13.42	13.01	13.01

Initial Supporting table - P054E_IFM_MinFuelIdleC1_PN

Description: During Normal combustion mode, this error threshold map indicates the minimum fuel requested [mm3] in nominal condition and with transmission in park and neutral. It’s function of engine coolant temperature [°C] and engine speed [rpm]

Notes:

y/x	511.00	730.00	800.00	1,200.00	1,600.00
-20.04	16.33	16.33	16.33	16.33	16.33
-10.04	14.86	14.86	14.86	14.86	14.86
-0.04	10.78	10.78	10.78	10.78	10.78
19.96	11.60	11.60	11.60	11.60	11.60
39.96	7.58	7.58	7.58	7.58	7.58
69.96	6.77	6.77	6.77	6.77	6.77

Initial Supporting table - P054E_IFM_MinFuelIdleHC_G

Description: During HC unloading combustion mode, this error threshold map indicates the minimum fuel requested [mm3] in nominal condition and with transmission in gear. It's function of engine coolant temperature [°C] and engine speed [rpm]

Notes:

y/x	511.00	730.00	800.00	1,200.00	1,600.00
-20.04	30.18	30.18	30.18	30.18	30.18
-10.04	25.42	25.42	25.42	25.42	25.42
-0.04	21.98	21.98	21.98	23.94	21.98
19.96	19.75	19.75	19.75	19.75	19.75
39.96	16.38	16.38	18.55	16.38	16.38
69.96	13.01	13.01	13.42	13.01	13.01

Initial Supporting table - P054E_IFM_MinFuelIdleHC_PN

Description: During HC unloading combustion mode, this error threshold map indicates the minimum fuel requested [mm3] in nominal condition and with transmission in park and neutral. It’s function of engine coolant temperature [°C] and engine speed [rpm]

Notes:

y/x	511.00	730.00	800.00	1,200.00	1,600.00
-20.04	16.33	16.33	16.33	16.33	16.33
-10.04	14.86	14.86	14.86	14.86	14.86
-0.04	10.78	10.78	10.78	10.78	10.78
19.96	11.60	11.60	11.60	11.60	11.60
39.96	7.58	7.58	7.58	7.58	7.58
69.96	6.77	6.77	6.77	6.77	6.77

Initial Supporting table - P054E_IFM_MinFuelIdleT1_G

Description: During SCR heating Mode 1 combustion mode, this error threshold map indicates the minimum fuel requested [mm3] in nominal condition and with transmission in gear. It's function of engine coolant temperature [°C] and engine speed [rpm]

Notes:

y/x	511.00	730.00	800.00	1,200.00	1,600.00
-20.04	30.18	30.18	30.18	30.18	30.18
-10.04	25.42	25.42	25.42	25.42	25.42
-0.04	21.98	21.98	21.98	23.94	21.98
19.96	19.75	19.75	19.75	19.75	19.75
39.96	16.38	16.38	18.55	16.38	16.38
69.96	13.01	13.01	13.42	13.01	13.01

Initial Supporting table - P054E_IFM_MinFuelIdleT1_PN

Description: During SCR heating Mode 1 combustion mode, this error threshold map indicates the minimum fuel requested [mm3] in nominal condition and with transmission in park and neutral. It’s function of engine coolant temperature [°C] and engine speed [rpm]

Notes:

y/x	511.00	730.00	800.00	1,200.00	1,600.00
-20.04	16.33	16.33	16.33	16.33	16.33
-10.04	14.86	14.86	14.86	14.86	14.86
-0.04	10.78	10.78	10.78	10.78	10.78
19.96	11.60	11.60	11.60	11.60	11.60
39.96	7.58	7.58	7.58	7.58	7.58
69.96	6.77	6.77	6.77	6.77	6.77

Initial Supporting table - P054E_IFM_MinFuelIdleT2_G

Description: During SCR heating Mode 2 combustion mode, this error threshold map indicates the minimum fuel requested [mm3] in nominal condition and with transmission in gear. It's function of engine coolant temperature [°C] and engine speed [rpm]

Notes:

y/x	511.00	730.00	800.00	1,200.00	1,600.00
-20.04	30.18	30.18	30.18	30.18	30.18
-10.04	25.42	25.42	25.42	25.42	25.42
-0.04	21.98	21.98	21.98	23.94	21.98
19.96	19.75	19.75	19.75	19.75	19.75
39.96	16.38	16.38	18.55	16.38	16.38
69.96	13.01	13.01	13.42	13.01	13.01

Initial Supporting table - P054E_IFM_MinFuelIdleT2_PN

Description: During SCR heating Mode 2 combustion mode, this error threshold map indicates the minimum fuel requested [mm3] in nominal condition and with transmission in park and neutral. It's function of engine coolant temperature [°C] and engine speed [rpm]

Notes:

y/x	511.00	730.00	800.00	1,200.00	1,600.00
-20.04	16.33	16.33	16.33	16.33	16.33
-10.04	14.86	14.86	14.86	14.86	14.86
-0.04	10.78	10.78	10.78	10.78	10.78
19.96	11.60	11.60	11.60	11.60	11.60
39.96	7.58	7.58	7.58	7.58	7.58
69.96	6.77	6.77	6.77	6.77	6.77

Initial Supporting table - P054E_IFM_MinFuelIdleT3_G

Description: During SCR heating Mode 3 combustion mode, this error threshold map indicates the minimum fuel requested [mm3] in nominal condition and with transmission in gear. It's function of engine coolant temperature [°C] and engine speed [rpm]

Notes:

y/x	511.00	730.00	800.00	1,200.00	1,600.00
-20.04	30.18	30.18	30.18	30.18	30.18
-10.04	25.42	25.42	25.42	25.42	25.42
-0.04	21.98	21.98	21.98	23.94	21.98
19.96	19.75	19.75	19.75	19.75	19.75
39.96	16.38	16.38	18.55	16.38	16.38
69.96	13.01	13.01	13.42	13.01	13.01

Initial Supporting table - P054E_IFM_MinFuelIdleT3_PN

Description: During SCR heating Mode 3 combustion mode, this error threshold map indicates the minimum fuel requested [mm3] in nominal condition and with transmission in park and neutral. It’s function of engine coolant temperature [°C] and engine speed [rpm]

Notes:

y/x	511.00	730.00	800.00	1,200.00	1,600.00
-20.04	16.33	16.33	16.33	16.33	16.33
-10.04	14.86	14.86	14.86	14.86	14.86
-0.04	10.78	10.78	10.78	10.78	10.78
19.96	11.60	11.60	11.60	11.60	11.60
39.96	7.58	7.58	7.58	7.58	7.58
69.96	6.77	6.77	6.77	6.77	6.77

Initial Supporting table - P054F_IFM_CombModesEnbl

Description: This calibration provides the capability to select in which combustion mode the Fuel Idle Monitoring shall be enabled.
1 -> monitor enabled
0 -> monitor disabled

Notes:

P054F_IFM_CombModesEnbl - Part 1

y/x	CeCMBR_e_Normal	CeCMBR_e_DPF_HiO2	CeCMBR_e_DPF_LoO2	CeCMBR_e_C2	CeCMBR_e_LNT_DeNOx	CeCMBR_e_LNT_DeSOx_Lean
1	1	0	0	0	0	0

P054F_IFM_CombModesEnbl - Part 2

y/x	CeCMBR_e_LNT_DeSOx_Rich	CeCMBR_e_C3	CeCMBR_e_SCR_Temp1	CeCMBR_e_SCR_Temp2	CeCMBR_e_DPF_PN	CeCMBR_e_DPF_RichIdle
1	0	0	0	0	0	0

P054F_IFM_CombModesEnbl - Part 3

y/x	CeCMBR_e_DPF_EngPrtct_HiO2	CeCMBR_e_DPF_EngPrtct_LoO2	CeCMBR_e_LNT_EngPrtct	CeCMBR_e_SCR_Temp3	CeCMBR_e_FAD_IdleInjLrn	CeCMBR_e_HCS_DeHC_Drive
1	0	0	0	0	0	1

P054F_IFM_CombModesEnbl - Part 4

y/x	CeCMBR_e_HCS_DeHC_Park	CeCMBR_e_SCR_ServWarmUp	CeCMBR_e_SCR_ServCheck	CeCMBR_e_SCR_DeSOx		
1	1	0	0	0		

Initial Supporting table - P054F_IFM_MaxFuelIdleC1_G

Description: During Normal combustion mode, this error threshold map indicates the maximum fuel requested [mm3] in nominal condition and with transmission in gear. It's function of engine coolant temperature [°C] and engine speed [rpm]

Notes:

y/x	511.00	730.00	800.00	1,200.00	1,600.00
-20.04	39.88	39.88	39.88	39.88	39.88
-10.04	35.12	35.12	35.12	35.12	35.12
-0.04	31.67	31.67	31.67	33.64	31.67
19.96	29.45	29.45	29.45	29.45	29.45
39.96	26.08	26.08	28.26	26.08	26.08
69.96	22.70	22.70	23.13	22.70	22.70

Initial Supporting table - P054F_IFM_MaxFuelIdleC1_PN

Description: During Normal combustion mode, this error threshold map indicates the maximum fuel requested [mm3] in nominal condition and with transmission in park and neutral. It's function of engine coolant temperature [°C] and engine speed [rpm]

Notes:

y/x	511.00	730.00	800.00	1,200.00	1,600.00
-20.04	28.03	28.03	28.03	28.03	28.03
-10.04	26.56	26.56	26.56	26.56	26.56
-0.04	22.48	22.48	22.48	22.48	22.48
19.96	23.30	23.30	23.30	23.30	23.30
39.96	19.27	19.27	19.27	19.27	19.27
69.96	18.48	18.48	18.48	18.48	18.48

Initial Supporting table - P054F_IFM_MaxFuelIdleHC_G

Description: During HC unloading combustion mode, this error threshold map indicates the maximum fuel requested [mm3] in nominal condition and with transmission in gear. It's function of engine coolant temperature [°C] and engine speed [rpm]

Notes:

y/x	511.00	730.00	800.00	1,200.00	1,600.00
-20.04	39.88	39.88	39.88	39.88	39.88
-10.04	35.12	35.12	35.12	35.12	35.12
-0.04	31.67	31.67	31.67	33.64	31.67
19.96	29.45	29.45	29.45	29.45	29.45
39.96	26.08	26.08	28.26	26.08	26.08
69.96	22.70	22.70	23.13	22.70	22.70

Initial Supporting table - P054F_IFM_MaxFuelIdleHC_PN

Description: During HC unloading combustion mode, this error threshold map indicates the maximum fuel requested [mm3] in nominal condition and with transmission in park and neutral. It’s function of engine coolant temperature [°C] and engine speed [rpm]

Notes:

y/x	511.00	730.00	800.00	1,200.00	1,600.00
-20.04	28.03	28.03	28.03	28.03	28.03
-10.04	26.56	26.56	26.56	26.56	26.56
-0.04	22.48	22.48	22.48	22.48	22.48
19.96	23.30	23.30	23.30	23.30	23.30
39.96	19.27	19.27	19.27	19.27	19.27
69.96	18.48	18.48	18.48	18.48	18.48

Initial Supporting table - P054F_IFM_MaxFuelIdleT1_G

Description: During SCR heating Mode 1 combustion mode, this error threshold map indicates the maximum fuel requested [mm3] in nominal condition and with transmission in gear. It's function of engine coolant temperature [°C] and engine speed [rpm]

Notes:

y/x	511.00	730.00	800.00	1,200.00	1,600.00
-20.04	39.88	39.88	39.88	39.88	39.88
-10.04	35.12	35.12	35.12	35.12	35.12
-0.04	31.67	31.67	31.67	33.64	31.67
19.96	29.45	29.45	29.45	29.45	29.45
39.96	26.08	26.08	28.26	26.08	26.08
69.96	22.70	22.70	23.13	22.70	22.70

Initial Supporting table - P054F_IFM_MaxFuelIdleT1_PN

Description: During SCR heating Mode 1 combustion mode, this error threshold map indicates the maximum fuel requested [mm3] in nominal condition and with transmission in park and neutral. It’s function of engine coolant temperature [°C] and engine speed [rpm]

Notes:

y/x	511.00	730.00	800.00	1,200.00	1,600.00
-20.04	28.03	28.03	28.03	28.03	28.03
-10.04	26.56	26.56	26.56	26.56	26.56
-0.04	22.48	22.48	22.48	22.48	22.48
19.96	23.30	23.30	23.30	23.30	23.30
39.96	19.27	19.27	19.27	19.27	19.27
69.96	18.48	18.48	18.48	18.48	18.48

Initial Supporting table - P054F_IFM_MaxFuelIdleT2_G

Description: During SCR heating Mode 2 combustion mode, this error threshold map indicates the maximum fuel requested [mm3] in nominal condition and with transmission in gear. It's function of engine coolant temperature [°C] and engine speed [rpm]

Notes:

y/x	511.00	730.00	800.00	1,200.00	1,600.00
-20.04	39.88	39.88	39.88	39.88	39.88
-10.04	35.12	35.12	35.12	35.12	35.12
-0.04	31.67	31.67	31.67	33.64	31.67
19.96	29.45	29.45	29.45	29.45	29.45
39.96	26.08	26.08	28.26	26.08	26.08
69.96	22.70	22.70	23.13	22.70	22.70

Initial Supporting table - P054F_IFM_MaxFuelIdleT2_PN

Description: During SCR heating Mode 2 combustion mode, this error threshold map indicates the maximum fuel requested [mm3] in nominal condition and with transmission in park and neutral. It’s function of engine coolant temperature [°C] and engine speed [rpm]

Notes:

y/x	511.00	730.00	800.00	1,200.00	1,600.00
-20.04	28.03	28.03	28.03	28.03	28.03
-10.04	26.56	26.56	26.56	26.56	26.56
-0.04	22.48	22.48	22.48	22.48	22.48
19.96	23.30	23.30	23.30	23.30	23.30
39.96	19.27	19.27	19.27	19.27	19.27
69.96	18.48	18.48	18.48	18.48	18.48

Initial Supporting table - P054F_IFM_MaxFuelIdleT3_G

Description: During SCR heating Mode 3 combustion mode, this error threshold map indicates the maximum fuel requested [mm3] in nominal condition and with transmission in gear. It's function of engine coolant temperature [°C] and engine speed [rpm]

Notes:

y/x	511.00	730.00	800.00	1,200.00	1,600.00
-20.04	39.88	39.88	39.88	39.88	39.88
-10.04	35.12	35.12	35.12	35.12	35.12
-0.04	31.67	31.67	31.67	33.64	31.67
19.96	29.45	29.45	29.45	29.45	29.45
39.96	26.08	26.08	28.26	26.08	26.08
69.96	22.70	22.70	23.13	22.70	22.70

Initial Supporting table - P054F_IFM_MaxFuelIdleT3_PN

Description: During SCR heating Mode 3 combustion mode, this error threshold map indicates the maximum fuel requested [mm3] in nominal condition and with transmission in park and neutral. It’s function of engine coolant temperature [°C] and engine speed [rpm]

Notes:

y/x	511.00	730.00	800.00	1,200.00	1,600.00
-20.04	28.03	28.03	28.03	28.03	28.03
-10.04	26.56	26.56	26.56	26.56	26.56
-0.04	22.48	22.48	22.48	22.48	22.48
19.96	23.30	23.30	23.30	23.30	23.30
39.96	19.27	19.27	19.27	19.27	19.27
69.96	18.48	18.48	18.48	18.48	18.48

Initial Supporting table - t_DerTempDsblTmr

Description: Disabling timer based on the time derivative of SCR average temperature [sec] for SCR NOx Catalyst Efficiency monitoring (P20EE)

Notes: x breakpoint is refered to SCR average temperature time derivative [°C/sec]

y/x	-10	-5	0	2	5	9	10	12
1	10	10	10	10	10	10	90	180

Initial Supporting table - T_MaxTempGrad

Description: Lower boundary of SCR temperature gradient (difference between SCR upstream and SCR downstream) [°C] for SCR NOx Catalyst Efficiency monitoring (P20EE)

Notes: x breakpoint is refered to SCR average temperature [°C]

y/x	100	150	200	250	300	350	400	450
1	35	35	35	35	35	35	35	35

Initial Supporting table - T_MinTempGrad

Description: Lower boundary of SCR temperature gradient (difference between SCR upstream and SCR downstream) [°C] for SCR NOx Catalyst Efficiency monitoring (P20EE)

Notes: x breakpoint is refered to SCR average temperature [°C]

y/x	100	150	200	250	300	350	400	450
1	-35	-35	-35	-35	-35	-35	-35	-35

Initial Supporting table - t_NOxFlowIncDsblTmr

Description: Debounce time to wait after the NOx flow enter in range [sec] for SCR NOx Catalyst Efficiency monitoring (P20EE)

Notes: x breakpoint is refered to NOx avarage flow [mg/sec]; y breakpoint is refered to time spent with NOx flow out of range [sec]

y/x	5	15	30	45	60	90	120
5	0	0	0	0	0	0	0
10	0	0	0	0	0	0	0
15	0	0	0	0	0	0	0
30	0	0	0	0	0	0	0
50	0	0	0	0	0	0	0
100	0	0	0	0	0	0	0
150	0	0	0	0	0	0	0
200	0	0	0	0	0	0	0

Initial Supporting table - P0128_Maximum Accumulated Energy for Start-up ECT conditions - Alternate

Description: KtECTR_E_CTR_WrmUpEnrgyLimTest1

Notes: Z axis is the cooling system energy failure threshold (kJ), X axis is ECT Temperature at Power up (° C), (Deluxe version)

y/x	-40	-7	10	20	55	69	90
1	27,000	17,400	13,100	10,350	2,500	2,500	2,500

Initial Supporting table - P0128_Maximum Accumulated Energy for Start-up ECT conditions - Primary

Description: KtECTR_E_CTR_WrmUpEnrgyLimTest0

Notes: Z axis is the cooling system energy failure threshold (kJ), X axis is ECT Temperature at Power up (° C) , (Deluxe version)

y/x	-40	-7	10	20	55	69	90
1	27,500	20,000	16,000	13,500	5,500	2,500	2,500

Initial Supporting table - P0606_Last Seed Timeout f(Loop Time)

Description: The max time for the Last Seed Timeout as a function of operating loop time sequence.

Notes: P0606, KaPISD_t_LastSeedTimeout[x]

y/x	CePISR_e_6p25msSeq	CePISR_e_12p5msSeq	CePISR_e_25msSeq	CePISR_e_LORES_C
1	0.200	0.200	0.200	409.594

Initial Supporting table - P0606_PSW Sequence Fail f(Loop Time)

Description: Fail threshold for PSW per operating loop.

Notes: P0606, KaPISD_Cnt_SequenceFail[x]

y/x	CePISR_e_6p25msSeq	CePISR_e_12p5msSeq	CePISR_e_25msSeq	CePISR_e_LORES_C
1	3	3	3	3

Initial Supporting table - P0606_PSW Sequence Sample f(Loop Time)

Description: Sample threshold for PSW per operating loop.

Notes: P0606, KaPISD_Cnt_SequenceSmpl[x]

y/x	CePISR_e_6p25msSeq	CePISR_e_12p5msSeq	CePISR_e_25msSeq	CePISR_e_LORES_C
1	4	4	4	4

Initial Supporting table - P1682_PT Relay Pull-in Run/Crank Voltage f(IAT)

Description: The Run/Crank voltages required to pull in the PT relay as a function of induction air temperature.

Notes: P1682, KtEROR_U_PT_RelayPullInEnbl

y/x	23.00	85.00	95.00	105.00	125.00
1.00	7.00	8.70	9.00	9.20	10.00

Initial Supporting table - P057B KtBRKI_K_CmpltTestPointWeight

Description:

Notes:

y/x	0.000	0.050	0.080	0.250	0.350	0.450	0.550	0.750	1.000
1	0	1	1	1	1	1	1	1	1

Initial Supporting table - P057B KtBRKI_K_FastTestPointWeight

Description:

Notes:

y/x	0.000	0.050	0.080	0.250	0.350	0.450	0.550	0.750	1.000
1	0	1	1	1	1	1	1	1	1

Initial Supporting table - P0531_Coolant_Weighting_Factor

Description: Coolant Weighting Factor for Delta Predicted AC Pressure

Notes: For P0531: KtACCD_k_HSPRat_EngageCoolCoeff with X Axis is Engine Coolant defined by KnACCD_T_HSPRat_EngageTstCool to weight the Delta Predicted Pressure

y/x	-20	0	20	60	60	60	60	60	100
1	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000

Initial Supporting table - P0531_Delta_Predicted_ Pressure

Description: AC High Side Pressure Sensor Sensor Engage Test Predicted Delta Pressure

Notes: For P0531: KtACCD_p_HSPR_DeltaPredicted with X Axis is defined by KnACCD_T_HSPRat_EngageTstAmb and Y Axis is defined by KnACCD_v_HSPRat_EngageTstVehSpd

y/x	-20	0	20	60	60	60	60	60	100
0	0.00	5.00	20.00	50.00	50.00	50.00	50.00	50.00	100.00
5	0.00	5.00	20.00	50.00	50.00	50.00	50.00	50.00	100.00
20	0.00	5.00	20.00	50.00	50.00	50.00	50.00	50.00	100.00
50	0.00	5.00	20.00	50.00	50.00	50.00	50.00	50.00	100.00
50	0.00	5.00	20.00	50.00	50.00	50.00	50.00	50.00	100.00
50	0.00	5.00	20.00	50.00	50.00	50.00	50.00	50.00	100.00
50	0.00	5.00	20.00	50.00	50.00	50.00	50.00	50.00	100.00
50	0.00	5.00	20.00	50.00	50.00	50.00	50.00	50.00	100.00
100	0.00	5.00	20.00	50.00	50.00	50.00	50.00	50.00	100.00

Initial Supporting table - P0531_Delta_Predicted_Quality_Factor

Description: Delta Predicted Qualtiy Factor for the Engage Test

Notes: For P0531: KtACCD_k_HSPR_QualFactor with X Axis is defined by KnACCD_T_HSPRat_EngageTstAmb and Y Axis is defined by KnACCD_v_HSPRat_EngageTstVehSpd

y/x	-20	0	20	60	60	60	60	60	100
0	0.00999	0.04999	0.20000	0.50000	0.50000	0.50000	0.50000	0.50000	0.99998
5	0.00999	0.04999	0.20000	0.50000	0.50000	0.50000	0.50000	0.50000	0.99998
20	0.00999	0.04999	0.20000	0.50000	0.50000	0.50000	0.50000	0.50000	0.99998
50	0.00999	0.04999	0.20000	0.50000	0.50000	0.50000	0.50000	0.50000	0.99998
50	0.00999	0.04999	0.20000	0.50000	0.50000	0.50000	0.50000	0.50000	0.99998
50	0.00999	0.04999	0.20000	0.50000	0.50000	0.50000	0.50000	0.50000	0.99998
50	0.00999	0.04999	0.20000	0.50000	0.50000	0.50000	0.50000	0.50000	0.99998
50	0.00999	0.04999	0.20000	0.50000	0.50000	0.50000	0.50000	0.50000	0.99998
100	0.00999	0.04999	0.20000	0.50000	0.50000	0.50000	0.50000	0.50000	0.99998

Initial Supporting table - P0531_FanSpeed_Weighting_Factor

Description: FanSpeed Weighting Factor for Delta Predicted AC Pressure

Notes: For P0531: KtACCD_k_HSPRat_EngageFanCoeff with X Axis is Fan Speed as desfined by KnACCD_Pct_HSPRat_EngageTestFan to weight the Delta Predicted Pressure

y/x	0	5	20	50	50	50	50	50	100
1	1	1	1	1	1	1	1	1	1

Initial Supporting table - P0606_Program Sequence Watch Enable f(Core, Loop Time)

Description: The enabling flags for the program sequence watch as a function of processor core and operating loop time sequence.

Notes: P0606, KaPISD_b_ProgSeqWatchEnbl

y/x	CeTSKR_e_CPU	CeTSKR_e_CPU2	CeTSKR_e_CPU3	CeTSKR_e_CPU4
CePISR_e_6p25msSeq	1	0	0	0
CePISR_e_12p5msSeq	1	0	0	0
CePISR_e_25msSeq	1	0	0	0
CePISR_e_LORES_C	1	0	0	0

16 OBDG04 Fault Bundle Definitions

Bundle Name: 5VoltReferenceB_FA
P0651
Bundle Name: AAP_AAP2_SnsrStabFA
P227E
Bundle Name: AAP_AAP5_SnsrCktFA
P2228, P2229
Bundle Name: AAP_AAP5_SnsrStabFA
P2230
Bundle Name: AAP_AmbientAirPresDfltd
P2227, P2228, P2229, P2230, P00C7
AAP_AmbientAirPresDfltd - Other Definitions:
Bundle Name: AAP_AmbPresSnsrTFTKO
P2227, P2228, P2229, P2230, P00C7
AAP_AmbPresSnsrTFTKO - Other Definitions:
Bundle Name: AAP_SnsrCktFA
Naturally aspirated: P2228, P2229. Turbocharged: P0237, P0238
Bundle Name: AAP_SnsrCktFP
Naturally aspirated: P2228, P2229. Turbocharged: P0237, P0238
Bundle Name: AAP_SnsrFA
Naturally Aspirated: P2227, P2228, P2229, P2230. Turbocharged: P0237, P0238.
Bundle Name: AAP2_SnsrCktFA
P2228, P2229
Bundle Name: AAP2_SnsrCktFP
P2228, P2229
Bundle Name: AAP2_SnsrFA
P2227, P2228, P2229, P2230
Bundle Name: AAP3_SnsrCktFA
P222C, P222D
Bundle Name: AAP3_SnsrCktFP
P222C, P222D
Bundle Name: AccCktLo_FA
P2537
Bundle Name: AcceleratorPedalFailure
P2122, P2123, P2127, P2128, P2138, P0697, P06A3
Bundle Name: ACCMLostComm
U016B

Bundle Name: ACFailedOnSD
See ACCM Document
Bundle Name: ACHighSidePressSnsrCktFA
P0532, P0533
Bundle Name: ACThrmlRefrigSpdVld
See ACCM Document
Bundle Name: AIC_AirCntrlShtOffAction

AIC_AirCntrlShtOffAction - Other Definitions:
Enumerative that is set to CeAICR_e_CntrlActv (air control is in closed loop) if NONE of the following conditions are verified:

1. Air control is shut off due to an air system fault
2. Engine mode is ready
3. Engine mode is cranking
4. HP EGR actuator, LP EGR actuator or Throttle actuator are NOT available
5. Zero torque condition is active (for all combustion modes except for the Rich ones)
6. EGR control request is maximum: TRUE if Air setpoint = 1,800.00 [mg]
7. Large injected fuel condition is active:
   FALSE for SCR service check, C2, C3 DeSOx Rich, DeNOx combustion modes.
   For other combustion modes, it is TRUE if Fuel request is higher than a high threshold, with hysteresis: if the condition is TRUE, then it remains TRUE until the Fuel request drops below a low threshold.

   These thresholds depend on specific calibrations, related to different combustion modes (look at the variable VeAICR_e_CombMode), which are function of the engine speed:

   - D1 and D3:
     - High: **AIC_AirCntrlShtOffActn: Fuel High Threshold for D1 and D3** [mm^3]
     - Low: **AIC_AirCntrlShtOffActn: Fuel Low Threshold for D1 and D3** [mm^3]
   - D2 and D4:
     - High: **AIC_AirCntrlShtOffActn: Fuel High Threshold for D2 and D4** [mm^3]
     - Low: **AIC_AirCntrlShtOffActn: Fuel Low Threshold for D2 and D4** [mm^3]
   - DeSOx Lean:
     - High: **AIC_AirCntrlShtOffActn: Fuel High Threshold for L3** [mm^3]
     - Low: **AIC_AirCntrlShtOffActn: Fuel Low Threshold for L3** [mm^3]
   - SCR modes:
     - High: **AIC_AirCntrlShtOffActn: Fuel High Threshold for SCR** [mm^3]
     - Low: **AIC_AirCntrlShtOffActn: Fuel Low Threshold for SCR** [mm^3]
   - All other modes:
     - High: **AIC_AirCntrlShtOffActn:Fuel High Threshold for others** [mm^3]
     - Low: **AIC_AirCntrlShtOffActn: Fuel Low Threshold for others** [mm^3]

8. Engine Coolant Temperature too high condition is active:
   FALSE for SCR service check, DeSOx Rich, DeNOx combustion modes.
   For other combustion modes, it is TRUE if Engine Coolant Temperature is higher than a high threshold, with hysteresis: if the condition is TRUE, then it remains TRUE until the Engine Coolant Temperature drops below a low threshold.

   These thresholds depend on specific calibrations, related to different combustion modes (look at the variable VeAICR_e_CombMode):

- o DPF and HCS modes:
  - High: 117.00 [°C]
  - Low: 114.00 [°C]
- o DeSOx Lean:
  - High: 117.00 [°C]
  - Low: 114.00 [°C]
- o C3:
  - High: 117.00 [°C]
  - Low: 114.00 [°C]
- o SCR modes:
  - High: 117.00 [°C]
  - Low: 114.00 [°C]
- o All other modes:
  - High: 117.00 [°C]
  - Low: 114.00 [°C]

9. Engine Coolant Temperature too low condition is active:
If Engine coolant temperature is NOT higher than the global temperature threshold for OBDII market (OBD Coolant Enable Criteria==FALSE) AND ECT_TooLow==TRUE:
This is FALSE for SCR service check, DeSOx Rich, DeNOx combustion modes.
For other combustion modes, it is TRUE if Engine Coolant Temperature is lower than a low threshold, with hysteresis: if the condition is TRUE, then it remains TRUE until the Engine Coolant Temperature goes above a high threshold.

These thresholds depend on specific calibrations, related to different combustion modes (look at the variable VeAICR_e_CombMode):

- o DPF and HCS modes (thresholds depending on the Outside Air Temperature):
  - High: **AIC_AirCntrlShtOffActn: ECT Too Low Hysteresis High Threshold for DPF** [°C]
  - Low: **AIC_AirCntrlShtOffActn: ECT Too Low Hysteresis Low Threshold for DPF** [°C]
- o DeSOx Lean:
  - High: 13.00 [°C]
  - Low: 10.00 [°C]
- o C3:
  - High: 13.00 [°C]
  - Low: 10.00 [°C]
- o SCR modes (thresholds depending on the Outside Air Temperature):
  - High: **AIC_AirCntrlShtOffActn: ECT Too Low Hysteresis High Threshold for SCR** [°C]
  - Low: **AIC_AirCntrlShtOffActn: ECT Too Low Hysteresis Low Threshold for SCR** [°C]
- o All other modes (thresholds depending on the Outside Air Temperature):
  - High: **AIC_AirCntrlShtOffActn: ECT Too Low Hysteresis High Threshold for others** [°C]
  - Low: **AIC_AirCntrlShtOffActn: ECT Too Low Hysteresis Low Threshold for others** [°C]

10. Intake Air Temperature too high condition is active:
FALSE for DeSOx Rich, DeNOx combustion modes.
For other combustion modes, it is TRUE if Intake Air Temperature is higher than a high threshold, with hysteresis: if the condition is TRUE, then it remains TRUE until the Intake Air Temperature drops below a low threshold.

These thresholds depend on specific calibrations, related to different combustion modes (look at the variable VeAICR_e_CombMode):

- o DPF and HCS modes:

  - High: 80.00 [°C]
  - Low: 70.00 [°C]
- SCR service check mode:
  - High: 80.00 [°C]
  - Low: 70.00 [°C]
- DeSOx Lean:
  - High: 80.00 [°C]
  - Low: 70.00 [°C]
- SCR modes:
  - High: 80.00 [°C]
  - Low: 70.00 [°C]
- All other modes:
  - High: 80.00 [°C]
  - Low: 70.00 [°C]

11. Intake Air Temperature too low condition is active:
FALSE for DeSOx Rich, DeNOx combustion modes.
For other combustion modes, it is TRUE if Intake Air Temperature is lower than a low threshold, with hysteresis: if the condition is TRUE, then it remains TRUE until the Intake Air Temperature goes above a high threshold.

These thresholds depend on specific calibrations, related to different combustion modes (look at the variable VeAICR_e_CombMode):

- DPF and HCS modes:
  - High: -40.00 [°C]
  - Low: -43.00 [°C]
- SCR service check mode:
  - High: -50.00 [°C]
  - Low: -55.00 [°C]
- DeSOx Lean:
  - High: -50.00 [°C]
  - Low: -55.00 [°C]
- SCR modes:
  - High: -50.00 [°C]
  - Low: -55.00 [°C]
- All other modes:
  - High: -50.00 [°C]
  - Low: -55.00 [°C]

12. Ambient pressure too low condition is active:
FALSE for DPF and HCS, SCR service check, LNT (DeNOx, DeSOx Rich and DeSOx Lean) combustion modes.
For other combustion modes, it is TRUE if Ambient Pressure is lower than a low threshold, with hysteresis: if the condition is TRUE, then it remains TRUE until the Ambient Pressure goes above a high threshold.

These thresholds depend on specific calibrations, related to different combustion modes (look at the variable VeAICR_e_CombMode):

- SCR modes:
  - High: 72.00 [kPa]
  - Low: 70.00 [kPa]
- C3:

- High: 72.00 [kPa]
- Low: 70.00 [kPa]

o All other modes:
- High: 72.00 [kPa]
- Low: 70.00 [kPa]

13. Overlong idle condition is active:
FALSE for DPF, SCR service check, LNT (DeNOx, DeSOx Rich and DeSOx Lean) combustion modes.
For other combustion modes, it is TRUE if Engine Speed is lower than a threshold and this condition lasts for a calibrate-able timer.

The threshold and the timer depend on specific calibrations, related to different combustion modes (look at the variable VeAICR_e_CombMode):

o SCR modes:
- Threshold: 600.00 [rpm]
- Timer: 409.59 [s]

o All other modes:
- Threshold: 600.00 [rpm]
- Timer: 409.59 [s]

14. MAF drift intrusive test is requested:
TRUE if the following conditions (in AND) are satisfied:
- MAF sensor rationality monitoring - intrusive airflow drift test is enabled (see the documentation related to P0101)
- Engine is in idle: 700.00 [rpm] < engine speed < 1,200.00 [rpm]
  for a debouncing time > 1.00 [s]
- Intake Manifold Pressure is steady state: |IntkPres – IntkPres_old| < 6.00 [kPa]
- Intake Manifold Pressure is in range: 70.00 [kPa] < IntkPres < 150.00 [kPa]

Conditions from 7 to 14 in AND with: Exhaust Gas Overtemperature NOT detected (EGT_ExhOverTemp==FALSE)

Conditions 8 and from 10 to 12 also in AND with (EOBD only): EGR intrusive test NOT enabled

Bundle Name: AIC_AirShtOffReq

AIC_AirShtOffReq - Other Definitions:
AAP_AmbientAirPresDfltd, AAP_AmbPresSnsrTFTKO, ECT_Sensor_FA, ECT_Sensor_TFTKO, MnfdTempSensorFA, MnfdTempSensorTFTKO, CrankSensor_FA, CrankSensor_TFTKO, LPE_TempSnsrFA, LPE_TempSnsrTFTKO, MAF_MAF_SnsrCktFlt, MAF_MAF_SnsrOfstFA, MAF_MAF_SnsrOfstTFTKO, MAF_MAF_SnsrPerfFA, MAF_MAF_SnsrPerfTFTKO, MAP_EngOffPressFA, MAP_EngOffPressTFTKO, MAP_SensorFA, MAP_SensorTFTKO, CEB_ActrCktLoFlt, EGR_IntkTempTooHiTFTKO, EGR_PstnShtOffReq, FUL_EGR_InjSysFA, LPE_PstnShtOffReq, SWC_SwirlShtOffReq, TPS_PstnShtOffReq, AIC_BstHiFsftActv, AIC_AirDvtnTFTKO, DPF_FR_LoFA, LPE_VlvOvrHtTFTKO

Bundle Name: AIC_BstCntrlCL

AIC_BstCntrlCL - Other Definitions:
Boolean that is set to TRUE if the following conditions are satisfied (conditions in AND):

- Fuel request is higher than a “On” threshold, with hysteresis: if the condition is TRUE, then it remains TRUE until the Fuel request drops below a “Off” threshold.

These thresholds depend on specific calibrations, related to different combustion modes (look at the variable VeAICR_e_CombMode), which are function of the engine speed:

- C2 and C3:
  - On: **AIC_BstCntrlCL: Fuel Request On Threshold for C2 and C3** [mm^3]
  - Off: **AIC_BstCntrlCL: Fuel Request On Threshold for C2 and C3** - 7.00 [mm^3]
- D1, D3 and HC unloading:
  - On: **AIC_BstCntrlCL: Fuel Request On Threshold for D1 and D3** [mm^3]
  - Off: **AIC_BstCntrlCL: Fuel Request On Threshold for D1 and D3** - 6.00 [mm^3]
- D2 and D4:
  - On: **AIC_BstCntrlCL: Fuel Request On Threshold for D2 and D4** [mm^3]
  - Off: **AIC_BstCntrlCL: Fuel Request On Threshold for D2 and D4** - 7.00 [mm^3]
- V3:
  - On: **AIC_BstCntrlCL: Fuel Request On Threshold for V3** [mm^3]
  - Off: **AIC_BstCntrlCL: Fuel Request On Threshold for V3** - 5.00 [mm^3]
- S2:
  - On: **AIC_BstCntrlCL: Fuel Request On Threshold for S2** [mm^3]
  - Off: **AIC_BstCntrlCL: Fuel Request On Threshold for S2** - 5.00 [mm^3]
- S3:
  - On: **AIC_BstCntrlCL: Fuel Request On Threshold for S3** [mm^3]
  - Off: **AIC_BstCntrlCL: Fuel Request On Threshold for S3** - 5.00 [mm^3]
- Default:
  - On: **AIC_BstCntrlCL: Fuel Request On Threshold for others** [mm^3]
  - Off: **AIC_BstCntrlCL: Fuel Request On Threshold for others** - 5.00 [mm^3]

- Turbo configuration is VGT and the VGT actuator is a DC motor, OR "Shared High Side driver driven closed"
- Run Crank Ignition in range: Battery voltage > 11.00 [V]
- Relay in range: Powertrain relay voltage > 11.00 [V]
- No faults

Bundle Name: AIC_BstSysDiagDenomDsbl

P226B

AIC_BstSysDiagDenomDsbl - Other Definitions:
VGT_ActCktFA, WGA_ActrCktFA, MAP_SensorFA, TPS_PstnDvtnFA, AIC_DCMtrGenericPstnFA, AAP_AmbientAirPresDfltd, AIC_OAT_SignalFA, ECT_Sensor_FA, TPS_PstnSnsrFA

Bundle Name: AIC_DCMtrGenericPstnFA

P2564, P2565 , P16B0, P16B1, P16B2, P003A, P2598, P2599

AIC_DCMtrGenericPstnFA - Other Definitions:
VGT_PstnCntrlFA, VGT_PstnSnsrFA

Bundle Name: AIC_EGR_FlowDiagAirTempFA

AIC_EGR_FlowDiagAirTempFA - Other Definitions:
IAT_SensorFA, MnfdTempSensorFA, AIC_OAT_SignalFA

Bundle Name: AIC_GenericBstSysFlt

P0234, P0299, P2263, P226B

AIC_GenericBstSysFlt - Other Definitions:

VGT_PstnSnsrFA, VGT_PstnSnsrTFTKO, VGT_PstnCntrlFA, VGT_PstnCntrlTFTKO, VGT_ActCktFA, VGT_ActCktTFTKO, WGA_ActrCktFA, WGA_ActrCktTFTKO, MAP_SensorFA, MAP_SensorTFTKO, TPS_PstnDvtnFA, TPS_PstnDvtnTFTKO
Bundle Name: AIC_OAT_SignalFA
AIC_OAT_SignalFA - Other Definitions: OAT_OAT_SnsrNonEmissFA, OAT_PtEstFiltFA.
Bundle Name: AmbPresDfltdStatus
Baro Sensor Present: P2227, P2228, P2229, P2230. No Baro Sensor Present: P0101, P0102, P0103, P0106, P0107, P0108, P0111, P0112, P0113, P0114, P0121, P0122, P0123, P012B, P012C, P012D, P0222, P0223, P1221
Bundle Name: AnyCamPhaser_FA
P0010, P0011, P0013, P0014, P0020, P0021, P0023, P0024, P2088, P2089, P2090, P2091, P2092, P2093, P2094, P2095, P05CC, P05CD, P05CE, P05CF,
Bundle Name: AnyCamPhaser_TFTKO
P0010, P0011, P0013, P0014, P0020, P0021, P0023, P0024, P2088, P2089, P2090, P2091, P2092, P2093, P2094, P2095, P05CC, P05CD, P05CE, P05CF,
Bundle Name: CamLctnExhFA
P0017, P0019, P0365, P0366, P0390, P0391
Bundle Name: CamLctnIntFA
P0016, P0018, P0340, P0341, P0345, P0346
Bundle Name: CamSensorAnyLctnTFTKO
P0016, P0017, P0018, P0019, P0340, P0341, P0345, P0346, P0365, P0366, P0390, P0391
Bundle Name: CAN_LostComm_FltN_BusB_NOxSnsr_A
U029D
Bundle Name: CAN_LostComm_FltN_BusB_NOxSnsr_B
U029E
Bundle Name: CAT_Cat2_SysEffLoB1_FA
P0422
Bundle Name: CAT_CatPresDropFlt
CAT_CatPresDropFlt - Other Definitions: EGT_SnsrCatUpFlt || EXF_TotExhCatUpFlt || EGP_PresCatDwnFlt
Bundle Name: CAT_CatSysEffLoB1_FA
P0421
Bundle Name: CAT_HC_Cat2_DwnFlt
CAT_HC_Cat2_DwnFlt - Other Definitions: HCI_HC_dm_Cat2_UpFlt || OXY_O2_Cat2_UpFlt || EXF_TotExhCat2_UpFlt || EGT_TempCat2_UpFlt || EGP_PresCat2_UpFlt || AmbientAirDefault || VehicleSpeedSensor_FA || CAT_OutsideTempFA

Bundle Name: CAT_OutsideTempFA
CAT_OutsideTempFA - Other Definitions: OAT_PtEstFiltFA
Bundle Name: CAT_PM_Cat2_DwnVld
CAT_PM_Cat2_DwnVld - Other Definitions: SOT_PM_Cat2_UpVld
Bundle Name: CEB_ActrCktFA
P245A , P245C, P245D
CEB_ActrCktFA - Other Definitions:
Bundle Name: CEB_ActrCktLoFA
P245C
Bundle Name: CET_DNSS_FA
P142A, P1429, P040E, P040C, P040D, P040B
Bundle Name: CET_UPSS_FA
P1427, P1428, P041C, P041D, P041E, P041B
Bundle Name: CET_UPSS_TFTKO
P1427, P1428, P041C, P041D, P041E, P041B
Bundle Name: CIT_CAC_DwnCktFA
P10D7, P10D6
Bundle Name: CIT_CAC_DwnFA
P10D6, P10D7, P10D8, P10D5
Bundle Name: CIT_CAC_DwnSelfCorFA
P10D8
Bundle Name: CIT_CAC_UpCktFA
P007D, P007C
Bundle Name: CIT_CAC_UpFA
P007D, P007C, P007E, P007B
Bundle Name: CIT_CAC_UpSelfCorFA
P007E
Bundle Name: ClchPstnSnsrPerf FA
P0806
Bundle Name: ClutchPstnSnsr FA
P0806, P0807, P0808
Bundle Name: ClutchPstnSnsrCktHi FA
P0808
Bundle Name: ClutchPstnSnsrCktLo FA

P0807
Bundle Name: ClutchPstnSnsrNotLearned
P080A
Bundle Name: CrankSensor_FA
P0335, P0336
Bundle Name: CrankSensor_TFTKO
P0335, P0336
Bundle Name: DPF_DPF_St
DPF_DPF_St - Other Definitions: DPF_DPF_St is equal to: - Soot Loading modes (no DPF regeration) if DPF_EnblDPF= 0 - Regeneration modes if DPF_EnblDPF = 1
Bundle Name: DPF_EnblDPF
DPF_EnblDPF - Other Definitions: DPFR_EnblDPF = 1 if: - Combustion mode is DPF Regeneration modes.
Bundle Name: DPF_FR_CalcDsbl
DPF_FR_CalcDsbl - Other Definitions: EGT_SnsrDPF_UpFlt OR EGP_DiffPresSnsrFlt OR EXF_TotExhDPF_UpFlt OR AmbPresDfltdStatus
Bundle Name: DPF_LastRgnAvg
DPF_LastRgnAvg - Other Definitions: DPF_LastRgnAvg is calculated as the average distance between two completed regenerations.
Bundle Name: DPF_ResistFlowCalcOff
DPF_ResistFlowCalcOff - Other Definitions: The Resistive flow calculation is disabled, **DPF_ResistFlowCalcOff** = 1, if one of those conditions is fulfilled for calibratable debouncing time 0.00 [sec]: - DPF Differential pressure sensor reading is below 1.00 [KPa] - Estimated exhaust gas volume flow rate is below 25.00 [l/s] - DPF_FR_CalcDsbl and 0.00 are both = 1 . Derivative of pressure drop across the DPF is above 5.00 [KPa/sec] - DPF_LastRgnAvg is below -1.00 - Fuel Request is outside the range identified by **DPF_ResistFlowDsblLo** and **DPF_ResistFlowDsblHi** - The regeneration is on going and with the DPF upstream tempearture greater than **DPF_EffRgnHysHi** (with hysteresys **DPF_EffRgnHysLo**)
Bundle Name: DPF_ResistFlowFltd
DPF_ResistFlowFltd - Other Definitions: It is the Filtered exhaust gas resistive flow, that indicates the amount of soot present inside in the DPF. The flow resistance depends on Pressure difference measured by exhaust pressure sensor(EGP) , between upstream and downstream DPF, and Exhaust Flow.

The Filtered Flow Resistance is filtered by a low pass filter with a calibratable time constant in order to obtain the mean value for diagnostic purposes.

Bundle Name: DPF_TempDPF_DwnFlt

DPF_TempDPF_DwnFlt - Other Definitions:
NOT(NOT EGP_PresDPF_UpFlt AND NOT EXF_TotExhDPF_UpFlt AND NOT VehicleSpeedSensor_FA AND NOTEGT_SnsrDPF_UpFlt AND NOT OAT_PtEstFiltFA AND NOT HCI_HC_dm_DPF_UpFlt AND NOT EXM_EQR_ExhMnfdNotVld AND NOT EGT_TempCat2_DwnFlt)

Bundle Name: ECT_Sensor_Ckt_FA

P0117, P0118

Bundle Name: ECT_Sensor_Ckt_FP

P0117, P0118

Bundle Name: ECT_Sensor_Ckt_TFTKO

P0117, P0118

Bundle Name: ECT_Sensor_DefaultDetected

P0116, P0117, P0118, P0119, P111E

Bundle Name: ECT_Sensor_FA

P0116, P0117, P0118, P0119, P0128, P111E

Bundle Name: ECT_Sensor_Perf_FA

P0116, P111E

Bundle Name: ECT_Sensor_TFTKO

P0116, P0117, P0118, P0119, P0128, P111E

ECT_Sensor_TFTKO - Other Definitions:

Bundle Name: EGP_DiffPresOfstTFTKO

P2452

Bundle Name: EGP_DiffPresQckChgFlt

P2456

Bundle Name: EGP_DiffPresSnsrCktFlt

P2454, P2455

Bundle Name: EGP_DiffPresSnsrFlt

P2452, P2453, P2454, P2455, P2456

Bundle Name: EGP_DiffPresSnsrRatFlt

P2453

EGP_DiffPresSnsrRatFlt - Other Definitions:
EGP_DiffPresSnsrFA **and with** EGP_DiffPresSnsrTFTKO

Bundle Name: EGP_DiffPresStkFltPresent

P2453

Bundle Name: EGP_PresCatDwnFlt

EGP_PresCatDwnFlt - Other Definitions: EGP_PresDEFMV_UpFlt, EPM_PresPipe1_DropFlt
Bundle Name: EGP_PresCatUpFlt
EGP_PresCatUpFlt - Other Definitions: CAT_CatPresDropFlt, EGP_PresCatDwnFlt
Bundle Name: EGP_PresDPF_DwnFlt
EGP_PresDPF_DwnFlt - Other Definitions: AAP_AmbPresSnsrTFTKO in AND with AAP_AmbientAirPresDfltd
Bundle Name: EGP_PresDPF_UpFlt
EGP_PresDPF_UpFlt - Other Definitions: EGP_DiffPresSnsrFlt, EXF_TotExhMufflerUpFlt, EGT_SnsrDPF_DwnFlt, (AAP_AmbPresSnsrTFTKO in AND with AAP_AmbientAirPresDfltd)
Bundle Name: EGP_PresHCI_UpFlt
EGP_PresHCI_UpFlt - Other Definitions: EPM_PresPipe4_DropFlt, EGP_PresCat2_UpFlt
Bundle Name: EGP_PresSCR_DwnFlt
EGP_PresSCR_DwnFlt - Other Definitions: EPM_PresPipe3_DropFlt, EGP_PresHCI_UpFlt
Bundle Name: EGP_PresSCR_UpFlt
EGP_PresSCR_UpFlt - Other Definitions: SCR_SCR_PresDropFlt, EGP_PresSCR_DwnFlt
Bundle Name: EGP_PresTurbDwnFlt
EGP_PresTurbDwnFlt - Other Definitions: CAT_CatPresDropFlt, EGP_PresCatDwnFlt
Bundle Name: EGR_MtrCurrLimTFTKO
P140F
Bundle Name: EGR_PstnDvtnFA
P042E, P042F
Bundle Name: EGR_PstnShtOffReq
P0403, P0405, P0406, P042E, P042F, P049D, P0489, P0490, P1402, P1407, P140F, P1424
Bundle Name: EGR_PstnShtOffReqFA
P0403, P0405, P0406, P042E, P042F, P049D, P0489, P0490, P1402, P1407, P140F, P1424
Bundle Name: EGR_PstnSnsrFA
P0405, P0406, P049D

Bundle Name: EGR_PstnSnsrFlt
P0405, P0406, P049D
Bundle Name: EGR_VlvTempNotVld
EGR_VlvTempNotVld - Other Definitions: CET_DNSS_FA, CET_DNSS_TFTKO, CET_UPSS_FA, CET_UPSS_TFTKO
Bundle Name: EGR_VlvTotFlowNomNotVld
P0405, P0406, P049D
EGR_VlvTotFlowNomNotVld - Other Definitions: EGR_VlvTempNotVld, MAP_SensorFA, MAP_SensorTFTKO, EXM_ExhMnfdPresNotVld
Bundle Name: EGR_VlvTotFlowNotValid
P0405, P0406, P049D
EGR_VlvTotFlowNotValid - Other Definitions: INM_IntkGapNotValid
Bundle Name: EGT_Avg
EGT_Avg - Other Definitions: Reference Temperature, EGT_Avg, at system start up is definited as: The reference temperature at system start-up is an average calculation done using all temperature sensors present in the system. The usage of each temperature in the average calculation shall be decided via calibration (one for each sensor) and only if the sensor is no faulty. The reference temperature shall be calculated only if all the following conditions are fulfilled: - System supplied but engine still not running (also crack phase excluded). If after the crank phase the engine is not running but it is turned back to key on state the calculation shall be disable for a calibratable time - Time from the last engine shutdown greater than a calibratable threshold(28,800.00) - At least four sensor are available for the reference temperature calculation - If after the crank phase the engine is not running but it is turned back to key on state the calculation shall be disable until the engine will run The reference temperature shall be calculated as following: T_AvrKeyOn= ((∑T_i) - T_Max- T_Min) / (n-2) where: T_i : i-th system temperature T_Max: Maximum temperature read T_Min: Minimum temperature read n: number of temperature sensors used for the reference temperature calculation
Bundle Name: EGT_DsblCL
EGT_DsblCL - Other Definitions: **VeEGTC_e_DsblCL == CeEGTC_e_AllCondEnblCL (CLC Enabled) if**: - Combustion Mode equal to one of allowed modes (DPF, DeSOx Lean) - Post Injection is enabled (FUL_PostEnbl) - Post Injection shall be currently released or Post Release Check shall be disabled (0.00) - If Post Release Check is enabled (0.00) , Post Injection shall be enabled (FUL_PostEnbl) and it shall be currently released or not released for less than a calibratable debouncing time (1.00) while post injection open loop plus previous closed loop quantity are not below a minimum quantity 0.00 . - Fuel Request above calibratable range : Fuel Requested > **EGT_FuelReqHysHiThrsh_DPF** with hysteresis **EGT_FuelReqHysLoThrsh_DPF**

- Catalyst Down Temperature Sensor < 700.00 [°C] AND with Post Injection Control PID > 0 [mm3]
- No Fault on Catalyst Down Temperature Sensor (EGT_SnsrCatDwnFlt)

Bundle Name: EGT_ExhGas1_CktTFTKO
P0546, P0545
Bundle Name: EGT_ExhGas1_FA
P0546, P0545, P2081, P2080, P113B
Bundle Name: EGT_ExhGas1_TFTKO
P0546, P0545, P2081, P2080, P113B
Bundle Name: EGT_ExhGas2_CktTFTKO
P2033, P2032
Bundle Name: EGT_ExhGas2_FA
P2033, P2032, P2085, P2084, P113C
Bundle Name: EGT_ExhGas2_TFTKO
P2033, P2032, P2085, P2084, P113C
Bundle Name: EGT_ExhGas3_CktTFTKO
P242D, P242C
Bundle Name: EGT_ExhGas3_FA
P242D, P242C, P242E, P242B, P113D
Bundle Name: EGT_ExhGas3_TFTKO
P242D, P242C, P242E, P242B, P113D
Bundle Name: EGT_ExhGas4_CktTFTKO
P2471, P2470
Bundle Name: EGT_ExhGas4_FA
P2471, P2470, P2472, P246F, P113E
Bundle Name: EGT_ExhGas4_TFTKO
P2471, P2470, P2472, P246F, P113E
Bundle Name: EGT_ExhGas5_CktTFTKO
P2482, P2481
Bundle Name: EGT_ExhGas5_FA
P2481, P2482, P2483, P2484, P113F
Bundle Name: EGT_ExhGas5_TFTKO
P2481, P2482, P2483, P2484, P113F
Bundle Name: EGT_ExhOverTemp
P200C, P200E
Bundle Name: EGT_HC_CL_Enbl

EGT_HC_CL_Enbl - Other Definitions:
EGT_HC_CL_Enbl = 1 if:
- HC Control is enabled (EGT_HC_ControlEnbl = 1)

- No Fault on DPF Up Temperature Sensor (EGT_SnsrDPF_UpFlt)
- DPF Up Temperature Sensor NOT above threshold KeEGTC_T_DPF_UpTempThrshDsblCL while HC Injection Control PID > 0

Bundle Name: EGT_HC_ControlEnbl

EGT_HC_ControlEnbl - Other Definitions:
EGT_HC_ControlEnbl = 1 if:
- HC Injector is supported by exhaust layout (EXC_HCI_Enbl)
- Combustion Mode equal to one of allowed modes (DPF)
- No Fault on HC Injector (HCI_GenericShtOffReq)
- HC Injector control enabled (HCI_HCI_CntrlEnbl)

Bundle Name: EGT_SnsrCat2_DwnFlt

P2470, P2471, P2472, P246F, P113E

Bundle Name: EGT_SnsrCatDwnFlt

P2033, P2032, P2085, P2084, P113C

Bundle Name: EGT_SnsrCatUpFlt

P0546, P0545, P2081, P2080, P113B

Bundle Name: EGT_SnsrDPF_DwnFlt

P2481, P2482, P2483, P2484, P113F

Bundle Name: EGT_SnsrDPF_DwnPresent

EGT_SnsrDPF_DwnPresent - Other Definitions:
GetEGTR_b_SnsrDPF_DwnPresent= 1 if:
- If CeEXCR_e_C_UI_SCR_HCI_C_DPF = CeEXCR_C_UI_SCR_HCI_C_DPF and
CeEXCR_e_EGT5_DPF_Dwn = CeEXCR_e_EGT5_DPF_Dwn

Bundle Name: EGT_SnsrDPF_UpFA

P2470, P2471, P2472, P246F, P113E

Bundle Name: EGT_SnsrDPF_UpFlt

P2470, P2471, P2472, P246F, P113E

Bundle Name: EGT_SnsrDPF_UpTFTKO

P2470, P2471, P2472, P246F, P113E

Bundle Name: EGT_SnsrTurbDwnFlt

P0546, P0545, P2081, P2080, P113B

Bundle Name: EGT_TempAvgVld

EGT_TempAvgVld - Other Definitions:
If EGT_TempAvgVld indicates that the reference temperature calculation , EGT_Avg , is on going.

Bundle Name: EGT_TempCat2_DwnFlt

P2470, P2471, P2472, P246F, P113E

Bundle Name: EGT_TempCat2_UpFlt

EGT_TempCat2_UpFlt - Other Definitions: EPM_TempPipe4_DwnFlt
Bundle Name: EGT_TempSCR_DwnFlt
EGT_TempSCR_DwnFlt - Other Definitions: SCR_TempSCR_DwnFlt
Bundle Name: EGT_TempSCR_UpFlt
EGT_TempSCR_UpFlt - Other Definitions: EPM_TempPipe2_DwnFlt
Bundle Name: EngineMisfireDetected_FA
P0300, P0301, P0302, P0303, P0304, P0305, P0306, P0307, P0308
Bundle Name: EngineModeNotRunTimer_FA
P2610
Bundle Name: EngineModeNotRunTimerError
P2610
Bundle Name: EnginePowerLimited
P0068, P00C8, P00C9, P00CA, P0090, P0091, P0092, P0122, P0123, P0191, P0192, P0193, P0222, P0223, P0601, P0604, P0606, P0697, P06A3, P06DB, P06D2, P06DE, P0A1D, P1104, P127A, P127C, P127D, P15F2, P160D, P160E, P1682, P16A0, P16A1, P16A2, P16A7, P16F3, P2100, P2101, P2102, P2103, P2122, P2123, P2127, P2128, P2135, P2138, P215B, P2176, P228C, P228D, U0073, U0074, U0293, U1817
Bundle Name: EngineTorqueEstInaccurate
EngineTorqueEstInaccurate - Other Definitions: FUL_GenericInjSysFlt, FHP_RPS_Flt, EngineMisfireDetected_FA
Bundle Name: EPM_TempPipe2_DwnFlt
EPM_TempPipe2_DwnFlt - Other Definitions: Fault flag related to temperature estimation at pipe outlet
Bundle Name: EPM_TempPipe4_DwnFlt
EPM_TempPipe4_DwnFlt - Other Definitions: Fault flag related to temperature estimation at pipe outlet
Bundle Name: EXC_HCI_Enbl
EXC_HCI_Enbl - Other Definitions: **EXC_HCI_Enbl = 1 if:** CeEXCR_e_C_UI_SCR_HCI_C_DPF == CeEXCR_e_C_UI_SCR_HCI_C_DPF
Bundle Name: EXF_TotExhCat2_UpFlt
EXF_TotExhCat2_UpFlt - Other Definitions:

HCI_TotExh_dm_HCI_DwnFlt

Bundle Name: EXF_TotExhCatUpFlt

EXF_TotExhCatUpFlt - Other Definitions:
EXM_TurbFlowNotValid

Bundle Name: EXF_TotExhDEFMV_UpFlt

EXF_TotExhDEFMV_UpFlt - Other Definitions:
EXM_TurbFlowNotValid

Bundle Name: EXF_TotExhDPF_UpFA

EXF_TotExhDPF_UpFA - Other Definitions:
HCI_TotExh_dm_HCI_DwnFA

Bundle Name: EXF_TotExhDPF_UpFlt

EXF_TotExhDPF_UpFlt - Other Definitions:
HCI_TotExh_dm_HCI_DwnFlt

Bundle Name: EXF_TotExhHC_InjUpFA

EXF_TotExhHC_InjUpFA - Other Definitions:
SCR_TotExh_DEFMV_DwnFA

Bundle Name: EXF_TotExhHC_InjUpFlt

EXF_TotExhHC_InjUpFlt - Other Definitions:
SCR_TotExh_DEFMV_DwnFlt

Bundle Name: EXF_TotExhMufflerUpFlt

EXF_TotExhMufflerUpFlt - Other Definitions:
HCI_TotExh_dm_HCI_DwnFlt

Bundle Name: EXF_TotExhSCR_UpFlt

EXF_TotExhSCR_UpFlt - Other Definitions:
SCR_TotExh_DEFMV_DwnFlt

Bundle Name: EXM_EQR_ExhMnfdNotVld

EXM_EQR_ExhMnfdNotVld - Other Definitions:
MAF_MAF_SnsrFA, MAF_MAF_SnsrTFTKO, FUL_GenericInjSysFlt

Bundle Name: EXM_ExhMnfdPresNotVld

EXM_ExhMnfdPresNotVld - Other Definitions:

EXM_PM_TurbFlowNotVld, EGT_SnsrTurbDwnFlt, CET_UPSS_FA, CET_UPSS_TFTKO, EGP_PresTurbDwnFlt, VGT_PstnSnsrFA, VGT_PstnSnsrTFTKO

Bundle Name: EXM_HC_TurbFlowNotValid

EXM_HC_TurbFlowNotValid - Other Definitions:
FUL_GenericInjSysFlt, EXM_TurbFlowNotValid, ECT_Sensor_FA, ECT_Sensor_TFTKO, OAT_PtEstFiltFA, OAT_OAT_SnsrNonEmissFA, OAT_OAT_SensorTFTKO, EXM_CylTotExhMassNotVld

Bundle Name: EXM_NOxMdl_ExhMnfdNotVld

EXM_NOxMdl_ExhMnfdNotVld - Other Definitions:
INM_O2_IntkMnfdNotValid, FHP_RPS_Flt, EXM_EQR_ExhMnfdNotVld, FUL_GenericInjSysFlt, MnfdTempSensorFA, MnfdTempSensorTFTKO, AAP_AmbientAirPresDfltd, AAP_AmbPresSnsrTFTKO, HumidityFA, HumidityTFTKO, MAP_SensorFA, MAP_SensorTFTKO, EXM_ExhMnfdPresNotVld, HumTempSnsrFA, HumTempSnsrTFTKO

Bundle Name: EXM_O2_ExhMnfdNotValid

EXM_O2_ExhMnfdNotValid - Other Definitions:
FUL_GenericInjSysFlt, INM_CylAirFlowNotValid, EXM_CylTotExhMassNotVld

Bundle Name: EXM_PM_TurbFlowNotRlb

EXM_PM_TurbFlowNotRlb - Other Definitions:
OXY_eqr_TurbDwnNotRlb, OXY_eqr_TurbDwnNotVld

Bundle Name: EXM_PM_TurbFlowNotVld

EXM_PM_TurbFlowNotVld - Other Definitions:
FHP_RPS_Flt, FUL_GenericInjSysFlt, EXM_EQR_ExhMnfdNotVld, INM_EGR_RateNotVld, ECT_Sensor_FA, ECT_Sensor_TFTKO, OAT_OAT_SnsrNonEmissFA, OAT_OAT_SensorTFTKO, OAT_PtEstFiltFA, IAT_SensorFA, IAT_SensorTFTKO, EXM_TurbFlowNotValid, AIC_AirShtOffReq, AIC_GenericBstSysFlt, AAP_AmbientAirPresDfltd, AAP_AmbPresSnsrTFTKO

Bundle Name: EXM_TurbFlowNotValid

EXM_TurbFlowNotValid - Other Definitions:
FUL_GenericInjSysFlt, INM_CylTotFlowNotValid, EGR_VlvTotFlowNotValid

Bundle Name: FAD_CB_CntrlType

FAD_CB_CntrlType - Other Definitions:
CB Enabled Via Calibration 1.00 [boolean]

No active DTCs: FAD_CB_ShtOffReq

Fuel Injectors not disabled FUL_InjectorDisable

Comustion Mode = **KaFADC_b_CB_EnblCMBR**

No CB ShutOff Request for Max Authority Reached FAD_CB_MaxAutShutOff

No CB ShutOff Request for wind-up:

Corrections saturated on 5.00 cylinders for 255.00 [Cylinder firing event] (soft shut-off)
OR
Correction saturated on 5.00 cylinders (hard shut-off)

Engine is running

Cylinder balancing not disabled during SQL(Small Quantity Adjustment)/IIL(Idle Injection Learning) Learning

Delay samples from cranking elapsed = 20.00 + 16.00 [Cylinder Firing Events]

In case of AWD:
Enabled in AWD o 2WD, not enabled with low ratio gears.

Fuel Request > 5.00

AND

Fuel Request < **KtFADC_V_CB_HiThrshFuelQnty**

If Cylinder Balancing and CWA are linked in both low engine speed range 0.00 AND high engine speed range 1.00 :

If CWA is not learnt:

CB Closed loop not active

If CWA learnt only in Low Engine speed range:

Engine speed > Desired Idle engine speed - 150.00 [rpm]

AND

Engine Speed < **KaFADC_n_CB_EngRngThrsh2**

If CWA learnt only in High Engine speed range:

Engine Speed > **KaFADC_n_CB_EngRngThrsh2**

AND

Engine Speed < **KaFADC_n_CB_EngRngThrsh3**

If CWA learnt on both high and low engine speed ranges:

Engine speed > Desired Idle engine speed - 150.00

AND

Engine Speed < **KaFADC_n_CB_EngRngThrsh3**

If Cylinder Balancing and CWA are linked on low engine speed range 0.00 AND high engine speed range 1.00 ==0:

If CWA has not learnt on Low Engine speed range:

Engine Speed > **KaFADC_n_CB_EngRngThrsh2**

AND

Engine Speed < **KaFADC_n_CB_EngRngThrsh3**

If CWA learnt only on low engine speed ranges:

Engine speed > Desired Idle engine speed - 150.00

AND

Engine Speed < **KaFADC_n_CB_EngRngThrsh3**

If Cylinder Balancing and CWA are linked only on High engine speed range 0.00 ==0 AND high engine speed range 1.00 :

If CWA has not learnt on High Engine speed range:

Engine speed > Desired Idle engine speed - 150.00

AND

Engine Speed > **KaFADC_n_CB_EngRngThrsh2**

If CWA learnt only on high engine speed ranges:

Engine speed > Desired engine speed - 150.00
AND

Engine Speed < **KaFADC_n_CB_EngRngThrsh3**

If Cylinder Balancing and CWA are not linked on both low engine speed range 0.00 ==0 AND high engine speed range 1.00 ==0:

Engine speed > Desired Idle engine speed - 150.00
AND

Engine Speed < **KaFADC_n_CB_EngRngThrsh3**

Bundle Name: FAD_CB_Cyl_A_HiSaturated

FAD_CB_Cyl_A_HiSaturated - Other Definitions:
If Combustion Mode == **KaFADC_b_CB_NormalCombMode** :
CB Fuel Volume Correction applied on cylinder A > **KtFADC_V_CB_CntrlLim**
Hysteresis on positive CB Fuel Volume Correction= 0.20

If Combustion Mode != **KaFADC_b_CB_NormalCombMode**:
CB Fuel Volume Correction applied on cylinder A > **KtFADC_V_CB_CntrlLimRgnt**
Hysteresis on positive CB Fuel Volume Correction= 0.20

Bundle Name: FAD_CB_Cyl_A_LoSaturated

FAD_CB_Cyl_A_LoSaturated - Other Definitions:
If Combustion Mode == **KaFADC_b_CB_NormalCombMode**:
CB Fuel Volume Correction applied on cylinder A <- **KtFADC_V_CB_CntrlLim**
Hysteresis on negative CB Fuel Volume Correction= 0.50

If Combustion Mode != **KaFADC_b_CB_NormalCombMode**:
CB Fuel Volume Correction applied on cylinder A < -**KtFADC_V_CB_CntrlLimRgnt**
Hysteresis on negative CB Fuel Volume Correction= 0.50

Bundle Name: FAD_CB_Cyl_B_HiSaturated

FAD_CB_Cyl_B_HiSaturated - Other Definitions:
If Combustion Mode == **KaFADC_b_CB_NormalCombMode**:
CB Fuel Volume Correction applied on cylinder B > **KtFADC_V_CB_CntrlLim**
Hysteresis on positive CB Fuel Volume Correction= 0.20

If Combustion Mode != **KaFADC_b_CB_NormalCombMode**:
CB Fuel Volume Correction applied on cylinder B > **KtFADC_V_CB_CntrlLimRgnt**
Hysteresis on positive CB Fuel Volume Correction= 0.20

Bundle Name: FAD_CB_Cyl_B_LoSaturated

FAD_CB_Cyl_B_LoSaturated - Other Definitions:
If Combustion Mode == **KaFADC_b_CB_NormalCombMode**:
CB Fuel Volume Correction applied on cylinder B <- **KtFADC_V_CB_CntrlLim**
Hysteresis on negative CB Fuel Volume Correction= 0.50

If Combustion Mode != **KaFADC_b_CB_NormalCombMode**:
CB Fuel Volume Correction applied on cylinder B < -**KtFADC_V_CB_CntrlLimRgnt**
Hysteresis on negative CB Fuel Volume Correction= 0.50

Bundle Name: FAD_CB_Cyl_C_HiSaturated

FAD_CB_Cyl_C_HiSaturated - Other Definitions:
If Combustion Mode == **KaFADC_b_CB_NormalCombMode**:
CB Fuel Volume Correction applied on cylinder C > **KtFADC_V_CB_CntrlLim**

Hysteresis on positive CB Fuel Volume Correction= 0.20

If Combustion Mode != **KaFADC_b_CB_NormalCombMode**:
CB Fuel Volume Correction applied on cylinder C > **KtFADC_V_CB_CntrlLimRgnt**
Hysteresis on positive CB Fuel Volume Correction= 0.20

Bundle Name: FAD_CB_Cyl_C_LoSaturated

FAD_CB_Cyl_C_LoSaturated - Other Definitions:
If Combustion Mode == **KaFADC_b_CB_NormalCombMode**:
CB Fuel Volume Correction applied on cylinder C <- **KtFADC_V_CB_CntrlLim**
Hysteresis on negative CB Fuel Volume Correction= 0.50

If Combustion Mode != **KaFADC_b_CB_NormalCombMode**:
CB Fuel Volume Correction applied on cylinder C < -**KtFADC_V_CB_CntrlLimRgnt**
Hysteresis on negative CB Fuel Volume Correction= 0.50

Bundle Name: FAD_CB_Cyl_D_HiSaturated

FAD_CB_Cyl_D_HiSaturated - Other Definitions:
If Combustion Mode == **KaFADC_b_CB_NormalCombMode**:
CB Fuel Volume Correction applied on cylinder D > **KtFADC_V_CB_CntrlLim**
Hysteresis on positive CB Fuel Volume Correction= 0.20

If Combustion Mode != **KaFADC_b_CB_NormalCombMode**:
CB Fuel Volume Correction applied on cylinder D > **KtFADC_V_CB_CntrlLimRgnt**
Hysteresis on positive CB Fuel Volume Correction= 0.20

Bundle Name: FAD_CB_Cyl_D_LoSaturated

FAD_CB_Cyl_D_LoSaturated - Other Definitions:
If Combustion Mode == **KaFADC_b_CB_NormalCombMode**:
CB Fuel Volume Correction applied on cylinder D <- **KtFADC_V_CB_CntrlLim**
Hysteresis on negative CB Fuel Volume Correction= 0.50

If Combustion Mode != **KaFADC_b_CB_NormalCombMode**:
CB Fuel Volume Correction applied on cylinder D < -**KtFADC_V_CB_CntrlLimRgnt**
Hysteresis on negative CB Fuel Volume Correction= 0.50

Bundle Name: FAD_CB_InjStkFlt

P029C, P02A0, P02A4, P02A8

Bundle Name: FAD_CB_MagnitudeChkFlt

FAD_CB_MagnitudeChkFlt - Other Definitions:
XOY_SecurityFlt

Bundle Name: FAD_CB_MaxAutShutOff

P0263, P0266, P0269, P0272

Bundle Name: FAD_CB_ShtOffReq

P029C, P02A0, P02A4, P02A8, P0263, P0266, P0269, P0272
FAD_CB_ShtOffReq - Other Definitions: FUL_GenericInjSysFlt, FAD_CB_MagnitudeChkFlt, FAD_CWA_RngShtOffReq, FAD_EIA_RedntFlt, FHP_HighPresSysFlt,FHP_InjLeakage, Transmission Estimated Gear Validity, CrankSensor_TFTKO
Bundle Name: FAD_CWA_RngShtOffReq
FAD_CWA_RngShtOffReq - Other Definitions: CrankSensor_TFTKO
Bundle Name: FAD_DFSA_EnblLrn
FAD_DFSA_EnblLrn - Other Definitions: Enabled by calibration: 1 Engine is running FSA learning is not active: FAD_FSA_EnblLrn == FALSE O2 sensor is fully operative: OXY_eqr_TurbDwnNotRlb == FALSE Enabled in combustion mode: **KaFADC_b_FSA_EnblCombMode** (OBD Coolant Enable Criteria == TRUE OR Engine coolant temperature > 45.00 [°C]) Engine coolant temperature < 117.00 [°C] Fuel temperature in range: > -10.00 [°C] < 90.00 [°C] Ambient air pressure > 67.00 [kPa] Intake air temperature in range: > -7.00 [°C] < 78.00 [°C] No Post released No After injection released when Boolean flag used to enable After injection check is FALSE: 0 Engine speed in range: > 700.00 [rpm] < 3,550.00 [rpm] Equivalence Ratio in range: > 0.15 [-] < 0.85 [-] Difference between fuel estimation and fuel injected quantity < 64.00 [mm^3] for a time > 0.00 [s]

Injected fuel quantity variation < 0.17 [mm^3]
for a time > 0.50 [s]

Injected fuel quantity > 2.10 [mm^3]
for a time > 2.00 [s]

Injected fuel quantity < **KtFADC_V_FSA_MaxFuelFall**[mm^3]

Engine speed variation < **KaFADC_n_DFSA_EngSpdThrsh**[rpm]
for a time > 0.25 [s]

Intake air mass variation < 3.00 [mg]
for a time > 0.25 [s]

No pending or confirmed DTCs: FAD_FSA_LrnShtOffReq, FAD_DFSA_LrnShtOffReq, OXY_eqr_TurbDwn_FSA_NotVld

Bundle Name: FAD_DFSA_LrnShtOffReq

FAD_DFSA_LrnShtOffReq - Other Definitions:
EXM_TurbFlowNotValid, EGP_PresTurbDwnFlt, EGT_SnsrTurbDwnFlt

Bundle Name: FAD_EIA_DID_Written

FAD_EIA_DID_Written - Other Definitions:
Set to TRUE if all EIA (End of line Injector Adjustment) codes have been successfully programmed via DID (DIDs $60-$64).

Bundle Name: FAD_EIA_RedntFlt

FAD_EIA_RedntFlt - Other Definitions:
XOY_SecurityFlt

Bundle Name: FAD_FSA_EnblLrn

FAD_FSA_EnblLrn - Other Definitions:
Enabled by calibration: 1

Engine is running

O2 sensor is fully operative: OXY_eqr_TurbDwnNotRlb== FALSE

Enabled in combustion mode: **KaFADC_b_FSA_EnblCombMode**

(OBD Coolant Enable Criteria == TRUE
OR
Engine coolant temperature > 45.00 [°C])

Engine coolant temperature < 117.00 [°C]

Fuel temperature in range: > -10.00 [°C]

< 90.00 [°C]

Ambient air pressure > 67.00 [kPa]

Intake air temperature in range: > -7.00 [°C]
< 78.00 [°C]

No Post released

No After injection released when Boolean flag used to enable After injection check is FALSE: 0

Engine speed in range: > 700.00 [rpm]
< 3,550.00 [rpm]

Equivalence Ratio in range: > 0.15 [-]
< 0.85 [-]

Difference between fuel estimation and fuel injected quantity < 64.00 [mm^3]
for a time > 1.00 [s]

Injected fuel quantity variation < 0.09 [mm^3]
for a time > 1.00 [s]

Injected fuel quantity > 2.10 [mm^3]
for a time > 2.00 [s]

Injected fuel quantity < **KtFADC_V_FSA_MaxFuelFall**[mm^3]

Engine speed variation < **KaFADC_n_FSA_EngSpdThrsh**[rpm]
for a time > 0.40 [s]

No pending or confirmed DTCs: FAD_FSA_LrnShtOffReq, OXY_eqr_TurbDwn_FSA_NotVld

Bundle Name: FAD_FSA_LrnShtOffReq

FAD_FSA_LrnShtOffReq - Other Definitions:
CrankSensor_TFTKO, (ECT_Sensor_FA AND ECT_Sensor_TFTKO), (IAT_SensorFAAND IAT_SensorTFTKO), FTS_FTS_CktFA, FTS_FTS_PlFA, AmbPresDfltdStatus,
FUL_GenericInjSysFlt, FAD_CB_InjStkFlt, FHP_InjLeakage ,
Transmission Gear Ratio Validity, (MAF_MAF_SnsrFA AND MAF_MAF_SnsrTFTKO)

Bundle Name: FAD_FSA_NormRngCrtnValid

FAD_FSA_NormRngCrtnValid - Other Definitions:
Not disabled by calibration: 0

No pending or confirmed DTCs: FAD_FSA_NormRngShtOffReq

Enabled in combustion mode = **KaFADC_b_FSA_CombModeEnblRls**

Bundle Name: FAD_FSA_NormRngShtOffReq

FAD_FSA_NormRngShtOffReq - Other Definitions:
CrankSensor_TFTKO, (ECT_Sensor_FA AND ECT_Sensor_TFTKO), (IAT_SensorFA AND IAT_SensorTFTKO), FTS_FTS_CktFA, FTS_FTS_PlFA, AmbPresDfltdStatus, FUL_GenericInjSysFlt

Bundle Name: FAD_SQA_InjMgntEnbld

FAD_SQA_InjMgntEnbld - Other Definitions:
XSQA Learning Enabled via calibration = 1.00
OR
SQC Enabled via calibration 1.00

Fuel Rail Discharge Request Not active FHP_FuelRailDischargeReq

Cumulative Fuel Request (Hot Chamber detection) >= 16,000.00 [mm3]
Increased during fuel injection and decreased, based on intake manifold air flow, during diesel fuel cut-off condition.

Air actuators delay time during zero torque before enable SQA (air actuators ready) >= 0.50 [s]

No active DTCs:FAD_SQC_LrnShtOffReq

No Fuel Rail Setpoint limited due to fuel overtemperature FHP_SetPtLimByFuelTemp

No Fuel Injected FUL_FuelInjected

SQA rail pressure value steady state (SQA Rail Pressure Set Point +/-**KaFADC_p_SQA_LrnDelt**)
conditions for time >= 0.20 [s] (rail pressure steady-state conditions)

Combustion mode = **KaFADC_b_SQA_EnblCMBR**[Boolean]

Engine coolant temperature > 68.00 [°C] < AND < 117.00 [°C]
Hysteresis on Engine coolant temperature = 1.50 [°C]

Fuel temperature > 0.00 [°C]AND < 70.00 [°C]
Hysteresis on Fuel temperature = 1.00 [°C]

CWA correction active in current and lower engine speed range.
Checked only if SQA and CWA are linked via calibration = 0.00 [boolean]
CWA learned in the following engine speed ranges **KaFADC_b_SQC_CWA_EnblLink**

Engine Speed < **KaFADC_n_SQC_HiThrsh**(Gear, Rail Pressure level) [rpm] AND > **KaFADC_n_SQC_LoThrsh** (Gear, Rail Pressure level) [rpm]
Hysteresis on Engine Speed= 10.00 [rpm]

Driveline steady state condition: Time from last gear shift > 1.00 [s]

SQA noise check (rough road detection) not failed less than 3.00 fail samples out of 15.00 samples.

Manifold Air Pressure (for Injection quantity and timing monitoring) < **KtFADD_p_XSQA_MAP_HiThrsh**(Engine Speed) [kPa]
Hysteresis on Manifold Air Pressure Threshold (for Injection quantity and timing monitoring) = 2.00 [kPa]

OR
Manifold Air Pressure (for SQA Control) < **KtFADC_p_SQA_MAP_HiThrsh**(Engine Speed) [kPa]
Hysteresis on Manifold Air Pressure Threshold (for SQA Control) = 2.00 [kPa]

No inhibit request during O2 increasing dynamic check:
P013A is not in timer evaluation state (Checked only if SQA inhibit during test execution is enabled via calibration 1.00)
AND
P014C is not in timer evaluation state (Checked only if SQA inhibit during test execution is enabled via calibration 0.00)
See P013A and P014C for details.

Diesel Fuel Cut-off conditions fulfilled for time > 0.20 [s]
AND
No CWA, SDC or OPA learning active.

Gears: 3, 4, 5, 6

In case of automatic transmission:
TCC status: Locked or Controlled slip

In case of AWD:
Enabled in AWD o 2WD, not enabled with low ratio gears.

Bundle Name: FAD_SQA_LrnET_Enbl

FAD_SQA_LrnET_Enbl - Other Definitions:
FAD_SQA_InjMgntEnbld

Bundle Name: FAD_SQA_LrnPresEnbl

FAD_SQA_LrnPresEnbl - Other Definitions:
XSQA Learning Enabled via calibration = 1.00

OR

SQC Enabled via calibration 1.00

Cumulative Fuel Request (Hot Chamber detection) >= 16,000.00 [mm3]
Increased during fuel injection and decreased, based on intake manifold air flow, during diesel fuel cut-off condition.

No active DTCs: FAD_SQC_LrnShtOffReq

Combustion mode= **KaFADC_b_SQA_EnblCMBR**[Boolean]

Engine coolant temperature > 68.00 [°C] < AND < 117.00 [°C]
Hysteresis on Engine coolant temperature = 1.50 [°C]

Fuel temperature > 0.00 [°C]AND < 70.00 [°C]
Hysteresis on Fuel temperature = 1.00 [°C]

CWA correction active in current and lower engine speed range.
Checked only if SQA and CWA are linked via calibration = 0.00 [boolean]
CWA learned in the following engine speed ranges **KaFADC_b_SQC_CWA_EnblLink**

Engine Speed range < **KaFADC_n_SQC_HiThrshDelt** + **KaFADC_n_SQC_HiThrsh**[rpm] AND > **KaFADC_n_SQC_LoThrsh** [rpm]
Hysteresis on Engine Speed= 10.00 [rpm]

Driveline steady state condition: Time from last gear shift > 1.00 [s]

Manifold Air Pressure (for Injection quantity and timing monitoring) < **KtFADD_p_XSQA_MAP_HiThrsh**(Engine Speed) [kPa]
Hysteresis on Manifold Air Pressure Threshold (for Injection quantity and timing monitoring) = 2.00 [kPa]
OR
Manifold Air Pressure (for SQA Control) < **KtFADC_p_SQA_MAP_HiThrsh**(Engine Speed) [kPa]
Hysteresis on Manifold Air Pressure Threshold (for SQA Control) = 2.00 [kPa]

Diesel Fuel Cut-off conditions fulfilled for time > 0.20 [s]
AND
No CWA (Crank-Wheel Adaptation), SDC(Sensor Drift Compensation) or OPA(Oxygen Pressure Adaptation) learning active.

Gears: 3, 4, 5, 6

In case of automatic transmission:
TCC status: Locked or Controlled slip

In case of AWD:
Enabled in AWD o 2WD, not enabled with low ratio gears.

Bundle Name: FAD_SQC_LrnShtOffReq

FAD_SQC_LrnShtOffReq - Other Definitions:
FAD_SQF_LrnShtOffReq, FTS_FTS_CktFA OR FTS_FTS_PlFA, FUL_InjLeakTempValid

Bundle Name: FAD_SQF_LrnShtOffReq

FAD_SQF_LrnShtOffReq - Other Definitions:
FAD_CWA_RngShtOffReq ,ClchPstnSnsrPerf FA, ClutchPstnSnsr FA, ClutchPstnSnsrCktLo FA, ClutchPstnSnsrNotLearned, ClutchPstnSnsrCktHi FA, CrankSensor_TFTKO, SWC_SwirlShtOffReq, EGR_PstnShtOffReq, TPS_PstnDvtnFA, FHP_InjLeakage, LPE_PstnShtOffReq, FourWheelDriveLowStateInvalid, FHP_HighPresSysFlt, FUL_GenericInjSysFlt,ECT_Sensor_TFTKO AND ECT_Sensor_FA, IAT_SensorFA AND IAT_SensorTFTKO , MnfdTempSensorTFTKO AND MnfdTempSensorFA, MAP_EngOffPressFA AND MAP_EngOffPressTFTKO, MAP_SensorFA AND MAP_SensorTFTKO, AmbPresDfltdStatus, Transmission Gear Ratio Validity

Bundle Name: FAD_XSQA_LrnCondEnbl

FAD_XSQA_LrnCondEnbl - Other Definitions:
XSQA Learning Enabled via calibration = 1.00

Fuel Rail Discharge Request Not active: FHP_FuelRailDischargeReq

Cumulative Fuel Request (Hot Chamber detection) >= 16,000.00 [mm3]

Increased during fuel injection and decreased, based on intake manifold air flow, during diesel fuel cut-off condition.

Air actuators delay time during zero torque before enable SQA (air actuators ready) >= 0.50 [s]

No active DTCs: FAD_SQC_LrnShtOffReq

No Fuel Rail Setpoint limited due to fuel overtemperature FHP_SetPtLimByFuelTemp

No Fuel Injected FUL_FuelInjected

SQA rail pressure value steady state (SQA Rail Pressure Set Point +/-**KaFADC_p_SQA_LrnDelt**)
conditions for time >= 0.20 [s] (rail pressure steady-state conditions)

Combustion mode = **KaFADC_b_SQA_EnblCMBR**[Boolean]

Engine coolant temperature > 68.00 [°C] < AND < 117.00 [°C]
Hysteresis on Engine coolant temperature = 1.50 [°C]

Fuel temperature > 0.00 [°C] AND < 70.00 [°C]
Hysteresis on Fuel temperature = 1.00 [°C]

CWA correction active in current and lower engine speed range.
Checked only if SQA and CWA are linked via calibration = 0.00 [boolean]
CWA learned in the following engine speed ranges **KaFADC_b_SQC_CWA_EnblLink**

Engine Speed < **KaFADC_n_SQC_HiThrsh** (Gear, Rail Pressure level) [rpm] AND > **KaFADC_n_SQC_LoThrsh** (Gear, Rail Pressure level) [rpm]
Hysteresis on Engine Speed= 10.00 [rpm]

Driveline steady condition: Time from last gear shift > 1.00 [s].

SQA noise check (rough road detection) not failed less than 3.00 fail samples over 15.00 samples.

Manifold Air Pressure < **KtFADD_p_XSQA_MAP_HiThrsh** [Engine Speed]
Hysteresis on Manifold Air Pressure Threshold = 2.00

No inhibit request during O2 increasing dynamic check:
P013A is not in timer evaluation state (Checked only if SQA inhibit during test execution is enabled via calibration 1.00)
AND
P014C is not in timer evaluation state (Checked only if SQA inhibit during test execution is enabled via calibration 0.00)
See P013A and P014C for details.

Diesel Fuel Cut-off conditions fulfilled for time > 0.20 [s]
AND
No CWA (Crank-Wheel Adaptation), SDC (Sensor Drift Compensation) or OPA (Oxygen Pressure Adaptation) learning active.

Gears: 3, 4, 5, 6

In case of automatic transmission:
TCC status: Locked or Controlled slip

In case of AWD: Enabled in AWD o 2WD, not enabled with low ratio gears.
Bundle Name: FHP_EngineShutdownReq
P0087
FHP_EngineShutdownReq - Other Definitions: [FHP_PR_CtrlModeInhb AND (P0092 OR P0090 OR P0191 OR P0194 OR P0089 OR P0193 OR P0192 OR P228A OR FHP_V5B_OutOfRangeFlt)] OR [FHP_MU_CtrlModeInhb AND (P2293 OR P228B)]
Bundle Name: FHP_FuelRailDischargeReq
FHP_FuelRailDischargeReq - Other Definitions: [(**Pressure Control Configuration**= CeFHPG_e_MU_ModeSel) OR (**Pressure Control Configuration**= CeFHPG_e_MU_And_PR_ModeSel AND FHP_MU_CtrlModeInhb= FALSE AND FHP_PR_CtrlModeInhb= TRUE)] AND (ZeroTorq = TRUE AND FHP_PresOfst= TRUE AND Engine is not required to shut off AND FUL_IFT_St= CeFULR_e_TstPhaseInit AND At least one injection has been commanded since begin of driving cycle AND FHP_ROD_InjActv= FALSE)
Bundle Name: FHP_HighPresSysFlt
FHP_HighPresSysFlt - Other Definitions: FHP_EngineShutdownReq OR FHP_RailPresRdctReq OR FHP_TorqRdctReq OR FHP_MU_CurrCktTFTKO
Bundle Name: FHP_InjLeakage
P0087, P228B, P228A
FHP_InjLeakage - Other Definitions:
Bundle Name: FHP_InjLeakageFA
P0087, P228B, P228A
Bundle Name: FHP_MU_CtrlModeInhb
P0191, P0192, P0193, P0194, P0089, P0090, P0091, P0092, P228A, P0089,
FHP_MU_CtrlModeInhb - Other Definitions: [P228D AND NOT(P229B)] OR **Metering Unit Valve present** = 0 OR FHP_V5B_OutOfRangeFlt
Bundle Name: FHP_MU_CurrCktTFTKO
P163A
Bundle Name: FHP_MU_DrvrCloseTFTKO

P0091
Bundle Name: FHP_MU_DrvrOpenTFTKO
P0090, P0092
Bundle Name: FHP_NoRailDischarge

FHP_NoRailDischarge - Other Definitions:
If { [(Fuel temperature > 63.0 °C) OR FTS_FTS_Flt] AND (ZeroTorqPrdtdActv OR ZeroTorq) } then
(Rail pressure setpoint gradient ≥ -1.00 MPa for at least 100 * 6.25 ms)
Else
(ZeroTorqPrdtdActv = FALSE AND ZeroTorq = FALSE)

Bundle Name: FHP_PR_CtrlModeInhb
P2293, P229B, P2294, P2295, P2296
FHP_PR_CtrlModeInhb - Other Definitions: [NOT(P228D) AND P229B] OR **Pressure Regulator Valve present** = 0
Bundle Name: FHP_PR_DrvrCloseTFTKO
P2295
Bundle Name: FHP_PR_DrvrOpenTFTKO
P2294, P2296
Bundle Name: FHP_PR_FuelTempLimEnbl
FHP_PR_FuelTempLimEnbl - Other Definitions: Rail pressure setpoint > **Rail Pressure limitation for Pressure Regulator**
Bundle Name: FHP_PresGovnSelSt
Refer to RailPresCntrl section.
Bundle Name: FHP_PresGovnSt
Refer to RailPresCntrl section.
Bundle Name: FHP_PresOfst
FHP_PresOfst - Other Definitions: Rail pressure setpoint - Rail pressure < 0 MPa AND ABS(Rail pressure setpoint - Rail pressure) > 4.0 MPa for 20 * 6.25 ms
Bundle Name: FHP_PresStdySt
FHP_PresStdySt - Other Definitions: ABS(Rail pressure setpoint - Rail pressure) < 2.9 MPa for 65 * 6.25 ms
Bundle Name: FHP_RailPresRdctReq
P1297, P228C, P229A
FHP_RailPresRdctReq - Other Definitions: [FHP_PR_CtrlModeInhb AND (P2293 OR P228D OR P229B OR P0092 OR P0090 OR P000F OR P0088 OR P0089 OR P228B)] OR

[FHP_MU_CtrlModeInhb AND (P228D OR P0092 OR P0090 OR P0191 OR P0194 OR P0089 OR P0193 OR P0192 OR P228A OR FHP_V5B_OutOfRangeFlt)]
Bundle Name: FHP_ROD_InjActv
FHP_ROD_InjActv - Other Definitions: False
Bundle Name: FHP_RPS_CktFA
P0192, P0193
Bundle Name: FHP_RPS_CktTFTKO
P0192, P0193
Bundle Name: FHP_RPS_Flt
P0191, P0192, P0193, P0194
FHP_RPS_Flt - Other Definitions: FHP_V5B_OutOfRangeFlt
Bundle Name: FHP_RPS_OfstTFTKO
P0191
Bundle Name: FHP_SetPtLimByFuelTemp
FHP_SetPtLimByFuelTemp - Other Definitions: Rail pressure setpoint > **Rail Pressure Setpoint limitation**
Bundle Name: FHP_TorqRdctReq
P1297
FHP_TorqRdctReq - Other Definitions: [FHP_PR_CtrlModeInhb AND (P2293 OR P228D OR P229B OR P0092 OR P0090 OR P000F OR P0088 OR P0089 OR P228B)] OR [FHP_MU_CtrlModeInhb AND (P228D OR P229B OR P0092 OR P0090 OR P0191 OR P0194 OR P0089 OR P0193 OR P0192 OR FHP_V5B_OutOfRangeFlt OR P228A)]
Bundle Name: FHP_V5B_OutOfRangeFlt
FHP_V5B_OutOfRangeFlt - Other Definitions: 5VoltReferenceB_FA
Bundle Name: FourWheelDriveLowStateInvalid
P2771
Bundle Name: FTS_FTS_CktFA
P0182, P0183
Bundle Name: FTS_FTS_Flt
FTS_FTS_Flt - Other Definitions: FTS_FTS_CktFA OR FTS_FTS_PlFA
Bundle Name: FTS_FTS_PlFA
P0181
Bundle Name: FTS_PlausRefSnsrFlt

FTS_PlausRefSnsrFlt - Other Definitions: ECT_Sensor_FA if **P0181 Fuel Temperature Sensor Reference** is equal to CeFTSR_e_ECT_Snsr; IAT_SensorFA if **P0181 Fuel Temperature Sensor Reference** is equal to CeFTSR_e_IAT_Snsr; MnfdTempSensorFA if **P0181 Fuel Temperature Sensor Reference** is equal to CeFTSR_e_IAT_2_Snsr; EGT_SnsrDPF_UpFA if **P0181 Fuel Temperature Sensor Reference** is equal to CeFTSR_e_MainCatTempSnsr.
Bundle Name: FuelLevelDataFault
P0461, P0462, P0463, P2066, P2067, P2068
FuelLevelDataFault - Other Definitions: AccCktLo_FA
Bundle Name: FUL_BoostVoltTFTKO
P062D
Bundle Name: FUL_CntrlrStTFTKO
P062B
Bundle Name: FUL_CylDisable_CiEPSR_CylinderA
FUL_CylDisable_CiEPSR_CylinderA - Other Definitions: Injector 1 disabled by CPID $18 (AE 18 80 80) (Injector Disable Test strategy only active at Service)
Bundle Name: FUL_CylDisable_CiEPSR_CylinderB
FUL_CylDisable_CiEPSR_CylinderB - Other Definitions: Injector 3 disabled by CPID $18 (AE 18 80 40) (Injector Disable Test strategy only active at Service)
Bundle Name: FUL_CylDisable_CiEPSR_CylinderC
FUL_CylDisable_CiEPSR_CylinderC - Other Definitions: Injector 4 disabled by CPID $18 (AE 18 80 20) (Injector Disable Test strategy only active at Service)
Bundle Name: FUL_CylDisable_CiEPSR_CylinderD
FUL_CylDisable_CiEPSR_CylinderD - Other Definitions: Injector 2 disabled by CPID $18 (AE 18 80 10) (Injector Disable Test strategy only active at Service)
Bundle Name: FUL_CylInjCktTFTKO_CiEPSR_CylinderA
P2147, P2148, P0261, P0262, P0201, P1248, P0271, P0270
Bundle Name: FUL_CylInjCktTFTKO_CiEPSR_CylinderB
P2150, P2151, P0267, P0268, P0203, P124A, P0264, P0265
Bundle Name: FUL_CylInjCktTFTKO_CiEPSR_CylinderC
P2147, P2148, P0270, P0271, P0204, P124B, P0261, P0262
Bundle Name: FUL_CylInjCktTFTKO_CiEPSR_CylinderD
P2150, P2151, P0264, P0265, P0202, P1249, P0267, P0268
Bundle Name: FUL_FuelInjected

FUL_FuelInjected - Other Definitions:
At least one Injection Pulse is requested by the application software (engine running and no cut off active)

Bundle Name: FUL_FuelInjectedCyl_CiEPSR_CylinderA

FUL_FuelInjectedCyl_CiEPSR_CylinderA - Other Definitions:
At least one Injection Pulse is requested by the application software for the cylinder 1 (engine running and no cut off active)

Bundle Name: FUL_FuelInjectedCyl_CiEPSR_CylinderB

FUL_FuelInjectedCyl_CiEPSR_CylinderB - Other Definitions:
At least one Injection Pulse is requested by the application software for the cylinder 3 (engine running and no cut off active)

Bundle Name: FUL_FuelInjectedCyl_CiEPSR_CylinderC

FUL_FuelInjectedCyl_CiEPSR_CylinderC - Other Definitions:
At least one Injection Pulse is requested by the application software for the cylinder 4 (engine running and no cut off active)

Bundle Name: FUL_FuelInjectedCyl_CiEPSR_CylinderD

FUL_FuelInjectedCyl_CiEPSR_CylinderD - Other Definitions:
At least one Injection Pulse is requested by the application software for the cylinder 2 (engine running and no cut off active)

Bundle Name: FUL_GenericInjSysFA

P2147, P2148, P2150, P2151, P0261, P0262, P0264, P0265, P0267, P0268, P0270, P0271, P0201, P0202, P0203, P0204, P1248, P1249, P124A, P124B, P062B, P062D, P0216, P126A, P02EE, P02EF, P02F0, P02F1, P020A, P020B, P020C, P020D

Bundle Name: FUL_GenericInjSysFlt

P2147, P2148, P2150, P2151, P0261, P0262, P0264, P0265, P0267, P0268, P0270, P0271, P0201, P0202, P0203, P0204, P1248, P1249, P124A, P124B, P062B, P062D, P0216, P126A, P02EE, P02EF, P02F0, P02F1, P020A, P020B, P020C, P020D

Bundle Name: FUL_IFT_St

FUL_IFT_St - Other Definitions:
This interface can assume the following values when the CPID related to the Injetor Flow Test is triggered (AE 22 04)
- CeFULR_e_TstPhaseInit: default status (CDIP not requested or abort reason evaluation in progress)
- CeFULR_e_IFT_PresSetPtReq:
- CeFULR_e_InjFlowPumpDisablePh1,
- CeFULR_e_InjFlowPumpDisablePh2,
- CeFULR_e_PostTstPhase,
- CeFULR_e_InterTstPrd

Due to the fact that this CPID is not calibrated, the status of this interface is always CeFULR_e_TstPhaseInit.

Bundle Name: FUL_InjCktTFTKO

P2147, P2148, P2150, P2151, P0261, P0262, P0264, P0265, P0267, P0268, P0270, P0271, P0201, P0202, P0203, P0204, P1248, P1249, P124A, P124B,

Bundle Name: FUL_InjectorDisable

FUL_InjectorDisable - Other Definitions:

device control active (AE 18 80 XX)
AND
XX refers to a valid cylinder (1 - 4)
AND
IFT not active (FUL_IFT_St == CeFULR_e_TstPhaseInit)
AND
device control timer > 0 sec

When the test is in progress, the injector is disabled for a fixed time (about 30s). The device control timer starts from this fixed time and it is decreased up to 0 s.

Bundle Name: FUL_InjLeakInitNotValid

FUL_InjLeakInitNotValid - Other Definitions:
This flag is TRUE when the following conditions are verified in AND:

engine synchronized, i.e.
(GetEPSR_e_EngSyncState() == CeEPSR_EngineSync) ||
(GetEPSR_e_EngSyncState() == CeEPSR_BackupSync) || (GetEPSR_e_EngSyncState()
== CeEPSR_e_VerifySync)

AND

(IAT_SensorTFTKO || EngineModeNotRunTimerError)

Bundle Name: FUL_InjLeakTempValid

FUL_InjLeakTempValid - Other Definitions:
NOT(FUL_InjLeakInitNotValid OR ECT_Sensor_FA OR FTS_FTS_CktFA OR FTS_FTS_PlFA OR
XOY_SecurityFlt_CeXOYR_e_FULR_FTD_RateLimFlt OR XOY_SecurityFlt_CeXOYR_e_ETMR_FTD_RedntCalcFlt)

Bundle Name: FUL_OutEnblCyl_CiEPSR_CylinderA

FUL_OutEnblCyl_CiEPSR_CylinderA - Other Definitions:
0.00 || FUL_CylInjCktTFTKO_CiEPSR_CylinderA || FUL_PullInErrTFTKO_CeDFIR_e_Cyl1InjTmng ||FUL_CylDisable_CiEPSR_CylinderA || (Injection controller status reported by HWIO ~= READY)

Bundle Name: FUL_OutEnblCyl_CiEPSR_CylinderB

FUL_OutEnblCyl_CiEPSR_CylinderB - Other Definitions:
0.00 || FUL_CylInjCktTFTKO_CiEPSR_CylinderB || FUL_PullInErrTFTKO_CeDFIR_e_Cyl3InjTmng || FUL_CylDisable_CiEPSR_CylinderB || (Injection controller status reported by HWIO ~= READY)

Bundle Name: FUL_OutEnblCyl_CiEPSR_CylinderC

FUL_OutEnblCyl_CiEPSR_CylinderC - Other Definitions:
0.00 ||FUL_CylInjCktTFTKO_CiEPSR_CylinderC || FUL_PullInErrTFTKO_CeDFIR_e_Cyl4InjTmng || FUL_CylDisable_CiEPSR_CylinderC || (Injection controller status reported by HWIO ~= READY)

Bundle Name: FUL_OutEnblCyl_CiEPSR_CylinderD

FUL_OutEnblCyl_CiEPSR_CylinderD - Other Definitions:
0.00 || FUL_CylInjCktTFTKO_CiEPSR_CylinderD || FUL_PullInErrTFTKO_CeDFIR_e_Cyl2InjTmng || FUL_CylDisable_CiEPSR_CylinderD || (Injection controller status reported by HWIO ~= READY)

Bundle Name: FUL_PostEnbl

FUL_PostEnbl - Other Definitions:
This flag is TRUE when the following conditions are verified in AND:

no combustion mode transition
(i.e. GetCMBR_e_CombModeSec() == GetCMBR_e_CombMode())

AND

NOT(HCI_DeHC_ExhInjDsbl)

AND

(GetCMBR_e_CombModeSec() equal to one of the combustion mode
CeCMBR_e_DPF_HiO2
CeCMBR_e_DPF_LoO2
CeCMBR_e_DPF_EngPrtct_HiO2
CeCMBR_e_DPF_EngPrtct_LoO2
CeCMBR_e_LNT_DeSOx_Lean
CeCMBR_e_LNT_EngPrtct
CeCMBR_e_DPF_PN)

AND

(

Temperature sensor > 150.00
AND
0.00 == FALSE

OR

Temperature sensor > 150.00
AND
0.00 == TRUE
AND
(post injection enebled during zero-torque condition for a continuous time <= 30.00 [s])
POST injection timer is incemented only when the post injections are enabled during zero-torque condition (ZeroTorqRefActv == TRUE) with a delay time equal to 0.50 seconds for the transition from zero-torque condition off to on, and equal to 5.00 seconds for the transition from zero-torque condition on to off
)

The temperature sensor to consider depends on the exhaust layout configuration.
If CeEXCR_e_C_UI_SCR_HCI_C_DPF == CeEXCR_e_C_UI_SCR_HCI_C_DPF

Temperature sensor IS Catalyst 1 downstream temperature sensor (EGT2)
else
Temperature sensor IS DPF up temperature sensor

Bundle Name: FUL_PullInErrTFTKO_CeDFIR_e_Cyl1InjTmng

P020A

Bundle Name: FUL_PullInErrTFTKO_CeDFIR_e_Cyl2InjTmng

P020B

Bundle Name: FUL_PullInErrTFTKO_CeDFIR_e_Cyl3InjTmng

P020C

Bundle Name: FUL_PullInErrTFTKO_CeDFIR_e_Cyl4InjTmng

P020D

Bundle Name: GLO_GlowPlugSplyVoltCktTFTKO

P161E

Bundle Name: HCI_DeHC_BasicReq

HCI_DeHC_BasicReq - Other Definitions:
Boolean flag indicating that DeHC is needed due to high HC storage in exhaust devices or due to not completed DeHC event.

Bundle Name: HCI_DeHC_ExhInjDsbl

HCI_DeHC_ExhInjDsbl - Other Definitions:
GetHCIR_b_DeHC_ExhInjDsbl =1 means that the actuators used to inject HC in the exhaust line (Post Injection and HC Injector) shall be disabled.
GetHCIR_b_DeHC_ExhInjDsbl = 1 if one of those two sets of conditions is satisfied:
- Combustion Mode equal to one of allowed modes (DPF), aftertreatment HC storage based request of DeHC, HCI_DeHC_BasicReq = 1 and none among EXM_PM_TurbFlowNotVld (Exhaust Mass Flow Fault Flag),EXM_O2_ExhMnfdNotValid (O2 Exhaust Manifold Concentration Fault Flag) and EXM_HC_TurbFlowNotValid(HC Exhaust Manifold Mass Flow Fault Flag) = 1.
- Generic DeHC Park or DeHC Drive request is = 1, none of EXM_TurbFlowNotValid,EXM_O2_ExhMnfdNotValid and EXM_HC_TurbFlowNotValid= 1 and no DeHC deactivation request for time or over temperature is present.

Bundle Name: HCI_GenericShtOffReq

P20CB, P20CD, P20CE, P2670

HCI_GenericShtOffReq - Other Definitions:

Bundle Name: HCI_HC_dm_DPF_UpFlt

HCI_HC_dm_DPF_UpFlt - Other Definitions:
CAT_HC_Cat2_DwnFlt

Bundle Name: HCI_HC_dm_SCR_UpFlt

HCI_HC_dm_SCR_UpFlt - Other Definitions:
EPM_HC_dm_Pipe2_DwnFlt

Bundle Name: HCI_HCI_CntrlEnbl

HCI_HCI_CntrlEnbl - Other Definitions:
GetHCIR_b_HCI_CntrlEnbl =1 when the control of HC Injector for regeneration purposes is enabled. GetHCIR_b_HCI_CntrlEnbl = 1 if:
- Combustion Mode equal to one of allowed modes (DPF)
- HCI_GenericShtOffReq = 0
- EXC_HCI_Enbl = 1
- HCI_DeHC_ExhInjDsbl = 0
- Sensor DPF Up Temperature is higher than 280.00 (with hysteresis threshold 260.00) and EGT_SnsrDPF_UpFlt = 0 or EGT_SnsrDPF_UpFlt =1 and modelled DPF Up Temperature respects the same thresholds mentioned before.
- modelled DOC 2 Up Temperature is higher than 300.00 (with hysteresis threshold 250.00) or EGT_TempCat2_UpFlt = 1
- PT Relè Voltage is in the range between 100,000.00 (with hysteresis threshold 100,000.00) and 6.00 (with hysteresis threshold 6.00)
- Differential Pressure Across HC Injector is higher than 320.00 (with hysteresis threshold 300.00) or EGP_PresHCI_UpFlt= 1
- Estimated Exhaust Mass Flow Upstream HC Injector (low pass filtered with 1.00 constant) is higher than 5.00 (with hysteresis threshold 4.50) and EXF_TotExhHC_InjUpFlt = 0

Bundle Name: HCI_HCI_RelRgn

HCI_HCI_RelRgn - Other Definitions:
GetHCIR_b_HCI_RelRgn = 1 when the low level logic of HC Injector for Regeneration purpose is enabled that means if:
- HCI_HCI_CntrlEnbl= 1
- Requested HC Injector Quantity is higher than 2.00 (with hysteresis threshold 1.00)

Bundle Name: HCI_InjReleaseSt

HCI_InjReleaseSt - Other Definitions:
GetHCIR_b_InjReleaseSt = 1 if:
- if HCI_HCI_RelRgn = 1
- if the current 100 ms task allows the injection, according to injection frequency
- if the requested HC quantity (equal to the currently requested quantity plus the integral of the quantity requested but not yet released) is greater than minimum quantity per task 67.00

Bundle Name: HCI_TotExh_dm_HCI_DwnFA

HCI_TotExh_dm_HCI_DwnFA - Other Definitions:
EXF_TotExhHC_InjUpFA

Bundle Name: HCI_TotExh_dm_HCI_DwnFlt

HCI_TotExh_dm_HCI_DwnFlt - Other Definitions:
EXF_TotExhHC_InjUpFlt

Bundle Name: HumidityFA

P0097, P0098, P00F4, P00F5, P2227, P2228, P2229, P2230

Bundle Name: HumidityTFTKO

P0097, P0098, P00F4, P00F5, P2227, P2228, P2229, P2230

Bundle Name: HumTempSnsrCktFA

P0097, P0098

Bundle Name: HumTempSnsrFA

P0096, P0097, P0098, P0099

Bundle Name: HumTempSnsrTFTKO

P0096, P0097, P0098, P0099
Bundle Name: IAT_SensorCircuitFA
P0112, P0113
Bundle Name: IAT_SensorFA
P0111, P0112, P0113, P0114
Bundle Name: IAT_SensorTFTKO
P0111, P0112, P0113, P0114
Bundle Name: INM_ComprAirFlowNotVld
INM_ComprAirFlowNotVld - Other Definitions: MAF_MAF_SnsrFA, MAF_MAF_SnsrTFTKO, LPE_VlvAirFlowNotVld
Bundle Name: INM_CylTotFlowNomNotVld
INM_CylTotFlowNomNotVld - Other Definitions: MAP_SensorFA, MAP_EngOffPressFA, MAP_SensorTFTKO, MAP_EngOffPressTFTKO, MnfdTempSensorFA, MnfdTempSensorTFTKO, ECT_Sensor_FA, ECT_Sensor_TFTKO, SWC_SwirlShtOffReq, FUL_GenericInjSysFlt
Bundle Name: INM_CylTotFlowNotValid
INM_CylTotFlowNotValid - Other Definitions: INM_IntkGapNotValid, EGR_PstnSnsrFlt, LPE_PstnSnsrFlt
Bundle Name: INM_EGR_RateNotVld
INM_EGR_RateNotVld - Other Definitions: INM_EGR_RateNotVld, LPE_VlvTotFlowNotVld, EGR_VlvTotFlowNotValid
Bundle Name: INM_IntkGapNotValid
INM_IntkGapNotValid - Other Definitions: MAF_MAF_SnsrFA, MAF_MAF_SnsrTFTKO, INM_CylTotFlowNomNotVld, LPE_VlvTotFlowNomNotVld
Bundle Name: INM_O2_IntkMnfdNotValid
INM_O2_IntkMnfdNotValid - Other Definitions: INM_CylTotFlowNotValid, EGR_VlvTotFlowNotValid, INM_ThrotAirFlowNotVld
Bundle Name: INM_ThrotAirFlowNotVld
INM_ThrotAirFlowNotVld - Other Definitions: INM_ComprAirFlowNotVld
Bundle Name: LowFuelConditionDiagnostic
LowFuelConditionDiagnostic - Other Definitions: Flag set to TRUE if the fuel level < 10.0 % AND

No Active DTCs: FuelLevelDataFault, P0462, P0463 for at least 30.0 seconds

Bundle Name: LPE_PstnShtOffReq

P044C, P044D, P045A, P045C, P045E, P045F, P045D, P049E, P1419, P141A, P141B, P141C

LPE_PstnShtOffReq - Other Definitions:
Stubbed to FALSE in OBDII MY16 applications

Bundle Name: LPE_PstnSnsrFlt

P044C, P044D, P049E

LPE_PstnSnsrFlt - Other Definitions:
Stubbed to FALSE in OBDII MY16 applications

Bundle Name: LPE_VlvTotFlowNomNotVld

LPE_VlvTotFlowNomNotVld - Other Definitions:
Stubbed to FALSE in OBDII MY16 applications

Bundle Name: LPE_VlvTotFlowNotVld

LPE_VlvTotFlowNotVld - Other Definitions:
Stubbed to FALSE in OBDII MY16 applications

Bundle Name: MAF_AirFlowEstdSS_NotVld

MAF_AirFlowEstdSS_NotVld - Other Definitions:
MAP_SensorFA, MAP_SensorTFTKO, MAP_EngOffPressFA, MAP_EngOffPressTFTKO, MnfdTempSensorFA, MnfdTempSensorTFTKO, ECT_Sensor_FA, ECT_Sensor_TFTKO, SWC_SwirlShtOffReq, FUL_GenericInjSysFlt

Bundle Name: MAF_MAF_SnsrCktOffstFA

P0102, P0100, P0103

Bundle Name: MAF_MAF_SnsrCktOffstTFKO

P0102, P0100, P0103

Bundle Name: MAF_MAF_SnsrFA

P0100, P0101, P0102, P0103

Bundle Name: MAF_MAF_SnsrTFTKO

P0100, P0101, P0102, P0103

Bundle Name: MAF_SensorFA

P0101, P0102, P0103, P010B, P010C, P010D

Bundle Name: MAF_SensorTFTKO

P0101, P0102, P0103, P010B, P010C, P010D

Bundle Name: MAP_EngOffPressFA

P00C7

Bundle Name: MAP_EngOffPressTFTKO

P00C7

Bundle Name: MAP_SensorCircuitFA

P0107, P0108
Bundle Name: MAP_SensorCircuitFP
P0107, P0108
Bundle Name: MAP_SensorFA
P0106, P0107, P0108
Bundle Name: MAP_SensorTFTKO
P0106, P0107, P0108
Bundle Name: Maximum fuel flow deliverable by high pressure pump
Refer to RailPresCntrl section.
Bundle Name: Metering Unit controlled in closed loop
Refer to RailPresCntrl section.
Bundle Name: MnfdTempSensorCktFA
Turbocharged or Supercharged, with Humidity sensor: P00EA, P00EB. Turbocharged or Supercharged, without Humidity sensor: P0097, P0098. Naturally Aspirated: P0112, P0113.
Bundle Name: MnfdTempSensorFA
Turbocharged or Supercharged, with Humidity sensor: P00E9, P00EA, P00EB, P00EC. Turbocharged or Supercharged, without Humidity sensor: P0096, P0097, P0098, P0099. Naturally Aspirated: P0111, P0112, P0113, P0114.
Bundle Name: MnfdTempSensorTFTKO
Turbocharged or Supercharged, with Humidity sensor: P00E9, P00EA, P00EB, P00EC. Turbocharged or Supercharged, without Humidity sensor: P0096, P0097, P0098, P0099. Naturally Aspirated: P0111, P0112, P0113, P0114.
Bundle Name: NOX_NOx_Rat_SCR_UpFlt
NOX_NOx_Rat_SCR_UpFlt - Other Definitions: EPM_NOx_Rat_Pipe2_DwnFlt
Bundle Name: NOX_NOx_SnsrSCR_DwnFlt
U029E,
NOX_NOx_SnsrSCR_DwnFlt - Other Definitions: NOX_Snsr2_NOx_Flt
Bundle Name: NOX_NOx1_DecrDynChkFlt
P22FA
NOX_NOx1_DecrDynChkFlt - Other Definitions:
Bundle Name: NOX_NOx1_IncrDynChkFlt
P22F9
Bundle Name: NOX_NOx1_NOxPlausFlt
P11CC
Bundle Name: NOX_NOx1_OutOfRngHiFlt
P2203
Bundle Name: NOX_NOx1_OutOfRngLoFlt
P2202

Bundle Name: NOX_NOx1_StBitChkFlt
P11DB
Bundle Name: NOX_NOx2_DynChkFlt
P229F
Bundle Name: NOX_NOx2_OutOfRngHiFlt
P22A1
Bundle Name: NOX_NOx2_OutOfRngLoFlt
P22A0
Bundle Name: NOX_NOx2_StBitChkFlt
P11DC
Bundle Name: NOX_NOx2SelfDiagFlt
P22FE
Bundle Name: NOX_Snsr1_ElecFA
P2205, P2209, P11DD, P2200, P220A, P115E, P115F, P1160, P116A, P116B, P116C, P116D, P116E, P116F, P1192, P1193, P1194, P2205, P2206, P2207, P2208, P2210, P2211, P11C5, P11C6, P119A, P119B, P119C
Bundle Name: NOX_Snsr1_FA
P11CC, U029D
NOX_Snsr1_FA - Other Definitions: NOX_Snsr1_ElecFA
Bundle Name: NOX_Snsr1_FltSt
P2205, P2209, P11DD, P2200, P220A, P115E, P115F, P1160, P116A, P116B, P116C, P116D, P116E, P116F, P1192, P1193, P1194, P2205, P2206, P2207, P2208, P2210, P2211, P11C5, P11C6, P119A, P119B, P119C
Bundle Name: NOX_Snsr1_NotVld
U029D
NOX_Snsr1_NotVld - Other Definitions: NOX_Snsr1_FltSt, NOX_NOx1_StBitChkFlt,
Bundle Name: NOX_Snsr1_NOx_Flt
NOX_Snsr1_NOx_Flt - Other Definitions: NOX_Snsr1_NotVld, NOX_NOx1_NOxPlausFlt,NOX_NOx2_OutOfRngLoFlt,NOX_NOx2_OutOfRngHiFlt, NOX_NOx1_DecrDynChkFlt, NOX_NOx1_IncrDynChkFlt
Bundle Name: NOX_Snsr1_O2_NotRlb
NOX_Snsr1_O2_NotRlb - Other Definitions: NOx Sensor 1 supply in range > 10,8V NOx Sensor 1 dewpoint is reached = TRUE - 0.03 < (sensor heater raw resistance - sensor heater target resistance) / sensor heater target resistence < + 0.03 Stability flag for NOx/Lambda = TRUE
Bundle Name: NOX_Snsr1_PresFlt
NOX_Snsr1_PresFlt - Other Definitions:

EGP_PresCatUpFlt
Bundle Name: NOX_Snsr2_ElecFA
P22A3, P22A7, P11DE, P229E, P220B, P11BE, P11BF, P11C0, P11D0, P11D1, P11D2, P11D8, P11D9, P11DA, P11FC, P11FD, P11FE, P22A3, P22A4, P22A5, P22A6, P22A8, P22A9, P11C7, P11C8, P119D, P119E, P119F
Bundle Name: NOX_Snsr2_FltSt
P22A3, P22A7, P11DE, P229E, P220B, P11BE, P11BF, P11C0, P11D0, P11D1, P11D2, P11D8, P11D9, P11DA, P11FC, P11FD, P11FE, P22A3, P22A4, P22A5, P22A6, P22A8, P22A9, P11C7, P11C8, P119D, P119E, P119F
Bundle Name: NOX_Snsr2_NotVld
U029E
NOX_Snsr2_NotVld - Other Definitions: NOX_Snsr2_FltSt, NOX_NOx2_StBitChkFlt,
Bundle Name: NOX_Snsr2_NOx_Flt
NOX_Snsr2_NOx_Flt - Other Definitions: NOX_Snsr2_NotVld, NOX_NOx2_DynChkFlt, NOX_NOx2_OutOfRngLoFlt, NOX_NOx2_OutOfRngHiFlt, NOX_NOx2SelfDiagFlt
Bundle Name: NOX_Snsr2_O2_NotRlb
NOX_Snsr2_O2_NotRlb - Other Definitions: NOx Sensor 2 supply in range > 10,8V Nox Sensor 2 dewpoint is reached = TRUE - 0.03 < (sensor heater raw resistance - sensor heater target resistance) / sensor heater target resistence < + 0.03 Stability flag for NOx/Lambda = TRUE
Bundle Name: NOX_Snsr2_PresFlt
NOX_Snsr2_PresFlt - Other Definitions: EGP_PresSCR_DwnFlt
Bundle Name: OAT_OAT_SensorTFTKO
P0071, P0072, P0073, P0074
Bundle Name: OAT_OAT_SnsrNonEmissFA
P0070, P0071
Bundle Name: OAT_PtEstFiltFA
ECM OAT: P0071, P0072, P0073, P0074, EngModeNotRunTmErr, VehicleSpeedSensor_FA, IAT_SensorFA, ECT_Sensor_DefaultDetected, MAF_SensorFA. VIMC OAT: P0072, P0073, EngModeNotRunTmErr, VehicleSpeedSensor_FA, ECT_Sensor_DefaultDetected. IAT-Based OAT: VehicleSpeedSensor_FA, IAT_SensorFA, MAF_SensorFA. All other cases: EngModeNotRunTmErr, VehicleSpeedSensor_FA, IAT_SensorFA, ECT_Sensor_DefaultDetected.
Bundle Name: OAT_PtEstRawFA
ECM OAT: P0071, P0072, P0073, P0074. VIMC OAT: P0071, P0072, P0073, EngModeNotRunTmErr, VehicleSpeedSensor_FA, ECT_Sensor_DefaultDetected. IAT-Based OAT: IAT_SensorFA. All other cases: IAT_SensorFA, ECT_Sensor_DefaultDetected.
Bundle Name: OXY_eqr_TurbDwn_FSA_NotVld
OXY_eqr_TurbDwn_FSA_NotVld - Other Definitions: OXY_NOx1_eqr_FSA_NotVld

Bundle Name: OXY_eqr_TurbDwnNotRlb
OXY_eqr_TurbDwnNotRlb - Other Definitions: OXY_NOx1_O2_RawNotRlb
Bundle Name: OXY_eqr_TurbDwnNotVld
OXY_eqr_TurbDwnNotVld - Other Definitions: OXY_NOx1_EQR_NotVld
Bundle Name: OXY_NOx1_eqr_FSA_NotVld
OXY_NOx1_eqr_FSA_NotVld - Other Definitions: NOX_Snsr1_NotVld, NOX_Snsr1_PresFlt, OXY_NOx1SignRngMinTFTKO, OXY_NOx1SignRngMaxTFTKO, OXY_NOx1ChkOvrrnTFTKO, OXY_NOx1DecrDynTFTKO, OXY_NOx1IncrDynTFTKO
Bundle Name: OXY_NOx1_EQR_NotVld
OXY_NOx1_EQR_NotVld - Other Definitions: NOX_Snsr1_NotVld, NOX_Snsr1_PresFlt, OXY_NOx1SignRngMinTFTKO, OXY_NOx1SignRngMaxTFTKO, OXY_NOx1ChkOvrrnTFTKO, OXY_NOx1ChkLoadTFTKO, OXY_NOx1DecrDynTFTKO, OXY_NOx1IncrDynTFTKO
Bundle Name: OXY_NOx1_O2_Flt
OXY_NOx1_O2_Flt - Other Definitions: NOX_Snsr1_NotVld, NOX_Snsr1_PresFlt, OXY_NOx1SignRngMinFlt, OXY_NOx1SignRngMaxFlt, OXY_NOx1ChkOvrrnFlt, OXY_NOx1ChkLoadFlt, OXY_NOx1DecrDynFlt, OXY_NOx1IncrDynFlt
Bundle Name: OXY_NOx1_O2_RawNotRlb
OXY_NOx1_O2_RawNotRlb - Other Definitions: NOX_Snsr1_O2_NotRlb
Bundle Name: OXY_NOx1ChkLoadFlt
P2A00
Bundle Name: OXY_NOx1ChkLoadTFTKO
P2A00
Bundle Name: OXY_NOx1ChkOvrrnFlt
P2297
Bundle Name: OXY_NOx1ChkOvrrnTFTKO
P2297
Bundle Name: OXY_NOx1DecrDynFlt
P014D
Bundle Name: OXY_NOx1DecrDynTFTKO
P014D
Bundle Name: OXY_NOx1IncrDynFlt

P014C
Bundle Name: OXY_NOx1IncrDynTFTKO
P014C
Bundle Name: OXY_NOx1SignRngChkFlt
OXY_NOx1SignRngChkFlt - Other Definitions: OXY_NOx1SignRngMaxFlt, OXY_NOx1SignRngMinFlt
Bundle Name: OXY_NOx1SignRngMaxFlt
P2628
Bundle Name: OXY_NOx1SignRngMaxTFTKO
P2628
Bundle Name: OXY_NOx1SignRngMinFlt
P2627
Bundle Name: OXY_NOx1SignRngMinTFTKO
P2627
Bundle Name: OXY_NOx2_O2_RawNotRlb
OXY_NOx2_O2_RawNotRlb - Other Definitions: NOX_Snsr2_O2_NotRlb
Bundle Name: OXY_NOx2ChkFlt
OXY_NOx2ChkFlt - Other Definitions: OXY_NOx2ChkLoadFlt, OXY_NOx2ChkOvrrnFlt
Bundle Name: OXY_NOx2ChkLoadFlt
P2A01
Bundle Name: OXY_NOx2ChkOvrrnFlt
P11B3
Bundle Name: OXY_NOx2SignRngChkFlt
OXY_NOx2SignRngChkFlt - Other Definitions: OXY_NOx2SignRngMaxFlt, OXY_NOx2SignRngMinFlt
Bundle Name: OXY_NOx2SignRngMaxFlt
P22B7
Bundle Name: OXY_NOx2SignRngMinFlt
P22B6
Bundle Name: OXY_O2_NOx1_PresCmpNotRlb
OXY_O2_NOx1_PresCmpNotRlb - Other Definitions: OXY_NOx1_O2_RawNotRlb

Bundle Name: OXY_O2_NOx1_SDC_CrtdNotRlb
OXY_O2_NOx1_SDC_CrtdNotRlb - Other Definitions: OXY_O2_NOx1_PresCmpNotRlb
Bundle Name: OXY_O2_NOx1PlausMdlFlt
OXY_O2_NOx1PlausMdlFlt - Other Definitions: EXM_O2_ExhMnfdNotValid
Bundle Name: OXY_O2_NOx2_PresCmpNotRlb
OXY_O2_NOx2_PresCmpNotRlb - Other Definitions: OXY_NOx2_O2_RawNotRlb
Bundle Name: OXY_O2_NOx2_SDC_CrtdNotRlb
OXY_O2_NOx2_SDC_CrtdNotRlb - Other Definitions: OXY_O2_NOx2_PresCmpNotRlb
Bundle Name: OXY_O2_SCR_UpFlt
OXY_O2_SCR_UpFlt - Other Definitions: EPM_O2_Pipe2_DwnFlt
Bundle Name: PowertrainRelayFault
P1682, P16A7, P16BC
Bundle Name: PowertrainRelayStateOn_FA
P0685, P0686, P0687
Bundle Name: Pressure Regulator controlled in closed loop
Refer to RailPresCntrl section.
Bundle Name: Rail pressure is governed by Metering Unit
Refer to RailPresCntrl section.
Rail pressure is governed by Metering Unit - Other Definitions:
Bundle Name: Rail pressure is governed by Pressure Regulator
Refer to RailPresCntrl section.
Bundle Name: SBR_RlyFA
P16D7, P16D8, P16D9
Bundle Name: SCR_ChemicalMdlFlt
SCR_ChemicalMdlFlt - Other Definitions: EGP_PresSCR_UpFlt EGP_PresSCR_DwnFlt NOX_NOx_Rat_SCR_UpFlt NOX_Snsr1_NOx_Flt SCR_ThermalMdlFlt
Bundle Name: SCR_DEF_PumpCmdFA

P1057, P1058, P1059
Bundle Name: SCR_DEFLH_ElecFltSt
P20BF, P20C0, P20BD
Bundle Name: SCR_DEFLS_ElecFltSt
P203D, P203C
Bundle Name: SCR_DEFMV_FA
P2047, P1049, P1048, P2049, P2048
Bundle Name: SCR_DEFPM_FA
P208A, P208C, P208D, P1040, P103F, P214E, P1056
Bundle Name: SCR_DEFPS_FA
P204D, P204C, P204B
Bundle Name: SCR_DEFTH_ElecFltSt
P20BB, P20BC, P20B9
Bundle Name: SCR_DEFTH_FA
P20BB, P20BC, P20B9, P1051
Bundle Name: SCR_DEFTS_ElecFltSt
P205C, P205D
Bundle Name: SCR_DEFTS_FA
P205D, P205C, P205B
Bundle Name: SCR_HC_SCR_DwnFlt
SCR_HC_SCR_DwnFlt - Other Definitions: EGP_PresSCR_UpFlt EGP_PresSCR_DwnFlt OXY_O2_SCR_UpFlt HCI_HC_dm_SCR_UpFlt SCR_ThermalMdlFlt
Bundle Name: SCR_LineHeatSplyVoltFA
P248C
Bundle Name: SCR_PmpRtrStlFA
P105A
Bundle Name: SCR_PresGovDvtnHiFA
P20E9
Bundle Name: SCR_RDP_Flt
P2BAA
Bundle Name: SCR_SCR_PresDropFlt
SCR_SCR_PresDropFlt - Other Definitions: EGT_TempSCR_UpFlt EXF_TotExhSCR_UpFlt EGP_PresSCR_DwnFlt
Bundle Name: SCR_TankHeatSplyVoltFA
P248A
Bundle Name: SCR_TempSCR_DwnFlt

SCR_TempSCR_DwnFlt - Other Definitions:
SCR_ThermalMdlFlt

Bundle Name: SCR_ThermalMdlFlt

SCR_ThermalMdlFlt - Other Definitions:
EXF_TotExhSCR_UpFlt EGT_TempSCR_UpFlt OAT_OAT_SnsrNonEmissFA VehicleSpeedSensor_FA AmbPresDfltdStatus

Bundle Name: SCR_TipStuckFltSt

P202E

Bundle Name: SCR_TotExh_DEFMV_DwnFlt

SCR_TotExh_DEFMV_DwnFlt - Other Definitions:
EXF_TotExhDEFMV_UpFlt

Bundle Name: SOT_EleclFault

P24D0, P1474, P1475, P1476, P24B3, P24B5, P24B6, P24B0, P24B1, P1477, P1478, P142D, P142C, P142F, P142E

Bundle Name: SOT_ExhPresSootSnsrVld

SOT_ExhPresSootSnsrVld - Other Definitions:
NOT(EGP_PresDPF_DwnFlt)

Bundle Name: SOT_ExhTempSootSnsrVld

SOT_ExhTempSootSnsrVld - Other Definitions:
IF (NOT EGT_SnsrDPF_DwnPresent OR EGT_SnsrDPF_DwnFlt) = 1

THEN (NOT (EGT_SnsrDPF_DwnFlt))

ELSE (True)

EGT_SnsrDPF_DwnFlt (if Temperature sensor Downstream DPF is not present or faulty)
True (if Temperature sensor Downstream DPF is present or not faulty)

Bundle Name: SOT_PM_DPF_UpVld

SOT_PM_DPF_UpVld - Other Definitions:
CAT_PM_Cat2_DwnVld

Bundle Name: SOT_SootSnsrFlt

P24D0, P1474, P1475, P1476, P24B3, P24B5, P24B6, P24B0, P24B1, P1477, P1478, P142D, P142C, P142F, P142E, P24C7, P118B, P147B, P1479, P24B4, P1488, P142B, P1435, P1436, P24D1

Bundle Name: SOT_TotExhSootSnsrVld

SOT_TotExhSootSnsrVld - Other Definitions:

NOT(EXF_TotExhDPF_UpFlt)
Bundle Name: SWC_SwirlShtOffReq
SWC_SwirlShtOffReq - Other Definitions: Stubbed to FALSE in OBDII MY16 applications
Bundle Name: THMR_AHV_FA
P2681, P26A3, P26A6, P26A7, P26A9
THMR_AHV_FA - Other Definitions:
Bundle Name: THMR_AWP_AuxPumpFA
B269A, B269C, B269D
Bundle Name: THMR_RCT_Sensor_Ckt_FA
P00B3, P00B4
Bundle Name: THMR_SWP_Control_FA
P261A, P261D, P261C
Bundle Name: THMR_SWP_FlowStuckOn_FA
P261A, P261D, P261E
Bundle Name: THMR_SWP_NoFlow_FA
P261B, P261C
Bundle Name: TPS_FA
P0122, P0123, P0222, P0223, P16A0, P16A1, P16A2, P2135
Bundle Name: TPS_MtrCurrLimTFTKO
P02EB
Bundle Name: TPS_PstnDvtnFA
P02E4, P02E5
Bundle Name: TPS_PstnShtOffReq
P02E4, P02E5, P02E8, P02E9, P122D, P16A0, P16A1, P16A2, P02E0, P02E2, P02E3, P02EB, P122B, P122C, P1425
Bundle Name: TPS_PstnSnsrFA
P02E8, P02E9, P122D, P16A0, P16A1, P16A2
Bundle Name: TPS_SENT_OOR_Flt
P16A0, P16A1
Bundle Name: TPS_SENT_PerfFlt
P16A2
Bundle Name: Transmission Estimated Gear Validity
P0502, P0503, P0722, P0723, P077C, P077D, P0729, P0731, P0732, P0733, P0734, P0735, P0736, P076F, P18C4, P18C5, P18C6, P18C7, P18C8, P18C9, P18CA
Bundle Name: Transmission Gear Ratio Validity
P0716, P0717, P0722, P0723, P077C, P077D, P07BF, P07C0
Bundle Name: Transmission Output Shaft Angular Velocity Validity

P0722, P0723, P077C, P077D
Bundle Name: TransmissionEngagedState_FA
P1824, P182A, P182B, P182C, P182D, P182E, P182F, P1838, P1839, P1840, P1841, P18B5, P18B6, P18B7, P18B8, P18B9, P18BA, P18BB, P18BC, P18BD, P18BE, P18BF, P18C0, P18C1, P18C2, P18C3, P1915
Bundle Name: VehicleSpeedSensor_FA
P0502, P0503, P0722, P0723
Bundle Name: VGT_ActCktFA
P0045, P0048, P169E, P169F, P16FA
Bundle Name: VGT_PstnCntrlFA
P2599, P2598
Bundle Name: VGT_PstnSnsrFA
P2564, P2565, P16B0, P16B1, P16B2, P003A
Bundle Name: VGT_PstnSnsrTFTKO
P2564, P2565, P16B0, P16B1, P16B2, P003A
Bundle Name: VGT_SENT_OOR_Flt
P16B0, P16B1
Bundle Name: VGT_SENT_PerfFlt
P16B2
Bundle Name: WGA_ActrCktFA
WGA_ActrCktFA - Other Definitions: Stubbed to FALSE in OBDII MY16 applications
Bundle Name: XOY_SecurityFlt
P16F3
XOY_SecurityFlt - Other Definitions: Latched security fault status
Bundle Name: XOY_SecurityFlt_CeXOYR_e_ETMR_FTD_RedntCalcFlt
P16F3
XOY_SecurityFlt_CeXOYR_e_ETMR_FTD_RedntCalcFlt - Other Definitions: Latched security fault status for case "Fuel Injector Backflow Temperature ET Compensation Redundant Fault"
Bundle Name: XOY_SecurityFlt_CeXOYR_e_FULR_FTD_RateLimFlt
P16F3
XOY_SecurityFlt_CeXOYR_e_FULR_FTD_RateLimFlt - Other Definitions: Latched security fault status for case "Fuel Injector Backflow Temperature Rate Limit Fault"
Bundle Name: ZeroTorq
ZeroTorq - Other Definitions: see PID $62
Bundle Name: ZeroTorqPrdtdActv

ZeroTorqPrdtdActv - Other Definitions: This fault bundle is based on RawIndicatetRequest (PID $245C) and other requestors (i.e. accelerator pedal)
Bundle Name: ZeroTorqRefActv
ZeroTorqRefActv - Other Definitions: Flag indicating Zero Torque condition on the real torque request without anti-oscillation system.