Component / System	Fault Code	Monitor Strategy Description	Primary Malfunction Criteria		Threshold Logic and Valu	le	Secondary Parameters		Enable Conditions		Time Required	MIL Illum.
Crankshaft to Camshaft Correlation	P0016	Detects a shift of the camshaft angle by monitoring the average offset angle.	average value of camshaft offset	<	-20.00	degrees	ignition on and basic enable conditions met:	=	TRUE see sheet enable tables		fail conditions exists for more than 4 events test performed continuously 0.01 s rate	В
Turbocharger Boost Control Position Not Learned	P003A	Detects in range vane position errors during a vane sweep initiated to learn minimum and maximum vane position values.	Path 1: mean offset learned value at fully open valve position or	<	5.54	%	injection quantity and injection quantity	>=	0.00	mm^3/r ev mm^3/r	fail conditions exists for 0.01 s monitor runs once per trip with 0.01 s rate whenever	В
	or mean offset learned value at fully of valve position	mean offset learned value at fully open valve position	>	36.94	%	and			ev	enable conditions are met		
							accelerator pedal position and	<=	0.10	%		
							Engine Speed and	>=	500.00	rpm		
							and	<=	760.00	rpm		
							Vehicle speed and	>=	0.00	mph		
							Vehicle speed and	<=	3.11	mph		
							Battery voltage and	>=	10.00	V		
							Engine Coolant Temperature and	>=	71.96	°C		
							Engine Coolant Temperature and	<=	99.96	°C		
							Barometric pressure and	>=	65.00	kPa		
							Barometric pressure and	<=	110.00	kPa		
							time since start and	>	10.08	sec		
							Regeneration Active	=	FALSE	-		
							Adaptation is finished for this driving cycle and	=	FALSE	-		
		1	1	1			valve open	=	TRUE	-	1	

Component / System	Fault Code	Monitor Strategy Description	Primary Malfunction Criteria	Threshold Logic and Value	Secondary Parameters		Enable Conditions		Time Required	MIL Illum.
					and turbocharger offset adaptation timer and NO Pending or Confirmed DTCs: and basic enable conditions met:	>= =	0.60 see sheet inhibit tables see sheet enable tables	sec - -		
			Path 2: time taken to learn the mean offset learned value at fully open value position	> 30.00 sec	injection quantity and	>=	0.00 m	nm^3/r ev		
			· · · · · · · · · · · · · · · · · · ·		injection quantity	<=	100 m	nm^3/r ev		
					and accelerator pedal position and	<=	0.10	%		
					Engine Speed and	>=	500.00	rpm		
					and Vehicle speed	<= >=	0.00	mph		
					and Vehicle speed and	<=	3.11	mph		
					Battery voltage and	>=	10.00	V		
					Engine Coolant Temperature and Engine Coolant Temperature	>=	71.96 99.96	℃ ℃		
					and Barometric pressure	>=	65.00	kPa		
					and Barometric pressure and	<=	110.00	kPa		
					time since start and	>	10.08	sec		
					Regeneration Active and Adaptation is finished for this driving	=	FALSE	-		
					cycle and valve open	=	TRUE	-		
					and turbocharger offset adaptation timer and	>=	0.60	sec		
					NO Pending or Confirmed DTCs:	=	see sheet inhibit tables	-		
					basic enable conditions met:	=	see sheet enable tables	-		

Component / System	Fault Code	Monitor Strategy Description	Primary Malfunction Criteria		Threshold Logic and Value	•	Secondary Parameters		Enable Conditions		Time Required	MIL Illum.
			Path 3:				injection quantity	>=	0.00	mm^3/r ev		
			mean offset learned value at fully closed valve position	<	68.01	%	and		100			
			or mean offset learned value at fully closed	>	95.61	%	and	<=	100	ev		
			valve position				accelerator pedal position	<=	0.10	%		
							Engine Speed	>=	500.00	rpm		
							and Engine Speed and	<=	760.00	rpm		
							Vehicle speed	>=	0.00	mph		
							Vehicle speed and	<=	3.11	mph		
							Battery voltage	>=	10.00	V		
							Engine Coolant Temperature	>=	71.96	°C		
							Engine Coolant Temperature	<=	99.96	°C		
							Barometric pressure and	>=	65.00	kPa		
							Barometric pressure and	<=	110.00	kPa		
							time since start and	>	10.08	sec		
							Regeneration Active	=	FALSE	-		
							Adaptation is finished for this driving cycle	=	FALSE	-		
							valve closed	=	TRUE	-		
							turbocharger offset adaptation timer and	>=	0.60	sec		
							mean offset learned value at fully open valve position and	>=	5.54	%		
							mean offset learned value at fully open valve position	<=	36.94	%		
							NO Pending or Confirmed DTCs:	=	see sheet inhibit tables	-		
							and basic enable conditions met:	=	see sheet enable tables	-		

Component / System	Fault Code	Monitor Strategy Description	Primary Malfunction Criteria		Tł Logie	nreshold c and Value	•	Secondary Parameters		Enable Conditions		Time Required	MIL Illum.
			Path 4: time taken to learn the mean offset learned value at fully closed valve	^		30.00	sec	injection quantity and	>=	0.00	mm^3/r ev		
			position					injection quantity	<=	100	mm^3/r ev		
								and accelerator pedal position and	<=	0.10	%		
								Engine Speed and	>=	500.00	rpm		
								Engine Speed and Vehicle speed	<=	0.00	rpm		
								and Vehicle speed	<=	3.11	mph		
								and Battery voltage	>=	10.00	V		
								and Engine Coolant Temperature	>=	71.96	°C		
								Engine Coolant Temperature and	<=	99.96	°C		
								Barometric pressure and	>=	65.00	kPa		
								Barometric pressure and	<=	110.00	kPa		
								and Regeneration Active	>	FALSE	-		
								and Adaptation is finished for this driving cycle	=	FALSE	-		
								and valve closed and	=	TRUE	-		
								turbocharger offset adaptation timer and	>=	0.60	sec		
								mean offset learned value at fully open valve position	>=	5.54	%		
								mean offset learned value at fully open valve position	<=	36.94	%		
								NO Pending or Confirmed DTCs:	=	see sheet inhibit tables	-		
								and basic enable conditions met:	=	see sheet enable tables	-		
					-	-	-			_	-		_

Component / System	Fault Code	Monitor Strategy Description	Primary Malfunction Criteria		Threshold Logic and Value	Secondary Parameters		Enable Conditions		Time Required	MIL Illum.
Turbocharger Boost Control Circuit	P0045	Diagnoses the Turbo Charger Boost Circuit low side driver circuit for circuit faults.	Voltage low during driver off state (indicates open circuit)	=	Open Circuit: ≥ - 200 K Ω impedance between ECU pin and load	battery voltage for time and starter is active cranking	> =	11.00 3.00 FALSE	V sec	fail conditions exists for 3 s monitor runs with 0.01 s rate whenever enable conditions are met	В
			The ECM detects that the commanded state of the driver and the actual state of the control circuit do not match.			battery voltage for time and starter is active cranking	> =	11.00 3.00 FALSE	V sec	fail conditions exists for 1 s monitor runs with 0.01 s rate whenever enable conditions are met	
Turbocharger Boost Control Circuit Low Voltage	P0047	Diagnoses the Turbo Charger Boost Circuit 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	battery voltage for time and starter is active cranking	>	11.00 3.00 FALSE	V sec	fail conditions exists for 3 s monitor runs with 0.01 s rate whenever enable conditions are met	В
Turbocharger Boost Control Circuit High Voltage	P0048	Diagnoses the Turbo Charger Boost Circuit 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	battery voltage	>	11.00	V	fail conditions exists for 1 s monitor runs with 0.01 s rate whenever	B

Component / System	Fault Code	Monitor Strategy Description	Primary Malfunction Criteria		Threshold Logic and Value		Secondary Parameters		Enable Conditions		Time Required	MIL Illum.
							for time and starter is active cranking	> =	3.00 FALSE	sec -	enable conditions are met	
Turbocharger Boost High Control Circuit Low Voltage	P006E	Diagnoses the Turbo Charger Boost Circuit 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		ignition on and basic enable conditions met:	=	TRUE see sheet enable tables	•	fail conditions exists for 1.5 s monitor runs with 0.1 s rate whenever enable conditions are met	В
Turbocharger Boost High Control Circuit High Voltage	P006F	Diagnoses the Turbo Charger Boost Circuit 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		battery voltage for time and starter is active cranking	>	11.00 3.00 FALSE	V sec -	fail conditions exists for 0.1 s monitor runs with 0.1 s rate whenever enable conditions are met	В
CAC Temperature Sensor Circuit Low Voltage	P007C	Detects a CAC temperature sensor circuit short to ground.	CAC downstream temperature sensor voltage same as downstream CAC temperature	~ >	0.11	∨ °C	ignition on and basic enable conditions met: and NO Pending or Confirmed DTCs:	=	TRUE see sheet enable tables see sheet inhibit tables	-	fail conditions exists for 5 s test performed continuously 0.1 s rate	A

Component / System	Fault Code	Monitor Strategy Description	Primary Malfunction Criteria		Threshold Logic and Value		Secondary Parameters		Enable Conditions		Time Required	MIL Illum.
CAC Temperature Sensor Circuit High Voltage	P007D	Detects a CAC temperature sensor circuit short to high voltage or a sensor open circuit	CAC downstream temperature sensor voltage same as downstream CAC temperature	~	4.93	∨ °C	ignition on and basic enable conditions met: and NO Pending or Confirmed DTCs:	=	TRUE see sheet enable tables see sheet inhibit tables	-	fail conditions exists for 5 s test performed continuously 0.1 s rate	A
Fuel Rail Pressure [FRP] Too Low	P0087	Measured rail pressure is checked against desired rail pressure to detect low rail pressure conditions.	rail pressure deviation from set point calculated out of difference between desired and actual value (see Look-Up- Table #68) rail pressure deviation from set point calculated out of difference between desired and actual value (see Look-Up- Table #71)	>	11000 to 80000	kPa	state machine rail pressure control equal to metering unit control mode and basic enable conditions met: and metering unit actuator test active and NO Pending or Confirmed DTCs: ( state machine rail pressure control equal to pressure control valve or state machine rail pressure control equal to pressure control valve or state machine rail pressure control equal coupled pressure control (rail pressure is controlled by metering unit and pressure control valve) ) and basic enable conditions met: and metering unit actuator test active and NO Pending or Confirmed DTCs:	=	TRUE see sheet enable tables FALSE see sheet inhibit tables TRUE TRUE see sheet enable tables FALSE see sheet inhibit tables	-	fail conditions exists for 8 s monitor runs with 0.02 s rate whenever enable conditions are met fail conditions exists for 8 s monitor runs with 0.02 s rate whenever enable conditions are met	В
Fuel Rail Pressure [FRP] Too High	P0088	Measured rail pressure is checked against desired rail pressure to detect high rail pressure conditions.	rail pressure deviation from set point calculated out of difference between desired and actual value (see Look-Up- Table #69)	<	-80000 to - 10000	kPa	current injection quantity	>	8.00	mm^3/r ev	fail conditions exists for 8 s monitor runs	В

Component / System	Fault Code	Monitor Strategy Description	Primary Malfunction Criteria		Threshold Logic and Value		Secondary Parameters		Enable Conditions		Time Required	MIL Illum.
							and state machine rail pressure control equal to metering unit control mode and	=	TRUE	-	with 0.02 s rate whenever enable	
							basic enable conditions met:	=	see sheet enable tables	-	conditions are met	
							and metering unit actuator test active	=	FALSE	-		
							NO Pending or Confirmed DTCs:	=	see sheet inhibit tables	-		
					_				_			
			rail pressure deviation from set point calculated out of difference between desired and actual value	<	-10000.00	kPa	(				fail conditions exists for 8 s	
							state machine rail pressure control equal to pressure control valve or	=	TRUE	-	monitor runs with 0.02 s	
							state machine rail pressure control equal coupled pressure control (rail pressure is controlled by metering unit and pressure control valve) )	=	TRUE	-	whenever enable conditions are met	
							and basic enable conditions met:	=	see sheet enable tables	-		
							NO Pending or Confirmed DTCs:	=	see sheet inhibit tables	-		
					_	-			_	-		
Engine Coolant Temperature (ECT)-Fuel Temperature Not	P008F	Detects a biased ECT or fuel temperature by comparing start-up temperatures between the	Path 1:				minimum engine-off time	>=	28800.00	sec	fail conditions exists for 0.2 s	В
Plausible		two sensors.	(a) - (b)  (see Look-Up-Table #15)	>	100 to 999	°C	and				once per trip	
			( (a) captured engine coolant temperature at start	=	measured	-	ambient temperature and	>	-60.04	°C	whill 0.2 s rate whenever	
			and		parameter		engine speed (see Look-Up-Table #91)	>	600 to 850	rpm	conditions	
			(b) captured fuel temperature at start	=	measured parameter	-	for				are met	
			)				time and	>	0.00	Sec		
			or Path 2:		100 10 000		engine post drive/ atterun and	=	FALSE	-		
			l(a) - (b)  (see Look-Up-Table #15) with	<=	100 to 999	ъС	diagnostic performed in current dc and	=	FALSE	-		

Component /	Fault	Monitor Strategy	Primary Malfunction		Threshold		Secondary		Enable		Time	MIL
System	Code	Description	Criteria		Logic and Value		Parameters		Conditions		Required	Illum.
			(a) captured engine coolant temperature at start and	=	parameter	-	basic enable conditions met:	=	see sheet enable tables	-		
			(b) captured fuel temperature at start	=	measured parameter	-	NO Pending or Confirmed DTCs:	=	see sheet inhibit tables	-		
			and  (a) - (b)  (see Look-Up-Table #16) where	>	20 to 999	°C						
			temperature at start and	-	parameter	-						
			(b) captured fuel temperature at start and	=	measured parameter	-						
			status of block heater (see parameter definition)	=	FALSE	-						
						_				_		
Fuel Pressure Regulator 1 Control Circuit/Open	P0090	Diagnoses the Fuel Pressure Regulator 1 low side driver circuit for circuit faults.	Voltage low during driver off state (indicates open circuit)	=	Open Circuit:≥ 200 K Ω impedance between ECU pin and load	-	battery voltage	^	11.00	V	fail conditions exists for 1 s monitor runs with 0.01 s rate	A
							time and	>	3.00	sec	whenever enable	
							starter is active cranking for time	= /	FALSE	-	conditions are met	
							and basic enable conditions met:	=	see sheet enable	-		
									tables			
			The ECM detects that the commanded state of the driver and the actual state of the control circuit do not match.				battery voltage	>	11.00	V	fail conditions exists for 1 s monitor runs	
							for				with 0.01 s	
							time	>	3.00	sec	rate whenever	
							starter is active cranking for	=	FALSE	-	enable conditions	
							time and	>	3.00	sec	are met	
							Dasic enable conditions met:	=	see sneet enable tables	-		

Component / System	Fault Code	Monitor Strategy Description	Primary Malfunction Criteria		Threshold Logic and Value		Secondary Parameters		Enable Conditions		Time Required	MIL Illum.
Fuel Pressure Regulator 1 Control Circuit Low	P0091	Diagnoses the Fuel Pressure Regulator 1 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	-	battery voltage for time and starter is active cranking for time and basic enable conditions met:	> = > =	11.00 3.00 FALSE 3.00 see sheet enable tables	V sec - sec -	fail conditions exists for 0.75 s monitor runs with 0.01 s rate whenever enable conditions are met	A
Fuel Pressure Regulator 1 Control Circuit High	P0092	Diagnoses the Fuel Pressure Regulator 1 Iow 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	-	battery voltage for time and starter is active cranking for time and basic enable conditions met:	> = > =	11.00 3.00 FALSE 3.00 see sheet enable tables	V sec - sec -	fail conditions exists for 1 s monitor runs with 0.01 s rate whenever enable conditions are met	A
Intake Air Temperature (IAT) Sensor 2 Circuit Low Voltage	P0097	Detects low voltage readings on the MAF IAT circuit, indicating an OOR low condition on the MAF IAT circuit (IAT #2)	MAF intake air temperature sensor voltage same as intake air temperature	~	0.08	v °C	ignition on and basic enable conditions met:	=	TRUE see sheet enable tables		fail conditions exists for 5 s test performed continuously with 0.1 s rate	A

Component / System	Fault Code	Monitor Strategy Description	Primary Malfunction Criteria		Threshold Logic and Value		Secondary Parameters		Enable Conditions		Time Required	MIL Illum.
Intake Air Temperature (IAT) Sensor 2 Circuit High Voltage	P0098	Detects high voltage readings on the MAF IAT circuit, indicating an OOR high condition on the MAF IAT circuit (IAT#2)	MAF intake air temperature sensor voltage same as intake air temperature	~ ~	4.93 -52	∨ °C	ignition on and basic enable conditions met:	=	TRUE see sheet enable tables	-	fail conditions exists for 5 s test performed continuously with 0.1 s rate	A
Fuel Pressure Regulator 1 High Control Circuit Low Voltage	P00C9	Diagnoses the Fuel Pressure Regulator 1 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	-	basic enable conditions met:	=	see sheet enable tables	-	fail conditions exists for 0.5s monitor runs with 0.01 s rate whenever enable conditions are met	A
Fuel Rail Pressure Regulator 1 High Control Circuit High Voltage	PooCA	Diagnoses the Fuel Pressure Regulator 1 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	-	battery voltage for time and starter is active cranking for time and engine post drive/ afterun for time and basic enable conditions met:	> = > =	11.00 3.00 FALSE 3.00 TRUE 2.00 see sheet enable tables	V sec - sec - sec -	fail conditions exists for 0.1 s monitor runs with 0.1 s rate whenever enable conditions are met	A
Intake Air Temperature Sensor 3 Circuit Low Voltage	POOEA	Detects low voltage readings on the intake air temperature sensor 3 circuit, indicating an OOR low condition.	intake air temperature sensor 3 voltage	<	0.03	V	ignition on	=	TRUE	-	fail conditions exists for 5 s test performed	В

Component / System	Fault Code	Monitor Strategy Description	Primary Malfunction Criteria		Threshold Logic and Value		Secondary Parameters		Enable Conditions		Time Required	MIL Illum.
			same as temperature of intake air temperature sensor 3	>	250	°C	and basic enable conditions met: and NO Pending or Confirmed DTCs:	=	see sheet enable tables see sheet inhibit tables	-	continuously 0.1 s rate	
Intake Air Temperature Sensor 3 Circuit High Voltage	POOEB	Detects high voltage readings on the intake air temperature sensor 3 circuit, indicating an OOR high condition.	intake air temperature sensor 3 voltage same as temperature of intake air temperature sensor 3	~	4.93 -53	°C	ignition on and basic enable conditions met: and NO Pending or Confirmed DTCs:	=	TRUE see sheet enable tables see sheet inhibit tables	-	fail conditions exists for 5 s test performed continuously 0.1 s rate	В
Humidity Sensor Circuit Low	P00F4	Detects a low duty cycle signal from the humidity sensor, indicating an OOR low condition on the humidity sensor circuit	Humidity Sensor Duty Cycle same as relative humidity	~	5.00	%	Engine Running (please see the definition) and following conditions for time: battery voltage battery voltage and basic enable conditions met: and no pending or confirmed DTCs	= ^ ^ = =	1.00 11.00 655.34 see sheet enable tables see sheet inhibit tables	sec V V	fail conditions exists for 0.1 s test performed continuously with 0.1 s rate	В
		The internal ECM PWM circuit driver detects either a duty cycle which has not been received or the maximum period has been exceeded, indicating short low condition on the humidity sensor circuit.	Internal ECM PWM circuit low voltage and ECM PWM circuit maximum period detected or Internal ECM PWM period not received	=	TRUE TRUE TRUE		Engine Running (please see the definition) and following conditions for time: battery voltage battery voltage	= ^ ~ ~	TRUE 1.00 11.00 655.34	sec V V	fail conditions exists for 0.1 s test performed continuously with 0.1 s rate	

Component / System	Fault Code	Monitor Strategy	Primary Malfunction Criteria	1	Threshold		Secondary Parameters		Enable		Time Required	MIL
			U.I.C.I.C.		ogio una vanao		and basic enable conditions met: and no pending or confirmed DTCs	=	see sheet enable tables see sheet inhibit tables	-	ricquirou	
Humidity Sensor Circuit High	P00F5	Detects a high duty cycle signal from the humidity sensor, indicating an OOR high condition on the humidity sensor circuit	Humidity Sensor Duty Cycle same as relative humidity	~	95.00	%	Engine Running (please see the definition) and following conditions for time: battery voltage battery voltage and basic enable conditions met: and no pending or confirmed DTCs	= ^ ^ ~ = =	TRUE 1.00 11.00 655.34 see sheet enable tables see sheet inhibit tables	- V V -	fail conditions exists for 0.1 s test performed continuously with 0.1 s rate	В
		The internal ECM PWM circuit driver detects either a duty cycle which has not been received or the maximum period has been exceeded, indicating short high condition on the humidity sensor circuit.	Internal ECM PWM circuit high voltage and ECM PWM circuit maximum period detected or Internal ECM PWM period not received	=	TRUE TRUE TRUE	-	Engine Running (please see the definition) and following conditions for time: battery voltage battery voltage and basic enable conditions met: and no pending or confirmed DTCs	= ^ ^ Y	TRUE 1.00 11.00 655.34 see sheet enable tables see sheet inhibit tables	- sec V -	fail conditions exists for 0.1 s test performed continuously with 0.1 s rate	

Component /	Fault	Monitor Strategy	Primary Malfunction		Threshold		Secondary		Enable		Time	MIL
System	Code	Description	Criteria		Logic and Value		Parameters		Conditions		Required	Illum.
Humidity Sensor Circuit Intermittent / Erratic	P00F6	The humidity signal performance monitor monitors the humidity signal delta in a defined time interval. The sum of these signal delta's over a number of time intervals is compared to a threshold.	Cumulative Humidity Sensor signal delta accumulated over a defined time interval same as accumulated over time	>	50.00 5.00 0.13	% counts sec	Engine Running (please see the definition) and basic enable conditions met: and no pending or confirmed DTCs	=	TRUE see sheet enable tables see sheet inhibit tables	-	fail conditions exists for 4 out of 5 windows (x out of y), test is performed continuously with 0.1 s rate	В
	Dodoć	Data da al constanta f							74.00	LD.	f - 11	
Mass Air Flow (MAF) Sensor Performance	P0101	Detects skewed MAF sensor by comparing measured MAF to calculated expected MAF based on volumetric efficiency of the engine	( measured air mass flow signal with (a) engine load dependent MAP for calculating lower threshold and with (b) air temperature dependent correction factor curve (see Look-Up-Table #1) or measured air mass flow signal with (c) Engine load dependent MAP for calculating higher threshold and with (b) air temperature dependent correction factor curve (see Look-Up-Table #1)	~ = = ^ = =	(a) - (b) 0.8 0 to 0.05 (c) + (b) 1.2 0 to 0.05	-	ambient pressure and engine coolant temperature and engine coolant temperature and gradient of the charge-air temperature and gradient of the charge-air temperature	> >= >= >= <=	74.80 69.96 122.96 -2.00 2.00	kPa °C °C / sec °C / sec	fail conditions exists for 10 s monitor runs with 0.01 s rate whenever enable conditions are met	В
			,				and ( Engine Running (see parameter definition) for	=		-		
							and control value of the throttle valve	>=	-400.00	%		
							control value of the throttle valve and (	<=	5.00	%		

Component / System	Fault Code	Monitor Strategy Description	Primary Malfunction Criteria	L	Threshold ogic and Value	Ð	Secondary Parameters		Enable Conditions		Time Required	MIL Illum.
						-	setpoint valve position of exhaust-gas recirculation and	>=	-400.00	%		
							setpoint valve position of exhaust-gas recirculation for	<=	2.00	%		
							time ) and	>	3.00	sec		
							( and					
							injection quantity	<=	300.00	mm^3/r ev		
							and air pressure in the induction volume	<=	280.00	kPa		
							and	>=	-16384.00	rom		
							and engine speed	<=	3100.00	rpm		
							and	>=	-7 04	°C		
							and intake air temperature	<=	51.96	°C		
							basic enable conditions met:	=	see sheet enable tables	-		
							NO Pending or Confirmed DTCs:	=	see sheet inhibit tables	-		
Mass Air Flow (MAF) Sensor Circuit High Voltage	P0102	Detects low frequency readings on the MAF circuit, indicating an OOR low condition on the MAF circuit	signal period of air mass flow sensor (MAF)	>	881.00	US	ignition on	=	TRUE	-	fail conditions exists for 3 s monitor runs	A
			same as air mass flow	<	3.9	kg/h	and basic enable conditions met:	=	see sheet enable tables	-	0.01 s rate whenever enable conditions	
							and NO Pending or Confirmed DTCs:	=	see sheet inhibit tables	-	are met	
					_	_			_			

Component / System	Fault Code	Monitor Strategy Description	Primary Malfunction Criteria		Threshold Logic and Value	•	Secondary Parameters		Enable Conditions		Time Required	MIL Illum.
Mass Air Flow (MAF) Sensor Circuit Low Voltage	P0103	Detects high frequency readings on the MAF circuit, indicating an OOR high condition on the MAF circuit	PWM period too long or signal period of air mass flow sensor (MAF) same as air mass flow	= ~ ^	TRUE 50.00 2043	us kg/h	ignition on and basic enable conditions met: and NO Pending or Confirmed DTCs:	=	TRUE see sheet enable tables see sheet inhibit tables	-	fail conditions exists for 3 s monitor runs 0.01 s rate whenever enable conditions are met	A
Manifold Absolute Pressure (MAP) Sensor Performance	P0106	Detects a skewed MAP or BARO sensor by comparing MAP readings to the BARO sensor	Path 1: (a) - (b) or Path 2: (a) - (b) where (a) MAP sensor measured pressure and (b) BARO sensor measured pressure	<	-15.00 15.00 measured parameter measured parameter	kPa kPa -	measured coolant engine downstream temperature and current injection quantity and actuator position of throttle valve and turbo charger (VNT) wiping is active and ( engine speed and engine speed and basic enable conditions met: and NO Pending or Confirmed DTCs:	> < <= = >= <= <= =	-3549.94 1308.00 327.67 FALSE 0.00 100.00 3.11 see sheet enable tables see sheet inhibit tables	°C mm^3/r ev - rpm rpm mph - -	fail conditions exists for 5 s monitor runs with 0.01 s rate whenever enable conditions are met	В
Manifold Absolute Pressure (MAP) Sensor Circuit Low Voltage	P0107	Detects low voltage readings on the MAP circuit, indicating an OOR low condition on the MAP circuit	Path 1: ( sensor voltage of manifold absolute pressure same as manifold absolute pressure	< <	0.91 44.9	V kPa	engine synchronization completed and basic enable conditions met:	=	TRUE see sheet enable tables	-	fail conditions exists for 5 s test performed continuously 0.01 s rate	A

Component / System	Fault Code	Monitor Strategy Description	Primary Malfunction Criteria		Threshold Logic and Value	e	Secondary Parameters		Enable Conditions		Time Required	MIL Illum.
			and actuator position of throttle valve ) or <b>Path 2:</b> ( sensor voltage of manifold absolute pressure same as manifold absolute pressure and actuator position of throttle valve )	< < >	20.00 0.38 -0.3 20.00	% V kPa %						
Manifold Absolute Pressure (MAP) Sensor Circuit High Voltage	P0108	Detects high voltage readings on the MAP circuit, indicating an OOR high condition on the MAP circuit	sensor voltage of manifold absolute pressure same as manifold absolute pressure	>	4.75 371.3	V kPa	engine synchronization completed and basic enable conditions met:	=	TRUE see sheet enable tables	-	fail conditions exists for 5 s test performed continuously 0.01 s rate	A
Intake Air Temperature Sensor 1 Circuit Low	P0112	Detects a low PWM period from the humidity temperature sensor, indicating an OOR low condition on the humidity temperature sensor circuit	Humidity Temperature sensor period same as humidity temperature	>	0.00260	sec °C	Engine Running (please see the definition) and following conditions for time: battery voltage battery voltage and basic enable conditions met: and no pending or confirmed DTCs	=	TRUE 1.00 11.00 655.34 see sheet enable tables see sheet inhibit tables	- V V -	fail conditions exists for 0.1 s test performed continuously with 0.1 s rate	Β

Component /	Fault	Monitor Strategy	Primary Malfunction		Threshold		Secondary		Enable		Time	MIL
		The internal ECM PWM circuit driver detects either a duty cycle which has not been received or the maximum period has been exceeded, indicating short low condition on the humidity sensor circuit.	Internal ECM PWM circuit low voltage and ECM PWM circuit maximum period detected	=	TRUE	-	Engine Running (please see the definition) and following conditions for time:	=	1.00	- sec	fail conditions exists for 0.1 s test performed continuously with 0.1 s rate	
			or Internal ECM PWM period not received	=	TRUE	-	battery voltage battery voltage and basic enable conditions met: and no pending or confirmed DTCs	> < = =	11.00 655.34 see sheet enable tables see sheet inhibit tables	V V -		
Intake Air Temperature Sensor 1 Circuit High	P0113	Detects a high PWM period from the humidity temperature sensor, indicating an OOR high condition on the humidity temperature sensor circuit	Humidity Temperature sensor period same as humidity temperature	л v	0.10	sec °C	Engine Running (please see the definition) and following conditions for time: battery voltage battery voltage and basic enable conditions met: and no pending or confirmed DTCs		1.00 11.00 655.34 see sheet enable tables see sheet inhibit tables	- V V -	fail conditions exists for 0.1 s test performed continuously with 0.1 s rate	В
		The internal ECM PWM circuit driver detects either a duty cycle which has not been received or the maximum period has been exceeded, indicating short high condition on the humidity sensor circuit.	Internal ECM PWM circuit high voltage and ECM PWM circuit maximum period detected or	=	TRUE	-	Engine Running (please see the definition) and following conditions for time: battery voltage	=	TRUE 1.00 11.00	- sec V	fail conditions exists for 0.1 s test performed continuously with 0.1 s rate	

Component / System	Fault Code	Monitor Strategy Description	Primary Malfunction Criteria		Threshold Logic and Value		Secondary Parameters		Enable Conditions		Time Required	MIL Illum.
			Internal ECM PWM period not received	=	TRUE	-	battery voltage and basic enable conditions met: and no pending or confirmed DTCs	<	655.34 see sheet enable tables see sheet inhibit tables	- -		
Engine Coolant Temperature (ECT) Sensor Circuit Low Voltage	P0117	Detects low voltage readings on the ECT circuit, indicating an OOR low condition on the ECT circuit	voltage of engine coolant temperature sensor same as engine coolant temperature	~ >	0.51	∨ °C	ignition on and basic enable conditions met:	=	TRUE see sheet enable tables		fail conditions exists for 15 s test performed continuously 0.2 s rate	A
Engine Coolant Temperature (ECT) Sensor Circuit High Voltage	P0118	Detects high voltage readings on the ECT circuit, indicating an OOR high condition on the ECT circuit	voltage of engine coolant temperature sensor same as engine coolant temperature	~	4.90 -53	°C	ignition on and basic enable conditions met:	=	TRUE see sheet enable tables	-	fail conditions exists for 60 s test performed continuously 0.2 s rate	A
Engine Coolant Temperature (ECT) Below Thermostat Regulating Temperature	P0128	Detects a stuck open thermostat by comparing actual engine coolant heat up profile to an expected modeled heat up profile. The targets are dependent on start up conditions (high and low regions) <b>Low Region</b> Engine Temperature at start < 31 degC AND ambient air temperature <= 10 degC.	modeled coolant temperature (model derived from injection quantity, coolant temperature at start, and ambient temperature) and measured engine coolant temperature	>=	59.96	°C	engine pre drive and time since start and measured engine coolant temperature and	= <	FALSE 1440.00 -40.04	- sec °C	fail conditions exists for 0.2 s monitor runs once per trip with 0.2 s rate whenever enable conditions are met	В

Component /	Fault	Monitor Strategy	Primary Malfunction		Threshold		Secondary		Enable		Time	MIL
System	Code	Description	Criteria	Lo	gic and Value		Parameters		Conditions		Required	Illum.
							captured value of coolant temperature during start and	<=	30.96	°C		
							( ambient temperature	>	-7.04	°C		
							and ambient temperature )	<	59.96	°C		
							and ambient temperature (used for low region determination) and	<=	9.96	°C		
							engine idle time ratio which is defined by (	<	0.50	%		
							idle time divided by time since start					
							, where idle time is incremented when:					
							accelerator pedal value and	<=	10.01	%		
							vehicle speed and	<=	9.94	mph		
							engine speed ) and	<=	750.00	rpm		
							diagnostic performed in current dc and	=	FALSE	-		
							basic enable conditions met:	=	see sheet enable tables	-		
							and NO Pending or Confirmed DTCs:	=	see sheet inhibit tables	-		
		Detects a stuck open	modeled coolant temperature	~-	81.96	°C	engine pre drive		EAL SE			
		thermostat by comparing actual engine coolant heat up profile to an expected modeled heat up profile. The targets are dependent on start up conditions (high and	(model derived from injection quantity, coolant temperature at start, and ambient temperature)	>=	01.00	U	engine pre anve	=	LAFSE	-		
		low regions)	and				and					
			measured engine coolant temperature	<	70.96	°C	time since start and	<	1440.00	sec		
							measured engine coolant temperature	>=	-40.04	°C		

Component / System	Fault Code	Monitor Strategy Description	Primary Malfunction Criteria		Threshold Logic and Value	•	Secondary Parameters		Enable Conditions		Time Required	MIL Illum.
		High region Engine Temperature at start < 52 degC AND ambient air temperature > 10 degC			Ĩ		and captured value of coolant temperature during start	<=	51.96	°C		
							and ( ambient temperature	>	-7.04	°C		
							and ambient temperature )	<	59.96	°C		
							and ambient temperature (used for high region determination)	>	9.96	°C		
							engine idle time ratio which is defined by ( idle time divided by time since start ) where idle time is incremented	<	0.50	%		
							when: ( accelerator pedal value	<=	10.01	%		
							and vehicle speed	<=	9.94	mph		
							and engine speed )	<=	750.00	rpm		
							diagnostic performed in current dc and	=	FALSE	-		
							basic enable conditions met:	=	see sheet enable tables	-		
							NO Pending or Confirmed DTCs:	=	see sheet inhibit tables	-		
HO2S Bank 1 Sensor 1 Circuit	P0131	Detects an out of range low fault of the upstream Nox	Upstream Nox sensor lambda signal received via CAN	<	-150.00	counts	Valid upstream NOx signal from CAN is received (no Nox sensor communication	=	TRUE	·	fault exists for more	В
LOW		Sensor lambua signal			(-150 counts = 1100 Lambda =	-	Engine Running (see parameter definition)	=	TRUE	-	monitor runs at 0.1 s	
					-21 /002]		for time (required for the NOx sensor to give valid response) and	>	20.00	sec	conditions are met	
							basic enable conditions met:	=	see sheet enable tables	-		

Component / System	Fault Code	Monitor Strategy Description	Primary Malfunction Criteria		Threshold Logic and Value	•	Secondary Parameters		Enable Conditions		Time Required	MIL Illum.
HO2S Bank 1 Sensor 1 Circuit High	P0132	Detects an out of range high fault of the upstream Nox sensor lambda signal	Upstream Nox sensor lambda signal received via CAN	>	1550.00 (1550 counts = 0.65 Lambda = - 0.1178 %O2)	-	Valid upstream NOx signal from CAN is received (no Nox sensor communication failures) Engine Running (see parameter definition) for time (required for the NOx sensor to give valid response) and basic enable conditions met:	=	TRUE TRUE 20.00 see sheet enable tables	- Sec	fault exists for more than 3 sec; monitor runs at 0.1 s when enable conditions are met	В
HO2S Bank1 Sensor2 Circuit Low	P0137	Detects an out of range low fault of the downstream Nox sensor lambda signal	Downstream Nox sensor lambda signal received via CAN	<	-150.00 (-150 counts = 1100 Lambda = ~27 %O2)	counts -	Valid downstream NOx signal from CAN is received (no Nox sensor communication failures) Engine Running (see parameter definition) for time (required for the NOx sensor to give valid response) and basic enable conditions met:	=	TRUE TRUE 20.00 see sheet enable tables	- - Sec -	fault exists for more than 3 sec; monitor runs at 0.1 s when enable conditions are met	В
HO2S Bank1 Sensor2 Circuit High	P0138	Detects an out of range high fault of the downstream Nox sensor lambda signal	Downstream Nox sensor lambda signal received via CAN	>	1550.00 (1550 counts = 0.65 Lambda = - 0.1178 %O2)	-	Valid downstream NOx signal from CAN is received (no Nox sensor communication failures) Engine Running (see parameter definition) for time (required for the NOx sensor to give valid response) and basic enable conditions met:	= >	TRUE TRUE 20.00 see sheet enable tables	- sec	fault exists for more than 3 sec; monitor runs at 0.1 s when enable conditions are met	В
O2 Sensor Slow Response - Rich to Lean Bank 1 Sensor 1	P014C	NOx sensor monitoring; transition time is too high to achieve an expected amount of oxygen	Measured O2 concentration at NOx sensor for transition time	< >=	Calculated O2 concentration at NOx sensor 2.00	- sec	### Basic enable conditions ###				fault exists for more than 0.1 sec; monitor runs at 0.1 s	В

Component /	Fault	Monitor Strategy	Primary Malfunction	Threshold	Secondary		Enable		Time	MIL
System	Code	Description	Criteria	Logic and value	Engine speed			rom	Required	illum.
					and		4000.00	ipin	conditions	
					Battery voltage	>	11.00	V	are met	
					and					
					Ambient Air Pressure	>=	74.80	kPa		
					Ambient Air Pressure	<=	106.00	кРа		
					Ambient Air Temperature	>=	-7.04	°C		
					Ambient Air Temperature	<=	124.96	°Č		
					and					
					Regeneration Active	=	FALSE	-		
					and Ovugen Concentration Signal	_	activo			
					and	-	active			
					NO Pending or Confirmed DTCs:	=	see sheet inhibit	-		
					and					
					Active Communication with NOx	=	TRUE	-		
					Sensor					
					and DOC Upstream Temperature		0.04	°C		
					DOC Opstream Temperature	>=	-0.04 1299 96	ີ ດ		
					Doo opsilean remperature	~-	1200.00	0		
					### Additional enable conditions during					
					"wait for calibrated time to exclude					
					dynamic effects" ###					
					calculated O2 signal (based on	_	0.12			
					injection quantity, air mass and fuel		0.12			
					density)					
					and					
					Fuel Injection Quantity	>	120.00	mm^3/r		
					and			ev		
					Engine speed	>	600.00	rom		
					for time	>	1.80	sec		
					### Additional enable conditions during					
					calculate O2 threshold dependent on					
					density for evaluation of transition time"					
					###					
					Fuel Injection Quantity	<	(a) + (b)	-		
					WITN a) Measured and stored Eucl	_	measured	_		
					Injection Quantity at start of	=	parameter	-		
					diagnosis		parameter			
					b) Decline of Injection Quantity	>=	18.00	mm^3/r		
					from stored fuel quantity at start of			ev		
					diagnosis					
					Fuel Injection Quantity	5	(a) - (h)			
					with		(0) (0)			

Component /	Fault	Monitor Strategy	Primary Malfunction	Threshold	Secondary		Enable		Time Required	MIL
- Oyotom	oout	Description	ontona		a) Measured and stored Fuel Injection Quantity at start of	=	measured parameter	-	rtoquirou	mann
					diagnosis b) Decline of Injection Quantity from stored fuel quantity at start of diagnosis	>=	18.00	mm^3/r ev		
					and Engine speed	>	600.00	rpm		
					### Additional enable conditions during "wait for calibrated time dependent on exhaust gas mass flow to concern exhaust gas transfer time" ###					
					Fuel Injection Quantity with	<=	(a) - (b)	-		
					a) Measured and stored Fuel Injection Quantity at start of diagnosis	=	measured parameter	-		
					<ul> <li>b) Decline of Injection Quantity from stored fuel quantity at start of diagnosis</li> </ul>	>=	18.00	mm^3/r ev		
					Fuel Injection Quantity with	<	(a) + (b)			
					a) Measured and stored Fuel Injection Quantity at start of	=	measured parameter	-		
					diagnosis b) Decline of Injection Quantity from stored fuel quantity at start of diagnosis	>=	18.00	mm^3/r ev		
					for exhaust gas transfer time	>	0.5	sec		
					### Additional enable conditions during "measure transition time needed to achieve calibrated oxygen threshold" ###					
					actual valve position of exhaust-gas recirculation and	>=	0.00	%		
					actual valve position of exhaust-gas recirculation	<=	80.00	%		
					Fuel Injection Quantity	<	16.00	mm^3/r ev		
					### Additional enable conditions during "validate measurement of transition time by excluding dynamic effects" ###					
					Deviation from maximum O2 concentration during overrun and	<	0.06	-		

Component /	Fault	Monitor Strategy	Primary Malfunction	Threshold	•	Secondary		Enable		Time	MIL
- Cystein	Cour	Description	Griefiu		5	Fuel Injection Quantity with a) Measured Minimum Fuel Injection Quantity b) Maximum fluctuation of Injection Quantity ### Additional enable conditions during "set fault" or "clear fault" process ### Deviation from maximum O2 concentration during overrun and Fuel Injection Quantity with	< =< <	(a) + (b) 16.00 0.06 (a) + (b)	- mm^3/r ev -		muni
						a) Measured Minimum Fuel Injection Quantity b) Maximum fluctuation of Injection Quantity	= =<	measured parameter 16.00	- mm^3/r ev		
Fuel Trim System Lean	P0171	Monitors the fuel mass observer correction quantity. Detects if the correction quantity exceeds the feedback limit.	Fuel mass observer emission correction quantity (see Look-Up-Table #47)	<= -164.64 to - 46.42	mm^3/re V	Status of the Observer function's lambda- signal means ( lambda signal from NOx sensor ready (see parameter definition) fuel system is in fuel cut off (see parameter definition) Particulate Filter Regeneration Mode (( component of combusted fuel in the engine or calculated EGR rate ) for time )) and Controller status of the observer means ( Load dependent release state (see look up table #) (see Look-Up- Table #48) and Component Protection release state (see look up table #) (see Look-Up- Table #43)	= = > > = >	TRUE FALSE FALSE 1 0 1.00 TRUE 0 to 1 0 to 1	- - - Sec -	fail conditions exists for 12 s monitor runs with 0.02 s rate whenever enable conditions are met	В

Component / System	Fault Code	Monitor Strategy	Primary Malfunction Criteria	Threshold	Secondary Parameters	Ena	able litions	Time Required	MIL
					) engine coolant temperature engine coolant temperature Normal Injection Mode Barometric pressure Ambient temperature NO Pending or Confirmed DTCs: basic enable conditions met:	<= 199 >= 64 = TR >= 77 = 77 = see she tat = see she tat	9.96 °C .96 °C UE .80 kPa .04 °C et inhibit - oles et enable - oles		
Fuel Trim System Rich	P0172	Monitors the fuel mass observer correction quantity. Detects if the correction quantity exceeds the feedback limit.	Fuel mass observer emission correction quantity (see Look-Up-Table #46)	>= 46.42 to 164.6 mm^3/re v	Status of the Observer function's lambda- signal means ( lambda signal from NOx sensor ready (see parameter definition) fuel system is in fuel cut off (see parameter definition) Particulate Filter Regeneration Mode (( component of combusted fuel in the engine or calculated EGR rate ) for time )) and Controller status of the observer means ( Load dependent release state (see look up table #) (see Look-Up- Table #48) and Component Protection release state (see look up table #) (see Look-Up-	= TR = FAI = FAI >= 0 > 1. = TR = 0t	RUE     -       RUE     -       LSE     -       LSE     -       1     -       0     -       00     sec       RUE     -       00     sec       RUE     -       001     -	fail conditions exists for 12 s monitor runs with 0.02 s rate whenever enable conditions are met	В
					Table #43) ) engine coolant temperature engine coolant temperature Normal Injection Mode Barometric pressure Ambient temperature NO Pending or Confirmed DTCs:	<= 199 >= 64 = TR >= 74 >= -7 = see she tat	9.96 °C .96 °C 2UE .80 kPa .04 °C et inhibit - oles		

Component /	Fault	Monitor Strategy	Primary Malfunction	Threshold			Secondary		Enable		Time	MIL
System	Code	Description	Criteria	L	ogic and Value	•	Parameters		Conditions		Required	Illum.
							basic enable conditions met:	=	see sheet enable tables	-		
Fuel Temperature Sensor 1 Circuit Low	P0182	Detects low voltage readings in the fuel pump temperature sensor 1 circuit, indicating an OOR low condition on the fuel pump temperature sensor 1 circuit	voltage of fuel temperature sensor 1 or same as fuel temperature	>	0.60	V °C	ignition on and basic enable conditions met:	-	TRUE see sheet enable tables		fail conditions exists for 5 s test performed continuously 0.2 s rate	В
Fuel Temperature Sensor 1 Circuit High	P0183	Detects high voltage readings in the fuel pump temperature sensor 1 circuit, indicating an OOR high condition on the fuel pump temperature sensor 1 circuit	voltage of fuel temperature sensor 1 same as fuel temperature	~	4.71	∨ °C	ignition on and basic enable conditions met:	=	TRUE see sheet enable tables	-	fail conditions exists for 5 s test performed continuously 0.2 ms rate	В
Fuel Temperature Sensor 2 Circuit Low	P0187	Detects low voltage condition of the fuel temperature sensor circuit, indicating an OOR low condition	fuel temperature sensor voltage same as fuel temperature	~	0.60	V °C	ignition on and basic enable conditions met:	=	TRUE see sheet enable tables	-	fail conditions exists for 5 s test performed continuously 0.2 s rate	В

Component / System	Fault Code	Monitor Strategy Description	Primary Malfunction Criteria		Threshold Logic and Value		Secondary Parameters		Enable Conditions		Time Required	MIL Illum.
Fuel Temperature Sensor 2 Circuit High	P0188	Detects high voltage condition of the fuel temperature sensor circuit, indicating an OOR high condition	fuel temperature sensor voltage same as fuel temperature	~	4.75 -50	°C	ignition on and basic enable conditions met:	=	TRUE see sheet enable tables	-	fail conditions exists for 5 s test performed continuously 0.2 s rate	В
Fuel Rail Pressure [FRP] Sensor Performance	P0191	Detects a drifted fuel rail pressure sensor by determining the adaptation factor of the fuel rail pressure regulator 2.	fuel pressure regulator 2 adaptation factor or fuel pressure regulator 2 adaptation factor	>=	1.25	factor	fuel pressure regulator 2 in closed loop control and adaptation for fuel pressure regulator 2 active means ( counter for successful adaptation or counter for the successful calculation of the adaptation and ( engine speed and engine speed and vehicle speed and vehicle speed and ( state machine rail pressure control equal to pressure control valve or state machine rail pressure control equal coupled pressure control (rail pressure is control led by metering unit and pressure control valve) ) and basic enable conditions met:		TRUE TRUE 0 9.00 400.00 1000.00 1.86 TRUE TRUE see sheet enable tables	- counts counts rpm rpm	fail conditions exists for 0.01 s monitor runs with 0.01 s rate whenever enable conditions are met	A

Component / System	Fault Code	Monitor Strategy Description	Primary Malfunction Criteria	I	Threshold Logic and Value		Secondary Parameters		Enable Conditions		Time Required	MIL Illum.
System	Code	Description Detects a biased sensor by determining the FRP sensor voltage to be in the correct range for atmospheric pressure at engine off and with sufficient pressure bleed-off time.	Criteria ( rail pressure sensor voltage or rail pressure sensor voltage )	< >	0.35 0.65	v v	engine post drive/ afterun and fuel temperature and engine has already run in this driving cycle and rail pressure is reduced means rail pressure and time since engine off and number of fault measurements during engine postdrive/ afterun and basic enable conditions met: and NO Pending or Confirmed DTCs: and NO Pending or Confirmed DTCs:		Conditions TRUE -0.04 TRUE TRUE 0.00 1.70 30.08 10.00 see sheet enable tables see sheet inhibit tables see sheet inhibit	- °C - kPa Amps sec counts - -	Required ail conditions exists for more than 0.30 s monitor runs once per driving cycle with 0.01 s rate whenever enable conditions are met	<u>Illum.</u>
Fuel Rail Pressure [FRP] Sensor Circuit Low	P0192	Detects low voltage readings on the FRP circuit, indicating an OOR low condition on the FRP circuit	rail pressure sensor voltage same as rail pressure	<	0.19	V kPa	ignition on and basic enable conditions met: and NO Pending or Confirmed DTCs:	-	TRUE see sheet enable tables see sheet inhibit tables	-	fail conditions exists for 0.14 s monitor runs with 0.01 s rate whenever enable conditions are met	A

Component /	Fault	Monitor Strategy	Primary Malfunction		Threshold		Secondary		Enable		Time	MIL
System	Code	Description	Criteria		Logic and Value		Parameters		Conditions		Required	Illum.
Fuel Kall Pressure [FRP] Sensor Circuit High	P0193	Detects high voltage readings on the FRP circuit, indicating an OOR high condition on the FRP circuit	rail pressure sensor voitage same as rail pressure	~	4.81 220000.00	kPa	and basic enable conditions met: and NO Pending or Confirmed DTCs:	=	see sheet enable tables see sheet inhibit tables	-	rail conditions exists for 0.2 S monitor runs with 0.01 s rate whenever enable conditions are met	A
Cylinder 1 Injection Timing Retarded	P01CB	Monitors the correction values for the energizing time of each cylinder. A correction value for the energizing time is learned for each cylinder at a calibrated rail pressure operating point. Detects a fault when the corrected energizing time exceeds the allowed limit.	( corrected energizing time for the rail pressure calibration points and cylinder 1 ( with (a) maximum injection energizing time and with (b) offset of the maximum filtered energizing time ) ) for rail pressure point	> = =	(a) - (b) 384.4 12 70000.00	- us kPa	environmental temperature and ( fuel temperature and fuel temperature and engine temperature and battery voltage and combustion chamber is not cold off means time since last combustion (see Look- Up-Table #94) and intake manifold pressure and intake manifold pressure and accelerator pedal position and Fuel system status and ( engine speed		-7.04 0.06 79.96 49.96 10.00 5 to 30 75.00 150.00 0.05 Fuel cut off (b) - (a)	°C °C °C ∨ sec kPa kPa % -	fail conditions exists for more than 0.01 s monitor runs with 0.01 s rate whenever enable conditions are met	В

Component / System	Fault Code	Monitor Strategy Description	Primary Malfunction Criteria		Threshold Logic and Valu	e	Secondary Parameters		Enable Conditions		Time Required	MIL Illum.
							engine speed	<	(a) + (c)	-		
							(a) value of engine speed	=	30.00	rpm		
							(b) gear specific minimum engine speed	=	950	rpm		
							and with					
							(c) gear specific maximum engine speed	=	1850	rpm		
							) and					
							current gear (see Look-Up-Table #93)	=	0 to 1	-		
							vehicle speed	>	0	mph		
							and rail pressure deviation from setpoint	<	5000.00	kPa		
							calculated out of difference between desired and actual value					
							and rail pressure is stable for at least	>	0.10	sec		
							and no gear change is occurred	=	TRUE	-		
							and 4 wheel mode	=	FALSE	-		
							and basic enable conditions met	_	see sheet enable			
							and	_	tables			
							NO Pending or Confirmed DTCs:	=	see sheet inhibit	-		
									tables			
Cylinder 2 Injection Timing	P01CD	Monitors the correction values for the energizing	(				environmental temperature	>	-7.04	°C	fail conditions	В
Retarded		time of each cylinder. A correction value for the									exists for more than	
		energizing time is learned for each cylinder at a									0.01 s monitor runs	
		calibrated rail pressure									with 0.01 s	
		Detects a fault when the	corrected energizing time for the rail	>	(a) - (b)	-	and				whenever	
		exceeds the allowed limit.					(				conditions	
			( with				fuel temperature	>=	0.06	°C	are met	
			(a) maximum injection energizing time and with	=	384.4	us	and fuel temperature	<=	79.96	°C		
			<ul> <li>(b) offset of the maximum filtered energizing time</li> </ul>	=	12	us	)					
			)				and					
			for rail pressure point	=	70000 00	kPa	engine temperature and	>	49.96	°C		
				_	,0000.00	Νια	battery voltage	>	10.00	V		

Component / System	Fault Code	Monitor Strategy Description	Primary Malfunction Criteria	Threshold Logic and Value	Secondary Parameters		Enable Conditions		Time Required	MIL Illum.
Component / System	Fault Code	Monitor Strategy Description	Primary Malfunction Criteria	Threshold Logic and Value	Secondary Parameters and combustion chamber is not cold off means time since last combustion (see Look- Up-Table #94) and intake manifold pressure and intake manifold pressure and accelerator pedal position and Fuel system status and (	> > < =	Enable Conditions 5 to 30 75.00 150.00 0.05 Fuel cut off	sec kPa kPa %	Time Required	MIL Illum.
					engine speed and engine speed with (c) using of anging speed	> <	(b) - (a) (a) + (c)	-		
					<ul><li>(a) value of engine speed</li><li>and with</li><li>(b) gear specific minimum engine speed</li></ul>	=	950	rpm		
					and with (c) gear specific maximum engine speed	=	1850	rpm		
					) and current gear (see Look-Up-Table #93) and	=	0 to 1	-		
					vehicle speed	>	0	mph		
					rail pressure deviation from setpoint calculated out of difference between desired and actual value and	<	5000.00	kPa		
					rail pressure is stable for at least	>	0.10	sec		
					no gear change is occurred	=	TRUE	-		
					4 wheel mode	=	FALSE	-		
					basic enable conditions met:	=	see sheet enable tables	-		
					NO Pending or Confirmed DTCs:	=	see sheet inhibit tables	-		

Component /	Fault	Monitor Strategy	Primary Malfunction		Threshold		Secondary		Enable		Time	MIL
System	Code	Description	Criteria		Logic and Valu	e	Parameters		Conditions		Required	Illum.
Cylinder 7 Injection Timing Retarded	P01D7	Monitors the correction values for the energizing time of each cylinder. A correction value for the	(				environmental temperature	>	-7.04	°C	fail conditions exists for more than	В
		energizing time is learned for each cylinder at a calibrated rail pressure operating point.	corrected eperaizing time for the rail		(a) - (b)		and				0.01 s monitor runs with 0.01 s rate	
		corrected energizing time exceeds the allowed limit.	pressure calibration points and cylinder 1		(a) (b)		( fuel temperature	~-	0.06	°C	enable conditions are met	
			(a) maximum injection energizing time and with	=	384.4	US	and fuel temperature	<=	79.96	°C		
			(b) offset of the maximum filtered energizing time )	=	12	US	) and					
			) for rail pressure point	=	70000.00	kPa	engine temperature and	>	49.96	°C		
							battery voltage	>	10.00	V		
							combustion chamber is not cold off means time since last combustion (see Look- Up-Table #94)	>=	5 to 30	sec		
							intake manifold pressure and	>	75.00	kPa		
							intake manifold pressure and	<	150.00	kPa		
							accelerator pedal position and Evel system status	<	0.05 Eucl cut off	%		
							and (	_	i dei cut on	-		
							engine speed and	>	(b) - (a)	-		
							engine speed with (a) value of engine speed	<	(a) + (c)	- rom		
							and with (b) gear specific minimum engine speed	=	950	rpm		
							and with (c) gear specific maximum engine speed	=	1850	rpm		
							) and current gear (see Look-Up-Table #93)	=	0 to 1	-		
							vehicle speed and	>	0	mph		

System Code Description	Criteria	Logi	c and value		rail pressure deviation from setpoint calculated out of difference between desired and actual value	<	5000.00	kPa	Required	illum.
					rail pressure is stable for at least	>	0.10	sec		
					no gear change is occurred	=	TRUE	-		
					4 wheel mode and	=	FALSE	-		
					basic enable conditions met:	=	see sheet enable tables	-		
					and NO Pending or Confirmed DTCs:	=	see sheet inhibit tables	-		
				_				_		
Cylinder 8 Injection Timing Retarded P01D9 Monitors the correction values for the energiz time of each cylinder correction value for the energizing time is lee for each cylinder at a calibrated rail pressu operating point. Detects a fault when corrected energizing exceeds the allowed	g A eed ne ne nit. ( with (a) maximum injection energizing time and with (b) offset of the maximum filtered energizing time ) for rail pressure point	= : = 70	a) - (b) 384.4 12 0000.00	- us kPa	environmental temperature and ( fuel temperature and fuel temperature and engine temperature and battery voltage and combustion chamber is not cold off means time since last combustion (see Look- Up-Table #94) and intake manifold pressure and intake manifold pressure and accelerator pedal position and Evel system status	> = <= > > = > < < =	-7.04 0.06 79.96 49.96 10.00 5 to 30 75.00 150.00 0.05 Fuel cut off	°C °C °C V sec kPa kPa % -	fail conditions exists for more than 0.01 s monitor runs with 0.01 s rate whenever enable conditions are met	В

Component / System	Fault Code	Monitor Strategy Description	Primary Malfunction Criteria	L	Threshold ogic and Value		Secondary Parameters		Enable Conditions		Time Required	MIL Illum.
							( engine speed	>	(b) - (a)	-		
							engine speed	<	(a) + (c)	-		
							(a) value of engine speed	=	30.00	rpm		
							and with (b) gear specific minimum engine speed	=	950	rpm		
							and with (c) gear specific maximum engine speed	=	1850	rpm		
							) and current gear (see Look-Up-Table #93) and	=	0 to 1	-		
							vehicle speed and	>	0	mph		
							rail pressure deviation from setpoint calculated out of difference between desired and actual value and	<	5000.00	kPa		
							rail pressure is stable for at least	>	0.10	sec		
							no gear change is occurred	=	TRUE	-		
							and 4 wheel mode	=	FALSE	-		
							and basic enable conditions met:	=	see sheet enable tables	-		
							and NO Pending or Confirmed DTCs:	=	see sheet inhibit tables	-		
Cylinder 4 Injection Timing Retarded	P01D1	Monitors the correction values for the energizing time of each cylinder. A correction value for the energizing time is learned for each cylinder at a calibrated rail pressure operating point. Detects a fault when the corrected energizing time exceeds the allowed limit.	( corrected energizing time for the rail pressure calibration points and cylinder 1 ( with (a) maximum injection energizing time and with (b) offset of the maximum filtered energizing time )	> = =	(a) - (b) 384.4 12	- us us	environmental temperature and ( fuel temperature and fuel temperature ) and	> >= <=	-7.04 0.06 79.96	⊃° ⊃° ⊃°	fail conditions exists for more than 0.01 s monitor runs with 0.01 s rate whenever enable conditions are met	В

Component /	Fault	Monitor Strategy	Primary Malfunction		Threshold		Secondary		Enable		Time	MIL
System	Code	Description	Griteria		Logic and value		Parameters		Conditions		Requirea	ilium.
			for		70000 00	LD-	engine temperature	>	49.96	°C		
			ran pressure point	=	70000.00	кга	anu battery voltage		10.00	V		
							ballely vollage	-	10.00	v		
							and					
							combustion chamber is not cold off					
							means					
							time since last combustion (see Look- Up-Table #94)	>=	5 to 30	sec		
							and					
							intake manifold pressure	>	75.00	kPa		
							and		450.00			
							Intake manifold pressure	<	150.00	кРа		
							and	_	0.05	0/_		
							and		0.05	70		
							Fuel system status	=	Fuel cut off	-		
							and					
							(					
							engine speed	>	(b) - (a)	-		
							and					
							engine speed	<	(a) + (c)	-		
							with	_	30.00	rom		
							and with	-	30.00	ipin		
							(b) gear specific minimum engine speed	=	950	rpm		
							() 311 1 1 1 3 1 1 1					
							and with					
							(c) gear specific maximum engine speed	=	1850	rpm		
							)					
							and surrent goor (oog Look Lin Toble #02)		0 to 1			
							and	-	0101	-		
							vehicle speed	>	0	mph		
							and		-			
							rail pressure deviation from setpoint	<	5000.00	kPa		
							calculated out of difference between					
							desired and actual value					
							and		0.40			
							and pressure is stable for at least	>	0.10	sec		
							no dear change is occurred	_	TRUE	-		
							and	_	INCL			
							4 wheel mode	=	FALSE	-		
							and					
							basic enable conditions met:	=	see sheet enable	-		
									tables			
							and					
							NO Penaing or Confirmed DTCs:	=	see sheet inhibit	-		
									lables			
Component /	Fault	Monitor Strategy	Primary Malfunction		Threshold		Secondary		Enable		Time	MIL
--------------------------------------------	-------	--------------------------------------------------------------------------------------------------------------------------------------------	-------------------------------------------------------------------	---	-----------------	-----	--------------------------------------------------------------------------------------------	----	--------------	-----	-----------------------------------------------------------	--------
System	Code	Description	Criteria		Logic and Value	•	Parameters		Conditions		Required	Illum.
Cylinder 5 Injection Timing Retarded	P01D3	Monitors the correction values for the energizing time of each cylinder. A correction value for the energizing time is learned	(				environmental temperature	>	-7.04	°C	fail conditions exists for more than 0.01 s	В
		for each cylinder at a calibrated rail pressure operating point. Detects a fault when the corrected energizing time	corrected energizing time for the rail	>	(a) - (b)	-	and				monitor runs with 0.01 s rate whenever enable	
		exceeds the allowed limit.	(				(				conditions are met	
			with (a) maximum injection energizing time	=	384.4	us	fuel temperature and	>=	0.06	°C		
			and with (b) offset of the maximum filtered energizing time	=	12	us	fuel temperature )	<=	79.96	°C		
			)				and					
			for rail pressure point	=	70000.00	kPa	engine temperature and	>	49.96	°C		
							battery voltage	>	10.00	V		
							and combustion chamber is not cold off means time since last combustion (see Look	×-	5 to 20			
							Up-Table #94) and	>=	5 10 50	560		
							intake manifold pressure and	>	75.00	kPa		
							intake manifold pressure and	<	150.00	kPa		
							accelerator pedal position and	<	0.05	%		
							Fuel system status and (	=	Fuel cut off	-		
							engine speed and	>	(b) - (a)	-		
							engine speed with	<	(a) + (c)	-		
							(a) value of engine speed and with	=	30.00	rpm		
							(b) gear specific minimum engine speed	=	950	rpm		
							and with (c) gear specific maximum engine speed	=	1850	rpm		
							) and current gear (see Look-Up-Table #93)	=	0 to 1	-		
							and vehicle speed and	>	0	mph		

System         Code         Lescription         Chiefral         Legic and value         Tail pressure deviation from setpoint calculated out of difference between desired and actual value mail pressure is stable for at least and no gear change is occurred and tables          0.10           Cylinder 6 Injection Timing Retarded         P01D5         Monitors the correction values for the energizing the energizing to effect on the energizing the energizing time is corrected energizing time exceeds the allowed limit.           (a) - (b)         -         and end and tables         >         -7.04           Cylinder 6 Injection Timing Retarded         P01D5         Monitors the correction values for the energizing time ensure correction value for the energizing time is corrected energizing time and with (a) maximum injection energizing time energizing time in pressure point         >         (a) - (b)         -         and end to least end to least end to least end to least end to reach end to rea	Component /	Enable	Time MIL
Cylinder 6 inglector Timing Relarded       P01D5 No lotors the correction values for the energizing time of each cylinder: A conficted energizing time for the energizing time is learned for corrected energizing time for the energizing time is elearned for for for for for       Monitors the correction values for the energizing time is learned for for for for       Monitors the correction values for the energizing time of each cylinder: A corrected energizing time for the rail pressure calibration points and cylinder: for for for       >       (a) - (b)       -       environmental temperature values for the energizing time is learned for for for for surve point       >       (a) - (b)       -       environmental temperature values for the energizing time is learned for for for for       >       (a) - (b)       -       environmental temperature values for the energizing time is learned for for for       >        0.06         (a) - (b)       -       environmental temperature values for the energizing time is learned for       >        0.06         (a) - (b)       -       environmental temperature values for the energizing time is learned for       >	System	< 5000.00 kPa	Requirea illum.
Cylinder 6 Injection Timing Retarded       P01D5 Values for the energizing time of each cylinder . A correction value for the energizing time of each cylinder . A corrected energizing time exceeds the allowed limit.       (		> 0.10 sec	
Cylinder 6 Injection Timing Retarded       P01D5       Monitors the correction values for the energizing time of each cylinder a corrected energizing time for the rail pressure calibration points and cylinder 1 (with (a) maximum injection energizing time (b) offset of the maximum filtered (c) offset of the maximum filtered (b) offset of the maximum filtered (c) offset of the maximum f		= TRUE -	
Cylinder 6 Injection Timing Retarded     P01D5     Monitors the correction values for the energizing time of each cylinder. A correction value for the energizing time is learned for each cylinder at corrected energizing time exceeds the allowed limit.     (     +     environmental temperature     >     -7.04       Vilue of each cylinder at corrected energizing time operating point.     (     -     and     and     -     -       (ull time of each cylinder at corrected energizing time operating point.     corrected energizing time for each cylinder at corrected energizing time exceeds the allowed limit.     -     (a) - (b)     -     and     -     -     -     -       (ull time if each cylinder at corrected energizing time exceeds the allowed limit.     -     =     384.4     us tot lemperature     -     -     -     -     -       (b) offset of the maximum filtered (b) offset of the maximum filtered (c) offset off		= FALSE -	
Cylinder 6 Injection Timing Retarded       P01D5       Monitors the correction values for the energizing time of each cylinder. A correction value for the energizing time is learned for each cylinder at a calibrated rail pressure operating point.       ()       ()       ()       ()       ()       ()       ()       ()       ()       ()       ()       ()       ()       ()       ()       ()       ()       ()       ()       ()       ()       ()       ()       ()       ()       ()       ()       ()       ()       ()       ()       ()       ()       ()       ()       ()       ()       ()       ()       ()       ()       ()       ()       ()       ()       ()       ()       ()       ()       ()       ()       ()       ()       ()       ()       ()       ()       ()       ()       ()       ()       ()       ()       ()       ()       ()       ()       ()       ()       ()       ()       ()       ()       ()       ()       ()       ()       ()       ()       ()       ()       ()       ()       ()       ()       ()       ()       ()       ()       ()       ()       ()       ()       ()       ()       ()       ()		= see sheet enable - tables	
Cylinder 6 Injection Timing Retarded       P01D5       Monitors the correction values for the energizing time of each cylinder. A correction value for the energizing time is learned for each cylinder. The corrected energizing time of the rail necessaries afault when the corrected energizing time exceeds the allowed limit.       Corrected energizing time for the rail pressure calibration points and cylinder 1 ( (th (a) maximum injection energizing time energizing time)       > (a) - (b)       -       and       > =       0.06         (if (a) maximum injection energizing time energizing time)       >       (a) - (b)       -       and       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       - </td <td></td> <td>= see sheet inhibit - tables</td> <td></td>		= see sheet inhibit - tables	
Cylinder 6 Injection Timing Retarded       P01D5       Monitors the correction values for the energizing time of each cylinder. A correction value for the energizing time is learned for each cylinder at a calibrated rail pressure operating point.       (       environmental temperature       >       -7.04         0       corrected energizing time is learned for each cylinder at a calibrated rail pressure operating point.       corrected energizing time for the rail pressure calibration points and cylinder 1 ( with (a) maximum injection energizing time and with (b) offset of the maximum filtered energizing time ) for rail pressure point       >       (a) - (b)       -       and         =       384.4       us and (fuel temperature and bitery voltage       >       0.06         and engine temperature       >       49.96         and engine temperature and bitery voltage       >       49.96			
means time since last combustion (see Look- Up-Table #94) and intake manifold pressure       >=       5 to 30         and intake manifold pressure       >       75.00         and and and accelerator pedal position       <	Cylinder 6 Injection Timing Retarded	<ul> <li>-7.04 °C</li> <li>-7.04 °C</li> <li>-7.06 °C</li> <li>-79.96 °C</li> <li>49.96 °C</li> <li>10.00 V</li> <li>5 to 30 sec</li> <li>75.00 kPa</li> <li>150.00 kPa</li> <li>0.05 %</li> <li>Eval out off</li> </ul>	fail B conditions exists for more than 0.01 s monitor runs with 0.01 s rate whenever enable conditions are met

Component / System	Fault Code	Monitor Strategy Description	Primary Malfunction Criteria	L	Threshold ogic and Value		Secondary Parameters		Enable Conditions		Time Required	MIL Illum.
							( engine speed	>	(b) - (a)	-		
							engine speed	<	(a) + (c)	-		
							(a) value of engine speed	=	30.00	rpm		
							and with (b) gear specific minimum engine speed	=	950	rpm		
							and with (c) gear specific maximum engine speed	=	1850	rpm		
							) and current gear (see Look-Up-Table #93) and	=	0 to 1	-		
							vehicle speed and	>	0	mph		
							rail pressure deviation from setpoint calculated out of difference between desired and actual value	<	5000.00	kPa		
							rail pressure is stable for at least	>	0.10	sec		
							and no gear change is occurred	=	TRUE	-		
							and 4 wheel mode	=	FALSE	-		
							and basic enable conditions met:	=	see sheet enable tables	-		
							and NO Pending or Confirmed DTCs:	=	see sheet inhibit tables	-		
					_							
Cylinder 3 Injection Timing Retarded	P01CF	Monitors the correction values for the energizing time of each cylinder. A correction value for the energizing time is learned for each cylinder at a calibrated rail pressure operating point. Detects a fault when the corrected energizing time exceeds the allowed limit.	( corrected energizing time for the rail pressure calibration points and cylinder 1 ( with (a) maximum injection energizing time and with (b) offset of the maximum filtered energizing time }	> = =	(a) - (b) 384.4 12	- us us	environmental temperature and ( fuel temperature and fuel temperature ) and	>= <=	-7.04 0.06 79.96	°C °C °C	fail conditions exists for more than 0.01 s monitor runs with 0.01 s rate whenever enable conditions are met	В

Component /	Fault	Monitor Strategy	Primary Malfunction	Threshold	Secondary		Enable		Time	MIL
Jystem	Code	Description	for	Logic and Value	engine temperature	>	49.96	°C	Required	mum.
			rail pressure point	= 70000.00 kPa	and	-	10100	Ũ		
					battery voltage	>	10.00	V		
					and					
					and combustion chamber is not cold off					
					means					
					time since last combustion (see Look- Up-Table #94)	>=	5 to 30	sec		
					and intake manifold pressure	>	75.00	kPa		
					and					
					intake manifold pressure and	<	150.00	kPa		
					accelerator pedal position and	<	0.05	%		
					Fuel system status and	=	Fuel cut off	-		
					( engine speed	>	(b) - (a)	-		
					and					
					engine speed with	<	(a) + (c)	-		
					(a) value of engine speed and with	=	30.00	rpm		
					(b) gear specific minimum engine speed	=	950	rpm		
					and with					
					(c) gear specific maximum engine speed	=	1850	rpm		
					)					
					current gear (see Look-Up-Table #93)	=	0 to 1	-		
					and vehicle speed	>	0	mph		
					and rail pressure deviation from setpoint	<	5000.00	kPa		
					calculated out of difference between desired and actual value					
					and					
					rail pressure is stable for at least and	>	0.10	sec		
					no gear change is occurred and	=	TRUE	-		
					4 wheel mode and	=	FALSE	-		
					basic enable conditions met:	=	see sheet enable tables	-		
					and					
					NO Pending or Confirmed DTCs:	=	see sheet inhibit tables	-		

Component /	Fault	Monitor Strategy	Primary Malfunction		Threshold		Secondary		Enable		Time	MIL
System	Code	Description	Criteria		Logic and Value	•	Parameters		Conditions		Required	Illum.
Cylinder 1 Injection Timing Advanced	P01CC	Monitors the correction values for the energizing time of each cylinder. A correction value for the energizing time is learned for each cylinder at a calibrated rail pressure	(				environmental temperature	>	-7.04	°C	fail conditions exists for more than 0.01 s monitor runs with 0.01 s	В
		operating point. Detects a fault when the corrected energizing time falls below the allowed limit.	corrected energizing time for the rail pressure calibration points and cylinder 1	<	(a) + (b)	-	and (	1			rate whenever enable conditions are met	
			with	_	107.2	116	fuel temperature	>=	0.06	°C		
			and with	_	60	us	fuel temperature	<=	79.96	°C		
			energizing time		00	uo	nd	I				
			, for rail pressure point	=	70000.00	kPa	engine temperature	>	49.96	°C		
				_	10000.00	Ki û	battery voltage	>	10.00	V		
							and combustion chamber is not cold off means	I				
							time since last combustion (see Look- Up-Table #94) and	>=	5 to 30	sec		
							intake manifold pressure and	>	75.00	kPa		
							intake manifold pressure and	<	150.00	kPa		
							accelerator pedal position and	<	0.05	%		
							Fuel system status and /	=	Fuel cut off	-		
							engine speed	>	(b) - (a)	-		
							engine speed with	<	(a) + (c)	-		
							(a) value of engine speed	=	30.00	rpm		
							(b) gear specific minimum engine speed	=	950	rpm		
							and with (c) gear specific maximum engine speed	=	1850	rpm		
							and current gear (see Look-Up-Table #93) and	=	0 to 1	-		
				1			vehicle speed	>	0	mph		

Component / System	Fault Code	Monitor Strategy Description	Primary Malfunction Criteria	L	Threshold ogic and Valu	e	Secondary Parameters		Enable Conditions		Time Required	MIL Illum.
System	Code	Description	Criteria		<u>-ogic and valu</u>	8	and rail pressure deviation from setpoint calculated out of difference between desired and actual value and rail pressure is stable for at least and no gear change is occurred and 4 wheel mode and basic enable conditions met: and NO Pending or Confirmed DTCs:	<	5000.00 0.10 TRUE FALSE see sheet enable tables	kPa sec - -	Kequirea	inum.
							NOT Changer Commission Dross.	_	tables			
Cylinder 2 Injection Timing Advanced	P01CE	Monitors the correction values for the energizing time of each cylinder. A correction value for the energizing time is learned for each cylinder at a calibrated rail pressure operating point. Detects a fault when the corrected energizing time falls below the allowed limit.	( corrected energizing time for the rail pressure calibration points and cylinder 1 ( with (a) minimum injection energizing time and with (b) offset of the minimum filtered energizing time ) ) for rail pressure point	< = =	(a) + (b) 107.2 60 70000.00	- us kPa	environmental temperature and ( fuel temperature and fuel temperature and engine temperature and battery voltage and combustion chamber is not cold off means time since last combustion (see Look- Up-Table #94) and intake manifold pressure and intake manifold pressure and accelerator pedal position	> > > > > > > > > > > > > > > > > > >	-7.04 0.06 79.96 49.96 10.00 5 to 30 75.00 150.00 0.05	°C °C °C V sec kPa kPa %	fail conditions exists for more than 0.01 s monitor runs with 0.01 s rate whenever enable conditions are met	В

Component / System	Fault Code	Monitor Strategy Description	Primary Malfunction Criteria	L	Threshold ogic and Value		Secondary Parameters		Enable Conditions		Time Required	MIL Illum.
							Fuel system status and	=	Fuel cut off	-		
							( engine speed and	>	(b) - (a)	-		
							engine speed with	<	(a) + (c)	-		
							(a) value of engine speed and with	=	30.00	rpm		
							and with	=	950	ipin		
							(c) gear specific maximum engine speed	=	1850	rpm		
							) and current gear (see Look-Up-Table #93)	=	0 to 1	-		
							and vehicle speed	>	0	mph		
							and rail pressure deviation from setpoint calculated out of difference between desired and actual value	<	5000.00	kPa		
							and rail pressure is stable for at least	>	0.10	sec		
							no gear change is occurred and	=	TRUE	-		
							4 wheel mode and	=	FALSE	-		
							basic enable conditions met:	=	see sheet enable tables	-		
							NO Pending or Confirmed DTCs:	=	see sheet inhibit tables	-		
					_				_			_
Cylinder 7 Injection Timing Advanced	P01D8	Monitors the correction values for the energizing time of each cylinder. A correction value for the energizing time is learned for each cylinder at a calibrated rail pressure operating point	(				environmental temperature	>	-7.04	°C	fail conditions exists for more than 0.01 s monitor runs with 0.01 s	В
		Detects a fault when the corrected energizing time falls below the allowed limit.	corrected energizing time for the rail pressure calibration points and cylinder 1	<	(a) + (b)	-	and				whenever enable conditions are met	
			with (a) minimum injection energizing time	=	107.2	us	fuel temperature and	>=	0.06	°C		
I		I	and with				fuel temperature	<=	79.96	°C		

Component / System	Fault Code	Monitor Strategy Description	Primary Malfunction Criteria		Threshold Logic and Value		Secondary Parameters		Enable Conditions		Time Required	MIL Illum.
			(b) offset of the minimum filtered	=	60	us	)					
			energizing time				and					
			)				anu					
			for		70000.00	L-D-	engine temperature	>	49.96	°C		
			rail pressure point	=	70000.00	кра	and battery voltage	>	10.00	V		
							and combustion chamber is not cold off means					
							time since last combustion (see Look- Up-Table #94) and	>=	5 to 30	sec		
							intake manifold pressure	>	75.00	kPa		
							intake manifold pressure and	<	150.00	kPa		
							accelerator pedal position and	<	0.05	%		
							Fuel system status and	=	Fuel cut off	-		
							( engine speed	>	(b) - (a)	-		
							engine speed	<	(a) + (c)	-		
							with (a) value of engine speed	=	30.00	rpm		
							(b) gear specific minimum engine speed	=	950	rpm		
							and with (c) gear specific maximum engine speed	=	1850	rpm		
							)					
							and current gear (see Look-Up-Table #93) and	=	0 to 1	-		
							vehicle speed	>	0	mph		
							rail pressure deviation from setpoint calculated out of difference between desired and actual value	<	5000.00	kPa		
							and rail pressure is stable for at least	>	0.10	sec		
							and no gear change is occurred	=	TRUE	-		
							4 wheel mode and	=	FALSE	-		
							basic enable conditions met:	=	see sheet enable tables	-		
							and NO Pending or Confirmed DTCs:	=	see sheet inhibit tables	-		

Cylinder 8 Injection Timing Advanced         P01DA         Monitors the correction values for the energizing time of each cylinder. A correction value for the energizing time is learned for each cylinder at calibrated rail pressure operating point.         (         environmental temperature         >         -7.04         °C         fail conditions exists for monitor runs with 0.01 s monitor runs	MIL Illum.	Time Required		Enable Conditions		Secondary Parameters	ue	Threshold Logic and Val	Τ	Primary Malfunction Criteria	Monitor Strategy Description	Fault Code	Component / System
Cylinder 8 Injection Timing Advanced       PO1DA       Monitors the correction values for the energizing ine of each cylinder . A correction value for the energizing time of each cylinder at a calibrated rail pressure operating point.       Monitors the correction values for the energizing time of each cylinder . A correction value for the operating point.       C       fail conditions exists for more than 0.01 s monitor runs exists for more than 0.01 s         (interpretation point.       corrected energizing time fails below the allowed limit.       corrected energizing time fails below the allowed limit.       corrected energizing time and with (b) offset of the minimum filtered energizing time and with (b) offset of the minimum filtered energizing time and with (b) offset of the minimum filtered energizing time and       =       107.2       us and       and       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -									$\square$				
rais below the allowed limit.       (       (       (       (       (       (       (       (       (       (       (       (       (       (       (       (       (       (       (       (       (       (       (       (       (       (       (       (       (       (       (       (       (       (       (       (       (       (       (       (       (       (       (       (       (       (       (       (       (       (       (       (       (       (       (       (       (       (       (       (       (       (       (       (       (       (       (       (       (       (       (       (       (       (       (       (       (       (       (       (       (       (       (       (       (       (       (       (       (       (       (       (       (       (       (       (       (       (       (       (       (       (       (       (       (       (       (       (       (       (       (       (       (       (       (       ( <t< td=""><td>B 3 11 15 5 7</td><td>fail conditions exists for more than 0.01 s monitor runs with 0.01 s rate whenever enable</td><td>°C</td><td>-7.04</td><td>&gt;</td><td>environmental temperature</td><td>-</td><td>(a) + (b)</td><td>&lt;</td><td>( corrected energizing time for the rail pressure calibration points and cylinder 1</td><td>Monitors the correction values for the energizing time of each cylinder. A correction value for the energizing time is learned for each cylinder at a calibrated rail pressure operating point. Detects a fault when the corrected energizing time</td><td>P01DA</td><td>Cylinder 8 Injection Timing Advanced</td></t<>	B 3 11 15 5 7	fail conditions exists for more than 0.01 s monitor runs with 0.01 s rate whenever enable	°C	-7.04	>	environmental temperature	-	(a) + (b)	<	( corrected energizing time for the rail pressure calibration points and cylinder 1	Monitors the correction values for the energizing time of each cylinder. A correction value for the energizing time is learned for each cylinder at a calibrated rail pressure operating point. Detects a fault when the corrected energizing time	P01DA	Cylinder 8 Injection Timing Advanced
Image: construction of the minimum filtered energizing time }       =       60       us       )       and       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -	3	conditions are met	°C °C	0.06	>=	( fuel temperature and	us	107.2	=	( with (a) minimum injection energizing time	falls below the allowed limit.		
for rail pressure point       =       70000.00       kPa       engine temperature and battery voltage       >       49.96       °C         and battery voltage       >       10.00       V         and combustion chamber is not cold off means time since last combustion (see Look- Up-Table #94) and intake manifold pressure and intake manifold pressure       >       5 to 30       sec			Ĵ	79.96	<=	and	us	60	=	and with (b) offset of the minimum filtered energizing time ) )			
and combustion chamber is not cold off means time since last combustion (see Look- Up-Table #94) and intake manifold pressure and intake manifold pressure intake manifold pressure combustion (see Look- Up-Table #94) and combustion (see Look- Up-Table #94) and combustion (see Look- Up-Table #94) and combustion (see Look- Up-Table #94) and combustion (see Look- Up-Table #94) combustion (			°C V	49.96 10.00	>	engine temperature and battery voltage	kPa	70000.00	=	for rail pressure point			
and intake manifold pressure > 75.00 kPa and intake manifold pressure < 150.00 kPa			sec	5 to 30	>=	and combustion chamber is not cold off means time since last combustion (see Look- Up-Table #94)							
intake manifold pressure < 150.00 kPa			kPa	75.00	>	and intake manifold pressure and							
anu			kPa	150.00	<	intake manifold pressure and	I						
accelerator pedal position     <			% -	0.05 Fuel cut off	< =	accelerator pedal position and Fuel system status and							
( engine speed > (b) - (a) -			-	(b) - (a)	>	( engine speed							
engine speed < (a) + (c) - with			-	(a) + (c)	<	engine speed with							
(a) value of engine speed = 30.00 rpm and with			rpm	30.00	=	(a) value of engine speed and with	I						
(b) gear specific minimum engine speed = 950 rpm			rpm	950	=	(b) gear specific minimum engine speed							
(c) gear specific maximum engine speed = 1850 rpm			rpm	1850	=	(c) gear specific maximum engine speed							

Component /	Fault	Monitor Strategy	Primary Malfunction		Threshold		Secondary		Enable		Time	MIL
System	Code	Description	Criteria		Logic and Valu	e	Parameters		Conditions		Required	Illum.
							current gear (see Look-Up-Table #93) and vehicle speed and	=	0 to 1 0	- mph		
							rail pressure deviation from serpoint calculated out of difference between desired and actual value and	<	5000.00	кра		
							rail pressure is stable for at least and	>	0.10	sec		
							no gear change is occurred and	=	TRUE	-		
							4 wheel mode and	=	FALSE	-		
							basic enable conditions met:	=	see sheet enable tables	-		
							and NO Pending or Confirmed DTCs:	=	see sheet inhibit tables	-		
Cylinder 4 Injection Timing Advanced	P01D2	Monitors the correction values for the energizing time of each cylinder. A correction value for the energizing time is learned for each cylinder at a calibrated rail pressure operating point. Detects a fault when the corrected energizing time falls below the allowed limit.	( corrected energizing time for the rail pressure calibration points and cylinder 1	<	(a) + (b)	-	environmental temperature and	>	-7.04	°C	fail conditions exists for more than 0.01 s monitor runs with 0.01 s rate whenever enable conditions are met	В
			with (a) minimum injection energizing time	=	107.2	us	fuel temperature and	>=	0.06	°C		
			and with (b) offset of the minimum filtered energizing time	=	60	us	fuel temperature )	<=	79.96	°C		
			/ ) for				engine temperature	>	49.96	°C		
			rail pressure point	=	70000.00	kPa	and battery voltage	>	10.00	V		
							and combustion chamber is not cold off means time since last combustion (see Look- Up-Table #94) and	>=	5 to 30	sec		
							intake manifold pressure and	>	75.00	kPa		
							intake manifold pressure	<	150.00	kPa		

Component / System	Fault Code	Monitor Strategy Description	Primary Malfunction Criteria	Threshold Logic and Value	Secondary Parameters		Enable Conditions		Time Required	MIL Illum.
					and accelerator pedal position	<	0.05	%		
					Fuel system status and	=	Fuel cut off	-		
					( engine speed and	>	(b) - (a)	-		
					engine speed with	<	(a) + (c)	-		
					(a) value of engine speed and with	=	30.00	rpm		
					(b) gear specific minimum engine speed	=	950	rpm		
					and with (c) gear specific maximum engine speed	=	1850	rpm		
					) and current gear (see Look-Up-Table #93) and	=	0 to 1	-		
					vehicle speed	>	0	mph		
					rail pressure deviation from setpoint calculated out of difference between desired and actual value	<	5000.00	kPa		
					rail pressure is stable for at least	>	0.10	sec		
					no gear change is occurred and	=	TRUE	-		
					4 wheel mode and	=	FALSE	-		
					basic enable conditions met:	=	see sheet enable tables	-		
					and NO Pending or Confirmed DTCs:	=	see sheet inhibit tables	-		
								_		
Cylinder 5 Injection Timing Advanced	P01D4	Monitors the correction values for the energizing time of each cylinder. A correction value for the energizing time is learned for each cylinder at a calibrated rail pressure operating point. Detects a fault when the corrected energizing time falls below the allowed limit.	( corrected energizing time for the rail pressure calibration points and cylinder 1	< (a) + (b) -	environmental temperature and	>	-7.04	⊃°	fail conditions exists for more than 0.01 s monitor runs with 0.01 s rate whenever enable conditions are met	В
			with		fuel temperature	>=	0.06	°C		

Component / System	Fault Code	Monitor Strategy Description	Primary Malfunction Criteria		Threshold Logic and Value		Secondary Parameters		Enable Conditions		Time Required	MIL Illum.
			(a) minimum injection energizing time and with (b) offset of the minimum filtered	=	107.2 60	us us	and fuel temperature )	<=	79.96	°C		
			energizing time				and					
			for rail pressure point	=	70000.00	kPa	engine temperature and	>	49.96	°C		
							battery voltage	>	10.00	V		
							and combustion chamber is not cold off means time since last combustion (see Look-	>=	5 to 30	SPC		
							Up-Table #94) and	-	01000	000		
							intake manifold pressure and	>	75.00	kPa		
							intake manifold pressure and	<	150.00	kPa		
							accelerator pedal position and	<	0.05	%		
							Fuel system status and (	=	Fuel cut off	-		
							engine speed and	>	(b) - (a)	-		
							engine speed with	<	(a) + (c)	-		
							(a) value of engine speed and with	=	30.00	rpm		
							(b) gear specific minimum engine speed	=	950	rpm		
							and with (c) gear specific maximum engine speed	=	1850	rpm		
							) and					
							current gear (see Look-Up-Table #93) and	=	0 to 1	-		
							vehicle speed and	>	0	mph		
							rail pressure deviation from setpoint calculated out of difference between desired and actual value	<	5000.00	kPa		
							and rail pressure is stable for at least and	>	0.10	sec		
							no gear change is occurred and	=	TRUE	-		
							4 wheel mode and	=	FALSE	-		
							basic enable conditions met:	=	see sheet enable tables	-		
		1					and					1

Component /	Fault	Monitor Strategy	Primary Malfunction		Threshold		Secondary		Enable		Time	MIL
System	Code	Description	Criteria		Logic and value		NO Pending or Confirmed DTCs:	=	see sheet inhibit	-	Required	mum.
							, , , , , , , , , , , , , , , , , , ,		tables			
Culinder 6	D01D6	Monitoro the correction	(				environmentel temperature		7.04	*	foil	B
Injection Timing Advanced	FUIDO	values for the energizing time of each cylinder. A correction value for the energizing time is learned for each cylinder at a calibrated rail pressure operating point. Detects a fault when the corrected energizing time	corrected energizing time for the rail pressure calibration points and cylinder 1	<	(a) + (b)	-	and	2	-7.04	C	conditions exists for more than 0.01 s monitor runs with 0.01 s rate whenever enable	B
		falls below the allowed limit.	(				(				conditions are met	
			with	_	107.2	119	fuel temperature	>=	0.06	°C		
			and with	-	107.2	us	fuel temperature	<=	79.96	°C		
			(b) offset of the minimum filtered energizing time	=	60	us	)					
			)				and					
			) for				engine temperature	>	49.96	°C		
			rail pressure point	=	70000.00	kPa	and battery voltage	>	10.00	V		
							and combustion chamber is not cold off means time since last combustion (see Look- Up-Table #94)	>=	5 to 30	sec		
							and intake manifold pressure and	>	75.00	kPa		
							intake manifold pressure and	<	150.00	kPa		
							accelerator pedal position	<	0.05	%		
							Fuel system status and	=	Fuel cut off	-		
							engine speed	>	(b) - (a)	-		
							engine speed	<	(a) + (c)	-		
							(a) value of engine speed	=	30.00	rpm		
							(b) gear specific minimum engine speed	=	950	rpm		
							and with (c) gear specific maximum engine speed	=	1850	rpm		

Cylinder 3 Indecurrent gear (see Look-Up-Table #93) and current gear (see Look-Up-Table #93) and vehicle speed and rail pressure deviation from setpoint calculated out of difference between desired and actual value and no gear change is accurred and 4 wheel mode and basic enable conditions met: and NO Pending or Confirmed DTCs:       = 0 to 1         Cylinder 3 Injection Timing Advanced       P01D0       Monitors the correction values for the energizing time of each cylinder at a correction value for the energizing time is learned for each cylinder at a calibrated rail pressure       < 0.10			
Cylinder 3 Injection Timing Advanced       P01D0       Monitors the correction values for the energizing time of each cylinder. A correction value for the energizing time is learned for each cylinder at a calibrated rail pressure       Monitors the correction values for the energizing time is learned for each cylinder at a       Image: Correction coll correction value for the energizing time is learned for each cylinder at a       Monitors the correction values for the energizing time is learned for each cylinder at a       Image: Correction value for the energizing time is learned for each cylinder at a       Image: Correction value for the energizing time is learned for each cylinder at a       Image: Correction value for the energizing time is learned for each cylinder at a       Image: Correction value for the energizing time is learned for each cylinder at a       Image: Correction value for the energizing time is learned for each cylinder at a       Image: Correction value for the energizing time is learned for each cylinder at a       Image: Correction value for the energizing time is learned for each cylinder at a       Image: Correction value for the energizing time is learned for each cylinder at a       Image: Correction value for the energizing time is learned for each cylinder at a       Image: Correction value for the energizing time is learned for each cylinder at a       Image: Correction value for the energizing time for each cylinder at a       Image: Correction value for the energizing time for each cylinder at a       Image: Correction value for the energizing time for each cylinder at a       Image: Correction value for the energizing time for each cylinder at a       Image: Correction value for the energizing time for each cylinder at a       Image: Correction value for the		- mph kPa sec 	=0 to 1->0mph<
operating point.       corrected energizing time for the rail pressure calibration points and cylinder 1       <	Cylinder 3 Injection Timing Advanced	°C     fail conditions exists for more than 0.01 s monitor runs with 0.01 s rate whenever enable conditions are met     B       °C     °C       °C     °C       °C     V	> $-7.04$ °C fail conditions exists for more than 0.01 s monitor runs with 0.01 s rate whenever enable conditions are met > $0.06$ °C <= $79.96$ °C > $10.00$ V + $-5.5$ to $30$ sec

Component / System	Fault Code	Monitor Strategy Description	Primary Malfunction Criteria	Lo	Threshold ogic and Val	ue	Secondary Parameters		Enable Conditions		Time Required	MIL Illum.
							and intake manifold pressure	<	150.00	kPa		
							accelerator pedal position	<	0.05	%		
							and Fuel system status and	=	Fuel cut off	-		
							( engine speed and	>	(b) - (a)	-		
							engine speed with	<	(a) + (c)	-		
							(a) value of engine speed and with	=	30.00	rpm		
							(b) gear specific minimum engine speed	=	950	rpm		
							and with (c) gear specific maximum engine speed	=	1850	rpm		
							) and					
							current gear (see Look-Up-Table #93) and	=	0 to 1	-		
							vehicle speed and	>	0	mph		
							rail pressure deviation from setpoint calculated out of difference between desired and actual value	<	5000.00	kPa		
							and rail pressure is stable for at least and	>	0.10	sec		
							no gear change is occurred	=	TRUE	-		
							4 wheel mode	=	FALSE	-		
							basic enable conditions met:	=	see sheet enable tables	-		
							and NO Pending or Confirmed DTCs:	=	see sheet inhibit tables	-		
Coolant	P01F0	Detects a stuck open	engine coolant temperature	<	70.96	°C	engine pre drive	=	FALSE	-	fail	В
Temperature Dropped Below Diagnostic Monitoring Temperature		thermostat by monitoring for a decrease of the engine coolant temperature below the OBD monitoring threshold during normal operating conditions			10.00	0					conditions exists for 0.2 s monitor runs with 0.2 s rate whenever	2
			for fault counter which is equivalent to fault time	>= >=	400.00 80.00	- sec	and ambient temperature	>=	-7.04	°C	enable	
							and engine coolant temperature	>=	70.96	°C	are met	

Component / System	Fault Code	Monitor Strategy Description	Primary Malfunction Criteria	Threshold Logic and Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
					at least once in driving cycle and instantaneous fuel consumption (low- pass filtered) and basic enable conditions met: and NO Pending or Confirmed DTCs:	>= 9.00 l/h = see sheet enable - tables = see sheet inhibit - tables		
Injector 1 Control Circuit	P0201	Diagnoses the Fuel Injector Cylinder #1 low side driver circuit for circuit faults.	Voltage low during driver off state (indicates open circuit)	<ul> <li>Open Circuit:&gt; - 200 K Ω impedance between ECU pin and load</li> </ul>	Engine Running (see parameter definition)	= TRUE -	fail conditions exists for more than 0.04 s monitor runs with 0.01 s rate whenever enable conditions are met	A
Injector 2 Control Circuit	P0202	Diagnoses the Fuel Injector Cylinder #2 low side driver circuit for circuit faults.	Voltage low during driver off state (indicates open circuit)	<ul> <li>Open Circuit:≥ - 200 K Ω impedance between ECU pin and load</li> </ul>	Engine Running (see parameter definition)	= TRUE -	fail conditions exists for more than 0.04 s monitor runs with 0.01 s rate whenever enable conditions are met	A
Injector 3 Control Circuit	P0203	Diagnoses the Fuel Injector Cylinder #3 low side driver circuit for circuit faults.	Voltage low during driver off state (indicates open circuit)	<ul> <li>Open Circuit:≥</li> <li>200 K Ω</li> <li>impedance</li> <li>between ECU</li> <li>pin and load</li> </ul>	Engine Running (see parameter definition)	= TRUE -	fail conditions exists for more than 0.04 s monitor runs	A

Component / System	Fault Code	Monitor Strategy Description	Primary Malfunction Criteria	Threshold Logic and Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
							with 0.01 s rate whenever enable conditions are met	
Injector 4 Control Circuit	P0204	Diagnoses the Fuel Injector Cylinder #4 low side driver circuit for circuit faults.	Voltage low during driver off state (indicates open circuit)	<ul> <li>Open Circuit:≥ - 200 K Ω impedance between ECU pin and load</li> </ul>	Engine Running (see parameter definition)	= TRUE -	fail conditions exists for more than 0.04 s monitor runs with 0.01 s rate whenever enable conditions are met	A
Injector 5 Control Circuit	P0205	Diagnoses the Fuel Injector Cylinder #5 low side driver circuit for circuit faults.	Voltage low during driver off state (indicates open circuit)	= Open Circuit:≥ - 200 K Ω impedance between ECU pin and load	Engine Running (see parameter definition)	= TRUE -	fail conditions exists for more than 0.04 s monitor runs with 0.01 s rate whenever enable conditions are met	A
Injector 6 Control Circuit	P0206	Diagnoses the Fuel Injector Cylinder #6 low side driver circuit for circuit faults.	Voltage low during driver off state (indicates open circuit)	<ul> <li>Open Circuit:≥</li> <li>200 K Ω</li> <li>impedance</li> <li>between ECU</li> <li>pin and load</li> </ul>	Engine Running (see parameter definition)	= TRUE -	fail conditions exists for more than 0.04 s monitor runs with 0.01 s rate whenever	A

Component / System	Fault Code	Monitor Strategy Description	Primary Malfunction Criteria	Threshold Logic and Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
							enable conditions are met	
Injector 7 Control Circuit	P0207	Diagnoses the Fuel Injector Cylinder #7 low side driver circuit for circuit faults.	Voltage low during driver off state (indicates open circuit)	<ul> <li>Open Circuit:&gt; - 200 K Ω impedance between ECU pin and load</li> </ul>	Engine Running (see parameter definition)	= TRUE -	fail conditions exists for more than 0.04 s monitor runs with 0.01 s rate whenever enable conditions are met	A
Injector 8 Control Circuit	P0208	Diagnoses the Fuel Injector Cylinder #8 low side driver circuit for circuit faults.	Voltage low during driver off state (indicates open circuit)	<ul> <li>Open Circuit:≥ - 200 K Ω impedance between ECU pin and load</li> </ul>	Engine Running (see parameter definition)	= TRUE -	fail conditions exists for more than 0.04 s monitor runs with 0.01 s rate whenever enable conditions are met	A
Turbocharger Overboost	P0234	Detects an permanent negative control deviation of the boost pressure	control deviation of the boost pressure calculated out of difference between desired and actual value	< a*b*c kPa			fail conditions exists for 10 s monitor runs with 0.02 s rate whenever enable conditions are met	В

Component /	Fault	Monitor Strategy	Primary Malfunction		Threshold		Secondary		Enable		Time	MIL
System	Code	Description	Criteria		Logic and Value		Parameters		Conditions		Required	Illum.
			with (a) control deviation threshold (see Look-Up-Table #62)	=	-40 to -12.5	kPa	offset learning for turbo charger (VNT) actuator position sensor is active during idling - in order to compensate sensor drift and valve aging, the valve is closed and opened fully once in a driving cycle during engine idling, the read positions for opening and closing are averaged and used for the calculation of offset drift of the valve	=	FALSE	-		
			(b) environmental pressure correction factor (see Look-Up-Table #60)	=	0.65 to 1	factor	and					
			(c) correction factor	=	1.00	factor	turbo charger (VNT) wiping is active - in order to prevent soot accumulation e.g. in a long idle operation under cold engine condition on the turbine the desired value of the boost pressure actuator position governor is assigned from the set-point value	=	FALSE	-		
							and		TOUE			
							means	=	TRUE	-		
							increase of injection quantity	<	6.00	(mm^3/ stroke)/		
							and			3		
							engine speed is stable means	=	TRUE	-		
							increase of engine speed and	<	25.00	rpm/s		
							injection Quantity	>=	112.00	mm^3/r ev		
							injection Quantity	<=	1310.68	mm^3/r ev		
							engine Speed	>=	1600.00	rpm		
							engine Speed and	<=	3000.00	rpm		
							working range of boost pressure is in closed-loop means (	=	TRUE	-		
							engine speed	>	550.00	rpm		
							injection quantity	>	80.00	mm^3/r ev		
							) NO Pending or Confirmed DTCs: )	=	see sheet inhibit tables	-		
							for time and	>	1.00	sec		

Component / System	Fault Code	Monitor Strategy	Primary Malfunction Criteria		Threshold	ue	Secondary Parameters		Enable		Time	MIL
bystem	ooue	Description	Unena				basic enable conditions met:	-	see sheet enable tables	•	Required	indin.
Cylinder 1 Balance System	P0263	Detects if the injector is leaking by Looking at the amount of fuel compensation (reduction) as determined by Fuel Balance Control (FBC)	fuel balance correction quantity or fuel balance correction quantity with (a) lower limitation (see Look-Up- Table #38) and with (b) factor for correction quantity and with (c) upper limitation (see Look-Up- Table #39)	<	(a) * (b) (c) * (b) -68 to 0 0.95 0 to 68	- mm^3/re V factor mm^3/re V	fuel balance control in closed loop (see closed loop conditions document for details) and current injection quantity current injection quantity engine coolant temperature ambient pressure engine speed engine speed engine speed vehicle speed and basic enable conditions met: and NO Pending or Confirmed DTCs:	=	TRUE 52.00 380.00 39.96 0.00 590.00 3000.00 186.45 see sheet enable tables see sheet inhibit tables	- ev mm^3/r ev °C kPa rpm rpm mph -	fail conditions exists for 30 s monitor runs with 0.01 s rate whenever enable conditions are met	В
Cylinder 2 Balance System	P0266	Detects if the injector is leaking by Looking at the amount of fuel compensation (reduction) as determined by Fuel Balance Control (FBC)	fuel balance correction quantity or fuel balance correction quantity with (a) lower limitation (see Look-Up- Table #38) and with (b) factor for correction quantity and with (c) upper limitation (see Look-Up- Table #39)	<	(a) * (b) (c) * (b) -68 to 0 0.95 0 to 68	- mm^3/re v factor mm^3/re v	fuel balance control in closed loop (see closed loop conditions document for details) and current injection quantity current injection quantity engine coolant temperature ambient pressure engine speed engine speed vehicle speed and basic enable conditions met: and	=	TRUE 52.00 380.00 39.96 0.00 590.00 3000.00 186.45 see sheet enable tables	- ev mm^3/r ev °C kPa rpm rpm mph	fail conditions exists for 30 s monitor runs with 0.01 s rate whenever enable conditions are met	В

Component / System	Fault Code	Monitor Strategy Description	Primary Malfunction Criteria		Threshold	ue	Secondary Parameters		Enable Conditions		Time Required	MIL Illum.
							NO Pending or Confirmed DTCs:	=	see sheet inhibit tables	-		
Cylinder 3 Balance System	P0269	Detects if the injector is leaking by Looking at the amount of fuel compensation (reduction) as determined by Fuel Balance Control (FBC)	fuel balance correction quantity or	<	(a) * (b)	-	fuel balance control in closed loop (see closed loop conditions document for details) and	=	TRUE	- 	fail conditions exists for 30 s monitor runs with 0.01 s rate	B
			(a) lower limitation (see Look-Up-	=	-68 to 0	- mm^3/re	current injection quantity engine coolant temperature	<	380.00 39.96	ev mm^3/r ev °C	enable conditions are met	
			Table #38) and with (b) factor for correction quantity and with (c) upper limitation (see Look-Up- Table #39)	=	0.95 0 to 68	v factor mm^3/re v	ambient pressure engine speed engine speed vehicle speed and	>= > < <=	0.00 590.00 3000.00 186.45	kPa rpm rpm mph		
							basic enable conditions met: and NO Pending or Confirmed DTCs:	=	see sheet enable tables see sheet inhibit tables	-		
Cylinder 4 Balance System	P0272	Detects if the injector is leaking by Looking at the amount of fuel compensation (reduction) as determined by Fuel Balance Control (FBC)	fuel balance correction quantity	<	(a) * (b)	-	fuel balance control in closed loop (see closed loop conditions document for details)	=	TRUE	-	fail conditions exists for 30 s monitor runs with 0.01 s	В
			or fuel balance correction quantity with	>	(c) * (b)	-	and current injection quantity current injection quantity	> <	52.00 380.00	mm^3/r ev mm^3/r	rate whenever enable conditions	
			(a) lower limitation (see Look-Up- Table #38)	=	-68 to 0	mm^3/re v	engine coolant temperature ambient pressure	>= >=	39.96 0.00	°C kPa	are met	
			and with (b) factor for correction quantity and with (c) upper limitation (see Look-Up- Table #39)	=	0.95 0 to 68	factor mm^3/re v	engine speed engine speed vehicle speed and	> < <=	590.00 3000.00 186.45	rpm rpm mph		
						·	basic enable conditions met: and	=	see sheet enable tables	-		

Component / System	Fault Code	Monitor Strategy Description	Primary Malfunction Criteria		Threshold Logic and Val	ue	Secondary Parameters		Enable Conditions		Time Required	MIL Illum.
					-		NO Pending or Confirmed DTCs:	=	see sheet inhibit tables	-		
Cylinder 5 Balance System	P0275	Detects if the injector is leaking by Looking at the amount of fuel compensation (reduction) as determined by Fuel Balance Control (FBC)	fuel balance correction quantity	<	(a) * (b)		fuel balance control in closed loop (see closed loop conditions document for details)	=	TRUE		fail conditions exists for 30 s monitor runs with 0.01 s rate	В
			(a) lower limitation (see Look-Up- Table #38)	>	(c) * (b) -68 to 0	- mm^3/re v	current injection quantity current injection quantity engine coolant temperature	> < >=	52.00 380.00 39.96	mm^3/r ev mm^3/r ev °C	whenever enable conditions are met	
			and with (b) factor for correction quantity and with (c) upper limitation (see Look-Up- Table #39)	=	0.95 0 to 68	factor mm^3/re v	ambient pressure engine speed engine speed vehicle speed and	>=	0.00 590.00 3000.00 186.45	kPa rpm rpm mph		
							basic enable conditions met: and NO Pending or Confirmed DTCs:	=	see sheet enable tables see sheet inhibit tables	-		
Cylinder 6 Balance System	P0278	Detects if the injector is leaking by Looking at the amount of fuel compensation (reduction) as determined by Fuel Balance Control (FBC)	fuel balance correction quantity	<	(a) * (b)	-	fuel balance control in closed loop (see closed loop conditions document for details)	=	TRUE	-	fail conditions exists for 30 s monitor runs with 0.01 s	В
			fuel balance correction quantity with	>	(c) * (b)	-	current injection quantity current injection quantity	> <	52.00 380.00	mm^3/r ev mm^3/r	whenever enable conditions	
			(a) lower limitation (see Look-Up- Table #38)	=	-68 to 0	mm^3/re v	engine coolant temperature ambient pressure	>= >=	39.96 0.00	°C kPa	are met	
			and with (b) factor for correction quantity and with (c) upper limitation (see Look-Up- Table #39)	=	0.95 0 to 68	factor mm^3/re v	engine speed engine speed vehicle speed and	> < <=	590.00 3000.00 186.45	rpm rpm mph		
							basic enable conditions met: and	=	see sheet enable tables	-		

Component / System	Fault Code	Monitor Strategy Description	Primary Malfunction Criteria		Threshold Logic and Val	ue	Secondary Parameters		Enable Conditions		Time Required	MIL Illum.
							NO Pending or Confirmed DTCs:	=	see sheet inhibit tables	-		
Cylinder 7 Balance System	P0281	Detects if the injector is leaking by Looking at the amount of fuel compensation (reduction) as determined by Fuel Balance Control (FBC)	fuel balance correction quantity	<	(a) * (b)	-	fuel balance control in closed loop (see closed loop conditions document for details) and	=	TRUE	-	fail conditions exists for 30 s monitor runs with 0.01 s rate	В
			fuel balance correction quantity with (a) lower limitation (see Look-Up-	>	(c) * (b) -68 to 0	- mm^3/re	current injection quantity current injection quantity engine coolant temperature	> < >=	52.00 380.00 39.96	mm^3/r ev mm^3/r ev °C	whenever enable conditions are met	
			Table #38) and with (b) factor for correction quantity and with (c) upper limitation (see Look-Up- Table #39)	=	0.95 0 to 68	v factor mm^3/re v	ambient pressure engine speed engine speed vehicle speed and	>= > < <=	0.00 590.00 3000.00 186.45	kPa rpm rpm mph		
							basic enable conditions met: and NO Pending or Confirmed DTCs:	=	see sheet enable tables see sheet inhibit tables	-		
Cylinder 8 Balance System	P0284	Detects if the injector is leaking by Looking at the amount of fuel compensation (reduction) as determined by Fuel Balance Control (FBC)	fuel balance correction quantity	<	(a) * (b)	-	fuel balance control in closed loop (see closed loop conditions document for details)	=	TRUE		fail conditions exists for 30 s monitor runs with 0.01 s	В
			fuel balance correction quantity with	>	(c) * (b)	-	current injection quantity	> <	52.00 380.00	mm^3/r ev mm^3/r	whenever enable conditions	
			(a) lower limitation (see Look-Up- Table #38) and with	=	-68 to 0	mm^3/re v	engine coolant temperature ambient pressure engine speed	>= >= >	39.96 0.00 590.00	ev °C kPa rpm	are met	
			(b) factor for correction quantity and with (c) upper limitation (see Look-Up- Table #39)	=	0.95 0 to 68	factor mm^3/re v	engine speed vehicle speed and	< <=	3000.00 186.45	rpm mph		
							basic enable conditions met: and	=	see sheet enable tables	-		

Component /	Fault	Monitor Strategy	Primary Malfunction	Threshold	Secondary		Enable		Time	MIL
System	Code	Description	Criteria	Logic and Value	Parameters		Conditions		Required	Illum.
					NO Pending or Confirmed DTCs:	=	see sheet inhibit	-		
							lables			
CAC Efficiency	DOOGA	Detecto incufficient chorge	filtered charge air eacler officiency	. 0.25	webiele epoed		27.20	mah	foil	P
Below Threshold	PUZOA	air cooler efficiency The	intered charge-an cooler enricency	< 0.25 -	venicie speed	>=	57.29	трп	conditions	D
Bolon micoliola		efficiency is calculated out							exists for 60	
		of temperature upstream of							s	
		the cooler, temperature							monitor runs	
		downstream of the cooler							once per	
					and				with 100 ms	
					air mass flow	>=	83.33	g/s	rate	
					air mass flow	<=	152.77	g/s	whenever	
					and		CO 0C	**	enable	
					engine temperature	>=	69.96 122.96	0°	conditions	
					and	-	122.00	Ũ	aremet	
					(maximum value of (a) and (b) )	>=	-4.00	-		
					the maximum value is then divided by (b)					
					with					
					(a) boost pressure downstream	=	measured	-		
					compressor		parameter			
					and with					
					(b) ambient pressure	=	measured	-		
					and		parameter			
					control value of the throttle valve	<=	5.00	%		
					and					
					(a) - (b)	>=	40.00	°C		
					WITN (a) temperature after compressor	_	measured			
					(a) temperature alter compressor	-	parameter	-		
					and with					
					(b) ambient air temperature	=	measured	-		
					and		parameter			
					injection quantity	>=	80.00	mm^3/r		
								ev		
					injection quantity	<=	200.00	mm^3/r		
					and a			ev		
					and ambient pressure	~	74 80	kPa		
					and	-	14.00	iti u		
					ambient temperature	>	-7.04	°C		
					and		and should apply be			
					basic enable conditions met:	=	see sheet enable tables	-		
					and		and about intitit			
					The renaing of Confirmed DTCs:	=	tables	-		

Component / System	Fault Code	Monitor Strategy Description	Primary Malfunction Criteria		Threshold Logic and Valu	e	Secondary Parameters		Enable Conditions		Time Required	MIL Illum.
Injection Quantity Too Low	P026C	Monitors the fuel mass observer correction quantity. Detects if the correction quantity exceeds the emissions limit.	Unlimited fuel mass observer correction quantity - emission control correction quantity (see Look-Up-Table #45)	<=	-34.8 to -20	mm^3/re v	((Status of the Observer function's lambda-signal	=	TRUE	-	fail conditions exists for 12 s monitor runs with 0.02 s	B
							means ( lambda signal from NOx sensor ready (see parameter definition) fuel system is in fuel cut off (see parameter definition)	=	TRUE FALSE	-	rate whenever enable conditions are met	
							Particulate Filter Regeneration Mode (( component of combusted fuel in the	=	FALSE 1	-		
							or or calculated EGR rate ) for time	>=	0	- Sec		
							)) AND Controller status of the observer means	=	TRUE	-		
							( Load dependent release state (see look up table # ) (see Look-Up- Table #48)	=	0 to 1	-		
							AND Component Protection release state (see look up table # ) (see Look-Up- Table #43)	>	0 to 1	-		
							angine coolant temperature engine coolant temperature Normal Injection Mode Barometric pressure Ambient temperature Vehicle speed NO Pending or Confirmed DTCs:	<pre>&lt; = = = = = = = = = = = = = = = = = = =</pre>	199.96 64.96 TRUE 74.80 -7.04 1.86 see sheet inhibit tables	°C °C - kPa °C mph -		
							( Engine speed AND	<=	1040	rpm		
							Engine speed ) AND NO Pending or Confirmed DTCs:	>=	476 see sheet inhibit tables	rpm -		
							) for time	>	72.00	sec		

Component /	Fault	Monitor Strategy	Primary Malfunction		Threshold		Secondary		Enable		Time	MIL
System	Code	Description	Criteria		Logic and Valu	le	Parameters		Conditions		Required	Illum.
							basic enable conditions met:	=	see sheet enable tables			
Injection Quantity Too High	P026D	Monitors the fuel mass observer correction quantity. Detects if the correction quantity exceeds the emissions limit.	Unlimited fuel mass observer correction quantity - emission control correction quantity (see Look-Up-Table #44)	>=	16 to 34.8	mm^3/re v	((Status of the Observer function's lambda-signal means	=	TRUE	-	fail conditions exists for 12 s monitor runs with 0.02 s rate	В
							( lambda signal from NOx sensor ready (see parameter definition) fuel outputs in fuel out off (cao	=	TRUE	-	whenever enable conditions	
							parameter definition)	-	FALSE	-	are met	
							(( component of combusted fuel in the engine	>=	1	-		
							calculated EGR rate	>=	0	-		
							for time	>	1.00	sec		
							Controller status of the observer means	=	TRUE	-		
							Coad dependent release state (see look up table # ) (see Look-Up- Table #48) AND	=	0 to 1	-		
							Component Protection release state (see look up table #) (see Look-Up- Table #43)	>	0 to 1	-		
							engine coolant temperature engine coolant temperature Normal Injection Mode Barometric pressure Ambient temperature	<= _= > = _= > _= > _=	199.96 64.96 TRUE 74.80 -7.04	°C °C - kPa °C		
							Vehicle speed NO Pending or Confirmed DTCs: AND	< =	1.86 see sheet inhibit tables	mph -		
							t Engine speed AND	<=	1040	rpm		
							Engine speed ) AND	>=	476	rpm		

Component / System	Fault Code	Monitor Strategy	Primary Malfunction Criteria	Threshold	Secondary Parameters		Enable		Time Required	MIL
- Oyotom	0000	Decomption			NO Pending or Confirmed DTCs:	=	see sheet inhibit tables	-	ricquircu	mann
					) for time	>	72.00	sec		
					basic enable conditions met:	=	see sheet enable tables	-		
Turbocharger Underboost	P0299	Detects an permanent positive control deviation of the boost pressure	control deviation of the boost pressure calculated out of difference between desired and actual value (see Look-Up- Table #61)	> 15 to 40 kPa	( offset learning for turbo charger (VNT) actuator position sensor is active during idling - in order to compensate sensor drift and valve aging, the valve is closed and opened fully once in a driving cycle during engine idling, the read positions for opening and closing are averaged and used for the calculation of offset drift of the valve and turbo charger (VNT) wiping is active - in order to prevent soot accumulation e.g. in a long idle operation under cold engine condition on the turbine the desired value of the boost pressure actuator position governor is assigned from the set-point value and injection quantity is stable means increase of injection quantity and engine speed is stable means increase of engine speed and injection Quantity and engine Speed engine Speed engine Speed and working range of boost pressure is in closed-loop		FALSE FALSE TRUE 24.00 TRUE 25.00 112.00 1310.68 1600.00 3000.00 TRUE	- - (mm^3/r ev)/sec - rpm/sec mm^3/r ev mm^3/r ev rpm rpm rpm rpm	fail conditions exists for 10 s monitor runs with 0.02 s rate whenever enable conditions are met	В

Component / System	Fault Code	Monitor Strategy Description	Primary Malfunction Criteria		Threshold	4	Secondary Parameters		Enable Conditions		Time Required	MIL Illum.
							means ( engine speed and injection quantity ) NO Pending or Confirmed DTCs: ) for time and basic enable conditions met:	> = > =	550.00 80.00 see sheet inhibit tables 1.00 see sheet enable tables	rpm mm^3/r ev - sec -		
Cylinder 1 Injection Timing Reached Feedback Limit	P02CD	Monitors the correction values for the energizing time of each cylinder. A correction value for the energizing time is learned for each cylinder at three different rail pressure operating point. Detects a fault when the corrected energizing time exceeds the feedback control limit.	<pre>(     corrected energizing time for the rail     pressure calibration points and cylinder 1     (     with     (a) maximum injection energizing time     (see Look-Up-Table #20)     and with     (b) offset of the maximum filtered     energizing time (see Look-Up-Table #21)     )     OR     (     corrected energizing time for the rail     pressure calibration points and cylinder 1</pre>	> = = <	(a) - (b) 353.2 to 670.8 10 to 16 (a) + (b)	- us us	environmental temperature and ( fuel temperature and fuel temperature ) and engine temperature and battery voltage	>= <= > >	-7.04 0.06 79.96 49.96 10.00	°C °C °C V	fail conditions exists for more than 0.5 s monitor runs with 0.01 s rate whenever enable conditions are met	В
			( with (a) minimum injection energizing time and with (b) offset of the minimum filtered energizing time (see Look-Up-Table #22) ) ) for	=	107.2 10 to 16	us us	and combustion chamber is not cooled off means time since last combustion (see Look- Up-Table #94) and intake manifold pressure and	>=	5 to 30 75.00	sec kPa		

Component / System	Fault Code	Monitor Strategy Description	Primary Malfunction Criteria		Threshold Logic and Value		Secondary Parameters		Enable Conditions		Time Required	MIL Illum.
			rail pressure point (see Look-Up-Table	=	30000 to 90000	kPa	intake manifold pressure	<	150.00	kPa		
			#19)				and					
							accelerator pedal position	<	0.05	%		
							and					
							Fuel system status	=	Fuel cut off	-		
							time	>	0.00	sec		
							and					
							( engine speed	>	(b) - (a)			
							and		(-) (-)			
							engine speed	<	(a) + (c)	-		
							(a) value of engine speed	=	30.00	rpm		
							and with			·		
							(b) gear specific minimum engine	=	950	rpm		
							and with					
							(c) gear specific maximum engine	=	1850	rpm		
							speed					
							and					
							current gear (see Look-Up-Table #93)	=	0 to 1	-		
							vehicle speed	>	0	mph		
							and					
							rail pressure deviation from setpoint	<	5000.00	kPa		
							desired and actual value					
							and					
							rail pressure is stable for at least	>	0.10	sec		
							no gear change has occurred	=	TRUE	-		
							and 4 wheel mede	_	EALSE			
							and	-	FALSE	-		
							basic enable conditions met:	=	see sheet enable	-		
							and		tables			
							NO Pending or Confirmed DTCs:	=	see sheet inhibit	-		
									tables			
	<b>B</b>										1 H	-
Cylinder 2	P02CF	Monitors the correction	(				environmental temperature	>	-7.04	°C	fail	В
Reached		time of each cylinder.									exists for	
Feedback Limit		A correction value for the									more than	
		energizing time is learned									0.5 S monitor runs	
		different rail pressure									with 0.01 s	
		operating point.									rate	

Component / System	Fault Code	Monitor Strategy Description	Primary Malfunction Criteria		Threshold Logic and Value		Secondary Parameters		Enable Conditions		Time Required	MIL Illum.
		Detects a fault when the corrected energizing time exceeds the feedback control limit.	corrected energizing time for the rail pressure calibration points and cylinder 1	>	(a) - (b)	-	and				whenever enable conditions are met	
			( with (a) maximum injection energizing time (see Look-LIn-Table #20)	=	353.2 to 670.8	us	( fuel temperature and	>=	0.06	°C		
			and with (b) offset of the maximum filtered energizing time (see Look-Up-Table #21)	=	10 to 16	us	fuel temperature )	<=	79.96	°C		
			)				and					
			OR (				engine temperature	>	49.96	°C		
			corrected energizing time for the rail pressure calibration points and cylinder 1	<	(a) + (b)	-	battery voltage	>	10.00	V		
			( with (a) minimum injection energizing time	=	107.2	us	and combustion chamber is not cooled off					
			(b) offset of the minimum filtered energizing time (see Look-Up-Table #22)	=	10 to 16	us	time since last combustion (see Look- Up-Table #94)	>=	5 to 30	sec		
			) ) for				and intake manifold pressure and	>	75.00	kPa		
			rail pressure point (see Look-Up-Table #19)	=	30000 to 90000	kPa	intake manifold pressure	<	150.00	kPa		
							accelerator pedal position and	<	0.05	%		
							Fuel system status	=	Fuel cut off	-		
							time and	>	0.00	sec		
							engine speed and	>	(b) - (a)	-		
							engine speed	<	(a) + (c)	-		
							(a) value of engine speed and with	=	30.00	rpm		
							(b) gear specific minimum engine speed and with	=	950	rpm		
							(c) gear specific maximum engine speed	=	1850	rpm		
							and current gear (see Look-Up-Table #93) and	=	0 to 1	-		
			1				vehicle speed	>	0	mph		

Component / System	Fault Code	Monitor Strategy Description	Primary Malfunction Criteria		Threshold		Secondary Parameters		Enable Conditions		Time Required	MIL Illum.
							and rail pressure deviation from setpoint calculated out of difference between desired and actual value	<	5000.00	kPa		
							and rail pressure is stable for at least and	>	0.10	sec		
							no gear change has occurred and 4 wheel mode	=	TRUE FALSE	-		
							and basic enable conditions met:	=	see sheet enable tables	-		
							and NO Pending or Confirmed DTCs:	=	see sheet inhibit tables	-		
Cylinder 7 Injection Timing Reached Feedback Limit	P02D9	Monitors the correction values for the energizing time of each cylinder. A correction value for the energizing time is learned for each cylinder at three different rail pressure operating point. Detects a fault when the corrected energizing time exceeds the feedback control limit.	( corrected energizing time for the rail pressure calibration points and cylinder 1	>	(a) - (b)	-	environmental temperature and	>	-7.04	°C	fail conditions exists for more than 0.5 s monitor runs with 0.01 s rate whenever enable conditions are met	В
			( with (a) maximum injection energizing time	=	353.2 to 670.8	us	( fuel temperature and	>=	0.06	°C		
			(see Look-Up-Table #20) and with (b) offset of the maximum filtered energizing time (see Look-Up-Table #21)	=	10 to 16	us	fuel temperature )	<=	79.96	°C		
			)				and					
			) OR (				engine temperature	>	49.96	°C		
			corrected energizing time for the rail pressure calibration points and cylinder 1	<	(a) + (b)	-	battery voltage	>	10.00	V		
			( with (a) minimum injection energizing time and with (b) offset of the minimum filtered energizing time (see Look-Up-Table #22)	=	107.2 10 to 16	us us	and combustion chamber is not cooled off means time since last combustion (see Look- Up-Table #94)	>=	5 to 30	sec		
			)				and intake manifold pressure	>	75.00	kPa		

Component / System	Fault Code	Monitor Strategy Description	Primary Malfunction Criteria		Threshold Logic and Value		Secondary Parameters		Enable Conditions		Time Required	MIL Illum.
			for rail pressure point (see Look-Up-Table	=	30000 to 90000	kPa	and intake manifold pressure	<	150.00	kPa		
			#19)				and accelerator pedal position	<	0.05	%		
							Fuel system status	=	Fuel cut off	-		
							time and	>	0.00	sec		
							( engine speed and	>	(b) - (a)	-		
							engine speed with	<	(a) + (c)	-		
							<ul> <li>(a) value of engine speed and with</li> </ul>	=	30.00	rpm		
							(b) gear specific minimum engine speed	=	950	rpm		
							(c) gear specific maximum engine speed	=	1850	rpm		
							) and					
							current gear (see Look-Up-Table #93) and	=	0 to 1	-		
							vehicle speed and	>	0	mph		
							rail pressure deviation from setpoint calculated out of difference between desired and actual value	<	5000.00	kPa		
							and rail pressure is stable for at least and	>	0.10	sec		
							no gear change has occurred and	=	TRUE	-		
							4 wheel mode and	=	FALSE	-		
							basic enable conditions met:	=	see sheet enable tables	-		
							NO Pending or Confirmed DTCs:	=	see sheet inhibit tables	-		
					_				_			
Cylinder 8 Injection Timing Reached Feedback Limit	P02DB	Monitors the correction values for the energizing time of each cylinder. A correction value for the energizing time is learned for each cylinder at three different rail pressure operating point.					environmental temperature	>	-7.04	°C	fail conditions exists for more than 0.5 s monitor runs with 0.01 s rate	B

Component / System	Fault Code	Monitor Strategy Description	Primary Malfunction Criteria		Threshold Logic and Value		Secondary Parameters		Enable Conditions		Time Required	MIL Illum.
		Detects a fault when the corrected energizing time exceeds the feedback control limit.	corrected energizing time for the rail pressure calibration points and cylinder 1	>	(a) - (b)	-	and				whenever enable conditions are met	
			( with (a) maximum injection energizing time (see Look-LIn-Table #20)	=	353.2 to 670.8	us	( fuel temperature and	>=	0.06	°C		
			and with (b) offset of the maximum filtered energizing time (see Look-Up-Table #21)	=	10 to 16	us	fuel temperature )	<=	79.96	°C		
			)				and					
			OR (				engine temperature	>	49.96	°C		
			corrected energizing time for the rail pressure calibration points and cylinder 1	<	(a) + (b)	-	battery voltage	>	10.00	V		
			( with (a) minimum injection energizing time	=	107.2	us	and combustion chamber is not cooled off					
			(b) offset of the minimum filtered energizing time (see Look-Up-Table #22)	=	10 to 16	us	time since last combustion (see Look- Up-Table #94)	>=	5 to 30	sec		
			) ) for				and intake manifold pressure and	>	75.00	kPa		
			rail pressure point (see Look-Up-Table #19)	=	30000 to 90000	kPa	intake manifold pressure	<	150.00	kPa		
							accelerator pedal position and	<	0.05	%		
							Fuel system status	=	Fuel cut off	-		
							time and	>	0.00	sec		
							engine speed and	>	(b) - (a)	-		
							engine speed	<	(a) + (c)	-		
							(a) value of engine speed and with	=	30.00	rpm		
							(b) gear specific minimum engine speed and with	=	950	rpm		
							(c) gear specific maximum engine speed	=	1850	rpm		
							and current gear (see Look-Up-Table #93) and	=	0 to 1	-		
			1				vehicle speed	>	0	mph		

Component / System	Fault Code	Monitor Strategy Description	Primary Malfunction Criteria		Threshold		Secondary Parameters		Enable Conditions		Time Required	MIL Illum.
							and rail pressure deviation from setpoint calculated out of difference between desired and actual value	<	5000.00	kPa		
							and rail pressure is stable for at least and	>	0.10	sec		
							no gear change has occurred and 4 wheel mode	=	TRUE FALSE	-		
							and basic enable conditions met:	=	see sheet enable tables	-		
							and NO Pending or Confirmed DTCs:	=	see sheet inhibit tables	-		
Cylinder 4 Injection Timing Reached Feedback Limit	P02D3	Monitors the correction values for the energizing time of each cylinder. A correction value for the energizing time is learned for each cylinder at three different rail pressure operating point. Detects a fault when the corrected energizing time exceeds the feedback control limit.	( corrected energizing time for the rail pressure calibration points and cylinder 1	>	(a) - (b)	-	environmental temperature and	>	-7.04	°C	fail conditions exists for more than 0.5 s monitor runs with 0.01 s rate whenever enable conditions are met	В
			( with (a) maximum injection energizing time	=	353.2 to 670.8	us	tuel temperature and	>=	0.06	°C		
			(see Look-Up-Table #20) and with (b) offset of the maximum filtered energizing time (see Look-Up-Table #21)	=	10 to 16	us	fuel temperature )	<=	79.96	°C		
			)				and					
			) OR (				engine temperature	>	49.96	°C		
			corrected energizing time for the rail pressure calibration points and cylinder 1	<	(a) + (b)	-	battery voltage	>	10.00	V		
			( with (a) minimum injection energizing time and with (b) offset of the minimum filtered energizing time (see Look-Up-Table #22)	=	107.2 10 to 16	us us	and combustion chamber is not cooled off means time since last combustion (see Look- Up-Table #94)	>=	5 to 30	sec		
			)				and intake manifold pressure	>	75.00	kPa		

Component / System	Fault Code	Monitor Strategy Description	Primary Malfunction Criteria		Threshold Logic and Value		Secondary Parameters		Enable Conditions		Time Required	MIL Illum.
			for rail pressure point (see Look-Up-Table	=	30000 to 90000	kPa	and intake manifold pressure	<	150.00	kPa		
			#19)				and accelerator pedal position	<	0.05	%		
							Fuel system status	=	Fuel cut off	-		
							time and	>	0.00	sec		
							( engine speed and	>	(b) - (a)	-		
							engine speed with	<	(a) + (c)	-		
							<ul><li>(a) value of engine speed and with</li></ul>	=	30.00	rpm		
							(b) gear specific minimum engine speed	=	950	rpm		
							(c) gear specific maximum engine speed	=	1850	rpm		
							) and					
							current gear (see Look-Up-Table #93) and	=	0 to 1	-		
							vehicle speed and	>	0	mph		
							rail pressure deviation from setpoint calculated out of difference between desired and actual value	<	5000.00	kPa		
							and rail pressure is stable for at least and	>	0.10	sec		
							no gear change has occurred and	=	TRUE	-		
							4 wheel mode and	=	FALSE	-		
							basic enable conditions met:	=	see sheet enable tables	-		
							NO Pending or Confirmed DTCs:	=	see sheet inhibit tables	-		
					_				_			
Cylinder 5 Injection Timing Reached Feedback Limit	P02D5	Monitors the correction values for the energizing time of each cylinder. A correction value for the energizing time is learned for each cylinder at three different rail pressure operating point.					environmental temperature	>	-7.04	°C	fail conditions exists for more than 0.5 s monitor runs with 0.01 s rate	B

Component / System	Fault Code	Monitor Strategy Description	Primary Malfunction Criteria		Threshold Logic and Value		Secondary Parameters		Enable Conditions		Time Required	MIL Illum.
		Detects a fault when the corrected energizing time exceeds the feedback control limit.	corrected energizing time for the rail pressure calibration points and cylinder 1	>	(a) - (b)	-	and				whenever enable conditions are met	
			( with (a) maximum injection energizing time (see Look-LIn-Table #20)	=	353.2 to 670.8	us	( fuel temperature and	>=	0.06	°C		
			and with (b) offset of the maximum filtered energizing time (see Look-Up-Table #21)	=	10 to 16	us	fuel temperature )	<=	79.96	°C		
			)				and					
			OR (				engine temperature	>	49.96	°C		
			corrected energizing time for the rail pressure calibration points and cylinder 1	<	(a) + (b)	-	battery voltage	>	10.00	V		
			( with (a) minimum injection energizing time	=	107.2	us	and combustion chamber is not cooled off					
			(b) offset of the minimum filtered energizing time (see Look-Up-Table #22)	=	10 to 16	us	time since last combustion (see Look- Up-Table #94)	>=	5 to 30	sec		
			) ) for				and intake manifold pressure and	>	75.00	kPa		
			rail pressure point (see Look-Up-Table #19)	=	30000 to 90000	kPa	intake manifold pressure	<	150.00	kPa		
							accelerator pedal position and	<	0.05	%		
							Fuel system status	=	Fuel cut off	-		
							time and	>	0.00	sec		
							engine speed and	>	(b) - (a)	-		
							engine speed	<	(a) + (c)	-		
							(a) value of engine speed and with	=	30.00	rpm		
							(b) gear specific minimum engine speed and with	=	950	rpm		
							(c) gear specific maximum engine speed	=	1850	rpm		
							and current gear (see Look-Up-Table #93) and	=	0 to 1	-		
			1				vehicle speed	>	0	mph		
Component / System	Fault Code	Monitor Strategy Description	Primary Malfunction Criteria		Threshold Logic and Value		Secondary Parameters		Enable Conditions		Time Required	MIL Illum.
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							and rail pressure deviation from setpoint calculated out of difference between desired and actual value and	<	5000.00	kPa		
							rail pressure is stable for at least and no gear change has occurred	>	0.10 TRUE	sec		
							and 4 wheel mode	=	FALSE	-		
							basic enable conditions met:	=	see sheet enable tables	-		
							and NO Pending or Confirmed DTCs:	=	see sheet inhibit tables	-		
Cylinder 6	P02D7	Monitors the correction	(				environmental temperature	>	-7 04	°C	fail	В
Feedback Limit		values for the energizing time of each cylinder. A correction value for the energizing time is learned for each cylinder at three different rail pressure operating point. Detects a fault when the corrected energizing time exceeds the feedback control limit.	corrected energizing time for the rail pressure calibration points and cylinder 1	>	(a) - (b)	-	and			Ū	conditions exists for more than 0.5 s monitor runs with 0.01 s rate whenever enable conditions are met	
			with (a) maximum injection energizing time	=	353.2 to 670.8	us	fuel temperature and	>=	0.06	°C		
			(see Look-Up-Table #20) and with (b) offset of the maximum filtered energizing time (see Look-Up-Table #21)	=	10 to 16	us	fuel temperature )	<=	79.96	°C		
			)				and					
			) OR (				engine temperature and	>	49.96	°C		
			corrected energizing time for the rail pressure calibration points and cylinder 1	<	(a) + (b)	-	battery voltage	>	10.00	V		
			( with (a) minimum injection energizing time and with (b) offset of the minimum filtered energizing time (see Look-Up-Table #22)	=	107.2 10 to 16	us us	and combustion chamber is not cooled off means time since last combustion (see Look- Up-Table #94)	>=	5 to 30	sec		
			)				and intake manifold pressure	>	75.00	kPa		

Component / System	Fault Code	Monitor Strategy Description	Primary Malfunction Criteria		Threshold Logic and Value		Secondary Parameters		Enable Conditions		Time Required	MIL Illum.
			for rail pressure point (see Look-Up-Table	=	30000 to 90000	kPa	and intake manifold pressure	<	150.00	kPa		
			#19)				and accelerator pedal position	<	0.05	%		
							Fuel system status	=	Fuel cut off	-		
							time and	>	0.00	sec		
							( engine speed and	>	(b) - (a)	-		
							engine speed with	<	(a) + (c)	-		
							<ul> <li>(a) value of engine speed and with</li> </ul>	=	30.00	rpm		
							(b) gear specific minimum engine speed	=	950	rpm		
							(c) gear specific maximum engine speed	=	1850	rpm		
							) and					
							current gear (see Look-Up-Table #93) and	=	0 to 1	-		
							vehicle speed and	>	0	mph		
							rail pressure deviation from setpoint calculated out of difference between desired and actual value	<	5000.00	kPa		
							and rail pressure is stable for at least and	>	0.10	sec		
							no gear change has occurred and	=	TRUE	-		
							4 wheel mode and	=	FALSE	-		
							basic enable conditions met:	=	see sheet enable tables	-		
							NO Pending or Confirmed DTCs:	=	see sheet inhibit tables	-		
					_				_			
Cylinder 3 Injection Timing Reached Feedback Limit	P02D1	Monitors the correction values for the energizing time of each cylinder. A correction value for the energizing time is learned for each cylinder at three different rail pressure operating point.	(				environmental temperature	>	-7.04	°C	fail conditions exists for more than 0.5 s monitor runs with 0.01 s rate	В

Component / System	Fault Code	Monitor Strategy Description	Primary Malfunction Criteria		Threshold Logic and Value		Secondary Parameters		Enable Conditions		Time Required	MIL Illum.
		Detects a fault when the corrected energizing time exceeds the feedback control limit.	corrected energizing time for the rail pressure calibration points and cylinder 1	>	(a) - (b)	-	and				whenever enable conditions are met	
			( with (a) maximum injection energizing time (see Look-LIn-Table #20)	=	353.2 to 670.8	us	( fuel temperature and	>=	0.06	°C		
			and with (b) offset of the maximum filtered energizing time (see Look-Up-Table #21)	=	10 to 16	us	fuel temperature )	<=	79.96	°C		
			)				and					
			OR (				engine temperature	>	49.96	°C		
			corrected energizing time for the rail pressure calibration points and cylinder 1	<	(a) + (b)	-	battery voltage	>	10.00	V		
			( with (a) minimum injection energizing time	=	107.2	us	and combustion chamber is not cooled off					
			(b) offset of the minimum filtered energizing time (see Look-Up-Table #22)	=	10 to 16	us	time since last combustion (see Look- Up-Table #94)	>=	5 to 30	sec		
			) ) for				and intake manifold pressure and	>	75.00	kPa		
			rail pressure point (see Look-Up-Table #19)	=	30000 to 90000	kPa	intake manifold pressure	<	150.00	kPa		
							accelerator pedal position and	<	0.05	%		
							Fuel system status	=	Fuel cut off	-		
							time and	>	0.00	sec		
							engine speed and	>	(b) - (a)	-		
							engine speed	<	(a) + (c)	-		
							(a) value of engine speed and with	=	30.00	rpm		
							(b) gear specific minimum engine speed and with	=	950	rpm		
							(c) gear specific maximum engine speed	=	1850	rpm		
							and current gear (see Look-Up-Table #93) and	=	0 to 1	-		
			1				vehicle speed	>	0	mph		

Component / System	Fault Code	Monitor Strategy Description	Primary Malfunction Criteria	Threshold Logic and Value	Secondary Parameters	Enable Conditions		Time Required	MIL Illum.
Jystem	Coue	Description	Gineria		and rail pressure deviation from setpoint calculated out of difference between desired and actual value and rail pressure is stable for at least and no gear change has occurred and 4 wheel mode and basic enable conditions met: and NO Pending or Confirmed DTCs:	<ul> <li>Source of the second sec</li></ul>	kPa sec - -	Required	
Intake Air Flow Valve Control Circuit	P02E0	Diagnoses the Throttle Valve low side driver circuit for circuit faults.	Voltage low during driver off state (indicates open circuit)	<ul> <li>Open Circuit:≥ - 200 K Ω impedance between ECU pin and load</li> </ul>	battery voltage for time and starter is active cranking for time Throttle Valve Actuator Solenoid Control Circuit and basic enable conditions met and NO Pending or Confirmed DTCs:	<ul> <li>&gt; 11.00</li> <li>&gt; 3.00</li> <li>= FALSE</li> <li>&gt; 3.00</li> <li>= ACTIVE</li> <li>= see sheet enable tables</li> <li>= see sheet inhibit tables</li> </ul>	V sec - sec - -	fail conditions exists for 7s monitor runs with 0.005 s rate whenever enable conditions are met	В
			The ECM detects that the commanded state of the driver and the actual state of the control circuit do not match.		battery voltage for time and starter is active cranking for time Throttle Valve Actuator Solenoid Control Circuit and	> 11.00 > 3.00 = FALSE > 3.00 = ACTIVE	V sec - sec -	fail conditions exists for 3 s monitor runs with 0.005 s rate whenever enable conditions are met	

Component /	Fault	Monitor Strategy	Primary Malfunction	Threshold	Secondary		Enable		Time	MIL
System	Code	Description	Criteria	Logic and Value	Parameters	-	See sheet enable		Required	IIIum.
					and NO Pending or Confirmed DTCs:	=	tables	-		
					and Open Load Diagnosis active	=	FALSE	-		
			The ECM detects that the commanded state of the driver and the actual state of the control circuit do not match.		battery voltage	>	11.00	V	fail conditions exists for 3 s monitor runs	
					tor time and	>	3.00	sec	with 0.005 s rate whenever	
					starter is active cranking for	=	FALSE	-	enable conditions	
					time Throttle Valve Actuator Solenoid Control Circuit and	> =	3.00 ACTIVE	sec -	are met	
					basic enable conditions met	=	see sheet enable tables	-		
					and NO Pending or Confirmed DTCs:	=	see sheet inhibit tables	-		
					Open Load Diagnosis active	=	FALSE	-		
Intake Air Flow Valve Control Circuit 1 Low Voltage	P02E2	Diagnoses the Throttle Valve low side driver circuit for circuit faults.	Voltage low during driver off state (indicates short-to-ground)	<ul> <li>Short to ground: - ≤ 0.5 Ω impedance between signal and controller ground</li> </ul>	battery voltage	>	11.00	V	fail conditions exists for 3 s monitor runs with 0.005 s rate whenever enable	В
					time and	>	3.00	sec	conditions are met	
					starter is active cranking for	=	FALSE	-		
					time Throttle Valve Actuator Solenoid Control Circuit and	> =	3.00 ACTIVE	sec -		
					basic enable conditions met	=	see sheet enable tables	-		
					NO Pending or Confirmed DTCs:	=	see sheet inhibit tables	-		

Component / System	Fault Code	Monitor Strategy Description	Primary Malfunction Criteria		Threshold Logic and Value		Secondary Parameters		Enable Conditions		Time Required	MIL Illum.
							and Open Load Diagnosis active	=	FALSE	-		
Intake Air Flow Valve Control Circuit 1 High Voltage	P02E3	Diagnoses the Throttle Valve low side driver circuit for circuit faults.	Voltage high during driver on state (indicates short to power)	=	Short to power: $\leq 0.5 \Omega$ impedance between signal and controller power	-	battery voltage	>	11.00	V	fail conditions exists for 3 s monitor runs with 0.005 s rate whenever	В
							for time and ctarter is active grapking	>	3.00	sec	enable conditions are met	
							for time Throttle Valve Actuator Solenoid Control Circuit	>	3.00 ACTIVE	sec -		
							and basic enable conditions met	=	see sheet enable tables	-		
							NO Pending or Confirmed DTCs:	=	see sheet inhibit tables	-		
							Open Load Diagnosis active	=	FALSE	-		
Throttle Valve Actuator (TVA) Position Sensor Performance	P02E7	Detects in range TVA position errors by comparing the difference between desired and actual TVA	throttle valve control deviation calculated out of difference between desired and actual value	<	10.00	%	throttle valve controller bypass is active	=	FALSE	-	fail conditions exists for 10 s	В
		position.	or throttle valve control deviation calculated out of difference between desired and actual value	>	-10.00	%	and throttle valve is driven to a mechanical stop	=	FALSE	-	monitor runs with 0.005 s rate whenever enable	
							and Throttle Governor Active and	=	TRUE	-	conditions are met	
							Throttle Valve Permanent Control Deviation and	=	FALSE	-		
							Engine Running (see parameter definition) and	=	TRUE	-		
							basic enable conditions met	=	see sheet enable tables	-		
							NO Pending or Confirmed DTCs:	=	see sheet inhibit tables	-		

Component / System	Fault Code	Monitor Strategy Description	Primary Malfunction Criteria	Threshold Logic and Value	Secondary Parameters	Enable Conditions	Time MIL Required Illum.
Diesel Intake Air Flow Position Sensor Circuit Low Voltage	P02E8	Detects low voltage readings on the throttle valve position sensor circuit, indicating an OOR low condition on the throttle valve position sensor circuit	measured throttle valve position voltage	< 0.40 V	ignition on and basic enable conditions met and NO Pending or Confirmed DTCs:	<ul> <li>TRUE -</li> <li>see sheet enable - tables</li> <li>see sheet inhibit - tables</li> </ul>	fail A conditions exists for 5 s test performed continuously 0.005 s rate
Diesel Intake Air Flow Position Sensor Circuit High Voltage	P02E9	Detects high voltage readings on the throttle valve position sensor circuit, indicating an OOR high condition on the throttle valve position sensor circuit	measured throttle valve position voltage	> 4.72 V	ignition on and basic enable conditions met and NO Pending or Confirmed DTCs:	= TRUE - = see sheet enable - tables = see sheet inhibit - tables	fail A conditions exists for 5 s test performed continuously 0.005 s rate
Intake Air Flow Valve Control Motor Current Performance	P02EB	Electronic out-put driver circuitry determines circuit integrity on the intake air flow valve.	driver output current	> 7.7 A	battery voltage for time and starter is active cranking for time Throttle Valve Actuator Solenoid Control Circuit and basic enable conditions met and NO Pending or Confirmed DTCs: and Open Load Diagnosis active	<ul> <li>&gt; 11.00 V</li> <li>&gt; 3.00 sec</li> <li>= FALSE -</li> <li>&gt; 3.00 sec</li> <li>= ACTIVE -</li> <li>= see sheet enable - tables</li> <li>= see sheet inhibit - tables</li> <li>= FALSE -</li> </ul>	fail B conditions exists for 2 s monitor runs with 0.005 s rate whenever enable conditions are met

Component / System	Fault Code	Monitor Strategy Description	Primary Malfunction Criteria		Threshold Logic and Valu	le	Secondary Parameters		Enable Conditions		Time Required	MIL Illum.
					_	-			_	-		
Engine Misfire Detected	P0300	Indicates engine has experienced more than one cylinder misfiring	angular acceleration of the crankshaft and	<	-1.40	sec^(2)	( Engine Running (see parameter	=	TRUE	_	fail conditions exists for 0.02 ms	В
			evaluated crankshaft revolutions	>=	(a) * (b)	-	definition) and		170.00		monitor runs with 0.02 s	
			with (a) number of crankshaft revolutions per block	=	20.00	counts	engine speed and	>	476.00	rpm	rate whenever enable	
			and with (b) number of test blocks	=	20.00	counts	engine speed ) and	<	1560.00	rpm	conditions are met	
			misfires exist on more than one cylinder	=	TRUE	-	(a) - (b)	<	200.00	rpm		
							with (a) actual desired idle speed	=	calculated parameter	-		
							(b) engine speed	=	measured parameter	-		
							( current injection quantity	>	12.00	mm^3/r		
							and current injection quantity	<	400.00	mm^3/r		
							) and engine coolant temperature	>=	39.96	°C		
							and vehicle speed	<=	1.86	mph		
							time since start and	>=	10.00	sec		
							and deletion of error memory (Mode\$4) not executed since last check of the monitoring conditions	=	TRUE	-		
							and adaptation value for tooth wheel has been learned	=	TRUE	-		
							and number of detected misfires and	>	140.00	counts		
							basic enable conditions met:	=	see sheet enable tables	-		
							NO Pending or Confirmed DTCs:	=	see sheet inhibit tables	-		

Component /	Fault	Monitor Strategy	Primary Malfunction		Threshold		Secondary		Enable		Time	MIL
System	Code	Description	Criteria		Logic and Valu	ie	Parameters		Conditions		Required	Illum.
Cylinder 1 Misfire Detected	P0301	Detects cylinder misfire. The minimum average angle acceleration is calculated every 2 rotations and represents the average angle acceleration that all cylinders are rotating at after a combustion event.	angular acceleration of the crankshaft	<	-1.40	sec^(2)	(				fail conditions exists for 0.02 s monitor runs with 0.02 s rate whenever	В
			and				Engine Running (see parameter definition)	=	TRUE	-	enable conditions are met	
			evaluated crankshaft revolutions with (a) number of crankshaft revolutions	>=	(a) * (b) 20.00	- counts	and engine speed and	>	476.00	rpm		
			per block and with (b) number of test blocks	=	20.00	counts	engine speed	<	1560.00	rpm		
					20.00	counto	, and  (a) - (b)  with	<	200.00	rpm		
							(a) actual desired idle speed	=	calculated parameter	-		
							(b) engine speed	=	measured parameter	-		
							and ( current injection quantity	>	12.00	mm^3/r		
							and current injection quantity	<	400.00	ev mm^3/r ev		
							) and engine coolant temperature and	>=	39.96	°C		
		Calculates angle acceleration after an					vehicle speed and	<=	1.86	mph		
		injection event for the cylinder under test and compares it to the minimum threshold										
							time since start and and	>=	10.00	sec		
							deletion of error memory (Mode\$4) not executed since last check of the monitoring conditions	=	TRUE	-		
							adaptation value for tooth wheel has been learned and	=	TRUE	-		
							number of detected misfires and	>	140.00	counts		

Component /	Fault	Monitor Strategy	Primary Malfunction	Threshold	Secondary		Enable		Time	MIL
System	Code	Description	Criteria	Logic and Value	Parameters		Conditions		Required	Illum.
					basic enable conditions met:	= :	see sheet enable tables	-		
					NO Pending or Confirmed DTCs:	=	see sheet inhibit tables	-		
Cylinder 2 Misfire Detected	P0302	Detects cylinder misfire. The minimum average angle acceleration is calculated every 2 rotations and represents the average angle acceleration that all cylinders are rotating at after a combustion event.	angular acceleration of the crankshaft and evaluated crankshaft revolutions with	< -1.40 sec^(2)	( Engine Running (see parameter definition) and engine speed and	=	TRUE 476.00	- rpm	fail conditions exists for 0.02 ms monitor runs with 0.02 s rate whenever enable conditions are met	В
			(a) humber of cranksnah revolutions per block and with (b) number of test blocks	= 20.00 counts	engine speed ) and	<	1560.00	rpm		
					((a) - (b)) with (a) actual desired idle speed	< =	200.00 calculated parameter	rpm -		
					and with (b) engine speed and	=	measured parameter	-		
					current injection quantity	>	12.00	mm^3/r ev		
					current injection quantity	<	400.00	mm^3/r ev		
					and engine coolant temperature and	>=	39.96	°C		
		Calculates angle acceleration after an injection event for the cylinder under test and compares it to the minimum threshold.			time since start	>=	1.86	mph		
1		I	I	1	and	I				

Component /	Fault Code	Monitor Strategy	Primary Malfunction	Threshold	Secondary Parameters		Enable		Time	MIL
- Oyotom	0000	Decomption	Uniona -		and deletion of error memory (Mode\$4) not executed since last check of the monitoring conditions	=	TRUE		Roquilou	
					and adaptation value for tooth wheel has been learned and	=	TRUE	-		
					number of detected misfires and	>	140.00	counts		
					basic enable conditions met:	=	see sheet enable tables	-		
					and NO Pending or Confirmed DTCs:	=	see sheet inhibit tables			
	_						_	_		
Cylinder 7 Misfire Detected	P0307	Detects cylinder misfire. The minimum average angle acceleration is calculated every 2 rotations and represents the average angle acceleration that all cylinders are rotating at after a combustion event.	angular acceleration of the crankshaft and evaluated crankshaft revolutions with (a) number of crankshaft revolutions per block and with (b) number of test blocks	< -1.40 sec^(2) >= (a)*(b) - = 20.00 counts = 20.00 counts	( Engine Running (see parameter definition) and engine speed and engine speed ) and [(a) - (b)] with (a) actual desired idle speed and with (b) engine speed and	= > < = =	TRUE 476.00 1560.00 200.00 calculated parameter measured parameter	- rpm rpm - -	fail conditions exists for 0.02 ms monitor runs with 0.02 s rate whenever enable conditions are met	В
					current injection quantity	>	12.00	mm^3/r ev		
					current injection quantity	<	400.00	mm^3/r ev		
					and engine coolant temperature and	>=	39.96	°C		
		I	l	I	vehicle speed	<=	1.86	mph		I

Component / System	Fault Code	Monitor Strategy Description	Primary Malfunction Criteria	L	Threshold ogic and Valu	ie	Secondary Parameters	Enable Conditions		Time Required	MIL Illum.
		Calculates angle acceleration after an injection event for the cylinder under test and compares it to the minimum threshold.					and time since start and deletion of error memory (Mode\$4) not executed since last check of the monitoring conditions and adaptation value for tooth wheel has been learned and number of detected misfires and basic enable conditions met: and NO Pending or Confirmed DTCs:	 10.00 TRUE TRUE 140.00 see sheet enable tables see sheet inhibit tables	sec - counts -		
								labics			
Cylinder 8 Misfire Detected	P0308	Detects cylinder misfire. The minimum average angle acceleration is calculated every 2 rotations and represents the average angle acceleration that all cylinders are rotating at after a combustion event.	angular acceleration of the crankshaft and evaluated crankshaft revolutions with (a) number of crankshaft revolutions per block and with (b) number of test blocks	< >= =	-1.40 (a) * (b) 20.00 20.00	sec^(2) - counts counts	( Engine Running (see parameter definition) and engine speed and ((a) - (b)] with (a) actual desired idle speed and with (b) engine speed and ( current injection quantity	TRUE 476.00 1560.00 200.00 calculated parameter measured parameter 12.00	- rpm rpm - - - mm^3/r	fail conditions exists for 0.02 ms monitor runs with 0.02 s rate whenever enable conditions are met	В

Component / System	Fault Code	Monitor Strategy Description	Primary Malfunction Criteria	Lo	Threshold ogic and Valu	e	Secondary Parameters		Enable Conditions		Time Required	MIL Illum.
							and current injection quantity	<	400.00	mm^3/r ev		
							) and engine coolant temperature and	>=	39.96	°C		
		Calculates angle acceleration after an injection event for the cylinder under test and compares it to the minimum threabeld					vehicle speed and	<=	1.86	mph		
		uniesnoia.					time since start and and	>=	10.00	sec		
							deletion of error memory (Mode\$4) not executed since last check of the monitoring conditions and	=	TRUE	-		
							adaptation value for tooth wheel has been learned and	=	TRUE	-		
							number of detected misfires and basis enable conditions mat	>	140.00	counts		
							and	=	tables	-		
							NO Pending or Confirmed DTCs:	=	see sheet inhibit tables	-		
Cylinder 4 Misfire Detected	P0304	Detects cylinder misfire. The minimum average angle acceleration is calculated every 2 rotations and represents the average angle acceleration that all cylinders are rotating at after a combustion event.	angular acceleration of the crankshaft	<	-1.40	sec^(2)	(				fail conditions exists for 0.02 ms monitor runs with 0.02 s rate whenever enable	В
			and		(a) * (b)		Engine Running (see parameter definition)	=	TRUE	-	conditions are met	
			with (a) number of crankshaft revolutions	=	(a) (b) 20.00	- counts	engine speed and	>	476.00	rpm		
			per block and with (b) number of test blocks	=	20.00	counts	engine speed )	<	1560.00	rpm		
							and  (a) - (b)  with	<	200.00	rpm		

Component / System	Fault Code	Monitor Strategy Description	Primary Malfunction Criteria	Lo	Threshold		Secondary Parameters		Enable Conditions		Time Required	MIL Illum.
							(a) actual desired idle speed	=	calculated parameter	-		
							(b) engine speed	=	measured parameter	-		
							and ( current injection quantity	>	12.00	mm^3/r		
							and current injection quantity	<	400.00	ev mm^3/r		
							) and			ev		
							engine coolant temperature and	>=	39.96	°C		
		Calculates angle acceleration after an injection event for the cylinder under test and					vehicle speed and	<=	1.86	mph		
		compares it to the minimum threshold.					time since start and	>=	10.00	sec		
							and deletion of error memory (Mode\$4) not executed since last check of the monitoring conditions	=	TRUE	-		
							and adaptation value for tooth wheel has been learned	=	TRUE	-		
							and number of detected misfires and	>	140.00	counts		
							basic enable conditions met:	=	see sheet enable tables	-		
							and NO Pending or Confirmed DTCs:	=	see sheet inhibit tables	-		
						-				-		
Cylinder 5 Misfire Detected	P0305	Detects cylinder misfire. The minimum average angle acceleration is calculated every 2 rotations and represents the average angle acceleration that all cylinders are rotating at after a combustion event.	angular acceleration of the crankshaft	<	-1.40	sec^(2)	(				fail conditions exists for 0.02 ms monitor runs with 0.02 s rate whenever enable	В
			and evaluated crankshaft revolutions	>=	(a) * (b)	-	Engine Running (see parameter definition) and	=	TRUE	-	conditions are met	

Component / System	Fault Code	Monitor Strategy	Primary Malfunction Criteria		Threshold		Secondary Parameters		Enable Conditions		Time Required	MIL
Component / System	Fault Code	Monitor Strategy Description	Primary Malfunction Criteria with (a) number of crankshaft revolutions per block and with (b) number of test blocks	=	Threshold Logic and Value 20.00 20.00	counts counts	Secondary Parameters engine speed and engine speed ) and [(a) - (b)] with (a) actual desired idle speed and with (b) engine speed and ( current injection quantity	> < < = _ >	Enable Conditions 476.00 1560.00 200.00 calculated parameter measured parameter 12.00	rpm rpm rpm - - mm^3/r	Time Required	MIL Illum.
		Calculates angle acceleration after an injection event for the cylinder under test and compares it to the minimum threshold.					and current injection quantity ) and engine coolant temperature and vehicle speed and	<	400.00 39.96 1.86	ev mm^3/r ev °C mph		
							and and deletion of error memory (Mode\$4) not executed since last check of the monitoring conditions and adaptation value for tooth wheel has been learned and number of detected misfires and basic enable conditions met: and NO Pending or Confirmed DTCs:	-	TRUE TRUE 140.00 see sheet enable tables see sheet inhibit tables	- counts -		

Component /	Fault	Monitor Strategy	Primary Malfunction		Threshold		Secondary		Enable		Time	MIL
System	Code	Description	Criteria		Logic and Valu	le	Parameters		Conditions		Required	Illum.
Cylinder 6 Misfire Detected	P0306	Detects cylinder misfire. The minimum average angle acceleration is calculated every 2 rotations and represents the average angle acceleration that all cylinders are rotating at after a combustion event.	angular acceleration of the crankshaft	<	-1.40	sec^(2)	(				fail conditions exists for 0.02 ms monitor runs with 0.02 s rate whenever	В
			and				Engine Running (see parameter definition)	=	TRUE	-	enable conditions are met	
			evaluated crankshaft revolutions with (a) number of crankshaft revolutions	>=	(a) * (b) 20.00	- counts	and engine speed and	>	476.00	rpm		
			per block and with (b) number of test blocks	=	20.00	counts	engine speed )	<	1560.00	rpm		
							and  (a) - (b)  with	<	200.00	rpm		
							(a) actual desired idle speed and with	=	calculated parameter	-		
							(b) engine speed and	=	measured parameter	-		
							( current injection quantity	>	12.00	mm^3/r ev		
							and current injection quantity	<	400.00	mm^3/r ev		
							) and engine coolant temperature and	>=	39.96	°C		
		Calculates angle acceleration after an injection event for the cylinder under test and compares it to the minimum					vehicle speed and	<=	1.86	mph		
		threshold.					time since start and and	>=	10.00	sec		
							deletion of error memory (Mode\$4) not executed since last check of the monitoring conditions and	=	TRUE	-		
							adaptation value for tooth wheel has been learned and	=	TRUE	-		
							number of detected misfires and	>	140.00	counts		

Component /	Fault	Monitor Strategy	Primary Malfunction	Th	hreshold		Secondary		Enable		Time	MIL
System	Code	Description	Criteria	Logi	c and value		basic enable conditions met: and NO Pending or Confirmed DTCs:	=	see sheet enable tables see sheet inhibit tables	-	Kequirea	illum.
Cylinder 3 Misfire Detected	P0303	Detects cylinder misfire. The minimum average angle acceleration is calculated every 2 rotations and represents the average angle acceleration that all cylinders are rotating at after a combustion event.	angular acceleration of the crankshaft and evaluated crankshaft revolutions with (a) number of crankshaft revolutions per block and with (b) number of test blocks	< >= (; =	-1.40 se a) * (b) 20.00 c 20.00 c	- ounts ounts	( Engine Running (see parameter definition) and engine speed and engine speed ) and [(a) - (b)] with (a) actual desired idle speed and with (b) engine speed and ( current injection quantity and current injection quantity ) and engine coolant temperature and vehicle speed and	= > < = = > < >= < = <	TRUE 476.00 1560.00 200.00 calculated parameter measured parameter 12.00 400.00 39.96 1.86	- rpm rpm - - mm^3/r ev mm^3/r ev mm^3/r	fail conditions exists for 0.02 ms monitor runs with 0.02 s rate whenever enable conditions are met	В
		cylinder under test and compares it to the minimum threshold.					time since start and and	>=	10.00	Sec		

Component / System	Fault Code	Monitor Strategy Description	Primary Malfunction Criteria	Le	Threshold	le	Secondary Parameters		Enable Conditions		Time Required	MIL Illum.
					<u>,</u>	-	deletion of error memory (Mode\$4) not executed since last check of the monitoring conditions and adaptation value for tooth wheel has been learned and number of detected misfires and basic enable conditions met: and NO Pending or Confirmed DTCs:	=	TRUE TRUE 140.00 see sheet enable tables see sheet inhibit tables	- counts -		
Crankshaft Position System Variation Not Learned	P0315	Wheel Learn - Fuel Balance System - Tooth Wheel Variation and Crankshaft Dynamics not learned quickly enough	fuel balance wheel learn complete	=	FALSE	-	fuel system is in fuel cut off and engine speed engine speed No Pending or Confirmed DTCs	= > <	TRUE 900 2750 see sheet inhibit tables	- rpm rpm -	fail conditions exists for 5000 s cumulative time, monitor runs with 1 s rate whenever enable conditions	В
Crankshaft Position [CKP] Sensor Circuit	P0335	Detects crankshaft sensor circuit failure by monitoring for valid signals from CKP sensor while CMP sensor is also sending valid signals	ECM has detected reference mark on the crankshaft and number of detected camshaft rotations	=	FALSE 6.00	counts	set condition ( ( engine speed and synchronization completed ) starter is active cranking ) and ( vehicle speed or vehicle speed and engine speed )	>= = > >=	400.00 TRUE TRUE 0 16 200.00	rpm - - mph mph rpm	fail conditions exists for more than 6 events monitor runs with 0.1 s rate whenever enable conditions are met	A

Component / System	Fault Code	Monitor Strategy Description	Primary Malfunction Criteria		Threshold Logic and Valu	e	Secondary Parameters		Enable Conditions		Time Required	MIL Illum.
					5		and not reset condition ( engine speed and starter is active cranking ) and basic enable conditions met:	< = =	200.00 FALSE see sheet enable tables	rpm - -		
Crankshaft Position Sensor Performance	P0336	Detects implausible crankshaft sensor operation by detecting incorrect crank sensor signal patterns.	number of disturbances in crankshaft signal crankshaft signal disturbance detected under the following conditions: Current tooth time period or Crankshaft tooth counts between detected gaps or If gap not expected, ratio of current tooth time to previous tooth time (see Look-Up- Table #18) or If gap expected, ratio of current tooth time to previous tooth time (see Look-Up- Table #17)	>=	10.00 1666667.00 68.00 1.5 to 2 3.375 to 8	counts us counts -	Engine Running (see parameter definition) and basic enable conditions met:	=	TRUE see sheet enable tables		fail conditions exists for 0.1 s monitor runs with 0.1 s rate whenever enable conditions are met	В
Camshaft Position [CMP] Sensor Circuit	P0340	Detects camshaft sensor circuit failure by monitoring for valid signals from CMP sensor while CKP sensor is also sending valid signals	number of crankshaft revolutions during missed camshaft signal	>=	4.00	counts	ECM has detected reference mark on the crankshaft and basic enable conditions met:	=	TRUE see sheet enable tables	-	fail conditions exists for 0.01 s test performed continuously 0.01 s rate	A

Component / System	Fault Code	Monitor Strategy Description	Primary Malfunction Criteria	Threshold Logic and Value	Secondary Parameters	Enable Conditions		Time Required	MIL Illum.
Camshaft Position [CMP] Sensor Performance	P0341	Detects implausible camshaft sensor operation by detecting incorrect cam sensor patterns	number of camshaft edges	> 4 counts	ECM has detected reference mark on the crankshaft and basic enable conditions met:	= TRUE = see sheet enable tables	-	fail conditions exists for more than 6 events test performed continuously 0.01 s rate	В
Wait to Start (WTS) Lamp Control Circuit	P0381	Diagnoses the Glow Lamp Circuit high side driver circuit for circuit faults.	Voltage low during driver on state (indicates short-to-ground)	<ul> <li>Short to ground: -</li> <li>≤ 0.5 Ω impedance between signal and controller ground</li> </ul>	lamp is commanded on and battery voltage for time and basic enable conditions met:	<ul> <li>TRUE</li> <li>11.00</li> <li>3.00</li> <li>see sheet enable tables</li> </ul>	- V sec	fail conditions exists for 3 s monitor runs with 0.01 s rate whenever enable conditions are met	В
			Voltage high during driver off state (indicates short to power )	<ul> <li>Short to power: -</li> <li>≤ 0.5 Ω</li> <li>impedance</li> <li>between signal</li> <li>and controller</li> <li>power</li> </ul>	lamp is commanded off and battery voltage for time and basic enable conditions met:	<ul> <li>TRUE</li> <li>&gt; 11.00</li> <li>&gt; 3.00</li> <li>see sheet enable tables</li> </ul>	- V sec	fail conditions exists for 0.5 S monitor runs with 0.01 s rate whenever enable conditions are met	

Component / System	Fault Code	Monitor Strategy Description	Primary Malfunction Criteria		Threshold Logic and Value	•	Secondary Parameters		Enable Conditions		Time Required	MIL Illum.
			Voltage high during driver off state (open circuit)	=	Open Circuit: ≥ 200 K Ω impedance between ECU pin and load signal and controller ground	-	circuit active at low current and battery voltage for time and basic enable conditions met:	= > >	TRUE 11.00 3.00 see sheet enable tables	- V sec	fail conditions exists for 0.1 s monitor runs with 0.01 s rate whenever enable conditions are met	
Exhaust Gas Recirculation(EGR ) Flow Excessive	P0400	Detects excessive EGR flow. Actual MAF readings are compared to desired MAF values as an indication of how much EGR is flowing.	controller deviation of the air mass = actual minus desired value (see Look-Up- Table #11)	>	1.6 to 2	g/rev	EGR controller is active and VGT offset learning is active and NO Pending or Confirmed DTCs: and basic enable conditions met:	-	TRUE FALSE see sheet inhibit tables see sheet enable tables	-	fail conditions exists for 15 s monitor runs 0.02 s rate whenever enable conditions are met	A
Exhaust Gas Recirculation(EGR ) Flow Insufficient	P0401	Detects insufficient EGR flow. Actual MAF readings are compared to desired MAF values as an indication of how much EGR is flowing.	controller deviation of the exhaust gas recirculation (EGR) - calculated out of desired and actual value with (a) Minimum Controller Deviation (see Look-Up-Table #12) (b) Environmental Pressure correction factor (see Look-Up-Table #8)	>	( a ) * ( b ) -1.2 to -0.56 0.71 to 1	g/rev factor	( EGR controller is active and change of injection quantity between actual and last received value for time and change of engine speed between actual and last received value for time	= < = < =	TRUE 40.00 0.25 50.00 0.50	(mm^3/r ev)/sec sec rpm/sec sec	fail conditions exists for 10 S monitor runs 0.02 s rate whenever enable conditions are met	В

Component / System	Fault Code	Monitor Strategy Description	Primary Malfunction Criteria		Threshold Logic and Valu	e	Secondary Parameters		Enable Conditions		Time Required	MIL Illum.
							and VGT offset learning is active	=	FALSE	-		
							maximum setpoint for air-mass flow (see Look-Up-Table #9) and	>	0.8 to 1.2	g/rev		
							Engine speed Engine speed	<= >=	950.00 500.00	rpm rpm		
							and Torque generating engine fuel injection quantity	<=	72.00	mm^3/r		
							Torque generating engine fuel injection quantity	>=	4.00	ev mm^3/r ev		
							setpoint valve position of exhaust-gas recirculation and	>	5.00	%		
							throttle position	<	5.00	%		
							basic enable conditions met:	=	see sheet enable tables	-		
							NO Pending or Confirmed DTCs:	=	see sheet inhibit tables	-		
							) for time	>=	5.00	sec		
Exhaust Gas Recirculation(EGR ) Flow Excessive	P0402	Detects excessive EGR flow. Actual MAF readings are compared to desired MAF values as an indication	controller deviation of the exhaust gas recirculation (EGR) - calculated out of desired and actual value	>	(a)*(b)		(				fail conditions exists for 7.5 s	В
		of how much EGR is									monitor runs	
		nowing.	with (a) Maximum Controller Deviation	=	0.4 to 0.6	g/rev	EGR controller is active and	=	TRUE	-	0.02 s rate whenever enable	
			(b) Environmental Pressure correction factor	=	1	factor	change of injection quantity between actual and last received value	<	40.00	(mm^3/r ev)/sec	are met	
							for time	=	0.25	sec		
							change of engine speed between actual and last received value	<	50.00	rpm/sec		
							for time and	=	0.50	sec		
							VGT offset learning is active	=	FALSE	-		
							maximum setpoint for EGR mass flow and	<	1.00	g/rev		
							Engine speed Engine speed and	<= >=	1400.00 1000.00	rpm rpm		

Component / System	Fault Code	Monitor Strategy Description	Primary Malfunction Criteria	Threshold	Secondary Parameters		Enable Conditions		Time Required	MIL Illum.
					Torque generating engine fuel injection quantity Torque generating engine fuel injection quantity and basic enable conditions met: and NO Pending or Confirmed DTCs: ) for time	<= >= = >=	200.00 50.00 see sheet enable tables see sheet inhibit tables 1.00	mm^3/r ev mm^3/r ev - sec		
Exhaust Gas Recirculation (EGR) Motor Control Circuit	P0403	Diagnoses the EGR Valve 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	EGR Solenoid Control Circuit and offset learning for EGR valve is completed and battery voltage for time and starter is active cranking for time and basic enable conditions met: and NO Pending or Confirmed DTCs:		ACTIVE TRUE 11.00 3.00 FALSE 3.00 see sheet enable tables see sheet inhibit tables	- V sec - sec -	fail conditions exists for 7 s monitor runs with 0.005 s rate enable conditions are met	В
			The ECM detects that the commanded state of the driver and the actual state of the control circuit do not match.		EGR Solenoid Control Circuit and battery voltage for	= >	ACTIVE	V	fail conditions exists for 3 s monitor runs with 0.005 s rate whenever enable	B

Component / System	Fault Code	Monitor Strategy Description	Primary Malfunction Criteria	L	Threshold ogic and Value		Secondary Parameters		Enable Conditions		Time Required	MIL Illum.
							time and starter is active cranking for time and basic enable conditions met: and NO Pending or Confirmed DTCs:	>	3.00 FALSE 3.00 see sheet enable tables see sheet inhibit tables	sec - sec -	conditions are met	
Exhaust Gas Recirculation(EGR ) Position Sensor Circuit Low Voltage	P0405	Detects low voltage readings on the EGR position circuit, indicating an OOR low condition on the EGR position circuit	raw voltage of EGR actuator position sensor same as EGR actuator position	<	0.25	V %	ignition on and basic enable conditions met: and NO Pending or Confirmed DTCs:	=	TRUE see sheet enable tables see sheet inhibit tables		fail conditions exists for 5 s test performed continuously 0.005 s rate	A
Exhaust Gas Recirculation(EGR ) Position Sensor Circuit High Voltage	P0406	Detects high voltage readings on the EGR position circuit, indicating an OOR high condition on the EGR position circuit	raw voltage of EGR actuator position sensor same as EGR actuator position	>	4.80	V %	ignition on and basic enable conditions met: and NO Pending or Confirmed DTCs:	=	TRUE see sheet enable tables see sheet inhibit tables	-	fail conditions exists for 5 s test performed continuously 0.005 s rate	A
Exhaust Gas Recirculation(EGR ) Temperature Sensor A Circuit Low Voltage	P040C	Detects low voltage readings on the EGR cooler temperature circuit, indicating an OOR low condition on the EGR cooler temperature 2 circuit	EGR temperature sensor 2 voltage same as	<	0.46	V	( time since engine start	>	0.00	Sec	fail conditions exists for 5 s monitor runs 0.05 s rate whenever enable conditions	В

Component / System	Fault Code	Monitor Strategy Description	Primary Malfunction Criteria		Threshold Logic and Value		Secondary Parameters		Enable Conditions		Time Required	MIL Illum.
			EGR sensor 2 temperature	>	220	°C	and engine coolant temperature	<	199.96	°C	are met	
							and ambient temperature	>	-60.04	°C		
							and ambient pressure and	>	20.00	kPa		
							setpoint valve position of exhaust-gas recirculation	>	-100.00	%		
							and setpoint valve position of exhaust-gas recirculation	<	200.00	%		
							and Engine Running (see parameter definition) and	=	TRUE	-		
							valve position of EGR cooler bypass and	>	-100.00	%		
							valve position of EGR cooler bypass and	<	200.00	%		
							basic enable conditions met:	=	see sheet enable tables	-		
							and NO Pending or Confirmed DTCs:	=	see sheet inhibit tables	-		
											<b>1</b> . 11	
Exhaust Gas Recirculation(EGR ) Temperature Sensor A Circuit High Voltage	P040D	Detects high voltage readings on the EGR temperature cooler circuit, indicating an OOR high condition on the EGR cooler temperature 2 circuit	EGR temperature sensor 2 voltage	>	4.84	V	(				fail conditions exists for 5 s monitor runs 0.05 s rate whenever enable	В
			same as EGR sensor 2 temperature	<	-50	°C	time since engine start and	>	0.00	sec	conditions are met	
							engine coolant temperature and	<	199.96	°C		
							ambient temperature and	>	-60.04	°C		
							ambient pressure and (	>	20.00	kPa		
							setpoint valve position of exhaust-gas recirculation	>	-100.00	%		
							setpoint valve position of exhaust-gas recirculation	<	200.00	%		
1							and	1			1	

Component / System	Fault Code	Monitor Strategy	Primary Malfunction Criteria		Threshold	<b>`</b>	Secondary Parameters		Enable		Time Required	MIL
						-	Engine Running (see parameter definition) and ( valve position of EGR cooler bypass and valve position of EGR cooler bypass	= > <	-100.00 200.00	- % %	rioquirou	
							and basic enable conditions met:	=	see sheet enable tables	-		
							and NO Pending or Confirmed DTCs:	=	see sheet inhibit tables	-		
Exhaust Gas Recirculation(EGR ) Temperature Sensor Correlation (EGR 1/ EGR 2)	P040F	Detects biased EGR temperature sensors by comparing the two EGR cooler temp sensor after an engine off soak time	Path 1:				minimum engine-off time	>=	28800.00	Sec	fail conditions exists for 0.1 s monitor runs	В
			(a) - (b)  (see Look-Up-Table #4)	>	100 to 999	°C	and				rate	
			with (a) captured EGR sensor 2	=	measured	-	ambient temperature and	>	-60.04	°C	whenever enable	
			and with		parameter		Engine Running (see parameter definition)	=	TRUE	-	are met	
			(b) captured EGR sensor 1 temperature at start	=	measured parameter	-	for		0.00			
			01				and	-	0.00	360		
			Path 2: (				engine post drive/ afterun and	=	FALSE	-		
			(a) - (b)  (see Look-Up-Table #4) with	<=	100 to 999	°C	diagnostic performed in current dc	=	FALSE	-		
			(a) captured EGR sensor 2 temperature at start and with	=	measured parameter	-	basic enable conditions met:	=	see sheet enable tables	-		
			(b) captured EGR sensor 1 temperature at start	=	measured parameter	-	NO Pending or Confirmed DTCs:	=	see sheet inhibit tables	-		
			(a) - (b) (see Look-Up-Table #7) with	>	20 to 999	°C						
			(a) captured EGR sensor 2 temperature at start and with	=	measured parameter	-						
			(b) captured EGR sensor 1 temperature at start and	=	measured parameter	-						
			status of block heater (see parameter definition) or	=	FALSE	-						

Component /	Fault	Monitor Strategy	Primary Malfunction		Threshold		Secondary		Enable		Time	MIL
Jystem	Code	Description	status of sun-load detection (see parameter definition) ) )	=	FALSE	-	r al ameters		Conditions		Kequireu	inum.
Exhaust Gas Recirculation(EGR ) Temperature Sensor B Circuit Low Voltage	P041C	Detects low voltage readings on the EGR cooler temperature circuit, indicating an OOR low condition on the EGR cooler temperature 1 circuit	voltage of EGR temperature sensor 1 same as EGR sensor 1 temperature	~ >	0.46	°C	( time since engine start and engine coolant temperature and ambient temperature and ambient pressure and ( setpoint valve position of exhaust-gas recirculation and setpoint valve position of exhaust-gas recirculation ) and Engine Running (see parameter definition) and ( valve position of EGR cooler bypass and valve position of EGR cooler bypass and valve position of EGR cooler bypass and basic enable conditions met:	~ ~ ~ ~ ~ = ~ ~ =	0.00 199.96 -60.04 20.00 -100.00 200.00 TRUE -100.00 200.00 see sheet enable tables	sec °C kPa % - % %	fail conditions exists for 5 s monitor runs 0.05 s rate whenever enable conditions are met	В
							and NO Pending or Confirmed DTCs:	=	see sheet inhibit			
Exhaust Gas Recirculation(EGR ) Temperature Sensor B Circuit High Voltage	P041D	Detects high voltage readings on the EGR cooler temperature circuit, indicating an OOR high condition on the EGR cooler temperature 1 circuit	voltage of EGR temperature sensor 1 same as	>	4.84	۷	( time since engine start	>	0.00	Sec	fail conditions exists for 5 s monitor runs 0.05 s rate whenever enable conditions are met	В
			l · · · ·				engine coolant temperature	<	199.96	°C		

Component / System	Fault Code	Monitor Strategy Description	Primary Malfunction Criteria	Threshold Logic and Value	Secondary Parameters		Enable Conditions		Time Required	MIL Illum.
					and ambient temperature	>	-60.04	°C		
					and ambient pressure and (	>	20.00	kPa		
					t setpoint valve position of exhaust-gas recirculation	>	-100.00	%		
					setpoint valve position of exhaust-gas recirculation	<	200.00	%		
					) and Engine Running (see parameter definition) and	=	TRUE	-		
					( valve position of EGR cooler bypass	>	-100.00	%		
					valve position of EGR cooler bypass	<	200.00	%		
					basic enable conditions met:	=	see sheet enable tables	-		
					NO Pending or Confirmed DTCs:	=	see sheet inhibit tables	-		
							_			
NMHC Catalyst Efficiency Below Threshold Bank 1	P0420	Detects insufficient conversion rate in oxidation catalyst. Actual conversion rate is compared to a conversion rate threshold as an indication of how much HC is converted in the oxidation catalyst.	Calculated HC conversion rate	< 0.20 -	( Modeled HC mass converted in the oxidation catalyst since monitor start and average HC mass flow and simulated heat quantity in oxidation catalyst and particulate filter regeneration and no reset condition for evaluation is active therefore (	N N I	115.00 0.00 0.00 TRUE	g g/s kJ	fail conditions exists for more than 0.1 seconds monitor runs once per driving cycle with 0.1 s rate whenever enable conditions are met	В

Component / System	Fault Code	Monitor Strategy Description	Primary Malfunction Criteria	Threshold Logic and Value	Secondary Parameters		Enable Conditions		Time Required	MIL Illum.
					regeneration was not aborted to assure that HC conversion was not disturbed and evaluation took place one time step before (to ensure P0420 has not already completed)	=	TRUE	-		
					) and there has been sufficient HC integrated in order to evaluate the monitor conversion efficiency. means ( act exercitien	=	TRUE	-		
					particulate filter regeneration and measured temperature upstream of the oxidation catalyst and	=	TRUE 249.96	- °C		
					( engine speed and	>	700.00	rpm		
					engine speed )	<	3400.00	rpm		
					and diagnostic performed in current dc and	=	FALSE	-		
					reset condition which becomes False under following conditions	=	FALSE	-		
					converted HC mass in the oxidation catalyst during monitoring or	<	115.00	g		
					particulate filter regeneration or regeneration was not aborted to assure that HC conversion was disturbed	=	FALSE	-		
					and NO Pending or Confirmed DTCs: )	=	see sheet inhibit tables	-		
					and basic enable conditions met:	=	see sheet enable tables			

Component / System	Fault Code	Monitor Strategy Description	Primary Malfunction Criteria		Threshold Logic and Value		Secondary Parameters		Enable Conditions		Time Required	MIL Illum.
Primary Fuel Sensor Performance	P0461	Detects an error in the primary fuel tank sensor performance by comparing the decrease of the fuel level for a certain driven mileage to a threshold.	(a) - (b)	>=	100.00	miles	Engine Running (see parameter definition)	=	TRUE	-	fail conditions exists for 0.02 s monitor runs 0.02 s rate	В
			with (a) total vehicle distance	=	measured parameter	-	for time	>=	60.00	sec	whenever enable conditions are met	
			(b) saved value of total vehicle distance at start of test	=	calculated parameter	-	External fuel pump control request from GM specific diagnosis tester commanded	=	FALSE	-		
			and (c) - (d) with	<	4.00	L	and fuel transfer pump active means (	=	FALSE	-		
			(c) maximum volume of fuel reached in primary tank during test	=	measured parameter	-	filtered fuel volume in primary tank	>=	1638.35	I		
			(c) minimum volume of fuel reached in primary tank during test	=	measured parameter	-	filtered fuel volume in secondary tank	<=	0.00	I		
							or cumulative transfer pump on time in current ignition cycle	>=	0.00	sec		
							or time between activations of transfer pump	<=	32767.00	sec		
							or fuel transfer pump installed ) and	=	FALSE	-		
							( fuel level zone 1 means	=	TRUE	-		
							( filtered fuel volume in primary tank and	>=	110.70	I		
							filtered fuel volume in secondary tank	>=	0.00	I		
							fuel level zone 3 means	=	TRUE	-		
							( filtered fuel volume in primary tank and	<	110.70	I		
							filtered fuel volume in secondary tank	>	0.00	Ι		
							fuel level zone 4 means	=	TRUE	-		
							( filtered fuel volume in primary tank and	<	110.70	I		

Component / System	Fault Code	Monitor Strategy Description	Primary Malfunction Criteria		Threshold	le	Secondary Parameters		Enable Conditions		Time Required	MIL Illum.
							filtered fuel volume in secondary tank ) or fuel level zone 5 means ( filtered fuel volume in primary tank and filtered fuel volume in secondary tank ) and basic enable conditions met: and NO Pending or Confirmed DTCs:	<= < < < < > > = = = = = = = = = = = = =	0.00 TRUE 110.70 0.00 see sheet enable tables see sheet inhibit tables	       -		
Fuel Level Sensor 1 Circuit Low	P0462	Detects low voltage readings in the fuel level sensor circuit, indicating an OOR low condition on the fuel level sensor circuit	voltage of fuel level sensor 1 same as fuel level	~	0.20	V	ignition on and basic enable conditions met:	=	TRUE see sheet enable tables	-	fail conditions exists for 24 s test performed continuously 0.1 s rate	В
Fuel Level Sensor 1 Circuit High	P0463	Detects high voltage readings in the fuel level sensor circuit, indicating an OOR high condition on the fuel level sensor circuit	voltage of fuel level sensor 1 same as fuel level	~	4.80 0	V	ignition on and basic enable conditions met:	=	TRUE see sheet enable tables	-	fail conditions exists for 24 s test performed continuously 0.1 s rate	В
Exhaust Gas Recirculation (EGR) Position Sensor Performance	P046C	Detects in range EGR valve position errors by comparing desired EGR position to actual EGR valve position	controller deviation of EGR valve calculated out of difference between desired and actual value or	>=	5.00	%	offset learning of EGR actuator active	=	FALSE	-	fail conditions exists for 8 s monitor runs with 0.02 s rate	B

Component / System	Fault Code	Monitor Strategy Description	Primary Malfunction Criteria		Threshold Logic and Value	Secondary Parameters		Enable Conditions		Time Required	MIL Illum.
			controller deviation of EGR valve calculated out of difference between desired and actual value	<=	<= -5.00 %	offset learning in the previous driving cycle was complete and Engine Running (see parameter	=	TRUE	-	whenever enable conditions are met	
						definition) and duty cycle of the Intake Air Heater output	<	5.00	%		
						and battery voltage and	>=	11.00	V		
						EGR Valve	=	ACTIVE	-		
						EGR Valve Jammed and NO Pending or Confirmed DTCs:	=	FALSE see sheet inhibit tables	-		
						and basic enable conditions met:		see sheet enable tables	-		
Cooling Fan Speed Output Circuit	P0480	Diagnoses the Cooling Fan low side driver circuit for circuit faults.	Voltage low during driver off state (indicates short-to-ground)	=	<ul> <li>Short to ground: -</li> <li>≤ 0.5 Ω</li> <li>impedance</li> <li>between signal</li> <li>and controller</li> <li>ground</li> </ul>	battery voltage	>	11.00	V	fail conditions exists for 3 s test performed continuously	В
			or Voltage low during driver off state (indicates open circuit)	=	= Open Circuit:≥ - 200 K Ω impedance between ECU pin and load	for time	>	3.00	sec	0.02 3 1010	
						and starter is active cranking for	=	FALSE	-		
						time and	>	3.00	sec		
						and basic enable conditions met:	=	IRUE see sheet enable tables	-		
						for time and ignition on and basic enable conditions met:	- > = =	3.00 TRUE see sheet enable tables	- sec - -		

Component / System	Fault Code	Monitor Strategy Description	Primary Malfunction Criteria		Threshold Logic and Value		Secondary Parameters		Enable Conditions		Time Required	MIL Illum.
		Diagnoses the Cooling Fan low side driver circuit for circuit faults.	Voltage high during driver on state (indicates short to power)	=	Short to power: $\leq 0.5 \Omega$ impedance between signal and controller power	-	battery voltage	>	11.00	V	fail conditions exists for 1 s test performed continuously 0.02 s rate	
							for time and	>	3.00	sec		
							starter is active cranking for	=	FALSE	-		
							and ignition on	>	TRUE	sec		
							and basic enable conditions met:	=	see sheet enable tables	-		
Cooling Fan System Performance	P0483	Detects inability to control fan speed to desired RPM	fan speed difference between actual and commanded value	<=	-500.00	rpm	PWM of fan driver output	>=	36.01	%	fail conditions exists for	В
			fan speed difference between actual and commanded value or	>=	500.00	rpm	and Commanded fan speed and	>=	0.00	rpm	monitor runs with 0.1 s rate	
			fan speed difference between actual and commanded value, unfiltered or fan speed difference between actual and	<=	-500.00 500.00	rpm rpm	( fan speed and	<	5320.00	rpm	whenever enable conditions are met	
			commanded value, unintered				fan speed )	>	400.00	rpm		
							and engine coolant temperature and	>	69.96	°C		
							fan drive speed rate of change and	<	2000.00	rpm		
							fan speed weight factor calculated out of ( (a) * (b) * (c) * (d)	>	0.59	factor		
							(a) factor based on input shaft stability (see Look-Up-Table #33) and with	=	0 to 1	factor		
							(b) factor based on intake air temperature (see Look-Up-Table #35)	=	0 to 1	factor		
							and with (c) factor based on engine coolant temperature (see Look-Up-Table #34)	=	0 to 1	factor		

Component / System	Fault Code	Monitor Strategy Description	Primary Malfunction Criteria	Threshold Logic and Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
					and with (d) factor based on fan drive speed (see Look-Up-Table #32)	= 0 to 1 factor		
					and basic enable conditions met:	= see sheet enable - tables		
Exhaust Gas Recirculation (EGR) Motor Control Circuit 1 Low Voltage	P0489	Diagnoses the EGR Valve low side driver circuit for circuit faults.	Voltage low during driver off state (indicates short-to-ground)	<ul> <li>Short to ground: - ≤ 0.5 Ω impedance between signal and controller ground</li> </ul>	EGR Solenoid Control Circuit and battery voltage for time and starter is active cranking for time and basic enable conditions met:	= ACTIVE - > 11.00 V > 3.00 sec = FALSE - > 3.00 sec see sheet enable tables	fail conditions exists for 3 s monitor runs with 0.005 s rate whenever enable conditions are met	В
Exhaust Gas Recirculation (EGR) Motor Control Circuit 1 High Voltage	P0490	Diagnoses the EGR Valve low side driver circuit for circuit faults.	Voltage high during driver on state (indicates short to power)	<ul> <li>Short to power: - ≤ 0.5 Ω impedance between signal and controller power</li> </ul>	EGR Solenoid Control Circuit and battery voltage for time and starter is active cranking for time and basic enable conditions met:	<ul> <li>ACTIVE -</li> <li>&gt; 11.00 V</li> <li>&gt; 3.00 sec</li> <li>= FALSE -</li> <li>&gt; 3.00 sec</li> <li>see sheet enable - tables</li> </ul>	fail conditions exists for 3 s monitor runs with 0.005 s rate whenever enable conditions are met	В

Component / System	Fault Code	Monitor Strategy Description	Primary Malfunction Criteria	Threshold Logic and Value		•	Secondary Parameters		Enable Conditions		Time Required	MIL Illum.
					_							_
Cooling Fan Speed High	P0495	Detects a locked fan. When fan speed control solenoid is off, the fan speed should follow accessory drive input speed plus some slip.	fan speed (see Look-Up-Table #36)	>	400 to 1500	rpm	fluid volume in Clutch (see Look-Up- Table #37)	<	0.005 to 0.0115	I	fail conditions exists for 0.02 s monitor runs with 0.1 s	В
			for Error counter	>=	800.00	counts	or Maximum allowed clutch pump out time when	>=	600 to 65534	sec	rate whenever enable conditions	
			equivalent to 80 sec				{ fan speed and	>	1500.00	rpm	are met	
							( PWM of fan driver output and	<=	36.00	%		
							Commanded fan speed ) and	<	600.00	rpm		
							ambient pressure and	>	55.00	kPa		
							intake air temperature and time since engine off	>	-40.04	°C		
							and (		0.00	000		
							engine speed (see Look-Up-Table #91) for	>	600 to 850	rpm		
							time ) }	>	0.00	sec		
							and basic enable conditions met:	=	see sheet enable tables	-		
Exhaust Gas	P049D	Detects adaptation values of	Path 1				offset learning is active	=	TRUE		fail	B
Recirculation (EGR) Control Position Not Learned	<u>עפויט ו</u>	EGR bypass that are not plausible. Compares the difference between the maximum and minimum adaptation values to a threshold.	1 au 1.					=	inde	-	conditions exists for 0.005 s monitor runs with 0.005 s rate	U
			(a) - (b)	>	30.00	%	active under following conditions				whenever	
			(a) maximum learned offset value for EGR valve	=	measured parameter	-	engine coolant temperature	>=	5.06	°C	enable conditions are met	
			and with (b) minimum learned offset value for EGR valve or	=	measured parameter	-	enu engine coolant temperature )	<=	123.06	°C		

Component /	Fault	Monitor Strategy	Primary Malfunction		Threshold		Secondary		Enable		Time	MIL
System	Code	Description	Criteria		Logic and Value	e	Parameters		Conditions		Required	Illum.
			Path 2: ( learned offset value for EGR valve in the present driving cycle	>	23.33	%	and ( battery voltage	>=	10.00	V		
			or learned offset value for EGR valve in the present driving cycle )	<	-23.33	%	and battery voltage )	<=	30.00	V		
							and EGR sweep has ended - no movement in EGR valve and	=	TRUE	-		
							engine post drive/ afterun and	=	TRUE	-		
							engine was running during last driving cycle means	=	TRUE	-		
							engine running during last driving cycle and	=	TRUE	-		
							NO Pending or Confirmed DTCs:	=	see sheet inhibit tables	-		
							basic enable conditions met:	=	see sheet enable tables	-		
					_	_						
		Detects a jammed EGR valve during opening or closing the valve.	Path 1:				Path 1:				fail conditions exists for	
			EGR valve stuck during opening means	=	TRUE	-	EGR valve is opening or	=	TRUE	-	0.005 s monitor runs	
			( (a) + (b) with	>=	20.01	%	Path 2: EGR valve is closing	=	TRUE	-	with 0.005 s rate	
			(a) position of EGR valve	=	measured parameter	-	engine post drive/ afterun	=	TRUE	-	enable conditions	
			(b) learned offset value of EGR valve in the previous driving cycle	=	measured parameter	-	offset learning active	=	TRUE	-	are met	
			or (a) - (c)	<=	0.01	%	basic enable conditions met:	=	see sheet enable tables	-		
			with (a) position of EGR valve	=	measured parameter	-						
			and with (c) position of EGR valve of previous process cycle )	=	measured parameter	-						
			for time or Path 2:	>	5.00	sec						
Component / System	Fault Code	Monitor Strategy Description	Primary Malfunction Criteria		Threshold Logic and Value		Secondary Parameters		Enable Conditions		Time Required	MIL Illum.
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			EGR valve stuck during closing means ( position of EGR valve with (a) reference position of the EGR valve in open position and with (b) factor for EGR valve close position or [(c) - (d)] with (c) position of EGR valve and with (d) position of EGR valve of previous process cycle ) for time	= = = = > = >	TRUE (a) * (b) measured parameter 0.50 0.02 measured parameter measured parameter 5.00	- - - % - sec						
Idle Speed Too Low	P0506	Detects an idle speed governor that is unable to achieve the desired idle speed and the idle speed is too low	engine speed with (a) minimum engine speed and with (b) minimum idle speed setpoint and with (c) factor for calculation of engine speed interval	<	maximum value of (a) <b>OR</b> (b - (b * c)) 300.00 calculated parameter 24.00	rpm - %	engine speed (see Look-Up-Table #91) and ( engine coolant temperature and engine coolant temperature ) and idle speed controller active and vehicle speed and no other torque demanding function active and setpoint torque of the speed controller and engine speed and basic enable conditions met: and NO Pending or Confirmed DTCs:	>= <	600 to 850 122.96 -7.04 TRUE 1.86 TRUE 0 300.00 see sheet enable tables see sheet inhibit	rpm °C °C - mph - NM rpm -	fail conditions exists for 20 S monitor runs with 0.1 s rate whenever enable conditions are met	В

Component / System	Fault Code	Monitor Strategy Description	Primary Malfunction Criteria		Threshold Logic and Value	•	Secondary Parameters		Enable Conditions		Time Required	MIL Illum.
					_	_			_	_		
Idle Speed Too High	P0507	Detects an idle speed governor that is unable to achieve the desired idle speed and the idle speed is	engine speed	>	minimum value of (a) <b>OR</b> (b + (b * c))		engine speed (see Look-Up-Table #91)	>=	600 to 850	rpm	fail conditions exists for 20 s	В
		too nign.	with (a) maximum engine speed and with (b) minimum idle speed setpoint and with (c) factor for calculation of engine speed interval	=	2500.00 calculated parameter 24.00	rpm - %	and ( engine coolant temperature and engine coolant temperature )	< ,	122.96 -7.04	℃ ℃	with 0.1 s rate whenever enable conditions are met	
							and idle speed controller active and	=	TRUE	-		
							vehicle speed and no other torque demanding function active	< =	1.86 TRUE	mph -		
							and setpoint torque of the speed controller and	>	0	NM		
							engine speed and	>	300.00	rpm		
							basic enable conditions met:	=	see sheet enable tables	-		
							and NO Pending or Confirmed DTCs:	=	see sheet inhibit tables	-		
Cooling Fan Speed Sensor Circuit	P0526	This diagnostic checks the circuit for electrical integrity during operation.	Path 1: period is too long to measure and (	>	0.21	sec	engine speed and { (	>	550.00	rpm	fail conditions exists for 3 s monitor runs with 0.020 s rate	В
			current state of the signal received from fan is low )	=	TRUE	-	PWM of fan driver output and	>=	36.00	%	whenever enable conditions	
			or				) for	/-	0.00	ipin	are met	
			Path 2: period is too long to measure and	>	0.21	sec	time or vehicle speed	>	30.00 203.65	sec mph		
			( current state of the signal received from fan is high	=	TRUE	-	for time	>	327.67	sec		
			)				} and					

Component / System	Fault Code	Monitor Strategy Description	Primary Malfunction Criteria		Threshold Logic and Value	9	Secondary Parameters		Enable Conditions		Time Required	MIL Illum.
							basic enable conditions met: and NO Pending or Confirmed DTCs:	=	see sheet enable tables see sheet inhibit tables	-		
Exhaust Gas Temperature (EGT) Sensor 1 Circuit Low Voltage	P0545	Detects low voltage readings on the EGT 1 circuit, indicating an OOR low condition on the EGT circuit	voltage of the temperature sensor upstream of oxidation catalyst same as temperature upstream of oxidation catalyst	<	0.65	∨ °C	NO Pending or Confirmed DTCs: for time and ignition on and basic enable conditions met:	-	see sheet inhibit tables 0.00 TRUE see sheet enable tables	- sec -	fail conditions exists for 3 s monitor runs 0.050 s rate whenever enable conditions are met	В
Exhaust Gas Temperature (EGT) Sensor 1 Circuit High Voltage	P0546	Detects high voltage readings on the EGT 1 circuit, indicating an OOR high condition on the EGT 1 circuit	voltage of the temperature sensor upstream of oxidation catalyst same as temperature upstream of oxidation catalyst	>	2.21	∨ °C	NO Pending or Confirmed DTCs: for time and ignition on and basic enable conditions met:	=	see sheet inhibit tables 0.00 TRUE see sheet enable tables	- sec -	fail conditions exists for 3 s monitor runs 0.050 s rate whenever enable conditions are met	В
Idle Control System - Fuel Quantity Lower Than Expected	P054E	Quantity Threshold - Fuel Quantity Lower Than Expected	( Current injection quantity	<	minimum expected injection quantity (map) factor for calculating the minimum threshold out of the reference map	mm^3/re v	( Current gear	=	unchanged		fail conditions exists for 15 s monitor runs 0.10 s rate whenever enable conditions are met	В

Component / System	Fault Code	Monitor Strategy Description	Primary Malfunction Criteria		Threshold Logic and Value	e	Secondary Parameters		Enable Conditions		Time Required	MIL Illum.
			with Current gear and	<>	Neutral	-	and Vehicle speed	<=	1.86	mph		
			(see Look-Up-Table #96)	=	44 to 148	mm^3/re v	Particulate filter regeneration	=	not active	-		
			and factor for calculating the minimum threshold out of the reference map	=	0.50	factor	and Engine speed	<=	1040.00	rpm		
			)				and Engine speed and	>=	476.00	rpm		
							Engine coolant temperature and	>	-20.04	°C		
							Idle speed controller all for time	= >	active 5.00	sec		
							and Fluctuation range of engine speed	<	16383.50	rpm		
							Basic enable conditions met	=	see sheet enable tables	-		
					_	_						_
Idle Control System - Fuel Quantity Higher	P054F	Quantity Threshold - Fuel Quantity Higher Than Expected	(				(				fail conditions exists for 15	В
Than Expected			Current injection quantity	<	maximum expected injection quantity (map) * factor for calculating the maximum threshold out of the reference map	mm^3/re v	Current gear	=	unchanged	-	s monitor runs 0.10 s rate whenever enable conditions are met	
			with Current gear and	<>	Neutral	-	and Vehicle speed and	<=	1.86	mph		
			maximum expected injection quantity (see Look-Up-Table #50)	=	126.8 to 230.8	mm^3/re v	Particulate filter regeneration	=	not active	-		
			factor for calculating the maximum threshold out of the reference map	=	1.50	factor	Engine speed	<=	1040.00	rpm		
			)				and Engine speed and	>=	476.00	rpm		
							Engine coolant temperature and	>	-20.04	°C		
							all for time	= >	active 5.00	sec		

Component / System	Fault Code	Monitor Strategy Description	Primary Malfunction Criteria	L	Threshold ogic and Value		Secondary Parameters		Enable Conditions		Time Required	MIL Illum.
					-		and Fluctuation range of engine speed and Basic enable conditions met	< =	16383.50 see sheet enable tables	rpm -		
Cruise Control Resume Switch Circuit	P0567	Resume switch state indicates problem with the circuit	Resume Switch CAN message in high / active state	=	TRUE	-	ignition on and input circuit active and basic enable conditions met and NO Pending or Confirmed DTCs:	=	TRUE TRUE see sheet enable tables see sheet inhibit tables	-	fail conditions exists for 90 s monitor runs with 0.005 s rate whenever enable conditions are met	Special C
Cruise Control Set Switch Circuit	P0568	Set switch state indicates problem with the circuit	Set Switch CAN message in high / active state	=	TRUE	-	ignition on and input circuit active and basic enable conditions met and NO Pending or Confirmed DTCs:	=	TRUE TRUE see sheet enable tables see sheet inhibit tables	-	fail conditions exists for 90 s monitor runs with 0.005 s rate whenever enable conditions are met	Special C
Cruise Control Input Circuit	P0575	Cruise control CAN communication monitoring	amount of errors in consecutive frames with number of consecutive frames	=	3.00 co 10.00 co	unts	ignition on and input circuit active and basic enable conditions met and NO Pending or Confirmed DTCs:	=	TRUE TRUE see sheet enable tables see sheet inhibit tables	-	fail conditions exists for 0.005 ms monitor runs with 0.005 s rate whenever enable conditions are met	Special C

Component / System	Fault Code	Monitor Strategy Description	Primary Malfunction Criteria		Threshold Logic and Value	÷	Secondary Parameters		Enable Conditions		Time Required	MIL Illum.
Brake Pedal Position Sensor "A" Circuit Range/Performanc e	P057B	Compare maximum delta of analog brake pedal sensor with a threshold	EWMA filtered test result based on the difference of  (a) - (b)  where	<=	0.40	factor	following conditions for time:	>	4 TRUE	sec	monitor runs 0.02 s rate whenever enable conditions are met	A
			<ul> <li>(a) maximum analog brake sensor raw</li> <li>voltage during test</li> <li>(b) minimum analog brake sensor raw</li> <li>voltage during test</li> </ul>	=	parameter measured parameter	v	and	=	TRUE	-		
			where difference of the brake sensor voltage corresponds to a corrected value of (see Look-Up-Table #14)	=	0 to 1	factor	starter is active cranking for	=	FALSE	-		
							time and batteny voltage	~ /	3.00	sec		
							for	>	3.00	sec		
							) and gear has been in Park during this driving cycle full test has not been completed this	=	TRUE	-		
							driving cycle gear selector currently not in Park	=	TRUE	-		
							vehicle speed accelerator pedal position 1	>= <	4.35 5.00	mph %		
							and No Pending or Confirmed DTCs:	=	see sheet inhibit tables	-		
							basic enable conditions met:	=	see sheet enable tables	-		
Brake Pedal Position Sensor - Circuit Low Voltage	P057C	Brake pedal voltage below threshold of a calibrated period of time	Brake pedal position sensor voltage	<	0.25	V	ignition on	=	TRUE	-	fail conditions exists for 0.5	A
i onago							and No Pending or Confirmed DTCs:	=	see sheet inhibit tables	-	monitor runs 0.01 s rate whenever	
							and basic enable conditions met:	=	see sheet enable tables	-	enable conditions are met	
						_				_		

Component / System	Fault Code	Monitor Strategy Description	Primary Malfunction Criteria		Threshold Logic and Value		Secondary Parameters		Enable Conditions		Time Required	MIL Illum.
Brake Pedal Position Sensor - Circuit High Voltage	P057D	Brake pedal voltage above threshold of a calibrated period of time	Brake pedal position sensor voltage	>	4.75	V	ignition on and No Pending or Confirmed DTCs: and basic enable conditions met:	-	TRUE see sheet inhibit tables see sheet enable tables	-	fail conditions exists for 0.5 S monitor runs 0.01 s rate whenever enable conditions are met	A
ROM Memory Fault	P0601	Detects a fault in the ROM memory	ECM detects multiple errors in the ROM- memory by comparing a calculated checksum with a check word	=	TRUE	-	engine post drive/ afterun	=	TRUE		fail conditions exists for 0.01 s test performed once per drive cycle during afterrun	A
Control Module Not Programmed	P0602	Detects if the ECM is programmed.	ECM not programmed	=	TRUE	-	ignition on and engine pre drive	=	TRUE		fail conditions exists for 0.01 s test performed test performed once per driving cycle during ECU initialization	A

Component /	Fault	Monitor Strategy	Primary Malfunction		Threshold		Secondary		Enable		Time	MIL
Control Module Internal Performance	P0606	Monitors and detects the improper operation of the ECM. This is accomplished by monitoring the output of various hardware modules within the ECM and by creating parallel redundant calculations of critical engine management system parameters.	SPI communication, data transfer lost	=	TRUE	-	ignition on and basic enable conditions met:	=	see sheet enable conditions	-	required fail conditions exists for 0.5 s test performed continuously with 0.01 s rate	A
			faults detected in the SPI communication IC internal	>	523.00	counts	ignition on and NO Pending or Confirmed DTCs:	=	TRUE see sheet inhibit tables	-	fail conditions exists for at least 0.64 s monitor runs once per trip during pre drive at least twice every 0.08s rate whenever enable	
			internal supply voltage or internal supply voltage	V N	4.2 5.25	V V	ignition on and counter of reactivation attempt of power output stage and NO Pending or Confirmed DTCs:	= >=	TRUE 2.00 see sheet inhibit tables	- counts -	fail conditions exists for 0.08s monitor runs once per trip during pre drive at least twice every 0.08s rate whenever	
			(a) - (b)  with (a) parallel redundant calculation of energizing time for fuel injection and with	>	50.00 measured parameter	us -	programmed energizing time for fuel injection has been read back means programmed energizing time for fuel injection and	= >=	TRUE 0	-	fail conditions exists for at least 0.05 s monitor runs with 0.01 s	

Component / System	Fault Code	Monitor Strategy Description	Primary Malfunction Criteria	L	Threshold ogic and Value	9	Secondary Parameters		Enable Conditions		Time Required	MIL Illum.
			(b) parallel redundant calculation of programmed energizing time for fuel injection	=	measured parameter	-	measured energizing time for fuel injection has been read back means measured energizing time for fuel injection	= >=	TRUE 0	-	rate whenever enable conditions are met	
							and engine speed and	>	1200.00	rpm		
							rail pressure and	>	20000.00	kPa		
							engine test active via diagnosis tester	=	FALSE	-		
			Path 1:		_		engine speed	>	1200.00	rpm	fail	
			( parallel redundant calculation of angle for pilot injection 1 quantity	<	-32.98	degrees	and engine test active via diagnosis tester	=	FALSE	-	exists for at least 0.05 s monitor runs	
			parallel redundant calculation of angle for pilot injection 1 quantity	>	102.99	degrees					vith 0.01 s rate whenever enable	
			or <b>Path 2:</b> (								conditions are met	
			parallel redundant calculation of angle for main injection quantity or	<	-32.98	degrees						
			parallel redundant calculation of angle for main injection quantity ) or	>	30.06	degrees						
			Path 3: ( parallel redundant colculation of angle for	_	260.00	dogroop						
			post injection quantity 1 or		-300.00	uegrees						
			parallel redundant calculation of angle for post injection quantity 1	>	-67.00	degrees						
			/ or Path 4: (									
			parallel redundant calculation of angle for post injection quantity 2 or	<	-83.00	degrees						
			parallel redundant calculation of angle for post injection quantity 2 )	>	30.06	degrees						
			or <b>Path 5:</b> /									
		l	н — — — — — — — — — — — — — — — — — — —				I				I I	

Component / System	Fault Code	Monitor Strategy Description	Primary Malfunction Criteria		Threshold Logic and Valu	e	Secondary Parameters		Enable Conditions		Time Required	MIL Illum.
			parallel redundant calculation of angle for post injection quantity 3 or parallel redundant calculation of angle for post injection quantity 3 )	~ >	-83.00 0.00	degrees degrees						
			( parallel redundant calculation of energizing times of the correction value for pilot injection quantity (see Look-Up- Table #56) or parallel redundant calculation of energizing times of the correction value for pilot injection quantity (see Look-Up- Table #55) }	<	-500 to -50 50 to 500	us us	redundant engine speed calculation and engine test active via diagnosis tester	=	1200.00 FALSE	rpm -	fail conditions exists for at least 0.2 s monitor runs with 0.04 s rate whenever enable conditions are met	
			parallel redundant calculation of post injection 2 quantity	>	130.00	mm^3	engine test active via diagnosis tester and change in injection operation mode requested	=	FALSE	-	fail conditions exists for at least 0.4 s monitor runs with 0.04 s rate whenever enable conditions are met	
			parallel redundant calculation of averaged torque creating energizing time per cylinder (see Look-Up-Table #58) and activation counter (intervention) of the surge damper	>=	200 to 6000 72.00	us counts	fuel system is in fuel cut off for time and redundant engine speed calculation and general engine speed demand (see parameter definition line #213) and	= > > =	TRUE 0.65 2040.00 FALSE	- sec rpm -	fail conditions exists for at least 0.8 s monitor runs with 0.04 s rate whenever enable conditions	

Component /	Fault	Monitor Strategy	Primary Malfunction		Threshold		Secondary Parameters		Enable		Time	MIL
System	Code	Description	Gitteria		Juc and value		external torque demand from stability ECU via CAN	=	FALSE	•	Kequireu	mum.
							and external torque demand from transmission ECU via CAN and	=	FALSE	-		
							(( cruise control active or	=	FALSE	-		
							brake pedal status	=	TRUE	-		
							redundant brake pedal status	=	TRUE	-		
							, for time )	>	0.28	sec		
							and (					
							pedal position or	=	0	%		
							redundant calculation of pedal position for time	= >	0 0.02	% sec		
							and (					
							redundant engine speed calculation after start detected	>	120.00	rpm		
							redundant engine speed calculation at start (see Look-Up-Table #57)	>	840 to 1080	rpm		
							) and engine test active via diagnosis tester	=	FALSE	-		
					5.00	10			1000.00		6 H	
			parallel redundant calculation of averaged wave correction quantity for pilot injection	>=	5.00	mm^3	redundant engine speed calculation	>=	1200.00	rpm	tail conditions exists for at	
			parallel redundant calculation of averaged wave correction quantity for main injection	>=	5.00	mm^3	engine test is active via diagnosis tester	=	FALSE	-	monitor runs with 0.04 s rate	
			or parallel redundant calculation of averaged wave correction quantity for post injection 2	>=	5.00	mm^3					whenever enable conditions are met	
			or parallel redundant calculation of averaged wave correction quantity for post injection 3	>=	5.00	mm^3						

Component / System	Fault Code	Monitor Strategy Description	Primary Malfunction Criteria		Threshold Logic and Value	•	Secondary Parameters		Enable Conditions		Time Required	MIL Illum.
			( substitute value of rail pressure or substitute value of rail pressure	<= ,=	16000.00 204000.00	kPa kPa	( parallel redundant calculation of voltage of rail pressure sensor or parallel redundant calculation of voltage of rail pressure sensor ) and delay time and parallel redundant calculation of injections active and redundant engine speed calculation and engine test active via diagnosis tester and level one signal range check detects fault	< > > = > = =	0.19 4.81 0.21 TRUE 1000.00 FALSE TRUE	V V sec - rpm -	fail conditions exists for 0.120 s monitor runs with 0.01 s rate whenever enable conditions are met	
			internal supply voltage or internal supply voltage	< >	4.2 5.25	V V	ignition on	=	TRUE	-	fail conditions exists for 0.05 s test performed continuously with 0.01 s rate	
			WDA (watch dog) shut off due to undervoltage means internal supply voltage	=	TRUE 4.2	- V	shut off path test active and battery voltage for time and WDA (watch dog) line active	= > >	FALSE 8.00 0.10 TRUE	- V sec	fail conditions exists for 0.01 s monitor runs with 0.01 s rate whenever enable conditions	
			WDA (watch dog) shut off due to overvoltage means	=	TRUE	-	shut off path test active and	=	FALSE	-	fail conditions exists for	

Component /	Fault	Monitor Strategy	Primary Malfunction		Threshold		Secondary		Enable	Time	MIL
System	Code	Description	Criteria internal supply voltage	>	Logic and Value 5.25	V	Parameters WDA (watch dog) line active	=	Conditions TRUE -	Required 0.01 s monitor runs with 0.01 s rate whenever enable conditions	Illum.
			WDA (watch dog) shut off due to internal security error	=	TRUE	-	shut off path test active and WDA (watch dog) line active	=	FALSE - TRUE -	fail conditions exists for 0.01 s monitor runs with 0.01 s rate whenever enable conditions	
			WDA (watch dog) shut off because of corrupt question-and-answer	=	TRUE	-	ignition on and WDA (watch dog) line active and shut off path test active	=	TRUE - FALSE -	fail conditions exists for 0.01 s monitor runs with 0.01 s rate whenever enable conditions are met	
			the actual response time from processor is not equal to the requested response- time	-	TRUE		ignition on and NO Pending or Confirmed DTCs:	-	TRUE - see sheet inhibit tables	fail conditions exists for more than 0.08 s monitor runs at least twice every 0.08 s rate whenever enable conditions	

Component / System	Fault Code	Monitor Strategy Description	Primary Malfunction Criteria		Threshold Logic and Value		Secondary Parameters		Enable Conditions		Time Required	MIL Illum.
			redundant, independent algorithm for plausibility fault of accelerator pedal signal for safety reasons:		Ū						tail conditions exists for	
			Path 1:				ignition on	=	TRUE	-	0.28 s monitor runs	1
			(maximum (a) (b)) - 2 * (maximum (c) (b))	>	0.29	V	and				rate whenever	1
			with (a) voltage accelerator pedal 1	=	measured	-	engine test active via diagnosis tester and	=	FALSE	-	enable	1
			and with (b) lower limit for accelerator pedal	=	0.80	V	Input signal fault present and	=	FALSE	-		1
			voltage and with (c) voltage accelerator pedal 2	=	measured	-	ADC fault present	=	FALSE	-		1
			and	1	parameter							1
			( voltage accelerator pedal 1	>	1.47	V						I
			or voltage accelerator pedal 2 )	>	1.47	V						1
			or <b>Path 2:</b>  (maximum (a) (b)) - 2 * (maximum (c)	>	0.41	V						l
			(b))  with (a) voltage accelerator pedal 1	=	measured	-						1
			and with		parameter	V						1
			voltage and with	_	0.00	v						I
			(c) voltage accelerator pedal 2	=	measured parameter	-						1
			( voltage accelerator pedal 1	<=	1.47	V						
			or voltage accelerator pedal 2	<=	1.47	V						1
			)									
			no response to an injection request	=	TRUE	•	ignition on	=	TRUE	•	fail	I
			processor internal				and		and about inhibit		exists for more than	I
							INC Periaing or Confirmed DTCs:	=	see sneet innibit tables	-	0.08 s monitor runs	I
											twice every 0.08 s rate	

Component / System	Fault Code	Monitor Strategy Description	Primary Malfunction Criteria	Threshold Logic and Value	Secondary Parameters	Enable Conditions	Time MIL Required Illum.
							enable
			no response to shut-off path test processor internal	= TRUE -	ignition on and NO Pending or Confirmed DTCs:	= TRUE - = see sheet inhibit - tables	fail conditions exists for more than 0.523 monitor runs at the 0.01 s rate whenever enable
			no response to hardware activation request processor internal	= TRUE -	ignition on and NO Pending or Confirmed DTCs:	= TRUE - = see sheet inhibit - tables	conditions exists for more than 0.437 monitor runs at least twice every 0.08 s rate whenever enable conditions
			no response from processor operative system processor internal	= TRUE -	ignition on and NO Pending or Confirmed DTCs:	= TRUE -	fail conditions exists for more than 0.08 s monitor runs at least twice every 0.08 s rate whenever enable conditions are met
			Path 1: repetitions of injection shut-off path test	>= 523.00 counts	ignition on and	= TRUE -	fail conditions exists for more than 0.64 s

Component / System	Fault Code	Monitor Strategy Description	Primary Malfunction Criteria		Threshold Logic and Valu	le	Secondary Parameters		Enable Conditions	Time Required	MIL Illum.
			or <b>Path 2:</b> ( number of a powerstage test too few and number of cylinders )	< >=	2.00 8.00	counts counts	injection shut-off path test	=	ACTIVE -	monitor runs at least twice every 0.08 s rate whenever enable conditions are met	
			prevention of the execution of the shut-off path test	=	TRUE	-	ignition on and injection shut-off path test	=	TRUE - ACTIVE -	fail conditions exists for 0.08 s monitor runs at least twice every 0.08 s rate whenever enable conditions are met	
			too few bytes received by monitoring module from CPU means bytes received by monitoring module from CPU as response	=	TRUE 4	- Bytes	ignition on	=	TRUE -	fail conditions exists for more than 0.4 s monitor runs at least twice every 0.08 s rate whenever enable conditions are met	
			ECM detects interruption in the SPI communication processor internal	=	TRUE		ignition on	=	TRUE -	fail conditions exists for more than 0.08 s monitor runs at least twice every 0.08 s rate whenever enable conditions are met	

Component / System	Fault Code	Monitor Strategy Description	Primary Malfunction Criteria	L	Threshold		Secondary Parameters		Enable Conditions		Time Required	MIL Illum.
			ECM detects plausibility error of the communication between controller and the monitoring module (2 processors in ECU) processor internal	=	TRUE	-	ignition on	Ξ	TRUE	-	fail conditions exists for more than 0.2 s monitor runs at least twice every 0.08 s rate whenever enable conditions are met	
			redundant filtered supply voltage to injector chip 1 or redundant filtered supply voltage to injector chip 1	~	3.10 3.51	V	ignition on and battery voltage and basic enable conditions met:	=	TRUE 8.00 see sheet enable tables	- V -	fail conditions exists for 0.5 s monitor runs with 0.01 s rate whenever enable conditions are met	
			redundant filtered supply voltage to injector chip 2 or redundant filtered supply voltage to injector chip 2	~	3.10	V	ignition on and battery voltage and basic enable conditions met:	=	TRUE 8.00 see sheet enable tables	- V -	fail conditions exists for 0.5 s monitor runs with 0.01 s rate whenever enable conditions are met	
			internal injector driver chip 1 error IC internal	=	TRUE	-	Engine Running and	=	TRUE	-	fail conditions	

Component /	Fault	Monitor Strategy	Primary Malfunction		Threshold		Secondary		Enable	Time	MIL
System	Code	Description	Criteria	1	ogic and Valu	e	Parameters		Conditions	Required	Illum.
							basic enable conditions met:	=	see sheet enable - tables	exists for more than 0.1 s monitor runs with 0.01 s rate whenever enable conditions are met	
			internal injector driver chip 2 error IC internal	=	TRUE	-	Engine Running and basic enable conditions met:	-	TRUE - see sheet enable - tables	fail conditions exists for more than 0.1 s monitor runs with 0.01 s rate whenever enable conditions are met	
			piezo injector actuator internal feedback voltage or piezo injector actuator internal feedback voltage	~	0.00	V	main injection	=	ACTIVE	fail conditions exists for more than 0.1 s monitor runs with 0.01 s rate whenever enable conditions	
			Path 1: engine speed or Path 2: engine speed	>	1500.00 1600.00	rpm	injection cut off demand from ECM internal monitoring	=	TRUE	fail conditions exists for 0.02 s test performed continuously with 0.02 s	

Component / System	Fault Code	Monitor Strategy Description	Primary Malfunction Criteria	Threshold Logic and Value	Secondary Parameters	Enable Conditions	Time MIL Required Illum
			security torque limitation request due to implausible air system control requests	= TRUE -	ignition on	= TRUE -	fail conditions exists for more than 533 events test performed continuously with 0.01 s
			security torque limitation request due to implausible rail pressure request	= TRUE -	ignition on	= TRUE -	fail conditions exists for more than 533 events test performed continuously with 0.01 s
			security torque limitation request due to implausible quantity setpoint control requests	= TRUE -	ignition on	= TRUE -	fail conditions exists for more than 533 events test performed continuously with 0.01 s
			indicated torque with (a) modeled inner engine torque and with (b) torque tolerance offset (see Look- Up-Table #54) and with (c) torque of engine speed controller and with (d) torque of surge damper control	<ul> <li>(a) + (b) + (c) + - (d)</li> <li>calculated - parameter</li> <li>11.71875 to %</li> <li>99.609375</li> <li>calculated - parameter</li> <li>calculated - parameter</li> <li>calculated - parameter</li> </ul>	Engine Running and basic enable conditions met:	= TRUE - = see sheet enable - tables	fail conditions exists for more than 0.28 s monitor runs with 0.04 s rate whenever enable conditions are met

Component / System	Fault Code	Monitor Strategy Description	Primary Malfunction Criteria		Threshold Logic and Value		Secondary Parameters		Enable Conditions		Time Required	MIL Illum.
			voltage of charging switch or voltage of charging switch if buffer of a bank is not charged completely, or not at	>	210.00	v	ECM is in startup before injections are released	Ξ	TRUE		fail conditions exists for more than 4 events monitor runs with 0.01 s rate whenever enable conditions are met	
			error at startup of DC/DC converter of one bank	=	TRUE	-	ignition on and DC/DC converter is in startup	=	TRUE TRUE	-	fail conditions exists for 0.01 ms monitor runs with 0.01 s rate whenever enable conditions	
			DC/DC converter cannot be switched off.	=	TRUE		ignition on	=	TRUE	-	are met	
Control Module Analog to Digital Performance	P060B	Electronic ECM circuitry determines if ADC is correctly converting signals within the correct time periods.	time for calibration of ADC	7	0.30	Sec	ignition on	=	TRUE		fail conditions exists for 0.01 s test performed continuously 0.01 s	A
			voltage at ADC test voltage input or voltage at ADC test voltage input	<	4.73	V V	ignition on	=	TRUE	-	fail conditions exists for at least 0.15 s	

Component / System	Fault Code	Monitor Strategy Description	Primary Malfunction Criteria		Threshold Logic and Value		Secondary Parameters		Enable Conditions		Time Required	MIL Illum.
											test performed continuously 0.01 s	
			(a) - (b)	,	0.15	V	ignition on	_	TRUE		fail	
			(a) - (b) with (a) voltage accelerator pedal signal 2 at internal ADC and with (b) voltage accelerator pedal signal 2	=	measured parameter measured	-	and ( counter for steady state detection of the internal AD converter means	>=	4.00	counts	conditions exists for at least 0.12 s monitor runs with 0.01 s rate whenever	
			at external ADC		parameter		(a) - (b)  with (a) voltage accelerator pedal signal 2	<=	0.06 measured	V -	enable conditions are met	
							at internal ADC and with (b) voltage of the accelerator pedal	=	parameter measured	-		
							signal 2 at the external ADC or		parameter			
							counter for steady state detection of the external AD converter means	>=	4.00	counts		
							(c) - (d) with	<=	0.06	V		
							(c) voltage accelerator pedal signal 2 at external ADC and with	=	measured parameter	-		
							(d) voltage of the accelerator pedal signal 2 at the internal ADC )	=	measured parameter	-		
			( ratio metric correction factor	<	0.62	-	ignition on	=	TRUE	-	fail conditions	
			or ratio metric correction factor )	>	0.74	-					exists for at least 0.15 s test performed continuously 0.01 s	
					_				_	_		

Component /	Fault	Monitor Strategy	Primary Malfunction		Threshold		Secondary		Enable		Time	MIL
System Internal Control Module Engine Speed (RPM) Performance	P061C	Monitors main and redundant engine speed calculations for agreement. Detects failure in engine speed calculation through redundant calculation algorithm.	I(a) - (b) with (a) redundant calculated engine speed and with (b) engine speed	=	calculated parameter measured parameter	rpm -	redundant calculated engine speed	=	600.00	rpm -	required fail conditions exists for more than 0.32 s monitor runs with 0.04 s rate whenever enable conditions are met	B
Fuel Pre-supply Pump Control Circuit Open	P0627	Diagnoses the Fuel Pre- Supply Pump low side driver circuit for circuit faults.	Voltage low during driver off state (indicates open circuit)	=	Open Circuit:2 200 K Ω impedance between ECU pin and load	-	engine post drive/ afterun for time and battery voltage for time and ( ignition on and basic enable conditions met: )		FALSE 1.00 11.00 3.00 TRUE see sheet enable tables	- V sec -	fail conditions exists for 1.99s monitor runs with 0.2 s rate whenever enable conditions are met	В
Fuel Pre-supply Pump Control Circuit Low Voltage	P0628	Diagnoses the Fuel Pre- Supply Pump 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	-	engine post drive/ afterun for time and battery voltage for	= ^ >	FALSE 1.00 11.00	- sec V	fail conditions exists for 1s monitor runs with 0.2 s rate whenever enable conditions are met	В

Component / System	Fault Code	Monitor Strategy Description	Primary Malfunction Criteria		Threshold Logic and Value	•	Secondary Parameters		Enable Conditions		Time Required	MIL Illum.
							time and ( ignition on and basic enable conditions met: )	∧	3.00 TRUE see sheet enable tables	sec - -		
Fuel Pre-supply Pump Control Circuit High Voltage	P0629	Diagnoses the Fuel Pre- Supply Pump 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	-	engine post drive/ afterun for time and battery voltage for time and ( ignition on and basic enable conditions met: )	=	FALSE 1.00 11.00 3.00 TRUE see sheet enable tables	- V sec -	fail conditions exists for 2 s monitor runs with 0.2 s rate whenever enable conditions are met	В
Control Module Long Term Memory Performance	P062F	Each data block of memory is read for a check sum error and flags if a fault is found.	EEPROM sector reports faults regarding: unable to erase or change whole EEPROM sector or read order is not successfully accomplished for more than amount of blocks or amount of write errors in current block	=	TRUE 3 3	- counts counts	ignition on and basic enable conditions met:	=	TRUE see sheet enable tables		fail conditions exists for 0.01 s test performed continuously at the 0.01 s rate	A

Component / System	Fault Code	Monitor Strategy Description	Primary Malfunction Criteria	Threshold Logic and Va	ue	Secondary Parameters		Enable Conditions		Time Required	MIL Illum.
5 Volt Reference 1 Circuit	P0641	Sensor supply voltage circuitry determines if faults related to maintaining the voltage level exist.	sensor supply voltage 1	<= 4.6	V	ignition on and basic enable conditions met:	=	TRUE see sheet enable tables	-	fail conditions exists for 0.1 s test performed continuously 0.01s rate	A
Malfunction Indicator Lamp (MIL) Control Circuit	P0650	Diagnoses the Malfunction Indicator Lamp (MIL) low side driver circuit for circuit faults.	Voltage low during driver off state (indicates short-to-ground)	<ul> <li>Short to groun</li> <li>≤ 0.5 Ω</li> <li>impedance</li> <li>between signa</li> <li>and controller</li> <li>ground</li> </ul>	d: - I	lamp is commanded on and ignition on and ( battery voltage for time and basic enable conditions met:	= > > =	TRUE TRUE 11.00 3.00 see sheet enable tables	- V sec	fail conditions exists for 3 s monitor runs with 0.01 s rate whenever enable conditions are met	A (no MIL)
			Voltage high during driver on state (indicates short to power)	<ul> <li>Short to power ≤ 0.5 Ω impedance between signa and controller power</li> </ul>	-	lamp is commanded off and ignition on and ( battery voltage for time and basic enable conditions met:	= > > =	TRUE TRUE 11.00 3.00 see sheet enable tables	- V sec	fail conditions exists for 2 s monitor runs with 0.01 s rate whenever enable conditions are met	

Component / System	Fault Code	Monitor Strategy Description	Primary Malfunction Criteria		Threshold Logic and Value	Secondary Parameters		Enable Conditions		Time Required	MIL Illum.
			Voltage low during driver off state (indicates open circuit)	=	Open Circuit:≥ - 200 K Ω impedance between ECU pin and load	circuit active at low current and ignition on and ( battery voltage for time and basic enable conditions met:	=	TRUE TRUE 11.00 3.00 see sheet enable tables	- V sec	fail conditions exists for 0.2 s monitor runs with 0.01 s rate whenever enable conditions are met	
5 Volt Reference 2 Circuit	P0651	Sensor supply voltage circuitry determines if faults related to maintaining the voltage level exist.	sensor supply voltage 2	<=	4.6 V	ignition on and basic enable conditions met:	-	TRUE see sheet enable tables	-	fail conditions exists for 0.1 s test performed continuously 0.01s rate	A
5 Volt Reference 3 Circuit	P0697	Sensor supply voltage circuitry determines if faults related to the voltage level present at the sensor supply voltage exist.	sensor supply voltage 3	<=	4.6 V	ignition on and basic enable conditions met:	=	TRUE see sheet enable tables	-	fail conditions exists for 0.1 s test performed continuously 0.01s rate	A
5 Volt Reference 4 Circuit	P06A3	Sensor supply voltage circuitry determines if faults related to the voltage level present at the sensor supply voltage exist.	sensor supply voltage 4	<=	4.6 V	ignition on	=	TRUE		fail conditions exists for 1.0 s test performed	В

Component / System	Fault Code	Monitor Strategy Description	Primary Malfunction Criteria	Threshold Logic and Value	Secondary Parameters	Enable Conditions		Time Required	MIL Illum.
					basic enable conditions met:	= see sheet enable tables	-	continuously 0.01s rate	
5 Volt Reference 5 Circuit	P06D2	Sensor supply voltage circuitry determines if faults related to the voltage level present at the sensor supply voltage exist.	sensor supply voltage 5	<= 4.6 V	ignition on and basic enable conditions met:	= TRUE = see sheet enable tables	-	fail conditions exists for 0.1 s test performed continuously 0.01s rate	В
Transmission Control Module (TCM) Requested MIL Illumination	P0700	Monitors Serial Data Communication for request from TCM to illuminate the MIL	Serial data communication from the TCM indicates the TCM has requested the MIL	= TRUE -	ignition on for time and new message is received via CAN and basic enable conditions met and NO Pending or Confirmed DTCs:	<ul> <li>TRUE</li> <li>0.25</li> <li>TRUE</li> <li>see sheet enable tables</li> <li>see sheet inhibit tables</li> </ul>	- sec - -	fail conditions exists for 1 s test performed continuously 0.5 s rate	A
Park/Neutral Position (PNP) Switch Circuit High Voltage	P0851	Detects high voltage condition on the PNP circuit by comparing the ECM sensed input to the broadcasted state from the TCM over GMLAN serial data	ECM (on-board control unit) sensed position based on PNP switch inputs to ECM indicates park or neutral and the GMLAN message from the TCM disagrees	= TRUE -	( battery voltage and battery voltage ) and engine speed and vehicle speed and	>= 11.00 <= 655.34 >= 650.00 >= 14.92	V V rpm mph	fail conditions exist for more than 3000 events monitor runs with 0.01 s rate whenever enable conditions are met	B

Component /	Fault Code	Monitor Strategy	Primary Malfunction	Threshold	Secondary Parameters		Enable		Time	MIL
					engine torque and accelerator pedal position and ( selected gear position is park or selected gear position is neutral ) and basic enable conditions: and NO Pending or Confirmed DTCs:	>= >= = =	120.00 0.00 FALSE FALSE see sheet enable tables see sheet inhibit tables	Nm % - - -		
Park/Neutral Position (PNP) Switch Circuit Low Voltage	P0852	Detects low voltage condition on the PNP circuit by comparing the ECM sensed input to the broadcasted state from the TCM over GMLAN serial data	GMLAN Message for PNP position indicates park neutral and disagrees with ECM (on-board control unit) sensed position based on PNP switch inputs to ECM	= TRUE -	( battery voltage and battery voltage ) and engine speed and ( selected gear position is park or selected gear position is neutral ) and basic enable conditions met: and NO Pending or Confirmed DTCs:	>= <= = =	11.00 655.34 7000.00 TRUE TRUE see sheet enable tables see sheet inhibit tables	V V rpm - -	fail conditions exist for more than 3000 events monitor runs with 0.01 s rate whenever enable conditions are met	В
Traction Control Input Signal	P0856	Detects a failure when a certain number of Traction Control System torque request messages within a defined message group checksum or rolling count values are incorrect	Error counter for Traction Control torque request message group	>= 8.00 counts	Traction Control Torque Request CAN Message Received and	=	TRUE	-	fault exists for 1 message group ; monitor runs whenever enable conditions	Special C

Component / System	Fault Code	Monitor Strategy Description	Primary Malfunction Criteria	Threshold	Secondary Parameters		Enable Conditions		Time Required	MIL Illum.
		2000, p. Con			no rolling count or protection errors on CAN Frame \$1C7 and ignition on and basic enable conditions met:	=	TRUE TRUE see sheet enable	-	are met.	
					and NO Pending or Confirmed DTCs:	=	tables see sheet inhibit tables	-		
Reductant Pump High Control Circuit Low Voltage	P1043	Diagnoses the Reductant Pump Motor high side driver circuit for circuit faults.	Voltage low during driver on state (indicates short to ground)	<ul> <li>Short to ground: - ≤ 0.5 Ω impedance between signal and controller ground</li> </ul>	engine pre drive for time and battery voltage	=	FALSE 1.00 11.00	- sec V	fail conditions exists for 3 s monitor runs with 0.01 sec rate whenever enable conditions are met	A
					for time and battery voltage for time and ( battery voltage correction factor and battery voltage correction factor ) for time battery voltage correction factor ) for time battery voltage correction factor ) for time battery voltage correction factor )		3.00 655.34 3.00 0.00 4.00 3.00 4.00 3.00 see sheet enable tables	sec V sec factor factor factor sec sec -		
Reductant Pump High Control Circuit High Voltage	P1044	Diagnoses the Ruductant Pump Motor high side driver circuit for circuit faults.	Voltage high during driver off state (indicates short to power )	<ul> <li>Short to power: -</li> <li>≤ 0.5 Ω</li> <li>impedance</li> <li>between signal</li> <li>and controller</li> <li>power</li> </ul>	engine pre drive for	=	FALSE	-	fail conditions exists for 3 s monitor runs with 0.01 sec rate whenever	В

Component / System	Fault Code	Monitor Strategy Description	Primary Malfunction Criteria	Threshold Logic and Value	Secondary Parameters		Enable Conditions		Time Required	MIL Illum.
					time and	>	1.00	Sec	enable conditions	
					battery voltage for	>	11.00	V	are met	
					time and battery voltage	>	3.00	sec		
					for time	>	3.00	sec		
					and (					
					battery voltage correction factor and	>	0.00	factor		
					battery voltage correction factor	<	4.00	factor		
					for time	>	3.00	sec		
					) for	<	4.00	Tactor		
					time and	>	3.00	sec		
					basic enable conditions met:	=	see sheet enable tables	-		
Reductant Purge Valve High Control Circuit High Voltage	P1046	Diagnoses the Reductant Purge Valve high side driver circuit for circuit faults.	Voltage high during driver off state (indicates short to power )	<ul> <li>Short to power: - ≤ 0.5 Ω impedance between signal and controller power</li> </ul>	engine pre drive for time and battery voltage for time and battery voltage correction factor and ( battery voltage correction factor and battery voltage correction factor ) for time battery voltage correction factor ) for time battery voltage correction factor ) for time		FALSE 1.00 111.00 3.00 655.34 3.00 0.00 4.00 3.00 4.00 3.00	- V sec V sec factor factor factor sec factor sec	fail conditions exists for 3 s monitor runs with 0.01 sec rate whenever enable conditions are met	В

Component / System	Fault Code	Monitor Strategy	Primary Malfunction Criteria		Threshold	Secondary Parameters		Enable		Time Required	MIL
- Oystom	0000	Becomption				and basic enable conditions met:	=	see sheet enable tables		Roganou	mann
Reductant Injector High Control Circuit Low Voltage	P1048	Diagnoses the Reductant Injector 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	engine pre drive for time and battery voltage for time and battery voltage for time and ( battery voltage correction factor and battery voltage correction factor ) for time battery contage correction factor ) for time		FALSE 1.00 11.00 3.00 655.34 3.00 0.00 4.00 3.00 4.00 3.00 see sheet enable tables	- V sec V sec factor factor factor sec factor -	fail conditions exists for 3 s monitor runs with 0.01 sec rate whenever enable conditions are met	A
Reductant Injector High Control Circuit High Voltage	P1049	Diagnoses the Reductant Injector 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	engine pre drive for time and battery voltage for time and battery voltage	= > > <	FALSE 1.00 11.00 3.00 655.34	sec V sec V	fail conditions exists for 3 s monitor runs with 0.01 sec rate whenever enable conditions are met	A

Component / System	Fault Code	Monitor Strategy Description	Primary Malfunction Criteria		Threshold Logic and Value		Secondary Parameters		Enable Conditions		Time Required	MIL Illum.
							for time and	>	3.00	sec		
							( battery voltage correction factor	>	0.00	factor		
							battery voltage correction factor	<	4.00	factor		
							for time battery voltage correction factor	> <	3.00 4.00	sec factor		
							) for time and	>	3.00	sec		
							basic enable conditions met:	=	see sheet enable tables	-		
Fuel Rail Pressure Performance	P1089	Measured rail pressure is checked against desired rail pressure to detect high rail pressure conditions in fuel	rail pressure deviation from setpoint calculated as the absolute value of difference between desired and actual value	>	5000.00	kPa	rail pressure control commanded during injection timing correction learning phase	=	TRUE	-	fail conditions exists for 720 crank	В
		cut-on					and NO Pending or Confirmed DTCs limiting	=	see sheet inhibit	-	monitor runs with 0.02 s	
							rail pressure set point for time and	>	tables 2.00	sec	rate whenever enable	
							basic enable conditions met:	=	see sheet enable tables	-	conditions are met	
Exhaust Aftertreatment Fuel Injector Control Circuit Shorted	P10CC	Diagnoses the Exhaust Aftertreatment Fuel Injector low side driver circuit for circuit faults.	Voltage high during driver on state (indicates short to power)	=	Short to power: $\leq 0.5 \Omega$ impedance between signal and controller power	-	engine pre drive	=	FALSE	-	fail conditions exists for more than 5 events monitor runs with 0.1 s	В
							for time	>	1.00	sec	rate whenever	
							battery voltage	>	11.00	V	enable conditions	
							time and	>	3.00	sec	are met	
							starter is active cranking for	=	FALSE	-		
							time and	>	3.00	sec		
							Diesel dosing valve: fuel injection and	=	ACTIVE	-		

Component /	Fault	Monitor Strategy	Primary Malfunction	Threshold	Secondary		Enable		Time	MIL
System	Code	Description	Criteria	 Logic and Value	Parameters		Conditions		Required	Illum.
					basic enable conditions met:	=	tables	-		
Exhaust Aftertreatment Fuel Injector High Control Circuit Low Voltage	P10CD	Electronic out-put driver circuitry determines circuit integrity on the diesel dosing valve control circuit.	The ECM detects that the commanded state of the driver and the actual state of the control circuit do not match.		engine pre drive for time and battery voltage for time and starter is active cranking for time and Diesel dosing valve: fuel injection and basic enable conditions met:		FALSE 1.00 11.00 3.00 FALSE 3.00 ACTIVE see sheet enable tables	- V sec - sec -	fail conditions exists for more than 30 events monitor runs with 0.1 s rate whenever enable conditions are met	В
Exhaust Aftertreatment Fuel Injector High Control Circuit High Voltage	P10CE	Diagnoses the Exhaust Aftertreatment Fuel Injector 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	engine pre drive for time and battery voltage for time and starter is active cranking for time and Diesel dosing valve: fuel injection and basic enable conditions met:		FALSE 1.00 11.00 3.00 FALSE 3.00 ACTIVE see sheet enable tables	- V sec - sec -	fail conditions exists for more than 30 events with 0.1 s rate whenever enable conditions are met	В

Component / System	Fault Code	Monitor Strategy Description	Primary Malfunction Criteria		Threshold Logic and Value		Secondary Parameters		Enable Conditions		Time Required	MIL Illum.
Charge Air Cooler Temperature Sensor Performance	P10CF	Detects a biased charge air cooler temperature sensor downstream or charge air cooler temperature sensor upstream by comparing the respective values at startup.	Path 1:				minimum engine-off time	>=	28800.00	Sec	fail conditions exists for 0.1 s monitor runs once per trip with 0.1 s rate	В
			<ul> <li>(a) - (b)  (see Look-Up-Table #3)</li> <li>with         <ul> <li>(a) captured charge air cooler</li> <li>downstream temperature at start</li> </ul> </li> </ul>	> =	100 to 999 measured parameter	°C -	and ambient temperature and	>	-60.04	°C	whenever enable conditions are met	
			and with (b) captured charge air cooler	=	measured		engine speed (see Look-Up-Table #91) for	>	600 to 850	rpm		
			upstream temperature at start		parameter		time and	>	0.00	sec		
			or Path 2: /				engine post drive/ afterun and diagnostic performed in current dc	=	FALSE	•		
			(a) - (b)  (see Look-Up-Table #3)	<=	100 to 999	°C	and	-	TALOL			
			with				basic enable conditions met:	=	see sheet enable tables	-		
			(a) captured charge air cooler downstream temperature at start and with	=	measured parameter	-	and NO Pending or Confirmed DTCs:	=	see sheet inhibit tables	-		
			(b) captured charge air cooler upstream temperature at start and	=	measured parameter	-						
			(a) - (b)  (see Look-Up-Table #6) with	>	35 to 999	°C						
			downstream temperature at start and with	=	parameter	-						
			(b) captured charge air cooler upstream temperature at start and	=	measured parameter	-						
			t status of block heater (see parameter definition)	=	FALSE	-						
			parameter definition)	=	FALSE	-						

Component /	Fault	Monitor Strategy	Primary Malfunction		Threshold		Secondary		Enable		Time	MIL
System Reductant Injector	P10D0	Description	Criteria	~	30 to 3276 7	°C	Parameters	-	TRUE		fail	B
Temperature - Exhaust Gas Temperature 2 Correlation	FIODO	dosing valve coil temperature by comparing the temperature with a reference temperature	[(a) - (b)] (see Look-op-Table #30)	2	30 10 3270.7	C	ignition on	=	TRUE	-	conditions exists for 0.1 s monitor with	В
			with				and				0.1 s rate	
			(a) dosing valve coil temperature	=	calculated parameter	°C	state of selective catalytic reduction system	=	STANDBY or NO PRESSURE CONTROL	-	enable conditions are met	
			(b) oxidation catalyst downstream temperature	=	measured parameter	°C	and active heating phase for dosing valve and	=	FALSE	-		
							valve already activated within this driving cycle and	=	FALSE	-		
							battery voltage and	>	11.00	V		
							ambient temperature and	>=	-60.04	°C		
							engine run time and	<	10.00	sec		
							engine off time and	>	28800.00	sec		
							urea pump motor output duty cycle	=	0.00	%		
							Max [(a), (b)] - Min [(a), (b)]	<=	7.00	°C		
							(a) ambient temperature	=	measured	-		
							(b) oxidation catalyst downstream temperature and	=	measured parameter	-		
							urea dosing valve output duty cycle and	>	3.00	%		
							coil current measurement is valid and	=	TRUE	-		
							basic enable conditions met: and	=	see sheet enable tables	-		
							NO Pending or Confirmed DTCs:	=	see sheet inhibit tables	-		
Fuel Temperature Sensor 1 Circuit High	P111F	Detects an error in the fuel pump temperature sensor performance by comparing	Path 1:				minimum engine-off time	>=	28800.00	sec	fail conditions exists for 0.2	В
		start-up temperatures between fuel pump temperature and fuel rail									s monitor runs once per trip	
		temperature	(a) - (b)  (see Look-Up-Table #41)	>	100 to 999	°C	and				with 0.2 s rate	

Component / System	Fault Code	Monitor Strategy Description	Primary Malfunction Criteria		Threshold Logic and Value		Secondary Parameters		Enable Conditions		Time Required	MIL Illum.
			where ( (a) captured fuel temperature 1 at start	=	measured	-	ambient temperature and	>	-60.04	°C	whenever enable conditions	
			and with		maggurad		engine speed (see Look-Up-Table #91)	>	600 to 850	rpm		
			start	=	parameter	-	time	>	0.00	sec		
			or Path 2:				and engine post drive/ afterun and	=	FALSE	-		
			(a) - (b)  (see Look-Up-Table #41) with	<=	100 to 999	°C	diagnostic performed in current dc and	=	FALSE	-		
			(a) captured fuel temperature 1 at start	=	measured parameter	-	basic enable conditions met:	=	see sheet enable tables	-		
			(b) captured fuel temperature 2 at start	=	measured parameter	-	NO Pending or Confirmed DTCs:	=	see sheet inhibit tables	-		
			and  (a) - (b)  (see Look-Up-Table #42) where	>	20 to 999	°C						
			(a) captured fuel temperature 1 at start and with	=	measured parameter	-						
			(b) captured fuel temperature 2 at start and	=	measured parameter	-						
			( status of block heater (see parameter definition)	=	FALSE	-						
HO2S Performance - Signal High During Moderate Load Bank 1 Sensor 1	P11A6	Compare the pressure compensated O2 concentration sensor signal with a threshold	Pressure compensated O2 concentration	>	(a) + (b)	factor	engine speed	<	2600.00	rpm	fail conditions exists for more than 2 event	В
			where				engine speed	>	1200	rpm	monitor runs with 0.1 s rate	

Component / System	Fault Code	Monitor Strategy Description	Primary Malfunction Criteria		Threshold Logic and Value		Secondary Parameters		Enable Conditions		Time Required	MIL Illum.	
			(a) Filtered calculated O2 concentration based on injection quantity, air mass and fuel density	=	Please see the general description for details of this calculated O2	factor	Inner combusted quantity	V	180.00	mm^3/r ev	whenever enable conditions are met		
			(b) Positive O2 concentration margin		calculated O2 concentration 0.05	factor	Inner combusted quantity Air mass per cylinder Air mass per cylinder Status of binary lambda signal valid for time oxidation catalyst upstream temperature oxidation catalyst upstream temperature integrated air mass since all other release conditions are fulfilled for O2 plausibility battery voltage Fuel volume in fuel tank Deceleration fuel cut-off Injection active calculated oxygen concentration calculated oxygen concentration calculated oxygen concentration (a) random start calculated Oxygen concentration (b) tolerance range of calculated Oxygen concentration for time Engine operation mode (Please see the definition) engine speed ambient temperature ambient temperature ambient pressure NO Pending or Confirmed DTCs: basic enable conditions met:	^ < ^ · · · · · · · · · · · · · · · · ·	108.00 4.20 2.20 TRUE 0.50 999.96 2.5 11.00 -1638.40 FALSE TRUE (a) + (b) (a) - (b) measure variable 0.02 0.10 normal operation 4500.00 600.00 122.96 -45.04 110.00 74.80 see sheet inhibit table see sheet enable tables	mm^3/r ev g/rev sec °C °C g V I - factor factor factor factor factor factor c c kPa kPa kPa -			
						_				_		_	
HO2S Performance - Signal Low During Moderate Load Bank 1 Sensor 1	P11A9	Compare the pressure compensated O2 concentration sensor signal with a threshold	Pressure compensated O2 concentration	<	(a) - (b)	factor	engine speed	< , ,	2600.00	rpm	fail conditions exists for more than 2 event monitor runs with 0.1 c	B	
							ongine opecu		1200	ipin	rate		
(a) Filtered calculated O2 concentration based on injection quantity, air mass and tuel density       =       Please see the general description for description for description for fine description for description for fine description for description for fine description for fine description for description for description for description for description for description for description for description for description for description for description for description for description for description for description for description for description for description for description for description for description for description for description for description for description for description for description for description for description for description for description for description for description for description for description for description for description for description for description for description for description for description for description for description for description for description for description for desc	Component / System	Fault Code	Monitor Strategy Description	Primary Malfunction Criteria		Threshold Logic and Value		Secondary Parameters		Enable Conditions		Time Required	MIL Illum.
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HO2S       P11AF       Compare the pressure contentration       Pressure compensated Q2 concentration       >       (a) + (b)       factor       Inner combusted quantity       >       108.00       mmm3/h         HO2S       P11AF       Compare the pressure concentration       Pressure compensated Q2 concentration       >       (a) + (b)       factor       Inner combusted quantity       >       108.00       mmm3/h         HO2S       P11AF       Compare the pressure concentration amore right of interposition       >       (a) + (b)       factor       interposition        2       2.00       mmm3/h         HO2S       P11AF       Compare the pressure concentration       Pressure compensated Q2 concentration       >       (a) + (b)       factor       ingine speed        2       200.00       mm       mmm3/h         HO2S       P11AF       Compare the pressure       Compare the pressure       >       (a) + (b)       factor       index of interposition        2       200.00       mmm       mmm       index of interposition        index of interpo				(a) Filtered calculated O2 concentration based on injection quantity, air mass and fuel density	=	Please see the general description for details of this calculated O2	factor	Inner combusted quantity	V	180.00	mm^3/r ev	whenever enable conditions are met	
HO2S P11AF Compare the pressure compensated O2 concentration performance - Signal High During Moderate Load Moderate Load Rank 1 Sensor 2				(b) Positive O2 concentration margin	=	0.05	factor	Inner combusted quantity Air mass per cylinder Air mass per cylinder Status of binary lambda signal valid for time oxidation catalyst upstream temperature oxidation catalyst upstream temperature integrated air mass since all other release conditions are fulfilled for O2 plausibility battery voltage Fuel volume in fuel tank Deceleration fuel cut-off Injection active calculated oxygen concentration calculated oxygen concentration (a) random start calculated Oxygen concentration (b) tolerance range of calculated Oxygen concentration for time Engine operation mode (Please see the definition) engine speed engine speed ambient temperature ambient pressure NO Pending or Confirmed DTCs: basic enable conditions met:	א עאואע א איזון או או אאעאעא א	108.00 4.20 2.20 TRUE 0.50 999.96 2.5 11.00 -1638.40 FALSE TRUE (a) + (b) (a) - (b) measure variable 0.02 0.10 normal operation 4500.00 600.00 122.96 -45.04 110.00 74.80 see sheet inhibit table see sheet enable tables	mm^3/r ev g/rev g/rev - sec °C g V I - factor factor factor factor factor factor c c kPa kPa - -		
where lengine speed > 1200 rpm with 0 1s	HO2S Performance - Signal High During Moderate Load Bank 1 Sensor 2	P11AF	Compare the pressure compensated O2 concentration sensor signal with a threshold	Pressure compensated O2 concentration	>	(a) + (b)	factor	engine speed	<	2600.00	rpm	fail conditions exists for more than 2 event monitor runs with 0.1 s	В

Component / System	Fault Code	Monitor Strategy Description	Primary Malfunction Criteria		Threshold Logic and Value		Secondary Parameters		Enable Conditions		Time Required	MIL Illum.
			(a) Filtered calculated O2 concentration based on injection quantity, air mass and fuel density	=	Please see the general description for details of this calculated O2	factor	Inner combusted quantity	<	180.00	mm^3/r ev	whenever enable conditions are met	
			(b) Positive O2 concentration margin	=	calculated O2 concentration 0.05	factor	Inner combusted quantity Air mass per cylinder Air mass per cylinder Status of binary lambda signal valid for time SCR downstream temperature SCR downstream temperature integrated air mass since all other release conditions are fulfilled for O2 plausibility battery voltage Fuel volume in fuel tank Deceleration fuel cut-off Injection active calculated oxygen concentration calculated oxygen concentration (a) random start calculated Oxygen concentration (b) tolerance range of calculated Oxygen concentration for time Engine operation mode (Please see the definition) engine speed engine speed ambient temperature ambient pressure ambient pressure ambient pressure ambient pressure ambient pressure ambient pressure ambient conditions met:	א עאזאעא אאוון או או אאעאעע איזעע א	108.00 4.20 2.20 TRUE 0.50 999.96 2.5 11.00 -1638.40 FALSE TRUE (a) + (b) (a) - (b) measured parameter 0.02 0.10 normal operation 4500.00 600.00 122.96 -45.04 110.00 74.80 see sheet inhibit table see sheet enable tables	mm^3/r ev g/rev sec °C °C g V I - factor factor factor - factor sec - rpm rpm °C °C kPa kPa -		
HO2S Performance - Signal Low During Moderate Load Bank 1 Sensor 2	P11B2	Compare the pressure compensated O2 concentration sensor signal with a threshold	Pressure compensated O2 concentration where	<	(a) - (b)	factor	engine speed engine speed	۲ ۸	2600.00 1200	rpm	fail conditions exists for more than 2 event monitor runs with 0.1 s	В

Component / System	Fault Code	Monitor Strategy Description	Primary Malfunction Criteria		Threshold Logic and Value		Secondary Parameters		Enable Conditions		Time Required	MIL Illum.
			(a) Filtered calculated O2 concentration based on injection quantity, air mass and fuel density	=	Please see the general description for details of this calculated O2	factor	Inner combusted quantity	V	180.00	mm^3/r ev	whenever enable conditions are met	
			(b) Positive O2 concentration margin	=	calculated O2 concentration 0.05	factor	Inner combusted quantity Air mass per cylinder Air mass per cylinder Status of binary lambda signal valid for time SCR downstream temperature SCR downstream temperature integrated air mass since all other release conditions are fulfilled for O2 plausibility battery voltage Fuel volume in fuel tank Deceleration fuel cut-off Injection active calculated oxygen concentration calculated oxygen concentration calculated oxygen concentration (a) random start calculated Oxygen concentration (b) tolerance range of calculated Oxygen concentration for time Engine operation mode (Please see the definition) engine speed engine speed ambient temperature ambient temperature ambient pressure ambient pressure	א אוזאאא איז איזער איזער א	108.00 4.20 2.20 TRUE 0.50 999.96 99.96 2.5 11.00 -1638.40 FALSE TRUE (a) + (b) (a) - (b) measured parameter 0.02 0.10 normal operation 4500.00 600.00 122.96 -45.04 110.00 74.80	mm^3/r ev g/rev g/rev sec °C °C g V I - factor factor factor factor sec - rpm rpm °C °C kPa kPa		
							NO Pending or Confirmed DTCs: basic enable conditions met:	=	see sheet inhibit table see sheet enable tables	-		
HO2S Current Performance Bank 1 Sensor 1	P11B4	Compares the ratio of valid lambda signal time to total time with a threshold	ratio of valid lambda signal time to total time: (a) / (b) where (a) time for which valid lambda signal received over CAN	<	0.1 measured parameter	ratio	NOx sensor's heater temperature has reached the set point for time Enabling Upstream NOx sensor heater diagnosis (please see the definition)	= > =	2.00 TRUE	- sec -	fail conditions exists for more than 60 sec monitor runs with 0.02 s	В
			(b) total time for which diagnosis is enabled	=	calculated parameter	-	Reciprocal lambda change :   (a) - (b)   (see Look-Up-Table #49) where (a) Reciprocal lambda	<=	0.1 to 10 measured parameter	factor	rate whenever enable conditions are met	

Component /	Fault	Monitor Strategy	Primary Malfunction	Threshold	Secondary	Enable	Time Required	MIL
Ujstem	oode	Description	Unterta		(b) Filtered reciprocal lambda for time NO Pending or Confirmed DTCs: not disabled during following conditions	= calculated - parameter > 5.00 sec = see sheet - inhibit tables = see sheet enable - tables	required	muni.
HO2S Current Performance Bank 1 Sensor 2	P11B5	Compares the ratio of valid lambda signal time to total time with a threshold	ratio of valid lambda signal time to total time: (a) / (b) where (a) time for which valid lambda signal received over CAN (b) total time for which diagnosis is enabled	< 0.1 ratio = measured - parameter = calculated - parameter	NOx sensor's heater temperature has reached the set point for time Enabling Downstream NOx sensor heater diagnosis (please see the definition) Reciprocal lambda change :   (a) - (b)   (see Look-Up-Table #49) where (a) Reciprocal lambda (b) Filtered reciprocal lambda for time NO Pending or Confirmed DTCs: not disabled during following conditions	<ul> <li>TRUE -</li> <li>120.00 sec</li> <li>TRUE -</li> <li>TRUE -</li> <li>0.1 to 10 factor</li> <li>measured - parameter</li> <li>calculated - parameter</li> <li>5.00 sec</li> <li>see sheet - inhibit tables</li> <li>see sheet enable tables</li> </ul>	fail conditions exists for more than 60 sec monitor runs with 0.02 s rate whenever enable conditions are met	В
NOx Sensor Performance - Signal High Bank 1 Sensor 1	P11CB	Detects a high deviation of the measured NOx sensor concentration from the modeled Nox concentration	Filtered NOx concentration deviation from model	> 0.70 -	Status of NOx signal of upstream NOx sensor (please see the definition) Normal Mode (Particulate Filter Regeneration not active) for time ambient pressure ambient pressure ambient temperature ambient temperature (( filtered modeled Nox concentration percent positive deviation filtered modeled Nox concentration percent negative deviation ) )) for time time since start Engine Coolant Temperature	= TRUE - = TRUE - >= 15.00 sec >= 75.00 kPa <= 106.00 kPa <= 106.00 kPa >= -7.04 °C <= 37.96 °C <= 0.050048828125 % >= 0.050048828125 % >= 0.050048828125 % >= 0.050048828125 %	fault exists for more than 1 event; monitor runs at 0.1 s once per trip	В

Component /	Fault	Monitor Strategy	Primary Malfunction	Threshold	Secondary		Enable		Time	MIL
System	Code	Description	Criteria	Logic and Value	Parameters		Conditions		Required	Illum.
					Engine Coolant Temperature	<=	104.96	°C		
					Exhaust gas temperature range at	>0	0 to 1	factor		
					Upstream Nox sensor (see Look-Up-					
					Table #81)					
					Fuel Injection pattern (see Look-Up-	=	0 to 58	pattern		
					Table #82)					
							24 = pilot 1 main			
							56 = pilot 2, pilot			
							1, main			
							58 = pilot 2, pilot			
							1, main, post 2			
							26 = pilot 1 main,			
							post 2			
							0 = all off			
							(overrun)			
					Ratio of transient factor	>	0.95	factor		
					for time	>	0.50	sec		
					Vehicle speed	>=	37.29	mph		
					for time	>	1.00	sec		
					relative humidity	<=	100.00	%		
					relative humidity	>=	0.00	%		
					Enable range for the plausibility check of	≠0	0 to 1	factor		
					Upstream Nox sensor (see Look-Up-					
					Table #74)					
					for time	>	0.00	sec		
					Air mass per cylinder	>=	0.00	g/rev		
					Air mass per cylinder	<=	6.00	g/rev		
					for time	>	5.00	sec		
					actual valve position of exhaust-gas	>=	0.00	%		
					recirculation					
					actual valve position of exhaust-gas	<=	100.00	%		
					recirculation					
					for time	>	0.50	sec		
					filtered modeled NOx-concentration	>=	0.00	ppm		
					upstream of the SCR					
					filtered modeled NOx-concentration	<=	1650.00	ppm		
					upstream of the SCR					
					for time	>	0.50	sec		
					Diagnostic has not completed this driving	=	FALSE	-		
					NO Penaing or Contirmed DTCs	=	see sneet inhibit	-		
							tables			
					basic enable conditions met:	=	see sheet enable	-		
							tables			
NOx Sensor	P11CC	Detects a high deviation of	Filtered NOx concentration deviation	< (a) * (b) -	Status of NOx signal of upstream NOx	=	TRUE	-	fault exists	В
Performance -		the measured NOx sensor	from model		sensor (please see the definition)				for more	
Signal Low Bank 1		concentration from the							than 1 event;	
Sensor 1		modeled Nox concentration							monitor runs	
									at 0.1 s once	

Component / System	Fault Code	Monitor Strategy Description	Primary Malfunction Criteria		Threshold Logic and Value		Secondary Parameters		Enable Conditions		Time Required	MIL Illum.
			(a) Table for the base value of the lower	=	-1 to -0.46	-	Normal Mode (Particulate Filter	=	TRUE	-	per trip	
			plausibility limit (see Look-Up-Table #80)				Regeneration not active)					
			(b) Factor correction based on Environmental Pressure	=	1	factor	for time		15.00	sec		
							ambient pressure	>=	75.00	kPa		
							ambient pressure	<=	106.00	kPa		
							ambient temperature	>=	-7.04	°C		
							ambient temperature	<=	37.96	°C		
							filtered modeled Nox concentration	<=	0.05	factor		
							filtered modeled Nox concentration percent negative deviation	>=	0.05	factor		
							))					
							for time	>	2.00	sec		
							time since start	>	30.00	sec		
							Engine Coolant Temperature	>=	68.96	°C		
							Engine Coolant Temperature	<=	104.96 0 to 1	factor		
							Upstream Nox sensor (see Look-Up-	20	0101	lacioi		
							Table #81) Fuel Injection pattern (see Look-Up-	=	0 to 58	pattern		
							Table #82)		24 = pilot 1 main			
									56 = pilot 2, pilot			
									1, main			
									58 = pilot 2, pilot 2			
									26 - nilot 1 main			
									post 2			
									0 = all off			
									(overrun)			
							Ratio of transient factor	>	0.95	factor		
							for time	>	0.50	sec		
							Vehicle speed	>=	37.29	mph		
							for time	>	1.00	sec		
							relative humidity	<=	100.00	%		
								/-	0.00	70		
							Enable range for the plausibility check of Upstream Nox sensor (see Look-Up- Table #75)	≠0	0 to 1	factor		
							for time	>	0.00	sec		
							Air mass per cylinder	>=	0.00	g/rev		
							Air mass per cylinder	<=	6.00	g/rev		
							for time	>	5.00	sec		
							actual valve position of exhaust-gas recirculation	>=	0.00	%		
							actual valve position of exhaust-gas recirculation	<=	100.00	%		
							for time	>	0.50	sec		
							filtered modeled NOx-concentration upstream of the SCR	>=	0.00	ppm		

Component / System	Fault Code	Monitor Strategy	Primary Malfunction	Threshold	Secondary Parameters		Enable Conditions		Time Required	MIL
					filtered modeled NOx-concentration upstream of the SCR for time Diagnostic has not completed this driving cycle NO Pending or Confirmed DTCs basic enable conditions:	<= >	1650.00 0.50 FALSE see sheet inhibit tables see sheet enable tables	ppm sec - -		
Nox Sensor Current Performance Bank 1 Sensor 1	P11DB	Detects a failure of the feedback performance of upstream NoX sensor	Ratio of valid to invalid upstream Nox sensor status time count	> 0.90 -	Sufficient number of valid and invalid NOx status time (sum of valid and invalid Nox status for diagnostic determination) and Engine Running (see parameter definition) for time (required for the NOx sensor to give valid response) and Upstream NoX sensor detects a lean A/F mixture and Valid NOx signal from CAN is received (no Nox sensor communication failures) or following conditions for time: battery voltage battery voltage SCR upstream temperature SCR upstream temperature Engine Running (see parameter definition) for time (required for the NOx sensor to give valid response) and Lambda signal is in steady state condition (see Look-Up-Table #28) for time Inhibit Status ( no inhibiting faults ) ( No pending or stored DTC ) basic enable conditions met:		20.00 TRUE 20.00 TRUE TRUE 45.00 11.00 655.34 94.96 3003.56 TRUE 20.00 0.1 to 10 5.00 see sheet inhibit tables see sheet enable tables	sec - - - - sec - sec - sec - sec - sec -	fault exists for more than 3 events; monitor runs at 0.1 s when enable conditions are met	В
Nox Sensor Current Performance Bank1 Sensor 2	P11DC	Detects a failure of the feedback performance of downstream NoX sensor	Ratio of valid to invalid downstream Nox sensor status time count	> 0.90 ratio	Sufficient number of valid and invalid downstream NOx sensor status time (sum of valid and invalid Nox status for diagnostic determination) and	>=	20.00	sec	fault exists for more than 3 events; monitor runs	В

Component / System	Fault Code	Monitor Strategy Description	Primary Malfunction Criteria	Threshold Logic and Value	Secondary Parameters		Enable Conditions		Time Required	MIL Illum.
					Engine Running (see parameter definition) for time (required for the NOx sensor to give valid response)	= >	TRUE 20.00	- sec	at 0.1 s when enable conditions are met	
					and Downstream NoX sensor detects a lean A/F mixture and	=	TRUE	-		
					Valid NOx signal from CAN is received (no Nox sensor communication failures)	=	TRUE	-		
					or following conditions for time:	、 、	120.00	Sec		
					battery voltage	>=	11.00	V		
					battery voltage	<=	655.34	V		
					SCR downstream temperature	>=	94.96	°C		
					SCR downstream temperature	<=	3003.56	°C		
					Engine Running (see parameter definition)	=	TRUE	-		
					for time (required for the NOx sensor to give valid response)	>	20.00	sec		
					Downstream Lambda signal is in steady state condition (  measured lambda signal - filtered lambda signal  ) (see Look-Iu-Table #27)	<=	0.2 to 3.2	-		
					for time	>=	5.00	sec		
					Inhibit Status ( no inhibiting faults ) ( No pending or stored DTC )	=	see sheet inhibit tables	-		
					basic enable conditions met:	=	see sheet enable tables	-		
Injector 1 Control Circuit Shorted	P1224	Diagnoses the Injector Cylinder #1 high side driver circuit for circuit faults.	Voltage low during driver on state (indicates short to ground)	<ul> <li>Short to ground: - ≤ 0.5 Ω impedance between signal and controller ground     </li> </ul>	Engine Running (see parameter definition)	=	TRUE	-	fail conditions exists for more than 0.04 s monitor runs with 0.01 s rate whenever enable conditions are met	A

Component / System	Fault Code	Monitor Strategy Description	Primary Malfunction Criteria	Threshold Logic and Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
Injector 2 Control Circuit Shorted	P1227	Diagnoses the Injector Cylinder #2 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	Engine Running (see parameter definition)	= TRUE -	fail conditions exists for more than 0.04 s monitor runs with 0.01 s rate whenever enable conditions are met	A
Injector 3 Control Circuit Shorted	P122A	Diagnoses the Injector Cylinder #3 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	Engine Running (see parameter definition)	= TRUE -	fail conditions exists for more than 0.04 s monitor runs with 0.01 s rate whenever enable conditions are met	A
Intake Air Flow Valve Control Circuit Shorted	P122C	Electronic out-put driver circuitry determines circuit integrity on the intake air flow valve.	The ECM detects that the commanded state of the driver and the actual state of the control circuit do not match.		battery voltage for time and starter is active cranking for time Throttle Valve Actuator Solenoid Control Circuit and basic enable conditions met	> 11.00 V > 3.00 sea = FALSE - > 3.00 sea = ACTIVE - = see sheet enable - tables	fail conditions exists for 3 s monitor runs with 0.005 s rate whenever enable conditions are met	В

Component / System	Fault Code	Monitor Strategy	Primary Malfunction Criteria		Threshold	A	Secondary Parameters		Enable		Time Required	MIL
Ujstem	out	Description	Uniona			<u> </u>	and NO Pending or Confirmed DTCs: and Open Load Diagnosis active	=	see sheet inhibit tables FALSE		Required	
Diesel Intake Air Flow Position Sensor Exceeded Learning Limit	P122D	Detects adaptation values of throttle valve that are not plausible. Compares the difference between the maximum and minimum adaptation values to a threshold.	throttle valve control deviation calculated out of difference between desired and actual value or throttle valve control deviation calculated out of difference between desired and actual value	~	-10.00	%	and throttle valve controller bypass is active and throttle valve is driven to a mechanical stop and offset learning for the throttle valve was successful in the previous driving cycle and engine post drive/ afterun and basic enable conditions met and NO Pending or Confirmed DTCs:	=	FALSE FALSE TRUE TRUE see sheet enable tables see sheet inhibit tables	-	fail conditions exists for 10.05 s monitor runs once per driving cycle with 0.005 s rate whenever enable conditions are met	В
		Detects implausible learned offset values.	Path 1: learned throttle valve offset position at open or closed position or learned throttle valve offset position at open or closed position or Path 2: difference between the maximum and minimum positions learned at closed position or Path 3: difference between the maximum and minimum positions learned at open position	~ ~ ~	-20.00 20.00 30.00 30.00	% % %	( engine temperature and engine temperature ) and ( battery voltage and battery voltage ) and Throttle Valve is not frozen consisting of:	>= <= >= <=	4.96 123.06 8.00 30.00	°C °C V	fail conditions exists for 0.005 s monitor runs once per driving cycle with 0.005 s rate whenever enable conditions are met	

Component / System	Fault Code	Monitor Strategy Description	Primary Malfunction Criteria		Threshold Logic and Value	Secondary Parameters		Enable Conditions		Time Required	MIL Illum.
					3	( charge air cooler downstream temperature or	>=	5.06	°C		
						if charge air cooler downstream temperature then	<	5.06	°C		
						charge air cooler downstream temperature for	>	6.06	°C		
						time ) and		10.00	sec		
						engine speed and engine post drive/ afterun	=	0 TRUE	rpm -		
						and basic enable conditions met	=	see sheet enable	-		
Intake Air Flow Valve Control Circuit 2 Low Voltage	P122E	Diagnoses the Throttle Valve 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	battery voltage	>	11.00	V	fail conditions exists for 3 s monitor runs with 0.005 s rate whenever	В
						time and	>	3.00	sec	conditions	
						starter is active cranking for	=	FALSE	-		
						time Throttle Valve Actuator Solenoid Control Circuit	>=	3.00 ACTIVE	sec -		
						and	=	see sheet enable tables	-		
						NO Pending or Confirmed DTCs:	=	see sheet inhibit tables	-		
						Open Load Diagnosis active	=	FALSE	-		
Intake Air Flow Valve Control Circuit 2 High Voltage	P122F	Diagnoses the Throttle Valve 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	battery voltage	>	11.00	V	fail conditions exists for 3 s monitor runs with 0.005 s rate	В

Component / System	Fault Code	Monitor Strategy Description	Primary Malfunction Criteria	Threshold Logic and Value	Secondary Parameters	Enable Conditions		Time Required	MIL Illum.
					for time and starter is active cranking for time Throttle Valve Actuator Solenoid Control Circuit and basic enable conditions met and NO Pending or Confirmed DTCs: and Open Load Diagnosis active	<ul> <li>&gt; 3.00</li> <li>= FALSE</li> <li>&gt; 3.00</li> <li>= ACTIVE</li> <li>= see sheet enable tables</li> <li>= see sheet inhibit tables</li> <li>= FALSE</li> </ul>	sec - - - -	whenever enable conditions are met	
Injector 4 Control Circuit Shorted	P1233	Diagnoses the Injector Cylinder #4 high side driver circuit for circuit faults.	Voltage low during driver on state (indicates short to ground)	<ul> <li>Short to ground: - ≤ 0.5 Ω impedance between signal and controller ground</li> </ul>	Engine Running (see parameter definition)	= TRUE	-	fail conditions exists for more than 0.04 s monitor runs with 0.01 s rate whenever enable conditions are met	A
Injector 5 Control Circuit Shorted	P1236	Diagnoses the Injector Cylinder #5 high side driver circuit for circuit faults.	Voltage low during driver on state (indicates short to ground)	<ul> <li>Short to ground: - ≤ 0.5 Ω impedance between signal and controller ground</li> </ul>	Engine Running (see parameter definition)	= TRUE		fail conditions exists for more than 0.04 s monitor runs with 0.01 s rate whenever enable conditions are met	A

Component / System	Fault Code	Monitor Strategy Description	Primary Malfunction Criteria	Threshold Logic and Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
Injector 6 Control Circuit Shorted	P1239	Diagnoses the Injector Cylinder #6 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	Engine Running (see parameter definition)	= TRUE -	fail conditions exists for more than 0.04 s monitor runs with 0.01 s rate whenever enable conditions are met	A
Injector 7 Control Circuit Shorted	P1242	Diagnoses the Injector Cylinder #7 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	Engine Running (see parameter definition)	= TRUE -	fail conditions exists for more than 0.04 s monitor runs with 0.01 s rate whenever enable conditions are met	A
Injector 8 Control Circuit Shorted	P1247	Diagnoses the Injector Cylinder #8 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	Engine Running (see parameter definition)	= TRUE -	fail conditions exists for more than 0.04 s monitor runs with 0.01 s rate	A

Component / System	Fault Code	Monitor Strategy Description	Primary Malfunction Criteria		Threshold Logic and Value	Secondary Parameters		Enable Conditions		Time Required	MIL Illum.
										whenever enable conditions are met	
Fuel Pressure Regulator 2 High Control Circuit Low Voltage	P125A	Diagnoses the Fuel Rail Pressure Regulator #2 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	battery voltage for time and ( ignition on and basic enable conditions met: )	> =	11.00 3.00 TRUE see sheet enable tables	V sec -	fail conditions exists for 0.5 S monitor runs with 0.01 s rate whenever enable conditions are met	A
Fuel Pressure Regulator 2 High Control Circuit High Voltage	P125B	Diagnoses the Fuel Rail Pressure Regulator #2 high side driver circuit for circuit faults.	Voltage high during driver off state (indicates short to power )	-	Short to power: $- \le 0.5 \Omega$ impedance between signal and controller power	battery voltage for time and ( ignition on and basic enable conditions met: )	> = =	11.00 3.00 TRUE see sheet enable tables	V sec -	fail conditions exists for 0.1 s monitor runs with 0.1s rate whenever enable conditions are met	В
Fuel Rail Pressure Performance	P128E	Actual rail pressure is compared to fixed absolute value to detect low or high rail pressure conditions.	rail pressure (see Look-Up-Table #67)	<	0 to 15000 kPa	(				fail conditions exists for 2 s monitor runs with 0.02 s	A

Component /	Fault	Monitor Strategy	Primary Malfunction		Threshold	2	Secondary		Enable		Time	MIL
Jystem	Code	Description	Gineria			6	state machine rail pressure control transitioning pressure control valve mode or state machine rail pressure control transitioning to coupled pressure control mode (rail pressure is controlled by metering unit and pressure control valve)	=	TRUE	-	rate whenever enable conditions are met	muni.
							or state machine rail pressure control equal transitioning to metering unit pressure control mode ) and basic enable conditions met: and NO Pending or Confirmed DTCs:	=	TRUE see sheet enable tables see sheet inhibit	-		
			rail pressure (see Look-Up-Table #72)	<	0 to 15000	kPa	( state machine rail pressure control equal to pressure control valve or state machine rail pressure control equal coupled pressure control (rail pressure is controlled by metering unit and pressure control valve) ) and basic enable conditions met:	=	tables TRUE TRUE see sheet enable tables	-		
			rail pressure (see Look-Up-Table #70)	<	0 to 15000	kPa	and NO Pending or Confirmed DTCs: state machine rail pressure control equal to metering unit control mode and basic enable conditions met: and NO Pending or Confirmed DTCs:	=	see sheet inhibit tables TRUE see sheet enable tables see sheet inhibit tables	-		
			rail pressure	>	215000.00	kPa	(				fail conditions exists for	

Component / System	Fault Code	Monitor Strategy Description	Primary Malfunction Criteria		Threshold Logic and Value		Secondary Parameters		Enable Conditions		Time Required	MIL Illum.
							state machine rail pressure control transitioning pressure control valve mode or state machine rail pressure control transitioning to coupled pressure control mode (rail pressure is controlled by metering unit and pressure control valve)	=	TRUE	-	1.01 s. monitor runs with 0.02 s rate whenever enable conditions are met	
							or state machine rail pressure control equal transitioning to metering unit pressure control mode ) and	=	TRUE	-		
							basic enable conditions met: and NO Pending or Confirmed DTCs:	=	see sheet enable tables	-		
									tables			
			rail pressure	>	215000.00 kF	'a	( state machine rail pressure control equal to pressure control valve or	=	TRUE	-		
							state machine rail pressure control equal coupled pressure control (rail pressure is controlled by metering unit and pressure control valve)	=	TRUE	-		
							, and basic enable conditions met:	=	see sheet enable tables	-		
							NO Pending or Confirmed DTCs:	=	see sheet inhibit tables	-		
			rail pressure	>	215000.00 kF	'a	state machine rail pressure control equal to metering unit control mode and	=	TRUE	•		
							and basic enable conditions met: and	=	see sheet enable tables	-		
							NO Pending or Confirmed DTCs:	=	see sheet inhibit tables			

Component / System	Fault Code	Monitor Strategy Description	Primary Malfunction Criteria		Threshold Logic and Value		Secondary Parameters		Enable Conditions		Time Required	MIL Illum.
Exhaust Gas Temperature Sensors 3-4 Not Plausible	P113A	Detects biased SCR catalysi temperature sensor by comparing SCR catalyst temperature sensor to the particulate filter temperature sensor after an engine off soak time	<ul> <li>(a) - (b) (see Look-Up-Table #95)</li> <li>and with         <ul> <li>(a) captured downstream SCR catalyst temperature at start</li> <li>(b) captured downstream Particulate Filter catalyst temperature at start</li> </ul> </li> </ul>		30 to 999 measured parameter measured parameter	- -	Power on reset by ignition on Engine Running (see parameter definition) for time Engine off soak time ambient temperature and NO Pending or Confirmed DTCs: basic enable conditions met:	= > >= >	TRUE TRUE 0 28800 -60.04 see sheet inhibit tables see sheet enable tables	- sec sec °C -	fail conditions exists for 0.01 s monitor runs with 0.01 s rate whenever enable conditions are met	В
Exhaust Gas Recirculation (EGR) Motor Control Circuit Shorted	P1407	Electronic out-put driver circuitry determines circuit integrity on the EGR solenoid.	The ECM detects that the commanded state of the driver and the actual state of the control circuit do not match.				EGR Solenoid Control Circuit and battery voltage for time and starter is active cranking for time and basic enable conditions met:	=	ACTIVE 11.00 3.00 FALSE 3.00 see sheet enable tables	- V sec - sec -	fail conditions exists for 3 s monitor runs with 0.005 s rate whenever enable conditions are met	В
Exhaust Gas Recirculation Slow Response- Increasing Flow	P140B	Detects a negative slow response by comparing expected system dynamics with actual value	average negative gradient of the air mass - calculated by accumulating control deviation (deviation between desired and actual value) over a sampling time and dividing result by sampling time	>	0.32	g/rev	ambient pressure and engine coolant temperature and EGR control is in closed loop for time and	> > = >	74.80 69.96 TRUE 1.50	kPa °C - sec	fail conditions exists for 15 S monitor runs with 0.1s rate whenever enable conditions are met	В

Component / System	Fault Code	Monitor Strategy Description	Primary Malfunction Criteria	Threshold Logic and Value	Secondary Parameters		Enable Conditions		Time Required	MIL Illum.
					EGR control is active	=	TRUE	-		
					for time	>	0.00	sec		
					exhaust gas system regeneration mode	=	FALSE	-		
					for time	>	5.00	sec		
					and		4000.00			
					Engine speed	>=	1000.00	rpm		
					and	<=	2200.00	ipm		
					injection quantity	>=	80.00	mm^3/r		
					injection quantity	<=	300.00	mm^3/r		
					and			ev		
					desired delta air mass flow	>	0.13	a/s		
					desired delta air mass flow	<	-0.02	g/s		
					and			U		
					difference of the air mass and	<	0	g/rev		
					NO Pending or Confirmed DTCs:	=	see sheet inhibit tables	-		
					for time	>	0.10	sec		
					basic enable conditions met:	=	see sheet enable	-		
					basic chable conditions met.		tables			
								_		
Exhaust Cas	P140C	Detects a positive clow	average positive gradient of the air mass	>= 0.22 a/rov	(				foil	P
Recirculation Slow	F 140C	response by comparing	calculated by accumulating control	>= -0.32 g/lev	(				conditions	D
Response-		expected system dynamics	deviation (deviation between desired and						exists for 15	
Decreasing Flow		with actual value	actual value) over a sampling time and						S	
_			dividing result by sampling time						monitor runs	
									with 0.1s	
					ambient pressure	>	74.80	kPa	rate	
					engine coolant temperature	>	69.96	°C	enable	
					and				conditions	
					EGR control is in closed loop	=	TRUE	-	are met	
					and	>	1.50	sec		
					EGR control is active	=	TRUE	-		
					for time	>	0.00	sec		
					and					
					exhaust gas system regeneration mode	=	FALSE	-		
					for time and	>	5.00	sec		
					Engine speed	>=	1450.00	rpm		
					Engine speed	<=	2200.00	rpm		
					injection quantity	>=	112.00	mm^3/r		
		-						01/		

Component / System	Fault Code	Monitor Strategy Description	Primary Malfunction Criteria	Threshold Logic and Value	Secondary Parameters		Enable Conditions		Time Required	MIL Illum.
					injection quantity and desired delta air mass flow and difference of the air mass and NO Pending or Confirmed DTCs: for time and basic enable conditions met:	<=	300.00 0.13 -0.02 0 see sheet inhibit tables 0.10 see sheet enable tables	mm^3/r ev g/s g/rev - sec -		
Exhaust Gas Recirculation (EGR) Motor Control Circuit 2 Low Voltage	P140D	Diagnoses the EGR Valve high side driver circuit for circuit faults.	Voltage low during driver on state (indicates short to ground)	<ul> <li>Short to ground: - ≤ 0.5 Ω impedance between signal and controller ground</li> </ul>	EGR Solenoid Control Circuit and battery voltage for time and starter is active cranking for time and basic enable conditions met:	=	ACTIVE 11.00 3.00 FALSE 3.00 see sheet enable tables	- V sec - sec -	fail conditions exists for 3 s monitor runs with 0.005 s rate whenever enable conditions are met	В
Exhaust Gas Recirculation (EGR) Motor Control Circuit 2 High Voltage	P140E	Diagnoses the EGR Valve high side driver circuit for circuit faults.	Voltage high during driver off state (indicates short to power )	<ul> <li>Short to power: -</li> <li>≤ 0.5 Ω impedance between signal and controller power</li> </ul>	EGR Solenoid Control Circuit and battery voltage for time and starter is active cranking for time and	= > >	ACTIVE 11.00 3.00 FALSE 3.00	V sec sec	fail conditions exists for 3 s monitor runs with 0.005 s rate whenever enable conditions are met	В

Component / System	Fault Code	Monitor Strategy Description	Primary Malfunction Criteria	Threshold Logic and Value	•	Secondary Parameters	Enable Conditions		Time Required	MIL Illum.
						basic enable conditions met:	see sheet enable tables	-		
Exhaust Gas Recirculation (EGR) Motor Current Performance	P140F	Diagnoses the EGR Valve 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	-	EGR Solenoid Control Circuit and battery voltage for time and starter is active cranking for time and basic enable conditions met:	 ACTIVE 11.00 3.00 FALSE 3.00 see sheet enable tables	V sec sec -	fail conditions exists for 2 s monitor runs with 0.005 s rate whenever enable conditions are met	В
Closed Loop Diesel Particulate Filter (DPF) Regeneration Control At Limit - Stage 1 Temperature Too Low	P144B	Detects insufficient exhaust temperature. Actual inner controller ratio and temperature readings are compared to desired controller ratio and temperature values as an indication of an insufficient exhaust gas temperature.	commanded control value of the inner control loop of the temperature controller and deviation from the temperature setpoint for inner control loop ( with (a) limitation of the temperature threshold and with (b) temperature threshold value for maximum deviation	>= 0.99 > maximum of (a) and (b) = 100.00 = 100	- - 20 20	current engine operating point is suitable for monitoring deviation of exhaust gas temperature control - depending on engine speed and injection quantity (see Look-Up-Table #23) for time and release of the exhaust gas temperature outer loop control monitoring means ( active operation mode of the inner control loop means ( particulate filter regeneration and temperature before oxidation catalyst and temperature after particulate filter and (	 0 to 1 0.00 TRUE TRUE 99.96	- sec - - °C	fail conditions exists for 200 s monitor runs with 0.1 s rate whenever enable conditions are met	В

Component / System	Fault Code	Monitor Strategy	Primary Malfunction Criteria		Threshold		Secondary		Enable Conditions		Time Required	MIL
							temperature before oxidation catalyst and temperature after particulate filter or temperature before oxidation catalyst and temperature after particulate filter for activated post injection	< <	649.96 649.96	°C °C		
							) and status maximum governor deviation means vehicle speed	= <=	TRUE 124.30	- mph		
							and Relative accelerator pedal position for	>	3.00	%		
							time and	>	1.00	sec		
							basic enable conditions met:	=	see sheet enable tables	-		
							NO Pending or Confirmed DTCs:	=	see sheet inhibit tables	-		
Closed Loop Diesel Particulate Filter (DPF) Regeneration Control At Limit - Stage 1 Temperature Too High	P144C	Detects excessive exhaust temperature. Actual inner controller ratio and temperature readings are compared to desired controller ratio and temperature values as an indication of an excessive exhaust gas temperature.	commanded control value of the inner control loop of the temperature controller and deviation from the temperature setpoint	<=	0.00 minimum of (a)	-	current engine operating point is suitable for monitoring deviation of exhaust gas temperature control - depending on engine speed and injection quantity (see Look-Up-Table #24) for time	=	0 to 1 0.00	- Sec	fail conditions exists for 200 s monitor runs with 0.1 s rate whenever enable conditions are met	В
			for inner control loop ( with		and (b)		and release of the exhaust gas temperature outer loop control monitoring	=	TRUE	-		
			(a) limitation of the temperature threshold	=	-100.00	°C	means					
			and with (b) temperature threshold value for minimum deviation	=	100	°C	( active operation mode of the inner control loop means (	=	TRUE	-		
							, particulate filter regeneration and	=	TRUE	-		
							temperature before oxidation catalyst and temperature after particulate filter	>	99.96	°C		

Component / System	Fault Code	Monitor Strategy Description	Primary Malfunction Criteria	Lo	Threshold ogic and Valu	e	Secondary Parameters		Enable Conditions		Time Required	MIL Illum.
					-		and ( temperature before oxidation catalyst and temperature after particulate filter	<	649.96	°C		
							temperature before oxidation catalyst and temperature after particulate filter for activated post injection )	<	649.96	°C		
							and status maximum governor deviation means	=	TRUE	-		
							vehicle speed and Relative accelerator pedal position	<=	124.30	mph %		
							for time	>	1.00	sec		
							and basic enable conditions met:	=	see sheet enable tables	-		
							and NO Pending or Confirmed DTCs:	=	see sheet inhibit tables	-		
TCM Engine Speed Request Signal Message Counter Incorrect	P150C	Detects implausible engine speed request information received from the TCM	Path 1:				ignition on	=	TRUE	-	fail conditions exists for 0.01 s	A
			( number of rolling count / protection values detected	>=	7.00	counts	and basic enable conditions met:	=	see sheet enable tables	-	test performed continuously	
			with number of consecutive frames	=	12.00	counts	and NO Pending or Confirmed DTCs:	=	see sheet inhibit tables	-	0.01 s	
			) or Path 2: (									
			I internal calculated checksum value for transmission is not equal the received value and	=	TRUE	-						
			number of fault results )	>	15.00	counts						
			or Path 3: time since last frame of validation protection was received from transmission	>	0.08	sec						

Component / System	Fault Code	Monitor Strategy Description	Primary Malfunction Criteria		Threshold Logic and Valu	ie	Secondary Parameters		Enable Conditions		Time Required	MIL Illum.
					_				_			
Validation Error in messages received from Power Take Off Control Module	P1591	Rolling counter and protection value evaluation of message received from Power Take Off Control Module	number of messages with validation errors	>=	4.00	counts	ignition on	=	TRUE	-	fail conditions exists for 0.12 s test	Special C
			in the last number of messages (sliding window) received from power take off control module	=	10.00	counts	for time and	>=	3.00	sec	performed continuously 0.01 s rate	
							basic enable conditions met:	=	see sheet enable tables	-		
							NO Pending or Confirmed DTCs:	=	see sheet inhibit tables	-		
Particulate filter efficiency monitoring	P2002	Statistical evaluation of the present exhaust gas volume flow signal and particulate filter delta pressure signal to determine particulate filter efficiency	particulate filter efficiency factor	~	0.35	-	Calculated exhaust-gas volume flow in the particulate filter and Calculated exhaust-gas volume flow in the particulate filter and Temperature upstream of the particulate filter and Temperature upstream of the particulate filter and Temperature downstream particulate filter and Temperature downstream particulate filter and Upstream and downstream particulate filter temperature difference and Upstream and downstream particulate filter temperature difference and Simulated surface temperature, particulate filter	~ ~ ~ ~ ~ ~ ~ ~ ~ ~ ~ ~ ~ ~ ~ ~ ~ ~ ~ ~	3000.00 600.00 799.96 499.96 799.96 499.96 300.00 -300.00 799.96	m^3/h m^3/h °C °C °C °C °C	fail conditions exists for 0.1 s monitor runs with 0.1s rate whenever enable conditions are met	В
							and Simulated surface temperature, particulate filter and	>	499.96	°C		

Component / System	Fault Code	Monitor Strategy Description	Primary Malfunction Criteria	Threshold	Secondary Parameters		Enable Conditions		Time Required	MIL Illum.
Cystom	0000	Decemption		Logio ana varao	Basic enable conditions met	=	see sheet enable tables	-	Required	mann
					and Number of segments filled with flow rate distributions for DPF efficiency regression analysis	>=	3.00	counts		
					and Sum of flow rate distribution for DPF efficiency regression analysis	>=	1.00	-		
							_			
Reductant Injector Performance	P202E	This diagnostic checks the Reductant Injector performance during operation.	Number of times the ECM detects that the commanded state of the Reductant Injector driver and the actual state of the control circuit do not match.	> 10.00 counts	Flag for successful measurement of current in opening phase of Reductant Injector	=	TRUE	-	fault exists for more than 80 injection events;	A
					( Reductant Dosing System Metering control substate of Pressure control state (see definition)	=	TRUE	-	with 100 ms rate whenever	
					Calculated Reductant Injector coil	>=	-6.64	°C	conditions	
					Calculated Reductant Injector coil temperature	<=	99.96	°C	are met	
					( battery voltage battery voltage	>= <=	11.00 655.34	V V		
					( Reductant Dosing System pump relative pressure	>=	350.00	kPa		
					Reductant Dosing System pump relative pressure )	<=	650.00	kPa		
					ambient pressure	>=	0.00	kPa kPa		
					) (	~-	130.00	Νά		
					NO Pending or Confirmed DTCs	=	see sheet inhibit tables	-		
					( ambient pressure ambient temperature	>	0.00 -30.04	kPa °C		
					) basic enable conditions met:	=	see sheet enable tables	-		

Component /	Fault	Monitor Strategy	Primary Malfunction		Threshold		Secondary		Enable		Time	MIL
System Exhaust Gas Temperature (EGT) Sensor 2 Circuit Low Voltage	P2032	Detects low voltage readings on the EGT 2 circuit, indicating an OOR low condition on the EGT 2 circuit	temperature sensor voltage downstream of oxidation catalyst same as temperature downstream of oxidation catalyst	v v	- 50	°C	and basic enable conditions met:	=	TRUE see sheet enable tables	-	fail conditions exists for 3 s monitor runs 0.050 s rate whenever enable conditions are met	A
Exhaust Gas Temperature (EGT) Sensor 2 Circuit High Voltage	P2033	Detects high voltage readings on the EGT 2 circuit, indicating an OOR high condition on the EGT 2 circuit	temperature sensor voltage downstream of oxidation catalyst same as temperature downstream of oxidation catalyst	^ ^	2.21	°C	ignition on and basic enable conditions met:	=	TRUE see sheet enable tables	-	fail conditions exists for 3 s monitor runs 0.050 s rate whenever enable conditions are met	A
Reductant Level Sensor "A" Circuit Range/Performanc e	P203B	Reductant level plausibility check error from CAN	CAN message "Reductant Level Plausibility Check Error" from reductant tank level evaluation module which means ( (measured tank level sensor 2 voltage after 1.5 ms since a test impulse was applied) (measured tank level sensor 1 voltage after 1.5 ms since a test impulse was applied) ) or ( (measured tank level sensor 3 voltage after 1.5 ms since a test impulse was applied)	=	TRUE ( 0.0 to 1.7 ) ( 1.71 to 3.56 ) ( 0.0 to 1.7 )	v v v	ignition on and basic enable conditions met: and NO Pending or Confirmed DTCs:	=	TRUE see sheet enable tables see sheet inhibit tables	-	fail conditions exists for 5 s test performed continuously 1 s rate	В

Component / System	Fault Code	Monitor Strategy Description	Primary Malfunction Criteria		Threshold Logic and Value		Secondary Parameters		Enable Conditions		Time Required	MIL Illum.
			( measured tank level sensor 1 voltage after 1.5 ms since a test impulse was applied ) ) or ( ( measured tank level sensor 3 voltage after 1.5 ms since a test impulse was applied ) ( measured tank level sensor 2 voltage after 1.5 ms since a test impulse was applied ) )		(1.71 to 3.56) (0.0 to 1.7) (1.71 to 3.56)	V V V						
Reductant Level Sensor 1 Circuit Low	P203C	CAN message: Discrete level sensor level 1 short to ground error	Reductant Tank Level 1 Error Status	=	1	•	ignition on	=	TRUE	•	fail conditions exists for	A
			( tank level sensor 1 voltage directly measured after a test impulse was applied )	~	(0.17)	V	battery voltage basic enable conditions met:	>	8 see sheet enable tables	-	more than 3 sec. monitor runs with 1 s rate whenever enable conditions are met	
Reductant Level Sensor 1 Circuit High	P203D	Path 1:									fail conditions exists for	A
		CAN message: Discrete level sensor 1 open load	Reductant Tank Level 1 Error Status	=	3	-	ignition on	=	TRUE	-	more than 3 sec.	
			( measured tank level sensor 1 voltage after 1.5 ms since a test impulse was applied )	>	(3.56)	V	battery voltage	>	8	V	with 1 s rate whenever enable	
			( measured tank level sensor 1 voltage after 1.5 ms since a test impulse was applied )	<	(4.74)	V	basic enable conditions met:	=	see sheet enable tables	-	conditions are met	
		Path 2: CAN message: Discrete level sensor 1 short to	Reductant Tank Level 1 Error Status	=	2	-	ignition on	=	TRUE	-		
		battery error	( measured tank level sensor 1 voltage after 1.5 ms since a test impulse was applied )	>	(4.74)	V	battery voltage	>	8	V		
							basic enable conditions met:	=	see sheet enable tables	-		

Component / System	Fault Code	Monitor Strategy Description	Primary Malfunction Criteria		Threshold Logic and Value	Secondary Parameters		Enable Conditions		Time Required	MIL Illum.
Reductant Injector Control Circuit	P2047	Diagnoses the Reductant Injector low side driver circuit for circuit faults.	Voltage low during driver off state (indicates open circuit)	=	Open Circuit:≥ - 200 K Ω impedance between ECU pin and load	engine pre drive	=	FALSE		fail conditions exists for 3 s monitor runs with 0.01	A
						for time and	>	1.00	sec	sec rate whenever enable	
						battery voltage for time	>	11.00 3.00	V sec	conditions are met	
						and battery voltage for	<	655.34	V		
						time and (	>	3.00	sec		
						battery voltage correction factor and	>	0.00	factor		
						) for	<	4.00	Tactor		
			time and basic enable conditions met:	>	3.00 see sheet enable	sec -					
					tables						
Reductant Injector Control Circuit Low Voltage	P2048	Diagnoses the Reductant Injector 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	engine pre drive	=	FALSE	-	fail conditions exists for 2 s monitor runs with 0.01 sec rate whenever enable	A
						time and	>	1.00	sec	conditions are met	
						battery voltage for time	>	11.00 3.00	V		
				and battery voltage	<	655.34	V				
				for time and	>	3.00	sec				
				( battery voltage correction factor and	>	0.00	factor				
						battery voltage correction factor ) for	<	4.00	factor		

Component /	Fault	Monitor Strategy	Primary Malfunction	Threshold	Secondary		Enable		Time	MIL
System	Code	Description	Criteria	Logic and value	time	~	3 00	SAC	Required	illum.
					and basic enable conditions met:	=	see sheet enable tables	-		
Reductant Injector Control Circuit High Voltage	P2049	Diagnoses the Reductant Injector low side driver circuit for circuit faults.	Voltage high during driver on state (indicates short to power)	<ul> <li>Short to power: -</li> <li>≤ 0.5 Ω</li> <li>impedance</li> <li>between signal</li> <li>and controller</li> <li>power</li> </ul>	engine pre drive for time and battery voltage for time and battery voltage for time and ( battery voltage correction factor and battery voltage correction factor ) for time and basic enable conditions met:	= ^ > < > < > =	FALSE 1.00 11.00 3.00 655.34 3.00 0.00 4.00 3.00 see sheet enable tables	sec V sec V sec factor factor factor sec -	fail conditions exists for 3 s monitor runs with 0.01 sec rate whenever enable conditions are met	A
Reductant Pump Pressure Sensor Performance	P204B	Unfiltered reductant pressure is compared to a threshold while the SCR system is in No Pressure Control state	Unfiltered Reductant Pump Module Pressure	> 50.00 kPa	Reductant filling state in the pressure line status of SCR control state (please see the definition) State of the defrosting check of pressure line (please see the definition) ambient pressure ambient temperature NO Pending or Confirmed DTCs: basic enable conditions met:	<= = >> =	0.00 No Pressure Control TRUE 0.00 -30.04 see sheet inhibit tables see sheet enable tables	% - - °C - -	fail conditions exists for more than 0.6 sec monitor runs with 0.01 s rate whenever enable conditions are met	A

Component / System	Fault Code	Monitor Strategy Description	Primary Malfunction Criteria		Threshold Logic and Valu	ie	Secondary Parameters		Enable Conditions		Time Required	MIL Illum.
									_	_		
Reductant Pump Pressure Sensor Circuit Low	P204C	Measured reductant pump pressure sensor signal low voltage	Reductant pump pressure sensor signal same as: reductant pump pressure	<	0.41	V kPa	ignition on NO Pending or Confirmed DTCs: basic enable conditions met:	=	TRUE see sheet inhibit tables see sheet enable tables	-	fail conditions exists for more than 0.4 sec. monitor runs with 0.01 s rate	A
Reductant Pump Pressure Sensor Circuit High	P204D	Measured reductant pump pressure sensor signal high voltage	Reductant pump pressure sensor signal same as: reductant pump pressure	>	4.80 800.00	V kPa	ignition on NO Pending or Confirmed DTCs: basic enable conditions met:	=	TRUE see sheet inhibit tables see sheet enable tables	-	fail conditions exists for more than 0.4 sec. monitor runs with 0.01 s rate whenever enable conditions are met	A
Reductant System Performance Bank 1	P204F	Unsuccessful reductant pressure build up	Reductant Pump Module Pressure	<=	350.00	kPa	status of SCR control sub state (please see the definition) and Reductant Defrost check (please see the definition) and ambient pressure and ambient temperature and number of pressure build-up attempts in pressure buildup and ventilation states with ( Dwell time in Pressure Build up substate Dwell time in ventilation substate ) and	= > > >= >= >=	PRESSURE BUILDUP 1.00 0.00 -30.04 30.00 10.00 10.00	- kPa °C counts sec sec	fail conditions exists for 1 event monitor runs with 0.1 s rate whenever enable conditions are met	A

Component /	Fault	Monitor Strategy	Primary Malfunction		Threshold		Secondary		Enable		Time	MIL
System		Description	Cinteria		gic and value		Vrea heater release reason and NO Pending or Confirmed DTCs: basic enable conditions met:	!= =	COMPONENT PROTECTION see sheet inhibit tables see sheet enable tables	-	Kequirea	mum.
Reductant Tank Temperature Sensor Performance	P205B	Path 1: The temperature difference between reductant tank temperature and diesel fuel temperature are compared to an upper threshold after sufficient engine-off duration	(a) - (b) where (a) Reductant tank temperature (b) fuel temperature	>	34.96 measured barameter measured barameter	°C - -	ignition on status of SCR control state (please see the definition) Engine off Time time since start Max [(a), (b), (c)] - Min [(a), (b), (c)] where (a) Oxidation Catalyst upstream temperature (b) fuel temperature (c) Particulate filter downstream temperature NO Pending or Confirmed DTCs: basic enable conditions met:	= > <= = = =	TRUE No Pressure control 28800.00 6.00 6.96 measured parameter measured parameter measured parameter see sheet inhibit tables see sheet enable tables	- sec °C - - -	fail conditions exists for morie than 0.5 sec monitor runs with 0.01 s rate whenever enable conditions are met	В
		Path 2:					ignition on	=	TRUE	-	fail conditions	

Component / System	Fault Code	Monitor Strategy Description	Primary Malfunction Criteria		Threshold Logic and Value		Secondary Parameters		Enable Conditions		Time Required	MIL Illum.
		The temperature difference between reductant tank temperature and diesel fuel temperature are compared to a lower threshold after sufficient engine-off duration	(a) - (b) where (a) Reductant tank temperature (b) fuel temperature	<	-35.04 measured parameter measured parameter	- -	status of SCR control state (please see the definition) Engine off Time time since start Max [(a), (b), (c)] - Min [(a), (b), (c)] where (a) Oxidation Catalyst upstream temperature (b) fuel temperature (c) Particulate filter downstream temperature NO Pending or Confirmed DTCs: basic enable conditions met:		No Pressure control 28800.00 6.00 6.96 measured parameter measured parameter see sheet inhibit tables see sheet enable tables	- sec sec - - - -	exists for more than 0.5 sec monitor runs with 0.01 s rate whenever enable conditions are met	
Reductant Tank Temperature Sensor Circuit Low	P205C	Detects an out of range low reading of the Reductant Tank Temperature Sensor via CAN Message	Raw value of the CAN message for the Reductant Tank Temperature Corresponds to a temperature of Corresponds to a resistance of Corresponds to a voltage of	<ul><li>✓</li><li>♥ ½</li><li>↓</li></ul>	1.00 -55.0 1200 5.0	°C kOhm V	basic enable conditions met: and No rolling count or protection value errors. (sliding window errors) in the CAN frame	=	see sheet enable tables	-	fault exists for more than 3 seconds; monitor runs at 1 s whenever enable conditions are met	A
Reductant Tank Temperature Sensor Circuit High	P205D	Detects an out of range high reading of the Reductant Tank Temperature Sensor via CAN Message or an invalid (initialization) value of the Reductant Tank Temperature CAN message	Raw value of the CAN message for the Reductant Tank Temperature Corresponds to a temperature of Corresponds to a resistance of	>	1022.00 160.0 0.153	°C kOhm	basic enable conditions met: and No rolling count or protection value errors. (sliding window errors) in the CAN frame	=	see sheet enable tables		fault exists for more than 6 seconds; monitor runs at 1 s whenever enable conditions are met	В

Component /	Fault	Monitor Strategy	Primary Malfunction		Threshold		Secondary		Enable		Time	MIL
System	Code	Description	Criteria		Logic and Value		Parameters		Conditions		Required	Illum.
			Corresponds to a voltage of OR Path2: Raw value of the CAN message for the Reductant Tank Temperature	=	0.270 0x3FF	V						
Exhaust Temperature Sensor 1 Performance	P2080	Detects a fault in the exhaust temperature sensor 1 performance by comparing the heat quantity on the sensor position to a threshold.	integrated heat quantity of exhaust gas temperature sensor 1	<	(a) / (b) * (c) / (d) * (e) * (f)	-	exhaust gas system regeneration mode	=	FALSE	-	fail conditions exists for xxs monitor runs with 0.1 s rate	В
			or integrated heat quantity of exhaust gas temperature sensor 1	>	(a) / (b) * (c) / (d) * (e) * (g)	-	time	>	1500.00	sec	whenever enable conditions	
			(a) exhaust gas mass flow	=	calculated parameter	-	time since start	>	327.00	sec	are met	
			(b) factor and with	=	3.600	g/s	( exhaust-gas temperature sensor 1	>	-60.04	°C		
			and with (d) factor	=	1000	kW/°C	exhaust-gas temperature sensor 1	<	1999.96	°C		
			and with (e) correction factor for heat flow quantity depending on exhaust gas mass flow for temperature sensor 1	=	1.00	factor	and change in exhaust-gas temperature sensor 1	<	7.00	°C		
			and with (f) minimum permissible temperature deviation for exhaust gas temperature	=	-100.00	°C	for time and	=	5.00	sec		
			(g) maximum permissible temperature deviation for exhaust gas temperature sensor 1	=	100.00	°C	engine operation point suitable for diagnostic (see Look-Up-Table #29) for	=255	0 to 255	-		
							time and	>=	0.05	sec		
							change in modeled exhaust-gas temperature sensor 1 and (	>	4.00	°C		
							heat quantity for exhaust gas temperature sensor 1 and	>	10.00	kJ		
							heat quantity for exhaust gas temperature sensor 1 )	<	12.00	kJ		
							and					

Component /	Fault	Monitor Strategy	Primary Malfunction		Threshold		Secondary		Enable		Time	MIL
System	Code	Description	Criteria		Logic and Value	•	Parameters		Conditions		Required	Illum.
							engine has been in normal mode for time or engine has been in exhaust warm-up mode for time and	>=	1.00	sec		
							basic enable conditions met:	=	see sheet enable tables	-		
							and NO Pending or Confirmed DTCs:	=	see sheet inhibit tables	-		
	Daga (				() ( () + ( ) ( ()				541.05		6.11	
Exhaust Temperature Sensor 2 Performance	P2084	Detects a fault in the exhaust temperature sensor 2 performance by comparing the heat quantity on the sensor position to a threshold.	integrated heat quantity of exhaust gas temperature sensor 2	<	(a) / (b) * (c) / (d) * (e) * (f)	-	exhaust gas system regeneration mode	=	FALSE	-	fail conditions exists for xxs monitor runs with 0.1 s rate	В
			or integrated heat quantity of exhaust gas temperature sensor 2	>	(a) / (b) * (c) / (d) * (e) * (g)	-	tor time	>	1500.00	sec	whenever enable conditions	
			with		(0) (9)		and				are met	
			(a) exhaust gas mass flow	=	calculated parameter	-	time since start	>	327.00	sec		
			(b) factor	=	3.600	a/s	(					
			and with (c) heat capacity	=	1050.00	J/Kg/°C	exhaust-gas temperature sensor 2 and	>	-60.04	°C		
			and with (d) factor	=	1000	kW/⁰C	exhaust-gas temperature sensor 2 )	<	1999.96	°C		
			and with (e) correction factor for heat flow quantity depending on exhaust gas mass flow for temperature sensor 2	=	1.00	factor	and change in exhaust-gas temperature sensor 2	<	7.00	°C		
			and with (f) minimum permissible temperature	=	-100.00	°C	for time and	=	5.00	sec		
			(q) maximum permissible temperature	=	100.00	°C	engine operation point suitable for diagnostic (see Look-Up-Table #29) for	=	0 to 255	-		
			deviation for exhaust gas temperature sensor 2									
							time and	>=	0.05	sec		
							change in modeled exhaust-gas temperature sensor 2 and (	>	4.00	°C		
							heat quantity for exhaust gas temperature sensor 2 and	>	10.00	kJ		

Component / System	Fault Code	Monitor Strategy Description	Primary Malfunction Criteria	Threshold Logic and Value	Secondary Parameters	Enable Conditions		Time Required	MIL Illum.
					heat quantity for exhaust gas temperature sensor 2 ) and engine has been in normal mode for time or engine has been in exhaust warm-up mode for time and basic enable conditions met: and NO Pending or Confirmed DTCs:	< 12.00 >= 1.00 >= 1.00 = see sheet enable tables = see sheet inhibit tables	kJ sec sec -		
Reductant Pump Control Circuit	P208A	Detects an open circuit or an overtemperature condition in the Reductant Pump Control Circuit	Voltage low during driver off state (indicates open circuit) Voltage high during driver off state (open circuit)	<ul> <li>= Open Circuit:≥ - 200 K Ω impedance between ECU pin and load</li> <li>= Open Circuit: ≥ - 200 K Ω impedance between ECU pin and load signal and controller ground</li> </ul>	(( Battery voltage for time OR Battery voltage ) ) ((	< 10.5 < 3 > 11	V sec	fail conditions exists for 6.2 s monitor runs with 0.010 s rate whenever enable conditions are met	В
					SCR system waiting for shut down in afterrun OR SCR system in standby in afterun ) ignition ) NO Pending or Confirmed DTCs basic enable conditions met:	<ul> <li>TRUE</li> <li>TRUE</li> <li>FALSE</li> <li>see sheet inhibit tables</li> <li>see sheet enable tables</li> </ul>	-		

Component / System	Fault Code	Monitor Strategy Description	Primary Malfunction Criteria		Threshold Logic and Value		Secondary Parameters		Enable Conditions		Time Required	MIL Illum.
Reductant Pump Performance	P208B	The ECM detects that the commanded state of the Reductant Pump driver and the actual state of the control circuit do not match.	timer for functional acknowledgement of the reductant pump motor	>	4.00	sec	(				fault exists for more than 30 s; monitor runs at 0.1 s whenever	A
			timer for functional acknowledgement of the reductant pump motor	<=	6.00	sec	ambient pressure	>	0.00	kPa	enable	
							ambient temperature )	>	-30.04	°C	are met	
							basic enable conditions met:	=	see sheet enable tables	-		
Reductant Pump Control Circuit High Voltage	P208D	Diagnoses the Reductant Pump Motor 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	-	engine pre drive for time and battery voltage for time and battery voltage for time and ( battery voltage correction factor and battery voltage correction factor ime and battery voltage correction factor ) for time and battery voltage correction factor and battery voltage correction factor and battery voltage correction factor ) for time and battery voltage correction factor )		FALSE 1.00 11.00 3.00 655.34 3.00 0.00 4.00 3.00 see sheet enable tables	sec V sec V sec factor factor sec -	fail conditions exists for 3 s monitor runs with 0.01 sec rate whenever enable conditions are met	A
Reductant Purge Valve Control Circuit	P20A0	Diagnoses the Reductant Purge Valve low side driver circuit for circuit faults.	Voltage low during driver off state (indicates open circuit)	=	Open Circuit:≥ 200 K Ω impedance between ECU pin and load	-	engine pre drive for time and	=	FALSE	- sec	fail conditions exists for 3 s monitor runs with 0.01 sec rate whenever enable	A

Component / System	Fault Code	Monitor Strategy Description	Primary Malfunction Criteria	Threshold Logic and Value	Secondary Parameters		Enable Conditions		Time Required	MIL Illum.	
					battery voltage	>	11.00	V	conditions are met		
					time	>	3.00	sec	aromot		
					and battery voltage	<	655.34	V			
					for time	>	3.00	sec			
					and						
					battery voltage correction factor	>	0.00	factor			
					and battery voltage correction factor	<	4.00	factor			
					) for						
					time and	>	3.00	sec			
					basic enable conditions met:	=	see sheet enable	-			
							lables				
Reductant Purge Valve	P20A1	This diagnostic checks the Reductant Purge valve	Difference between reductant pump pressure at beginning and end of	< 50.00 kPa	(				fault exists for more	A	
Performance		performance during operation by detecting a lack	pressure reduction phase						than 1 event monitor runs		
		of reduction of the reductant							with 100 ms		
					Reductant Dosing System state pressure	=	TRUE	-	whenever		
					Reductant Dosing System pump relative	>=	350.00	kPa	conditions		
					)				are met		
					AND ((						
					Time attempting to reduce dosing pressure	>=	5.00	sec			
					AND						
					Reductant Dosing System pump relative	>	50.00	kPa			
					pressure						
					) OR						
					Reductant Dosing System pump relative pressure after attempting to reduce	<=	50.00	kPa			
					pressure )						
					( ambient pressure	>	0.00	kPa			
					ambient temperature	>	-100.04	°C			
					) NO Pending or Confirmed DTCs	=	see sheet inhibit	-			
							( - 1, 1				
Component / System	Fault Code	Monitor Strategy Description	Primary Malfunction Criteria	Threshol Logic and V	d alue	Secondary Parameters		Enable Conditions		Time Required	MIL Illum.
-------------------------------------------------------------	---------------	---------------------------------------------------------------------------------------	--------------------------------------------------------------------	-------------------------------------------------------------------------------------	-----------------------------------------	----------------------------------------------------------------------------------------------------------------------------------------	-----	--------------------------------------------------	-----------------------------	------------------------------------------------------------------------------------------------------------------------------	---------------
Reductant Purge Valve Control Circuit Low Voltage	P20A2	Diagnoses the Reductant Purge Valve low side driver circuit for circuit faults.	Voltage low during driver off state (indicates short-to-ground)	Short to grous ≤ 0.5 Ω impedance between sign and controlle ground	nd: - e nal r	engine pre drive	=	FALSE	-	fail conditions exists for 2 s monitor runs with 0.01 sec rate whenever enable	A
					a	time and pattery voltage	>	1.00	sec V	conditions are met	
						for time	>	3.00	sec		
					b	pattery voltage for	<	655.34	V		
					a (	time and	>	3.00	Sec		
					b a b	pattery voltage correction factor and pattery voltage correction factor	>	0.00	factor factor		
					) a b	for time and pasic enable conditions met:	> =	3.00 see sheet enable tables	sec		
Reductant Purge Valve Control Circuit High Voltage	P20A3	Diagnoses the Reductant Purge Valve 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 sigr and controller power	er: - e nal r a b a b	for time and battery voltage for time and battery voltage for time and battery voltage for time	=	FALSE 1.00 11.00 3.00 655.34 3.00	sec V sec V sec	fail conditions exists for 3 s monitor runs with 0.01 sec rate whenever enable conditions are met	A

Component / System	Fault Code	Monitor Strategy Description	Primary Malfunction Criteria	Lo	Threshold		Secondary Parameters		Enable Conditions		Time Required	MIL Illum.
					<u>.</u>		and battery voltage correction factor ) for time and basic enable conditions met:	< > =	4.00 3.00 see sheet enable tables	factor sec -		
Exhaust Aftertreatment Fuel Injector Control Circuit	P20CB	Electronic output driver circuitry determines circuit integrity on the exhaust aftertreatment fuel injector control circuit.	The ECM detects that the commanded state of the driver and the actual state of the control circuit do not match.				engine pre drive for time and battery voltage for time and starter is active cranking for time and basic enable conditions met:		FALSE 1.00 11.00 3.00 FALSE 3.00 see sheet enable tables	sec V sec sec	fail conditions exists for more than 30 events monitor runs with 0.1 s rate whenever enable conditions are met	В
Exhaust Aftertreatment Fuel Injector Performance	P20CC	Detects high exhaust temperatures in order to protect the engine	oxidation catalyst downstream temperature - oxidation catalyst upstream temperature OR particulate filter downstream temperature - SCR downstream temperature	>	300	°C	( oxidation catalyst upstream temperature change for time ) and (( time since last successful regeneration ) and (( Normal Mode (Particulate Filter Regeneration not active) or Exhaust Gas Temperature (Active) Management Mode )	<pre>&lt; &gt; = =</pre>	50.00 10.00 900.00 TRUE TRUE	°C sec sec	fail conditions exists for 180 s test performed continuously 0.1 s rate	A

Component / System	Fault Code	Monitor Strategy Description	Primary Malfunction Criteria	Threshold	Secondary Parameters		Enable Conditions		Time Required	MIL Illum
					for time ) and ( time since the end of the last tip cleaning request of the Exhaust Aftertreatment Fuel Injector ) AND basic enable conditions met: AND NO Pending or Confirmed DTCs:	>	300.00 300.00 see sheet enable tables see sheet inhibit tables	sec sec		
Exhaust Aftertreatment Fuel Injector Control Circuit Low Voltage	P20CD	Electronic out-put driver circuitry determines circuit integrity on the exhaust aftertreatment fuel injector control circuit.	The ECM detects that the commanded state of the driver and the actual state of the control circuit do not match.		engine pre drive for time and battery voltage for time and starter is active cranking for time and basic enable conditions met: and Diesel dosing valve: fuel injection		FALSE 1.00 11.00 3.00 FALSE 3.00 see sheet enable tables INACTIVE	- V sec - sec -	fail conditions exists for more than 30 events monitor runs with 0.1 s rate whenever enable conditions are met	В
Exhaust Aftertreatment Fuel Injector Control Circuit High Voltage	P20CE	Diagnoses the Exhaust Aftertreatment Fuel Injector 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	engine pre drive for time and battery voltage for time and starter is active cranking	=	FALSE 1.00 11.00 3.00 FALSE	- sec V sec -	fail conditions exists for more than 30 events monitor runs with 0.1 s rate whenever enable conditions are met	В

Component / System	Fault Code	Monitor Strategy Description	Primary Malfunction Criteria		Threshold Logic and Value		Secondary Parameters		Enable Conditions		Time Required	MIL Illum.
					-		for time and basic enable conditions met:	> =	3.00 see sheet enable tables	sec -		
Exhaust Gas Temperature (EGT) Sensors 1-2 not plausible	P20E2	Detects biased exhaust temperature sensors by comparing the upstream and downstream oxidation catalyst temperature sensors after a calibrated engine off soak time	Path 1: [(a) - (b)] (see Look-Up-Table #30) with (a) captured oxidation catalyst downstream temperature at start and with (b) captured oxidation catalyst upstream temperature at start as reference temperature or Path 2: ( [(a) - (b)] (see Look-Up-Table #30) with (a) captured oxidation catalyst downstream temperature at start and with (b) captured oxidation catalyst upstream temperature at start as reference temperature and [(a) - (b)] (see Look-Up-Table #31) with (a) captured oxidation catalyst downstream temperature at start and with (b) captured oxidation catalyst downstream temperature at start and with (b) captured oxidation catalyst upstream temperature at start and with (b) captured oxidation catalyst upstream temperature at start as reference temperature and status of block heater	> = <= = > = =	100 to 999 measured parameter measured parameter 100 to 999 measured parameter 30 to 999 measured parameter measured parameter saured parameter	°C - - - - - - -	minimum engine-off time and ambient temperature and Engine Running (see parameter definition) for time and engine post drive/ afterun and diagnostic performed in current dc and basic enable conditions met: and NO Pending or Confirmed DTCs:		28800.00 -60.04 TRUE 0.00 FALSE FALSE see sheet enable tables see sheet inhibit	sec - sec - -	fail conditions exists for 0.050 s monitor runs with 0.050 s rate whenever enable conditions are met	В
Delivery performance bank 1	P20E8	Compare Reductant tank pressure with lower thresholds under metering control	Reductant Pump Module Pressure	<	400.00	kPa	status of SCR control sub state (please see the definition)	=	Metering control	-	fail conditions exists for more than	A

Component / System	Fault Code	Monitor Strategy Description	Primary Malfunction Criteria	L	Threshold		Secondary Parameters		Enable Conditions		Time Required	MIL Illum.
					<u>, , , , , , , , , , , , , , , , , , , </u>		status byte in substate METERING CONTROL Dwell time in Metering control substate ambient pressure ambient temperature NO Pending or Confirmed DTCs: basic enable conditions met:		Running 1.00 -30.04 see sheet inhibit tables see sheet enable tables	sec kPa °C -	60.0 s monitor runs with 0.1 s rate whenever enable conditions are met	
Reductant System Performance Bank 1	P20E9	Path 1: Compare Reductant tank pressure with upper threshold under metering control	Reductant Pump Module Pressure	>	650.00	kPa	status of SCR control sub state (please see the definition) status byte in substate METERING CONTROL Dwell time in Metering control substate ambient pressure ambient temperature NO Pending or Confirmed DTCs: basic enable conditions met:	=	Metering control Running 1.00 0.00 -30.04 see sheet inhibit tables see sheet enable tables	- sec kPa °C -	fail conditions exists for monitor runs with 0.1 s rate whenever enable conditions are met	A
		Path 2: Or Reductant tank pressure high	Unfiltered Reductant Pump Module Pressure	>=	795.00	kPa	ambient pressure ambient temperature basic enable conditions met:	A A II	0.00 -30.04 see sheet enable tables	kPa °C -	fail conditions exists for more than 1 s monitor runs with 0.1 s rate whenever enable conditions	
SCR Nox Catalyst Efficiency Below Threshold Bank 1	P20EE	Compare EWMA filtered NOx conversion efficiency of SCR catalyst with a threshold value	EWMA filtered delta SCR catalyst efficiency of (a) - (b) where	<	0.00	factor	NO Pending or Confirmed DTCs: for time	=	see sheet inhibit tables 300.00	sec	fail conditions exists for more than 1 event	A

Component / System	Fault Code	Monitor Strategy Description	Primary Malfunction Criteria		Threshold Logic and Value		Secondary Parameters		Enable Conditions		Time Required	MIL Illum.
		••••	(a) measured SCR catalyst efficiency	=	calculated parameter	-					monitor runs with 0.01 s	
			<ul> <li>(b) offset-corrected modeled SCR catalyst efficiency (please see the general description for details)</li> </ul>	=	calculated parameter	-	Status of NOx signal of upstream NOx sensor (please see the definition)	=	Active	-	rate whenever enable	
			general accomption for actailey				for time	>	60.00	sec	conditions	
							Status of NOx signal of downstream NOx	=	Active	-	are met	
							sensor (please see the definition)		60.00		aremet	
							, ior ume	>	60.00	Sec		
							( Release of dosing strategy (please see the definition)	=	TRUE	-		
							for time	>=	(a) + (b)	sec		
							(a) Turn on delay time 1 of status metering strategy		380.00	sec		
							<ul> <li>(b) Turn on delay time 2 of status metering strategy</li> <li>)</li> </ul>		20.00	sec		
							( Status for disabling SCR Efficiency monitoring following an SCR Adaptation completion (please see the definition)	=	FALSE	-		
							for time		(a) + (b)			
							(a) Debounce time after pre controlled	>	(a) + (b) 0.50	sec		
							dosing over	-				
							<ul> <li>(b) delay time the status of disabling SCR Efficiency monitoring or</li> </ul>	>	80.00	sec		
							integrated upstream NOx )	>=	3276.70	g		
							( Chattan of any contactly distance (along		EAL OF			
							see the definition)	=	FALSE	-		
							for time	>	(a) + (b)			
							<ul> <li>(a) Debounce time after pre controlled dosing off</li> </ul>	=	0.50	sec		
							(b) Delay time after pre controlled dosing off	=	180.00	sec		
							or integrated upstream NOx )	>=	3276.70	g		
							( Decrease of Reductant load level (please see the definition)	=	FALSE	-		
							for time	>	300.00	sec		
							) (					
							Average slow filtered NOx mass flow upstream SCR	<=	0.12	g/sec		

Component /	Fault	Monitor Strategy	Primary Malfunction	Threshold	Secondary		Enable		Time	MIL
System	Code	Description	Criteria	Logic and value	Farameters		Conditions		Required	mum.
					for time	>	0.50	sec		
					Monitor disable time based on average	>	0 to 85	sec		
					NOx mass flow and the time (see Look-					
					Up-Table #88)					
					)					
					1					
					for time with		45.00			
					for time with	>	15.00	sec		
					((					
					Delta SCR temperature (see Look-Up-	<=	23.96 to 74.96	°C		
					Table #85)					
					or					
					Delta SCR temperature	>	524.96	°C		
					Delta SCR temperature	~	199.96	°Č		
					or		100.00	0		
							0.50			
					initialization time of temperature gradient	<	2.50	sec		
					calculation					
					)					
					or					
					Delta SCR temperature	<	229.96	°C		
					or					
					Delta SCR temperature	>	499.96	°C		
					for time	~	10.00	Sec		
						-	10.00	000		
					)					
					1					
					(					
					normalized HC load in SCR catalyst	>	21.00	-		
					)					
					(					
					ambient pressure	>=	74.80	kPa		
					ambient temperature	>=	-7 04	°C		
								Ũ		
					)					
					( Church an durate stand de sin such a fault unas					
					Stuck reductant dosing valve fault was	=	FALSE	-		
					healed					
					last particulate filter regeneration	=	TRUE	-		
					successful					
					)					
				1	(					
				1	State of the NH3 slip detection	=	FALSE	-		
					integrated upstream NOx during SCR	>=	20.00	a		
					adaptation plausibility check active		20.00	э		
					Status of the SCP adaptation plausibility	_				
					status of the SCR adaptation plausibility	=	FALSE	-		
				1	check active (please see the definition)					
					tor time	>	600.00	sec		
					)					
					SCR NOx Catalyst Efficiency Below	=	FALSE	-		
					Threshold Bank 1 was performed this					
					drive cycle					
				1	(					
				1	engine speed	~-	1000.00	rnm		
						2=	2000.00	ipin		
				1	for time	<=	0.00	ipili		
					tor time	>	0.00	sec		
1	I	I		1	)				I I	I

Component /	Fault	Monitor Strategy	Primary Malfunction	Threshold	Secondary		Enable		Time	MIL
Oystem	ooue	Description	Onteria	Logic and Value	SCR estimated current Reductant load	>=	0.06 to 1.3	n	Required	
			1		(see Look-Up-Table #77)		0.00 10 1.5	9		1
			1		SCR estimated current Reductant load	<=	0.2 to 2.7	g		1
			1		(see Look-Up-Table #76)					1
			1		Difference between nominal and	>=	-0.35 to -0.05	g		1
			1		estimated Reductant (see Look-Up-Table					1
			1		#79) Difference between envirol and		0.05 += 0.0	-		1
			1		Difference between nominal and	<=	0.05 to 0.2	g		1
			1							1
			1		SCR in Pre-Control State (please see the	=	FALSE	-		1
			1		definition)					1
			1							1
			1		(					1
			1		Disable after adaptation	=	FALSE			1
			1		for time		600.00	SAC		1
			1			_	000.00	300		1
			1		((					1
			1		(a) - (b) (see Look-Up-Table #86)	<=	44.96 to 74.96	°C		1
			1		for time	>	0.00	sec		1
			1		)					1
			1		or (					1
			1		( (a) - (b) (see Look-LIn-Table #87)	>=	-40 04 to -0 04	°C		1
			1		for time	>	0.00	sec		1
			1		(a) upstream SCR catalyst	=	measured	-		1
			1		temperature		parameter			1
			1		(b) downstream SCR catalyst	=	measured	-		1
			1		temperature		parameter			1
			1		)) Integrated NOx mass unstream SCR		1 50	a		1
			1		for time	>	0.00	sec		1
			1							1
			1		Average SCR Temperature	<=	399.96	°C		1
			1		Average SCR Temperature	>=	-3549.94	°C		1
			1		Downstream SCR catalyst temperature	>=	3003.56	°C		1
			1		Downstream SCR catalyst temperature	<=	-3549.94	°C		1
										1
			1		Filtered and delayed upstream NOx raw	>=	475.00	ppm		1
			1		emission		100.00			1
			1		Filtered and delayed upstream NOx raw	<=	100.00	ppm		1
			1		Filtered and delayed NOx raw emission	~-	0.25	a/sec		1
			1		mass flow upstream of SCR	~-	0.20	9,000		
			1							
			1		Filtered and delayed NOx raw emission	>=	0.01	g/sec		1
			1		mass flow upstream of SCR					1
			1		Filtered exhaust gas mass flow	<=	236 11	a/sec		
			1		Filtered exhaust gas mass flow	>=	-910.20	g/sec		
			1		MAP for valid engine operation points for	=	0 to 1	factor		
			1		SCR efficiency monitoring (see Look-Up-					1
			1		Table #83)					1

Component /	Fault	Monitor Strategy	Primary Malfunction	Threshold	Secondary		Enable		Time	MIL
System	Code	Description	Criteria	Logic and value	Parameters		Conditions		Required	llium.
					for time	>	0.00	sec		
					Inverse calculated accelerator pedal	>	5.00	%		
					value		0.00			
					for time	>	0.00	sec		
					EW/MA fact initialization mode:					
					filter coefficient for fast initialization	_	0.30	factor		
					number of SCP efficiency	_	2.00	count		
					measurements for fast initialization	/-	2.00	count		
					mode					
					mode					
					EWMA Rapid Response mode:					
					EWMA filtered delta SCR catalyst	>	0.12	factor		
					efficiency					
					(a) - (b)	<	0.00	factor		
					(a) measured SCR catalyst	=	measured	-		
					efficiency		parameter			
					(b) offset-corrected modeled SCR	=	measured	-		
					catalyst efficiency (please see the		parameter			
					general description for details)					
					offset-corrected modeled SCR	>	0.00	factor		
					catalyst efficiency (please see the					
					general description for details)					
					filter coefficient for Rapid Response	=	0.07	factor		
					mode					
					number of SCR efficiency	>=	6.00	count		
					measurements for Rapid Response					
					mode					
					EWMA filtered value tee email in Feet					
					Livit And Denid Deenenee medee					
					init. And Kapid Response modes:					
					EWMA filtered delta SCR catalvet	_	0.00	factor		
					efficiency of (a) - (b)		0.00	lactor		
					(a) measured SCR catalyst	=	measured	-		
					efficiency		parameter			
					(b) offset-corrected modeled SCR	=	measured	-		
					catalyst efficiency (please see the		parameter			
					general description for details)					
					EWMA stabilized mode:					
					filter coefficient for stabilized mode	=	0.05	factor		
					number of SCR efficiency	=	1	count		
					measurements for stabilized mode					
					hania anabla anaditiana matu		and also at any life			
					basic enable conditions met:	=	see sneet enable	-		
							ranie2			

Component / System	Fault Code	Monitor Strategy Description	Primary Malfunction Criteria		Threshold		Secondary Parameters		Enable Conditions		Time Required	MIL Illum.
Accelerator Pedal Position (APP) Sensor 1 Circuit Low Voltage	P2122	Detects low voltage readings on the APP circuit, indicating an OOR low condition on the APP 1 circuit	voltage of acceleration pedal sensor 1 same as acceleration pedal position	<=	-6.6	V %	ignition on and basic enable conditions met: and NO Pending or Confirmed DTCs:	=	TRUE see sheet enable tables see sheet inhibit tables	-	fail conditions exists for 0.19 s monitor runs with 0.01 s rate whenever enable conditions are met	A
Accelerator Pedal Position (APP) Sensor 1 Circuit High Voltage	P2123	Detects high voltage readings on the APP circuit, indicating an OOR high condition on the APP 1 circuit	voltage of acceleration pedal sensor 1 same as acceleration pedal position	>=	4.75	%	ignition on and basic enable conditions met: and NO Pending or Confirmed DTCs:	=	TRUE see sheet enable tables see sheet inhibit tables	-	fail conditions exists for 0.19 s monitor runs with 0.01 s rate whenever enable conditions are met	A
Accelerator Pedal Position (APP) Sensor 2 Circuit Low Voltage	P2127	Detects low voltage readings on the APP circuit, indicating an OOR low condition on the APP 2 circuit	voltage of acceleration pedal sensor 2 same as acceleration pedal position	<=	0.31 -13.9	V %	ignition on and basic enable conditions met: and NO Pending or Confirmed DTCs:	=	TRUE see sheet enable tables see sheet inhibit tables	-	fail conditions exists for 0.19 s monitor runs with 0.01 s rate whenever enable conditions are met	A
Accelerator Pedal Position (APP) Sensor 2 Circuit High Voltage	P2128	Detects high voltage readings on the APP circuit, indicating an OOR high condition on the APP 2 circuit	voltage of acceleration pedal sensor 2 same as acceleration pedal position	>=	2.32	V %	ignition on and basic enable conditions met: and	=	TRUE see sheet enable tables	-	fail conditions exists for 0.19 s monitor runs with 0.01 s rate whenever enable	A

Component / System	Fault Code	Monitor Strategy Description	Primary Malfunction Criteria		Threshold Logic and Value		Secondary Parameters		Enable Conditions		Time Required	MIL Illum.
					Ĩ		NO Pending or Confirmed DTCs:	=	see sheet inhibit tables	-	conditions are met	
Accelerator Pedal Position (APP) Sensor 1-2 Correlation	P2138	Detects in range pedal positions errors by comparing voltages on each sensor.	[maximum value ((a/b) or (c)) - maximum value ((c) or (d))] (see Look-Up-Table #13) with (a) voltage of acceleration pedal position sensor 1 and with (b) factor between sensor raw values and with (c) minimum voltage and with (d) redundant voltage of acceleration pedal (from pedal position sensor 2)	>	0.120 to 0.180 measured parameter 2.00 0.45 calculated parameter	V V factor V -	ignition on and basic enable conditions met: and NO Pending or Confirmed DTCs:	=	TRUE see sheet enable tables see sheet inhibit tables		fail conditions exists for 0.2 s monitor runs with 0.01 rate whenever enable conditions are met	A
Injector Positive Voltage Control Circuit Group 1	P2146	ECM Electronic out-put driver circuitry determines if faults (open/short/no load) exist on injector charging bank #1.	Voltage high during driver off state (indicates short to power, short to ground, or open circuit)	=	Short to power: $\leq 0.5 \Omega$ impedance between signal and controller power Open Circuit: $\geq$ 200 K $\Omega$ impedance between ECU pin and load signal and controller ground: $\leq 0.5 \Omega$ impedance between signal and controller ground	-	Engine Running (see parameter definition) and fuel system status	=	TRUE no fuel cut off		fail conditions exists for more than 0.04 s monitor runs with 0.01 s rate whenever enable conditions are met	A

Component / System	Fault Code	Monitor Strategy Description	Primary Malfunction Criteria	Threshold	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
							Toquirou	
Injector Positive Voltage Control Circuit Group 2	P2149	ECM Electronic out-put driver circuitry determines if faults (open/short/no load) exist on injector charging bank #2.	Voltage high during driver off state (indicates short to power, short to ground, or open circuit)	<ul> <li>Short to power: ≤ 0.5 Ω impedance between signal and controller power</li> <li>Open Circuit: ≥ 200 K Ω impedance between ECU pin and load signal and controller ground</li> <li>Short to ground: ≤ 0.5 Ω impedance between signal and controller ground</li> </ul>	Engine Running (see parameter definition) and fuel system status	= TRUE -	fail conditions exists for more than 0.04 s monitor runs with 0.01 s rate whenever enable conditions are met	A
Reductant Heater "A" Current Too High	P214F	Detects a tank heater short circuit by detecting high conductance in the heater	<ul> <li>(a) &gt;= (b)</li> <li>with <ul> <li>(a) maximum conductance of the urea tank heater</li> <li>and with</li> <li>(b) maximum tolerance threshold of the conductance for the urea tank heater</li> </ul> </li> </ul>	= TRUE - = calculated 1/Ohm parameter = 0.56 1/Ohm	ignition switch on and urea tank heater powerstage on and battery voltage and battery voltage and engine off time and urea tank temperature	= TRUE - = TRUE - >= 11.00 V <= 100.00 V >= 5400.00 sec <= 41.96 °C	fail conditions exists for 0.1 s monitor runs once per trip with 0.1 s rate whenever enable conditions are met	В

Component / Fault System Code	Monitor Strategy Description	Primary Malfunction Criteria	Threshold Logic and Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
			Ĭ	and ( conductance of the urea tank heater is steady or falling for time or heater activation time ) and basic enable conditions met: and NO Pending or Confirmed DTCs:	> 1000.00 sec >= 600.00 sec = see sheet enable - tables = see sheet inhibit - tables		
Injector Positive Voltage Control Circuit Group 3	ECM Electronic out-put driver circuitry determines if faults (open/short/no load) exist on injector charging bank #3.	Voltage high during driver off state (indicates short to power, short to ground, or open circuit)	<ul> <li>Short to power: - ≤ 0.5 Ω impedance between signal and controller power</li> <li>Open Circuit: ≥ 200 K Ω impedance between ECU pin and load signal and controller ground</li> <li>Short to ground: ≤ 0.5 Ω impedance between signal and controller ground</li> </ul>	Engine Running (see parameter definition) and fuel system status	= TRUE -	fail conditions exists for more than 0.04 s monitor runs with 0.01 s rate whenever enable conditions are met	A

Component / System	Fault Code	Monitor Strategy Description	Primary Malfunction Criteria		Threshold Logic and Value		Secondary Parameters		Enable Conditions		Time Required	MIL Illum.
Injector Positive Voltage Control Circuit Group 4	P2155	ECM Electronic out-put driver circuitry determines if faults (open/short/no load) exist on injector charging bank #4.	Voltage high during driver off state (indicates short to power, short to ground, or open circuit)	=	Short to power: ≤ 0.5 Ω impedance between signal and controller power Open Circuit: ≥ 200 K Ω impedance between ECU	-	Engine Running (see parameter definition) and fuel system status	=	TRUE	-	fail conditions exists for more than 0.04 s monitor runs with 0.01 s rate whenever enable conditions are met	A
Intake Air Temp Sensor 1 / 2 Correlation	P2199	Detects biased Humidity Temperature Sensor or MAF Intake Air Temperature Sensor by comparing the measured temperatures at start.	Path 1:				minimum engine-off time	>=	28800.00	sec	fail conditions exists for 0.1 s monitor runs once per trip	В
			<ul> <li>(a) - (b)  (see Look-Up-Table #2)</li> <li>where</li> <li>(a) captured intake air temperature at</li> </ul>	> =	100 to 999 measured	°C -	and ambient air temperature and	>	-60.04	°C	with 0.1 s rate whenever	
			start and		parameter		Engine Running (see parameter definition)	=	TRUE	-	enable conditions are met	
			(b) captured numidity temperature at start	=	parameter	-	time	>	0.00	sec		
			or Path 2:				and engine post drive/ afterun	=	FALSE	-		
			(  (a) - (b)  (see Look-Up-Table #2) where	<=	100 to 999	°C	diagnostic performed in current dc and	=	FALSE	-		
			(a) captured intake air temperature at start	=	measured parameter	-	basic enable conditions met:	=	see sheet enable tables	-		
			(b) captured humidity temperature at start	=	measured parameter	-	NO Pending or Confirmed DTCs:	=	see sheet inhibit tables	-		
			(a) - (b)  (see Look-Up-Table #5)	>	20 to 999	°C						
			where (a) captured intake air temperature at start and	=	measured parameter	-						

Component / System	Fault Code	Monitor Strategy Description	Primary Malfunction Criteria		Threshold Logic and Value		Secondary Parameters		Enable Conditions		Time Required	MIL Illum.
			(b) captured humidity temperature at start and	=	measured parameter	-						
			( status of block heater (see parameter definition) or	=	FALSE	-						
			status of sun-load detection (see parameter definition) ) )	=	FALSE	-						
Reductant Level Sensor 2 Circuit	P21AA	CAN message: Discrete level sensor level 2 short to	Reductant Tank Level 2 Error Status	=	1	-	ignition on	=	TRUE	-	fail conditions	A
LOW		giouna enor	( tank level sensor 2 voltage directly measured after a test impulse was	<	(0.17)	V	battery voltage	>	8	V	more than 3 sec	
							basic enable conditions met:	=	see sheet enable tables	-	with 1 s rate whenever enable conditions	
Reductant Level Sensor 2 Circuit	P21AB	Path 1:									are met	
High		CAN message: Discrete level sensor 2 open load	Reductant Tank Level 2 Error Status	=	3	-	ignition on	=	TRUE	-		
		entor	( measured tank level sensor 2 voltage after 1.5 ms since a test impulse was	>	(3.56)	V	battery voltage	>	8	V		
			(measured tank level sensor 2 voltage after 1.5 ms since a test impulse was applied )	<	(4.74)	V	basic enable conditions met:	=	see sheet enable tables	-		
		Path 2: CAN message: Discrete level sensor 2 short to	Reductant Tank Level 2 Error Status	=	2	-	ignition on	=	TRUE	-		
		battery error	( measured tank level sensor 2 voltage after 1.5 ms since a test impulse was	>	(4.74)	V	battery voltage	>	8	V		
			applied )				basic enable conditions met:	=	see sheet enable tables	-		
Reductant Level Sensor 3 Circuit Low	P21AF	CAN message: Discrete level sensor level 3 short to ground error	Reductant Tank Level 3 Error Status	=	1	-	ignition on	=	TRUE	-		

Component / System	Fault Code	Monitor Strategy Description	Primary Malfunction Criteria		Threshold Logic and Value	•	Secondary Parameters		Enable Conditions		Time Required	MIL Illum.
			( tank level sensor 3 voltage directly measured after a test impulse was applied )	<	(0.17)	V	battery voltage basic enable conditions met:	>	8 see sheet enable tables	V -		
Reductant Level Sensor 3 Circuit High	P21B0	Path 1: CAN message: Discrete level sensor 3 open load error	Reductant Tank Level 3 Error Status ( measured tank level sensor 3 voltage after 1.5 ms since a test impulse was applied ) ( measured tank level sensor 3 voltage after 1.5 ms since a test impulse was applied )	= > <	3 (3.56) (4.74)	- V V	ignition on battery voltage basic enable conditions met:	= >	TRUE 8 see sheet enable tables	- V -	fail conditions exists for more than 3 sec monitor runs with 1 s rate whenever enable conditions are met	A
		Path 2: CAN message: Discrete level sensor 3 short to battery error	Reductant Tank Level 3 Error Status ( measured tank level sensor 3 voltage after 1.5 ms since a test impulse was applied )	=	2 (4.74)	- V	ignition on battery voltage basic enable conditions met:	= > =	TRUE 8 see sheet enable tables	- V -		
Reductant Heater "A" Current Too Low	P21DD	Detects a tank heater open circuit by detecting low conductance in the heater	<ul> <li>(a) &lt;= (b)</li> <li>with <ul> <li>(a) maximum conductance of the urea tank heater</li> <li>and with</li> <li>(b) minimum tolerance threshold of the conductance for the urea tank heater</li> </ul> </li> </ul>	=	TRUE calculated parameter 0.35	- 1/Ohm 1/Ohm	ignition switch on and urea tank heater powerstage on and battery voltage and battery voltage and engine off time and urea tank temperature and	= = >= <= <=	TRUE TRUE 11.00 100.00 300.00 41.96	- V V sec °C	fail conditions exists for 0.05 s monitor runs once per trip with 0.05 s rate whenever enable conditions are met	В

Component / System	Fault Code	Monitor Strategy	Primary Malfunction Criteria	Threshold	Secondary Parameters		Enable		Time Required	MIL
					conductance of the urea tank heater is steady or falling for time or heater activation time ) and basic enable conditions met: and NO Pending or Confirmed DTCs:	> >===	1000.00 600.00 see sheet enable tables see sheet inhibit tables	sec sec -		
NOx Sensor Circuit Bank 1 Sensor 1	P2200	Detects a failure when open circuit status message from NOx sensor is received continuously for a time period	Open circuit NOx signal error	= TRUE -	following conditions for time battery voltage battery voltage SCR upstream temperature SCR upstream temperature Engine Running for time Can Bus Initialized ( CAN Bus is Active ) consisting of: ignition on for time battery voltage battery voltage battery voltage Upstream NOx sensor dewpoint achieved (please see the definition) no pending or confirmed faults basic enable conditions met:	~	0.50 11.00 655.34 94.96 3003.56 TRUE 20.00 TRUE TRUE 3 9.8 655.34 TRUE see sheet inhibit tables see sheet enable tables	V V °C - sec - Sec V V -	fail conditions exists for more than 13 sec. monitor runs with 0.01 s rate whenever enable conditions are met	A
		Detects a failure when open circuit status message from binary lambda signal from the NOx sensor is received continuously for a time period	Open circuit binary lambda signal error	= TRUE -	following conditions for time battery voltage	>	0.50	sec V	fail conditions exists for more than 13 sec. monitor runs with 0.01 s rate	

Component / System	Fault Code	Monitor Strategy Description	Primary Malfunction Criteria	Threshold Logic and Value	Secondary Parameters		Enable Conditions		Time Required	MIL Illum.
					battery voltage	<=	655.34	V	whenever	
					SCR upstream temperature	>=	94.96	°C	enable conditions	
					SCR upstream temperature	<=	3003.56	°C	are met	
					Engine Running	=	TRUE	-		
					for time	>=	20.00	sec		
					Can Bus Initialized ( CAN Bus is Active ) consisting of:	=	TRUE	-		
					ignition on	=	TRUE	-		
					for time	>=	3	sec		
					battery voltage	~	9.0 655.34	v		
					Upstream NOx sensor dewpoint	=	TRUE	-		
					achieved (please see the definition)					
					no pending or confirmed faults	=	see sheet inhibit tables	-		
					basic enable conditions met:	=	see sheet enable	-		
							tables			
		Detects a failure when open circuit status message from linear lambda signal from the NOx sensor is received continuously for a time period	Open circuit linear lambda signal error	= TRUE -	following conditions for time	>	0.50	Sec	fail conditions exists for more than 13 sec. monitor runs with 0 01 s	
					battery voltage	>=	11.00	V	rate	
					battery voltage	<=	655.34	V	whenever	
					SCR upstream temperature	>=	94.96	°C	conditions	
					SCR upstream temperature	<=	3003.56	°C	are met	
					Engine Running	=	TRUE	-		
					for time	>=	20.00	sec		
					Can Bus Initialized ( CAN Bus is Active ) consisting of:	=	TRUE	-		
					ignition on	=	TRUE	-		
					for time	>=	3	sec		
					battery voltage	>	9.8 655 24	V		
					Upstream NOx sensor dewpoint achieved (please see the definition)	=	TRUE	-		
					no pending or confirmed faults	=	see sheet inhibit	-		
					basic enable conditions met:	=	see sheet enable	-		

Component / System	Fault Code	Monitor Strategy Description	Primary Malfunction Criteria	Threshold Logic and Value	Secondary Parameters		Enable Conditions		Time Required	MIL Illum.
		Detects a failure when short circuit status message from NOx sensor is received continuously for a time period	Short Circuit Nox signal error	= TRUE -	following conditions for time	>	0.50	sec	fail conditions exists for more than 13 sec.	
					battery voltage battery voltage SCR upstream temperature	>= <= >=	11.00 655.34 94.96	∨ ∨ °C	monitor runs with 0.01 s rate whenever enable	
					SCR upstream temperature	<=	3003.56	°C	conditions are met	
					Engine Running for time	= >=	TRUE 20.00	- sec		
					Can Bus Initialized ( CAN Bus is Active ) consisting of:	=	TRUE	-		
					ianition on for time battery voltage	= >= >	TRUE 3 9.8	sec V		
					battery voltage Upstream NOx sensor dewpoint achieved (please see the definition)	< =	655.34 TRUE	V -		
					no pending or confirmed faults	= 56	e sheet inhibit tables	-		
					basic enable conditions met:	= Se	tables	-		
		Detects a failure when short circuit status message from binary lambda signal form the NOx sensor is received continuously for a time period	Short Circuit binary lambda signal error	= TRUE -	following conditions for time	>	0.50	sec	fail conditions exists for more than 13 sec. monitor runs	
					battery voltage	>=	11.00	V	vith 0.01 s rate	
					battery voltage	<=	655.34	V	whenever	
					SCR upstream temperature	>=	94.96	°C	conditions	
					SCR upstream temperature	<=	3003.56	°C	are met	
					Engine Running	=	TRUE	-		
					for time	>=	20.00	sec		
					Can Bus Initialized ( CAN Bus is consisting of:	=	TRUE	-		
					for time	= >=	TRUE	sec		
					battery voltage battery voltage	> <	9.8 655.34	V V		

Component / System	Fault Code	Monitor Strategy Description	Primary Malfunction Criteria	Threshold Logic and Value	Secondary Parameters		Enable Conditions		Time Required	MIL Illum.
					Upstream NOx sensor dewpoint no pending or confirmed faults basic enable conditions met:	= =	TRUE see sheet inhibit tables see sheet enable tables	-		
		Detects a failure when short circuit status message from linear lambda signal from the NOx sensor is received continuously for a time period	Short Circuit linear lambda signal error	= TRUE -	following conditions for time battery voltage battery voltage	> >= <=	0.50 11.00 655.34	sec V V	fail conditions exists for more than 13 sec. monitor runs with 0.01 s rate whenever	
					SCR upstream temperature	>=	94.96	°C	enable conditions	
					SCR upstream temperature	<=	3003.56	°C	are met	
					Engine Running	=	TRUE	-		
					for time	>=	20.00	sec		
					Can Bus Initialized ( CAN Bus is	=	TRUE	-		
					consisting of: iqnition on for time batterv voltage batterv voltage Upstream NOx sensor dewpoint no pending or confirmed faults basic enable conditions met:	= <del> </del>	TRUE 3 9.8 655.34 TRUE see sheet inhibit tables see sheet enable tables	sec V V -		
N0x Sensor Circuit	P2203	Detects an out of range high	Nox sensor signal (raw information	> 2500.00 ppm	Nox sensor 1 ready status (see	=	TRUE	•	fault exists	В
High Bank 1 Sensor 1		fault of the upstream NoX Sensor	received via CAN from Nox sensor)		parameter definition) Valid NOx signal from CAN is received (no Nox sensor communication failures)	=	TRUE	-	for more than 10 sec; monitor runs at 0.1 s when enable	
					Engine Running (see parameter definition)	=	TRUE	-	conditions are met	
N0x Sensor Circuit Low Bank 1 Sensor 1	P2202	Detects an out of range low fault of the upstream NoX Sensor	Nox sensor signal (raw information received via CAN from Nox sensor)	< -90.00 ppm	for time and	>	20.00	sec		
					Injection Quantity	>	8.00	mm^3/r ev		
					or Upstream NOx sensor dewpoint achieved (please see the definition)	=	TRUE	-		

Component / System	Fault Code	Monitor Strategy Description	Primary Malfunction Criteria	Threshold	Secondary Parameters		Enable Conditions		Time Required	MIL Illum.
					for time	>	600.00	sec		
Nox Sensor Heater Control Circuit Bank 1 Sensor 1	P2205	Detects a failure when open circuit status message from NOx sensor heater is received continuously for a time period	Open Circuit Nox Heater signal error	= TRUE -	following conditions for time	>	0.50	Sec	fail conditions exists for more than 13 sec. monitor runs	A
					battery voltage	>=	11.00	V	with 0.01 s	
					SCR upstroam temporature	<=	04.06	v °C	rate whenever	
					SCR upstream temperature	~=	3003.56	°C	enable	
					Engine Running	=	TRUE	-	are met	
					for time	>=	20.00	sec		
					Can Bus Initialized ( CAN Bus is Active )	=	TRUE	-		
					consisting of: ignition on for time	= >=	TRUE	- sec		
					battery voltage Upstream NOx sensor dewpoint no pending or confirmed faults	< = =	655.34 TRUE see sheet inhibit	V -		
					basic enable conditions met:	=	see sheet enable tables	-		
		Detects a failure when short circuit status message from NOx sensor heater is received continuously for a time period	Short Circuit Nox heater signal error	= TRUE -	following conditions for time	>	0.50	sec	fail conditions exists for more than 13 sec. monitor runs	
					battery voltage	>=	11.00	V	with 0.01 s	
					SCR upstream temperature	<=	022.34 04.06	v °C	rate whenever	
					SCR upstream temperature	<=	3003.56	°C	enable conditions	
					Engine Running	_		_	are met	
					for time	>=	20.00	sec		
					Can Bus Initialized ( CAN Bus is	=	TRUE	-		

Component / System	Fault Code	Monitor Strategy Description	Primary Malfunction Criteria		Threshold Logic and Value	9	Secondary Parameters		Enable Conditions		Time Required	MIL Illum.
					5		consisting of: ianition on for time batterv voltaae batterv voltaae Upstream NOx sensor dewpoint no pending or confirmed faults basic enable conditions met:	", " " "	TRUE 3 9.8 655.34 TRUE see sheet inhibit tables see sheet enable tables	sec V V -		
NOx Heater Performance Bank 1 Sensor 1	P2209	Monitoring of the upstream NOx sensor signal readiness	Upstream NOx sensor heater temperature has reached setpoint	=	FALSE	-	( battery voltage and battery voltage and Oxidation Catalyst upstream temperature and Oxidation Catalyst upstream temperature and Engine running for time and Upstream NOx sensor dewpoint end is reached (please see parameter definition) ) for time and basic enable conditions met: No Pending or Confirmed DTC	>= <= >= = =	11.00 655.34 94.96 3003.56 TRUE 20.00 TRUE 150.5 see sheet enable tables see sheet inhibit tables	V °C - sec - sec -	fault exists for more than 1 event when dewpoint end is reached; monitor runs at 0.02 s when enable conditions are met	В
Reductant Heater "B" Current Too Low	P221C	Detects a pressure line heater open circuit by detecting low conductance in the heater	<ul> <li>(a) &lt;= (b)</li> <li>with <ul> <li>(a) conductance of the urea pressure</li> <li>line heater</li> <li>and with</li> <li>(b) minimum tolerance threshold of</li> <li>the conductance for the urea pressure</li> <li>line heater</li> </ul> </li> </ul>	=	TRUE calculated parameter 0.28	- 1/Ohm 1/Ohm	ignition switch on and urea pressure line heater powerstage on and battery voltage and	= = >=	TRUE TRUE 11.00	- - V	fail conditions exists for 0.05 s monitor runs with 0.05 s rate whenever enable conditions are met	В

Component / System	Fault Code	Monitor Strategy Description	Primary Malfunction Criteria		Threshold	e	Secondary Parameters		Enable Conditions		Time Required	MIL Illum.
							battery voltage and engine off time and heater activation time and basic enable conditions met: and NO Pending or Confirmed DTCs:	~	100.00 0.00 81.00 see sheet enable tables see sheet inhibit tables	V sec sec -		
Reductant Heater "B" Current Too High	P221D	Detects a pressure line heater short circuit by detecting high conductance in the heater	<ul> <li>(a) &gt;= (b)</li> <li>with <ul> <li>(a) conductance of the urea pressure</li> <li>line heater</li> <li>and with</li> <li>(b) maximum tolerance threshold of</li> <li>the conductance for the urea pressure</li> <li>line heater</li> </ul> </li> </ul>	=	TRUE calculated parameter 0.92	- 1/Ohm 1/Ohm	ignition switch on and urea pressure line heater powerstage on and battery voltage and battery voltage and engine off time and heater activation time and basic enable conditions met: and NO Pending or Confirmed DTCs:		TRUE TRUE 11.00 100.00 0.00 81.00 see sheet enable tables see sheet inhibit tables	- V V sec sec -	fail conditions exists for 0.05 s monitor runs with 0.05 s rate whenever enable conditions are met	В
Reductant Heater "C" Current Too Low	P221E	Detects a supply module heater open circuit by detecting low conductance in the heater	<ul> <li>(a) &lt;= (b)</li> <li>with         <ul> <li>(a) maximum conductance of the supply module heater and with</li> <li>(b) minimum tolerance threshold of the conductance for the supply module heater</li> </ul> </li> </ul>	=	TRUE calculated parameter 0.14	1/Ohm 1/Ohm	ignition switch on and supply module heater powerstage on and battery voltage and battery voltage	= >= <=	TRUE TRUE 11.00 100.00	- - V	fail conditions exists for 0.1 s monitor runs once per trip with 0.1 s rate whenever enable conditions are met	В

Component / System	Fault Code	Monitor Strategy Description	Primary Malfunction Criteria	La	Threshold		Secondary Parameters		Enable Conditions		Time Required	MIL Illum.
					<u> </u>		and engine off time and ( conductance of the urea tank heater is steady or falling	>=	7600.00	sec		
							for time or	>	100.00	sec		
							heater activation time ) and	>=	10.00	sec		
							basic enable conditions met:	=	see sheet enable tables	-		
							NO Pending or Confirmed DTCs:	=	see sheet inhibit tables	-		
Reductant Heater "C" Current Too High	P221F	Detects a supply module heater short circuit by detecting high conductance in the heater	(a) >= (b) with	=	TRUE	-	ignition switch on and	=	TRUE	-	fail conditions exists for 0.1 s	В
			<ul> <li>(a) maximum conductance of the supply module heater and with</li> </ul>	=	calculated 1/ parameter	/Ohm	supply module heater powerstage on and	=	TRUE	-	monitor runs once per trip with 0.1 s	
			(b) maximum tolerance threshold of the conductance for the supply module heater	=	0.35 1/	/Ohm	battery voltage	>=	11.00	V	rate whenever enable	
							and battery voltage	<=	100.00	V	conditions are met	
							and engine off time and (	>=	7600.00	sec		
							conductance of the urea tank heater is steady or falling for					
							time	>	100.00	sec		
							heater activation time )	>=	10.00	sec		
							and basic enable conditions met:	=	see sheet enable tables	-		
							NO Pending or Confirmed DTCs:	=	see sheet inhibit tables	-		
					_				_			

Component /	Fault	Monitor Strategy	Primary Malfunction		Threshold		Secondary		Enable		Time	MIL
System	Code	Description	Criteria		Logic and Value		Parameters		Conditions		Required	Illum.
Barometric Pressure (BARO) Circuit Low	P2228	Detects low voltage readings on the ECM internal BARO circuit, indicating an OOR low condition on the BARO circuit.	voltage of barometric pressure sensor same as ambient pressure	<=	1.97	kPa	ignition on and basic enable conditions met:	=	TRUE see sheet enable tables	-	fail conditions exists for 0.8 S monitor runs 0.1 s rate whenever enable conditions are met	A
Barometric Pressure (BARO) Circuit High	P2229	Detects high voltage readings on the ECM internal BARO circuit, indicating an OOR high condition on the BARO circuit.	voltage of barometric pressure sensor same as ambient pressure	> >=	4.54	V kPa	ignition on and basic enable conditions met:	-	TRUE see sheet enable tables	-	fail conditions exists for 0.8 s monitor runs 0.1 s rate whenever enable conditions are met	A
Turbo Boost System Performance	P2263	Detects if the Turbocharger is severely over or under boosting based on control deviation	Path 1: control deviation of the boost pressure calculated out of difference between desired and actual value with (a) control deviation threshold (see Look-Up-Table #64) (b) environmental pressure correction factor(see Look-Up-Table #59)	>	(a)*(b) 80 to 100 0.67 to 1	- kPa factor	offset learning for turbo charger (VNT) actuator position sensor is active during idling - in order to compensate sensor drift and valve aging, the valve is closed and opened fully once in a driving cycle during engine idling, the read positions for opening and closing are averaged and used for the calculation of offset drift of the valve and turbo charger (VNT) wiping is active	=	FALSE	-	fail conditions exists for 15 s test performed continuously 0.01 s rate	A

Component / System	Fault Code	Monitor Strategy Description	Primary Malfunction Criteria	Threshold	Secondary Parameters		Enable Conditions		Time Required	MIL Illum.
					<ul> <li>in order to prevent soot accumulation</li> <li>e.g. in a long idle operation under cold</li> <li>engine condition on the turbine the</li> <li>desired value of the boost pressure</li> <li>actuator position governor is assigned</li> <li>from the set-point value</li> </ul>					
					and injection quantity is stable means increase of injection quantity	= <	TRUE 24.00	- (mm^3/r ev)/sec		
					and engine speed is stable means	=	TRUE	-		
					increase of engine speed and injection Quantity	< >=	100.00 80.00	rpm/sec mm^3/r		
					injection Quantity	<=	480.00	ev mm^3/r ev		
					and engine Speed engine Speed and	>= <=	1200.00 3400.00	rpm rpm		
					working range of boost pressure is in closed-loop means	=	TRUE	-		
					( engine speed and	>	550.00	rpm		
					injection quantity	>	80.00	mm^3/r ev		
					NO Pending or Confirmed DTCs:	=	see sheet inhibit tables	-		
					for time and	>	2.00	sec		
					pasic enable conditions met:	=	see sneet enable tables	-		
			Path 2 control deviation of the boost pressure calculated out of difference between desired and actual value	< (a)*(b) -	offset learning for turbo charger (VNT) actuator position sensor is active during idling	=	FALSE	-	fail conditions exists for 15 s test	

Component / System	Fault Code	Monitor Strategy Description	Primary Malfunction Criteria		Threshold Logic and Value	e	Secondary Parameters		Enable Conditions		Time Required	MIL Illum.
			with (a) control deviation threshold (see Look-Up-Table #63)	=	-50 to -40	kPa	<ul> <li>in order to compensate sensor drift and valve aging, the valve is closed and opened fully once in a driving cycle during engine idling, the read positions for opening and closing are averaged and used for the calculation of offset drift of the valve and</li> </ul>				performed continuously 0.01 s rate	
			(b) environmental pressure correction factor	=	1.00	factor	<ul> <li>turbo charger (VNT) wiping is active</li> <li>in order to prevent soot accumulation</li> <li>e.g. in a long idle operation under cold engine condition on the turbine the desired value of the boost pressure actuator position governor is assigned from the set-point value</li> </ul>	=	FALSE	-		
							injection quantity is stable means increase of injection quantity	= <	TRUE 24.00	- (mm^3/r ev)/sec		
							and engine speed is stable	=	TRUE	-		
							increase of engine speed	<	100.00	rpm/sec		
							and injection Quantity	>=	80.00	mm^3/r ev		
							injection Quantity	<=	480.00	mm^3/r ev		
							engine Speed engine Speed	>= <=	1200.00 3400.00	rpm rpm		
							and working range of boost pressure is in closed-loop means	=	TRUE	-		
							( engine speed and	>	550.00	rpm		
							injection quantity	>	80.00	mm^3/r ev		
							) NO Pending or Confirmed DTCs:	=	see sheet inhibit tables	-		
							for time and basic enable conditions met:	>	2.00 see sheet enable tables	sec -		

Component / System	Fault Code	Monitor Strategy Description	Primary Malfunction Criteria	Threshold Logic and Value	Secondary Parameters	Enable Conditions		Time Required	MIL Illum.
Fuel Pressure Regulator 2 Control Circuit	P2294	Diagnoses the Fuel Pressure Regulator 2 low side driver circuit for circuit faults.	Voltage low during driver off state (indicates short-to-ground)	= Open Circuit: ≥ - 200 K Ω impedance between ECU pin and load signal and controller ground	battery voltage for time and ignition on and basic enable conditions met:	<ul> <li>&gt; 11.00</li> <li>&gt; 3.00</li> <li>= TRUE</li> <li>= see sheet enable tables</li> </ul>	V sec -	fail conditions exists for 0.75 s monitor runs with 0.01 s rate whenever enable conditions are met	A
			Electronic power stage circuitry determines over temperature on the fuel pressure regulator 2 control circuit.		battery voltage for time and ignition on and basic enable conditions met:	> 11.00 > 3.00 = TRUE = see sheet enable tables	V sec -	fail conditions exists for 1 s monitor runs with 0.01 s rate whenever enable conditions are met	A
Fuel Pressure Regulator 2 Control Circuit Low Voltage	P2295	Diagnoses the Fuel Pressure Regulator 2 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	battery voltage for time and ignition on and basic enable conditions met:	> 11.00 > 3.00 = TRUE = see sheet enable tables	V sec - -	fail conditions exists for 0.75 s monitor runs with 0.01 s rate whenever enable conditions are met	A

Component / System	Fault Code	Monitor Strategy Description	Primary Malfunction Criteria	Threshold Logic and Value	Secondary Parameters	Ena Cond	able itions	Time Required	MIL Illum.
Fuel Pressure Regulator 2 Control Circuit High Voltage	P2296	Diagnoses the Fuel Pressure Regulator 2 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	battery voltage for time and ignition on and basic enable conditions met:	> 11. > 3. = TR = see shee tab	00 V 00 sec UE - et enable - les	fail conditions exists for 0.50 s monitor runs with 0.01 s rate whenever enable conditions are met	A
NOx Sensor Circuit Bank 1 Sensor 2	P229E	Detects a failure when open circuit status message from downstream NOx sensor is received continuously for a time period	Open circuit downstream NOx signal error	= TRUE -	following conditions for time battery voltage battery voltage SCR downstream temperature SCR downstream temperature Engine Running for time Can Bus Initialized ( CAN Bus is Active ) consisting of: ignition on for time battery voltage battery voltage Downstream NOx sensor dewpoint achieved (please see the definition) no pending or confirmed faults basic enable conditions met:	> 0.: >= 11 <= 655 >= 94 <= 3000 = TR >= 20 = TR >= 20 = TR = TR = TR = TR = TR = TR = TR = See shee tab	50 sec .00 V .34 V .96 °C .3.56 °C UE - .00 sec UE - .00 sec UE - .00 sec UE - .01 - .02 - .03 V .04 V .04 V .05 °C .05 °C .05 °C .05 °C .05 °C .06 °C .06 °C .07 V .08 °C .00 sec .00	fail conditions exists for more than 13 s monitor runs with 0.1 s rate whenever enable conditions are met	A
		Open circuit error of the binary lambda signal of Downstream NOx sensor via the CAN message	Open circuit lambda binary error of downstream NOx sensor via CAN message	= TRUE -	following conditions for time battery voltage battery voltage SCR downstream temperature SCR downstream temperature Engine Running for time	> 0. >= 11 <= 655 >= 94 <= 300 = TR >= 20	50 sec .00 V .34 V .96 °C 3.56 °C UE - .00 sec	fail conditions exists for more than 13 s monitor runs with 0.1 s rate whenever enable	

Component / System	Fault Code	Monitor Strategy Description	Primary Malfunction Criteria	Threshold Logic and Value	Secondary Parameters	Enable Conditions		Time Required	MIL Illum.
					Can Bus Initialized ( CAN Bus is Active ) consisting of: ignition on for time battery voltage battery voltage Downstream NOx sensor dewpoint achieved (please see the definition) no pending or confirmed faults basic enable conditions met:	= TRUE = TRUE >= 3 > 9.8 < 655.34 = TRUE = see sheet inhibit tables = see sheet enable tables	- sec V - -	conditions are met	
		Open circuit error of linear lambda signal of Downstream NOx sensor via the CAN message	Open circuit lambda linear error of downstream NOx sensor via CAN message	= TRUE -	following conditions for time battery voltage SCR downstream temperature SCR downstream temperature Engine Running for time Can Bus Initialized ( CAN Bus is Active ) consisting of: ignition on for time battery voltage battery voltage Downstream NOx sensor dewpoint achieved (please see the definition) no pending or confirmed faults basic enable conditions met:	<ul> <li>&gt; 0.50</li> <li>&gt;= 11.00</li> <li>&lt;= 655.34</li> <li>&gt;= 94.96</li> <li>&lt;= 3003.56</li> <li>= TRUE</li> <li>&gt;= 20.00</li> <li>= TRUE</li> <li>&gt;= 3</li> <li>&gt; 9.8</li> <li>&lt; 655.34</li> <li>= TRUE</li> <li>= see sheet inhibit tables</li> <li>= see sheet enable tables</li> </ul>	Sec V °C - Sec - Sec V V - -	fail conditions exists for more than 13 s nonitor runs with 0.1 s rate whenever enable conditions are met	
		Downstream NOx sensor short circuit error via the CAN message	Short circuit NOx signal error of downstream NOx sensor via CAN message	= TRUE -	following conditions for time battery voltage battery voltage SCR downstream temperature SCR downstream temperature Engine Running for time Can Bus Initialized ( CAN Bus is Active ) consisting of: ignition on	> 0.50 >= 11.00 <= 655.34 >= 94.96 <= 3003.56 = TRUE >= 20.00 = TRUE = TRUE	Sec V V °C n °C Sec - Sec -	fail conditions exists for more than 13 s nonitor runs with 0.1 s rate whenever enable conditions are met	

Component /	Fault	Monitor Strategy	Primary Malfunction	Threshold	Secondary	Enable		Time	MIL
System	Code	Description	Criteria	Logic and Value	Parameters	Conditions		Required	Illum.
					for time battery voltage battery voltage Downstream NOx sensor dewpoint achieved (please see the definition) no pending or confirmed faults basic enable conditions met:	>= 3 > 9.8 < 655.34 = TRUE = see sheet inhibit tables = see sheet enable tables	sec V V -		
		Short circuit error of binary lambda signal of Downstream NOx sensor via the CAN message	Short circuit lambda binary error of downstream NOx sensor via CAN message	= TRUE -	following conditions for time battery voltage battery voltage SCR downstream temperature SCR downstream temperature Engine Running for time Can Bus Initialized ( CAN Bus is Active ) consisting of: ignition on for time battery voltage battery voltage Downstream NOx sensor dewpoint achieved (please see the definition) no pending or confirmed faults basic enable conditions met:	<ul> <li>&gt; 0.50</li> <li>&gt;= 11.00</li> <li>&lt;= 655.34</li> <li>&gt;= 94.96</li> <li>&lt;= 3003.56</li> <li>= TRUE</li> <li>&gt;= 20.00</li> <li>= TRUE</li> <li>= TRUE</li> <li>= 3</li> <li>&gt; 9.8</li> <li>&lt; 655.34</li> <li>= TRUE</li> <li>= see sheet inhibit tables</li> <li>= see sheet enable tables</li> </ul>	V V °C °C - sec V V V - sec V v -	fail conditions exists for more than 13 s monitor runs with 0.1 s rate whenever enable conditions are met	
		Short circuit error of linear lambda signal of Downstream NOx sensor via the CAN message	Short circuit lambda linear error of downstream NOx sensor via CAN message	= TRUE -	following conditions for time battery voltage battery voltage SCR downstream temperature SCR downstream temperature Engine Running for time Can Bus Initialized ( CAN Bus is Active ) consisting of: ignition on for time battery voltage battery voltage	> 0.50 >= 11.00 <= 655.34 >= 94.96 <= 3003.56 = TRUE >= 20.00 = TRUE = TRUE = 3 > 9.8 < 655.34	V V °C °C - sec - sec V V	fail conditions exists for morte than 13 s monitor runs with 0.1 s rate whenever enable conditions are met	

Component /	Fault	Monitor Strategy	Primary Malfunction		Threshold		Secondary		Enable		Time	MIL
Gystein		Description	Unterta		Logic and value		Downstream NOx sensor dewpoint achieved (please see the definition) no pending or confirmed faults basic enable conditions met:	= =	TRUE see sheet inhibit tables see sheet enable tables	-	Required	
NOx Sensor Range / Performance - Bank 1 Sensor 2	P229F	Compares Delta NOx concentration of downstream NOx sensor with a threshold after upstream Nox concentration change is detected	Maximum deviation of downstream NOx concentration from the state machine_5	<	Min [(a) or (b)]	ppm	NO Pending or Confirmed DTCs:	=	See sheet inhibit table	-	fail conditions exists for more than 2 event monitor runs with 0.01s	В
			and with ( (a) Limit value for Stuck in range check of downstrean NOx	=	5.00	ppm	Status of NOx signal of upstream NOx sensor (please see the definition) for time Status of NOx signal of downstream NOx sensor (please see the definition)	= > =	TRUE 0.50 TRUE	- sec -	rate whenever enable conditions are met	
			concentration and (b) = ( c) * (d) and with ( (c) Weighting factor for calculating	=	32.767	factor	for time exhaust gas mass flow engine speed for time	> >= > >	0.50 2.78 100.00 10.00	sec g/sec rpm sec		
			the peak limit value based on the SCR temperature and the NOx mass flow (d) Average upstream NOx concentration	=	measured parameter	ppm	Status of the SCR adaptation plausibility check active (please see the definition)	=	FALSE	-		
			)				for time	>	0.00	sec		
							CR catalyst average temperature SCR catalyst average temperature ) or	<= >=	299.96 -0.04	℃ ℃		
							( SCR catalyst average temperature SCR catalyst average temperature	<= >=	999.96 349.96	°C ℃		
							State of Reductant injection valve Component Protection (please see definition)	=	FALSE	-		
							for time ( State machine_0 : starting state and waiting for low upstream NOx mass flow / concentration ( Eithered upstream NO:	>	120.00	sec		
							Filtered upstream NOX mass flow Filtered NOx concentration Exhaust mass flow	< < <	0.02 170.00 69.40	g/sec ppm g/sec		

Component / System	Fault Code	Monitor Strategy Description	Primary Malfunction Criteria	Threshold Logic and Value	Secondary Parameters		Enable Conditions		Time Required	MIL Illum.
· · · · · · · · · · · · · · · · · · ·				ŭ	for time	<	1.00	sec		
					)					1
			1		,					1
			1		State machine_1 : low upstream NOx					1
					mass flow /concentration reached					I
					(					I
			1		Old State machine_0 : starting state and	=	TRUE	-		1
					waiting for low upstream NOx mass flow					I
					/ concentration		4.00			I
					for time	>=	1.00	sec		I
					Filtered upstream NOX mass now	<	0.02	g/sec		I
					Expansion mass flow	<	69.40	d/sec		I
					captured minimum downstream NOx	_	Measured	y/360		I
					concentration in State machine 1	-	narameter			I
							parameter			I
					1					I
					State machine 2 : start Upstream NOx					I
					peak					I
					(					I
					Old State machine_1 : low upstream	=	TRUE	-		I
					NOx mass flow /concentration reached					I
					(					I
					Filtered upstream NOx mass flow	>	0.02	g/sec		I
					or					I
					Filtered NOx concentration	>	170.00	ppm		l
			1		or			,		I
					Exhaust mass flow	>	69.40	g/sec		l
					) fan time		2.00			I
					for time	<	2.00 Macourod	sec		l
					Absolute deviation of downstream NOX	-	narameter	-		l
					and with		parameter			I
					(a) Filtered downstream NOx	=	Measured	-		I
					concentration		parameter			I
					(b) captured minimum downstream	=	Measured	-		I
					NOx concentration in State		parameter			1
					machine 1, 2, and 3					I
					)					I
			1							1
					State machine_3 : Upstream NOx peak					I
					detection					I
					( Old Otata mashina, 0 , atart Unatragen		TDUE			I
					Nov peek	=	TRUE	-		I
					for time		2.00	600		I
			1		Filtered upstream NOx mass flow	>=	0.04	a/sec		
			1		Filtered NOx concentration	>=	190.00	0,300 nnm		
			1		Exhaust mass flow message	>=	125.00	g/sec		
			1		for time	<	0.50	Sec		
			1		Absolute deviation of downstream NOx	=	Measured	ppm		
			1		concentration:   (a) - (b)		parameter			
			1		and with					
			1		(a) Filtered downstream NOx	=	Measured	ppm		
		I	1		concentration		parameter			1

Component / System	Fault Code	Monitor Strategy Description	Primary Malfunction Criteria	Threshold Logic and Value	Secondary Parameters		Enable Conditions		Time Required	MIL Illum.
					(b) captured minimum downstream NOx concentration in State machine 1, 2, and 3 )	=	Measured parameter	ppm		
					State machine_4 : delay for downstream NOx peak evaluation					
					Old State machine_3 : Upstream NOx peak detection	=	TRUE	-		
					for time Filtered and estimated NOx conversion	>= <=	0.50 0.60	sec factor		
					efficiency of SCR catalyst Absolute deviation of downstream NOx concentration:   (a) - (b)   and with	=	Measured parameter	ppm		
					(a) Filtered downstream NOx concentration	=	Measured parameter	ppm		
					(b) captured minimum downstream NOx concentration in State	=	Measured parameter	ppm		
					for time (see Look-Up-Table #89)	<	4.5 to 5.5	sec		
					State machine_5 : end of downstream NOx peak and evaluation					
					Filtered and estimated NOx conversion efficiency of SCR catalyst	<=	0.80	-		
					for time (	>	0.10	sec		
					downstream NOx peak evaluation	=	I RUE	-		
					Maximum deviation of downstream NOx concentration among different states of	=	Measured parameter	ppm		
					Average SCR catalyst temperature	>	149.96	°C ma/s		
					state machine 3 and 4 Average upstream NOx concentration in	>=	190.00	ppm		
					state machine 3 and 4 NO Pending or Confirmed DTCs:	=	see sheet inhibit	-		
					)		labies			
					basic enable conditions met:	=	see sheet enable tables	-		
NOx Sensor	P22A1	Detects an out of range high	Downstream Nox sensor signal (raw	> 2500.00 ppm	Downstream Nox sensor ready status	=	TRUE		fault exists	В
Circuit High Bank 1 Sensor 2		fault of the downstream NoX Sensor	information received via CAN from Nox sensor)	PP	(see parameter definition)		-		for more than 10 sec;	

Component / System	Fault Code	Monitor Strategy Description	Primary Malfunction Criteria	Threshold Logic and Value	Secondary Parameters	Enable Conditions		Time Required	MIL Illum.
					Valid NOx signal from CAN is received (no Nox sensor communication failures)	= TRUE	-	monitor runs at 0.1 s when enable	
NOx Sensor Circuit Low Bank 1	P22A0	Detects an out of range low fault of the downstream NoX	Downstream Nox sensor signal (raw information received via CAN from Nox	< -90.00 ppm	Engine Running (see parameter definition)	= TRUE	-	conditions are met	
Sensor 2		Sensor	sensor)		for time	> 20.00	sec		
					Injection Quantity	> 8.00	mm^3/r ev		
					or Downstream NOx sensor dewpoint achieved (please see the definition)	= TRUE	-		
					for time	> 600.00	sec		
NOx Heater	P22A3	Downstream NOx sensor	Open circuit heater error of downstream	= TRUE -	following conditions for time	> 0.50	sec	fail	A
Control Circuit Bank 1 Sensor 2		heater open circuit error via the CAN message	NOx sensor via CAN message		battery voltage battery voltage SCR downstream temperature SCR downstream temperature Engine Running for time Can Bus Initialized ( CAN Bus is Active ) consisting of: ignition on for time battery voltage battery voltage Downstream NOx sensor dewpoint achieved (please see the definition) no pending or confirmed faults basic enable conditions met:	>= 11.00 <= 655.34 >= 94.96 <= 3003.56 = TRUE >= 20.00 = TRUE = TRUE = 3 > 9.8 < 655.34 = TRUE = see sheet inhi tables = see sheet enal tables	V °C °C - sec - sec V V - bit - ble -	conditions exists for more than 13 s monitor runs with 0.1 s rate whenever enable conditions are met	
		Downstream NOx sensor heater short circuit error via the CAN message	Short circuit heater error of downstream NOx sensor via CAN message	= TRUE -	following conditions for time battery voltage battery voltage SCR downstream temperature SCR downstream temperature Engine Running for time Can Bus Initialized ( CAN Bus is Active ) consisting of:	> 0.50 >= 11.00 <= 655.34 >= 94.96 <= 3003.56 = TRUE >= 20.00 = TRUE	Sec V °C °C - Sec -	fail conditions exists for more than 13 s monitor runs with 0.1 s rate whenever enable conditions are met	

Component / System	Fault Code	Monitor Strategy Description	Primary Malfunction Criteria		Threshold		Secondary Parameters		Enable Conditions		Time Required	MIL Illum.
							ignition on for time battery voltage battery voltage Downstream NOx sensor dewpoint achieved (please see the definition) no pending or confirmed faults basic enable conditions met:	= >= = =	TRUE 3 9.8 655.34 TRUE see sheet inhibit tables see sheet enable tables	sec V V -		
NOx Heater Performance Bank 1 Sensor 2	P22A7	Monitoring of the downstream NoX sensor signal readiness	Downstream NOx sensor heater temperature has reached setpoint	=	FALSE		<pre>( battery voltage and battery voltage and SCR downstream temperature and SCR downstream temperature and Engine running for time and Downstream Nox Sensor Dewpoint end is reached (please see the parameter definition) ) for time and basic enable conditions met: No Pending or Confirmed DTCs</pre>	>= <= <= = = =	11.00 655.34 94.96 3003.56 TRUE 20.00 TRUE 150.5 see sheet enable tables see sheet inhibit tables	V °C - sec - sec -	fault exists for more than 1 event when dewpoint end is reached; monitor runs at 0.02 s when enable conditions are met	В
NOx Sensor Performance - Slow Response High to Low Bank 1 Sensor 1	P22FA	If when transitioning from engine load to overrun, the rate at which the NOx concentration falls is slower than a calibrated threshold a fault is set.	Time it takes for the NOx concentration level to fall from 70% to 40% of the initial Nox concentration value or Downstream NOx concentration for time	>	2.30 40% of Initial Nox Concentration Level 5.00	sec - sec	State of the NOx sensor dynamic monitoring state machine and Injection quantity for current cylinder for time	= <	Evaluate falling edge of NOx concentration signal 2.00 1.05	- mm^3/r ev sec	fail conditions exist for 1 event, test is performed in the 0.01 ms rate when enable conditions are met	В
Component / System	Fault Code	Monitor Strategy Description	Primary Malfunction Criteria		Threshold Logic and Value	;	Secondary Parameters		Enable Conditions		Time Required	MIL Illum.
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Exhaust Gas High Temperature	P2428	Detects implausible temperatures in order to protect the engine	Any two of the following four conditions: ((a) and (b)) or ((a) and (c)) or ((a) and (d)) or ((b) and (c)) or ((b) and (d)) or ((c) and (d)) with (a) oxidation catalyst upstream temperature and with (b) oxidation catalyst downstream temperature and with (c) SCR downstream temperature and with (d) particulate filter downstream temperature	~ ~ ~ ~	799.96 799.96 799.96 799.96	ວ ວ ວ ວ	basic enable conditions met: and NO Pending or Confirmed DTCs:	=	see sheet enable tables see sheet inhibit tables	-	fail conditions exists for 6 s test performed continuously 0.1 s rate	A
Exhaust Temperature Sensor 3 Performance	P242B	Detects a fault in the exhaust temperature sensor 3 performance by comparing the heat quantity on the sensor position to a threshold.	integrated heat quantity of exhaust gas temperature sensor 3 or integrated heat quantity of exhaust gas temperature sensor 3 with (a) exhaust gas mass flow and with (b) factor and with (c) heat capacity and with (d) factor and with (e) correction factor for heat flow quantity depending on exhaust gas mass flow for temperature sensor 3 and with (f) minimum permissible temperature deviation for exhaust gas temperature sensor 3 and with (g) maximum permissible temperature deviation for exhaust gas temperature deviation for exhaust gas temperature sensor 3	<	<ul> <li>(a) / (b) * (c) / (d) * (e) * (f)</li> <li>(a) / (b) * (c) / (d) * (e) * (g)</li> <li>calculated parameter</li> <li>3.60</li> <li>1050.00</li> <li>1000</li> <li>1.00</li> <li>-100.00</li> <li>100.00</li> </ul>	g/sec J/Kq/°C kW/°C factor °C	exhaust gas system regeneration mode for time and time since start and ( exhaust-gas temperature sensor 3 and exhaust-gas temperature sensor 3 ) and change in exhaust-gas temperature sensor 3 for time and engine operation point suitable for diagnostic (see Look-Up-Table #29) for time		FALSE 1500.00 327.00 -60.04 1999.96 7.00 5.00 0 to 255 0.05	- sec °C °C °C sec -	fail conditions exists for xxs monitor runs with 0.1 s rate whenever enable conditions are met	В

Component / System	Fault Code	Monitor Strategy Description	Primary Malfunction Criteria	Lo	Threshold ogic and Value		Secondary Parameters		Enable Conditions		Time Required	MIL Illum.
					-		and change in modeled exhaust-gas temperature sensor 3 and	>	4.00	°C		
							( heat quantity for exhaust gas temperature sensor 3 and	>	10.00	kJ		
							heat quantity for exhaust gas temperature sensor 3 )	<	12.00	kJ		
							and engine has been in normal mode for time	>=	1.00	sec		
							or engine has been in exhaust warm-up mode for time and	>=	1.00	sec		
							basic enable conditions met:	=	see sheet enable tables	-		
							NO Pending or Confirmed DTCs:	=	see sheet inhibit tables	-		
Exhaust Gas Temperature (EGT) Sensor 3 Circuit Low Voltage	P242C	Detects low voltage condition of the downstream SCR catalyst temperature sensor circuit, indicating an OOR low condition	voltage of SCR downstream catalyst temperature sensor	<	0.65	V	((				fail conditions exists for more than 5.0 sec.	A
			same as Downstream SCR Catalyst	<	-50	°C	engine speed engine speed	<= >=	6000.00 0.00	rpm rpm	with 0.1 s rate	
			temperature				current injection quantity	<=	800.00	mm^3/r ev	enable conditions	
							current injection quantity	>=	0.00	mm^3/r ev	are met	
							engine coolant temperature time since engine start	> >	-50.04 0.00	°C sec		
							exhaust-gas mass flow downstream of the exhaust manifold	>	0.00	g/sec		
							or SCR catalyst temperature )	>	-45.04	°C		
							for time NO Pending or Confirmed DTCs:	> =	0.00 see sheet inhibit tables	sec -		
							basic enable conditions met:	=	see sheet enable tables	-		
					_	-			_			

Component /	Fault	Monitor Strategy	Primary Malfunction		Threshold		Secondary		Enable		Time	MIL
Exhaust Gas Temperature (EGT) Sensor 3 Circuit High Voltage	P242D	Detects high voltage condition of the downstream SCR catalyst temperature sensor circuit, indicating an OOR high condition	voltage of SCR downstream catalyst temperature sensor	>	2.21	V	((		Continuons		fail conditions exists for more than 5.0 sec.	A
			same as Downstream SCR Catalyst temperature	>	1000	℃	engine speed engine speed current injection quantity current injection quantity engine coolant temperature time since engine start exhaust-gas mass flow downstream of the exhaust manifold ) or SCR catalyst temperature ) for time NO Pending or Confirmed DTCs: basic enable conditions met:		6000.00 0.00 800.00 -50.04 0.00 0.00 -45.04 0.00 see sheet inhibit tables see sheet enable tables	rpm rpm ev mm^3/r ev °C sec g/sec °C sec g/sec -	with 0.1 s rate whenever enable conditions are met	
Diesel Particulate Filter Differential Pressure Sensor Performance	P2453	Detects in range faults on the DPF differential pressures sensor.	Path 1: change in differential pressure or change in differential pressure	<	-1.00	kPa/sec kPa/sec	( change in exhaust gas volume flow or change in exhaust gas volume flow ) and current exhaust gas volume flow and basic enable conditions met: and NO Pending or Confirmed DTCs:	> < > = =	0.10 -0.10 0.10 see sheet enable tables see sheet inhibit tables	m^3/s^2 m^3/s^2 m^3/s - -	fail conditions exists for 3 s test performed continuously 0.1 s rate	В
			Path 2: differential pressure sensor	>	3.20	kPa	Engine State for time	=	After Run 35.00	- sec	fail conditions exists for 0.5 s	

Component / System	Fault Code	Monitor Strategy Description	Primary Malfunction Criteria	L	Threshold ogic and Valu	e	Secondary Parameters		Enable Conditions		Time Required	MIL Illum.
							and basic enable conditions met: and NO Pending or Confirmed DTCs:	=	see sheet enable tables see sheet inhibit tables	-	monitor runs with 0.1 s rate whenever enable conditions	
Diesel Particulate Filter Differential Pressure Sensor Circuit Low Voltage	P2454	Detects low voltage readings on the DPF differential pressure sensor circuit, indicating an OOR low condition on the circuit	voltage of differential pressure sensor same as differential pressure	<	-4.20	V kPa	ignition on and basic enable conditions met: and NO Pending or Confirmed DTCs:	=	TRUE see sheet enable tables see sheet inhibit tables	-	fail conditions exists for 3 s test performed continuously 0.020 s rate	В
Diesel Particulate Filter Differential Pressure Sensor Circuit High Voltage	P2455	Detects high voltage readings on the DPF differential pressure sensor circuit, indicating an OOR high condition on the circuit	voltage of differential pressure sensor same as differential pressure	>	4.67 91.70	V kPa	ignition on and basic enable conditions met: and NO Pending or Confirmed DTCs:	=	TRUE see sheet enable tables see sheet inhibit tables	-	fail conditions exists for 3 s test performed continuously 0.020 s rate	В
Exhaust Gas (EGR) Cooler Performance	P2457	Performs a check of the EGR cooler performance by monitoring the EGR efficiency and comparing it to a threshold value	EGR cooler efficiency	<	0.45		( engine speed and engine speed	>= <=	1400.00 2800.00	rpm	fail conditions exists for 0.1 s monitor runs with 0.1 s rate whenever enable conditions are met	В

Component / System	Fault Code	Monitor Strategy Description	Primary Malfunction Criteria	Threshold Logic and Value	Secondary Parameters		Enable Conditions		Time Required	MIL Illum.
					) and					
					( injection quantity	>=	20.00	mm^3/r ev		
					and injection quantity	<=	320.00	mm^3/r ev		
					, and (					
					downstream of the EGR cooler and	>=	12.50	g/sec		
					recirculated exhaust-gas mass flow downstream of the EGR cooler )	<=	34.72	g/sec		
					and EGR controller is active and DPF is not in regeneration mode and	=	TRUE	-		
					( engine temperature	>=	69.96	°C		
					engine temperature	<=	122.96	°C		
					/ and ( actual valve position of exhaust-gas recirculation )	>=	10.00	%		
					and ( and control value provided for EGR cooling bypass	<=	5.00	%		
					) and ambient pressure and /	>=	74.80	kPa		
					ambient temperature	>=	-7.04	°C		
					ambient temperature	<=	3003.56	°C		
					and diagnostic performed in current dc and	=	FALSE	-		
					NO Pending or Confirmed DTCs:	=	see sheet inhibit tables	-		
					for time and	>=	90.00	sec		

Component / System	Fault Code	Monitor Strategy Description	Primary Malfunction Criteria		Threshold	2	Secondary Parameters		Enable Conditions		Time Required	MIL Illum.
					;;		basic enable conditions met:	=	see sheet enable tables	-		
Diesel Particulate Filter Regeneration Frequency	P2459	Detects a DPF that is regeneration too frequently by comparing a threshold to a soot model.	soot mass in the particulate filter with (a) engine out soot mass flow in the exhaust-gas and with (b) delta time step and with (c) simulated maximum base soot mass from previous time step and with (d) factor for calculation of a soot mass value offset depending on the simulated maximum base soot mass (see Look-Up-Table #65) and with (e) factor for determination of correction factor for ash in the particulate filter and with (f) amount of remaining soot from previous regen cycle	×	minimum of (((a) * (b) + (c)) - (f)) + (((a) * (b) + (c)) - (f)) * ((d)) * ((i) * (b) + (c)) - (f)) * (e))) or 327.67 measured parameter calculated parameter 0 to 450 1 calculated parameter	g - g factor -	particulate filter regeneration - transition false to true and last particulate filter regeneration successful or particulate filter regeneration must have been completed and basic enable conditions met: and NO Pending or Confirmed DTCs:	=	TRUE TRUE TRUE see sheet enable tables see sheet inhibit tables	-	fail conditions exists for more than 1 event monitor runs 0.1 s rate whenever enable conditions are met	В
Diesel Particulate Filter - Soot Accumulation	P2463	Detects high levels of soot in the DPF as indicated by the soot model.	soot mass in the particulate filter	>	69.60	g	ignition on and basic enable conditions met: and NO Pending or Confirmed DTCs:	=	TRUE see sheet enable tables see sheet inhibit tables	-	fail conditions exists for 30 s test performed continuously 0.1 s rate	A

Component / System	Fault Code	Monitor Strategy Description	Primary Malfunction Criteria		Threshold Logic and Value	•	Secondary Parameters		Enable Conditions		Time Required	MIL Illum.
Exhaust Temperature Sensor 4 Performance	P246F	Detects a fault in the exhaust temperature sensor 4 performance by comparing the heat quantity on the sensor position to a	integrated heat quantity of exhaust gas temperature sensor 4	<	(a) / (b) * (c) / (d) * (e) * (f)	-	exhaust gas system regeneration mode	=	FALSE	-	fail conditions exists for xxs monitor runs with 0.1 s	В
		threshold.	or integrated heat quantity of exhaust gas temperature sensor 4 with	>	(a) / (b) * (c) / (d) * (e) * (g)	-	for time and	>	1500.00	sec	rate whenever enable conditions are met	
			(a) exhaust gas mass flow and with (b) factor	=	calculated parameter 4.60	- g/sec	time since start and (	>	327.00	Sec		
			and with (c) heat capacity and with (d) factor	=	1050.00 1000	J/K <u>q</u> /°C kW/°C	exhaust-gas temperature sensor 4 and exhaust-gas temperature sensor 4 )	> <	-60.04 1999.96	°C °C		
			and with (e) correction factor for heat flow quantity depending on exhaust gas mass flow for temperature sensor 4	=	1.00	factor	, and change in exhaust-gas temperature sensor 4	<	7.00	°C		
			and with (f) minimum permissible temperature deviation for exhaust gas temperature	=	-100.00	°C	for time and	=	5.00	sec		
			sensor 4 and with (g) maximum permissible temperature deviation for exhaust gas temperature	=	100.00	°C	engine operation point suitable for diagnostic (see Look-Up-Table #29) for	=	0 to 255	-		
			sensor 4				time	>=	0.05	sec		
							change in modeled exhaust-gas temperature sensor 4 and	>	4.00	°C		
							( heat quantity for exhaust gas temperature sensor 4 and	>	10.00	kJ		
							heat quantity for exhaust gas temperature sensor 4 ) and	<	12.00	kJ		
							engine has been in normal mode for time	>=	1.00	sec		
							engine has been in exhaust warm-up mode for time and	>=	1.00	sec		
							basic enable conditions met: and	=	see sheet enable tables	-		

Component / System	Fault Code	Monitor Strategy Description	Primary Malfunction Criteria	L	Threshold ogic and Valu	ie	Secondary Parameters		Enable Conditions		Time Required	MIL Illum.
							NO Pending or Confirmed DTCs:	=	see sheet inhibit tables	-		
Exhaust Gas Temperature (EGT) Sensor 4 Sensor Circuit Low Voltage	P2470	Detects low voltage readings on the EGT 4 circuit, indicating an OOR low condition on the EGT 4	particulate filter downstream temperature sensor voltage same as particulate filter downstream temperature	<	-60	v °C	ignition on and basic enable conditions met:	=	TRUE see sheet enable tables	-	fail conditions exists for 3 s monitor runs 0.05 s rate whenever enable conditions are met	В
Exhaust Gas Temperature (EGT) Sensor 4 Circuit High Voltage	P2471	Detects high voltage readings on the EGT 4 circuit, indicating an OOR high condition on the EGT 4	particulate filter downstream temperature sensor voltage same as particulate filter downstream temperature	>	2.21 999.6	∨ °C	ignition on and basic enable conditions met:	=	TRUE see sheet enable tables	-	fail conditions exists for 3 s monitor runs 0.05 s rate whenever enable conditions are met	В
Closed loop Reductant Injection Control at Limit-Flow too high	P249D	Detects an out of range high of the long term Reductant quantity adaptation factor	long term adaptation factor of Reductant quantity	>	1.69	factor	long term adaptation triggered NO Pending or Confirmed DTCs basic enable conditions met:	=	TRUE see sheet inhibit tables see sheet enable tables	-	fault exists for more than 0.1 s; monitor runs at 0.1 s whenever enable conditions are met	В
Closed loop Reductant Injection Control at Limit-Flow too low	P249E	Detects an out of range low of the long term Reductant quantity adaptation factor	long term adaptation factor of Reductant quantity	<	0.41	factor	long term adaptation triggered	=	TRUE	-	fault exists for more than 0.1 s; monitor runs at 0.1 s	В

Component / System	Fault Code	Monitor Strategy Description	Primary Malfunction Criteria		Threshold Logic and Value		Secondary Parameters		Enable Conditions		Time Required	MIL Illum.
							NO Pending or Confirmed DTCs basic enable conditions met:	=	see sheet inhibit tables see sheet enable tables	-	whenever enable conditions are met	
Closed Loop Particulate Filter Regeneration Control At Limit - Temperature Too Low	P24A0	Detects insufficient HCI temperature. Temperature readings are compared to desired temperature values as an indication of an insufficient exhaust gas temperature.	commanded control value of the HCI temperature controller and deviation from the temperature setpoint for HCI control loop with (a) temperature threshold value and with (b) temperature value for threshold of monitoring and with (c) basic temperature threshold value for monitoring	>=	0.00 maximum of (a) and (b+c) 100.00 0 100	- °C °C	current engine operating point is suitable for monitoring deviation of exhaust gas temperature control - depending on engine speed and injection quantity (see Look-Up-Table #25) for time and ( exhaust gas temperature control is active means ( temperature upstream of the oxidation catalyst and ( particulate filter temperature and ( particulate filter temperature and ( particulate filter temperature or particulate filter temperature or particulate filter temperature for activated post injection ) ) and release status means ( vehicle speed and Actual time spent in coastdown mode ) and basic enable conditions met: and NO Pending or Confirmed DTCs:		0 to 1 30.00 TRUE 224.96 229.96 719.96 749.96 TRUE 14.92 124.30 60.00 see sheet enable tables	- sec ℃ ℃ ℃ ℃ ℃ ℃	fail conditions exists for 300 s monitor runs with 0.1 s rate whenever enable conditions are met	В
							and NO Pending or Confirmed DTCs:	=	see sheet inhibit tables	-		

Component / System	Fault Code	Monitor Strategy Description	Primary Malfunction Criteria	Threshold Logic and Value		Secondary Parameters		Enable Conditions		Time Required	MIL Illum.	
Closed Loop Particulate Filter Regeneration Control At Limit - Temperature Too High	P24A1	Detects excessive HCI temperature. Actual HCI controller ratio and temperature readings are compared to desired HCI controller ratio and temperature values as an indication of an excessive exhaust gas temperature.	commanded control value of the HCI temperature controller	<=	0.00	-	current engine operating point is suitable for monitoring deviation of exhaust gas temperature control - depending on engine speed and injection quantity (see Look-Up-Table #26)	=	0 to 1	-	fail conditions exists for 300 s monitor runs with 0.1 s rate whenever enable	В
			and deviation from the temperature setpoint for HCI control loop with (a) and with	<	minimum of (a) and (b+c-(d-e)) -75.00	- °C	for time and (	>	30.00	sec	conditions are met	
			(b) temperature value for threshold of monitoring with		0	°C	means	=				
			(c) basic temperature threshold value for monitoring		100	Ĵ	temperature upstream of the oxidation catalyst and ( particulate filter temperature	>	224.96	°C		
							and ( particulate filter temperature	<	719.96	°C		
							or particulate filter temperature for activated post injection )	<	749.96	°C		
							) and release status means (	=	TRUE	-		
							vehicle speed and vehicle speed	>=	14.92	mph		
							and Actual time spent in coastdown mode	<	60.00	sec		
							) and basic enable conditions met: and NO Pending or Confirmed DTCs:	=	see sheet enable tables see sheet inhibit tables	-		
						-		-		-		

Component / System	Fault Code	Monitor Strategy Description	Primary Malfunction Criteria	Lo	Threshold gic and Value	Secondary Parameters		Enable Conditions		Time Required	MIL Illum.
ECM Power Relay Circuit Performance	P2510	Detects stuck power relay that is not responding to ECM commands to power down or a relay that is opening too early in power down. Stuck on is determined by timer values longer than possible if relay opened at end of after run.	counter value out of EEPROM for open the main relay	>	1.00 -	ignition on and engine pre drive and basic enable conditions met:	=	TRUE TRUE see sheet enable conditions	-	fail conditions exists for 0.02 s monitor runs once per driving cycle during predrive with 0.02 s rate whenever enable conditions are met	В
		Opening too soon is indicated by a lack of EEPROM write at the last	sticky main relay is detected	=	TRUE -	ignition off	=	TRUE	-	fail conditions exists for	
			means time after request to open the main relay	>	1.40 sec	and engine pre drive and	=	FALSE	-	monitor runs once per driving cycle during	
						battery voltage and basic enable conditions met:	>	0.50 see sheet enable conditions	-	predrive with 0.02 s rate whenever enable conditions	
						and NO Pending or Confirmed DTCs:	=	see sheet inhibit tables	-	are met	
Transition Torque Request Signal Message Counter Incorrect	P2544	Detects implausible torque request information received from the TCM	Path 1:		7.00	ignition on	=	TRUE	-	fail conditions exist for 0.005 s	В
			received from TCM with number of consecutive frames or	>=	15.00 counts	and new message received and basic enable conditions met:	=	TRUE see sheet enable tables	-	performed continuously 0.005 s rate	

Component / System	Fault Code	Monitor Strategy Description	Primary Malfunction Criteria		Threshold Logic and Val	ue	Secondary Parameters		Enable Conditions		Time Required	MIL Illum.
			Path 2: number of protection value errors in TCM message	>	15.00	counts	and NO Pending or Confirmed DTCs:	=	see sheet inhibit tables	-		
Turbocharger Boost Control Position Sensor Circuit Low Voltage	P2564	Detects low voltage readings on the turbo boost control position sensor circuit, indicating an OOR low condition on the circuit	voltage of boost pressure position sensor same as boost pressure position	<	0.15	ν	ignition on and basic enable conditions met:	=	TRUE see sheet enable tables	-	fail conditions exists for 5 s test performed continuously 0.01 s rate	A
Turbocharger Boost Control Position Sensor Circuit High Voltage	P2565	Detects high voltage readings on the turbo boost control position sensor circuit, indicating an OOR high condition on the circuit	voltage of boost pressure position sensor same as boost pressure position	>	4.75 95	V %	ignition on and basic enable conditions met:	=	TRUE see sheet enable tables	-	fail conditions exists for 5 s test performed continuously 0.01 s rate	A
Turbocharger Boost Control Position Sensor "A" Circuit Range/Performanc e - Stuck Low	P2598	Detects in range Turbo vane position errors by comparing desired vane position to actual vane position	turbo charger control deviation calculated out of difference between desired and actual value	>	15.00	%	engine speed and engine speed (see Look-Up-Table #91)	>=	-16384.00 600 to 850	rpm	fail conditions exists for 10 s monitor runs with 0.02 s rate whenever enable anditions	В
Turbocharger Boost Control Position Sensor "A" Circuit Range/Performanc e - Stuck High	P2599	Detects in range Turbo vane position errors by comparing desired vane position to actual vane position	turbo charger control deviation calculated out of difference between desired and actual value	<	-15.00	%	and ( engine coolant temperature engine coolant temperature	> >= <=	30to 327.67 69.96 122.96	sec °C °C	are met	

Component / System	Fault Code	Monitor Strategy Description	Primary Malfunction Criteria	Threshold Logic and Value	Secondary Parameters	Enable Conditions		Time Required	MIL Illum.
					<ul> <li>and         <ul> <li>and temperature</li> <li>and ambient temperature</li> <li>and</li> <li>and temperature</li> <li>and</li> <li>offset learning for turbo charger (VNT)</li> <li>actuator position sensor is active during idling                 <ul> <li>in order to compensate sensor drift and valve aging the valve is closed and opened fully once in a driving cycle during engine idling, the read positions for opening and closing are averaged and used for the calculation of offset drift of the valve</li> <li>and offset learned since last clearing of fault code memory and basic enable conditions met:</li> <li>and</li> <li>No Pending or Confirmed DTCs:</li></ul></li></ul></li></ul>	>= -15.04 <= 199.86 = FALSE = TRUE = see sheet enable tables = see sheet inhibit tables	°C 		
Control Module Ignition Off Timer Performance	P2610	Detects a failure in the engine off timer calculation during ECM power up or afterrun, when the EOT timer IC is not responding	amount of retries in case of communication or bus error	> 5.00 counts	ignition on and engine pre drive and basic enable conditions met:	= TRUE = TRUE = see sheet enable tables	-	fail conditions exists for 0.01 s monitor runs once per driving cycle with 0.01 s rate whenever enable conditions are met	В

Component / System	Fault Code	Monitor Strategy Description	Primary Malfunction Criteria		Threshold Logic and Value		Secondary Parameters		Enable Conditions		Time Required	MIL Illum.
		Detects a failure in the engine off timer if during the after run the internal SW timer and the EOT do not correlate. A failure is detected when the respective timers are started after a calibration time then both are stopped	Path 1: acquired stop counter time or Path 2: acquired stop counter time ( where (a) and (b) tolerance threshold and (c) correction factor and (d) system time since engine post drive/ afterun )	< > = = = =	((a) - (b - c))*d ((a) + (b - c))*d 100 17.19 7.5 calculated parameter	- - % % -	and engine post drive/ afterun and basic enable conditions met:	V II II	20.00 TRUE see sheet enable tables	Sec -	fail conditions exists for 0.01 s monitor runs once per driving cycle with 0.01 s rate whenever enable conditions are met	
		Detects an interrupted supply voltage.	permanent supply voltage is interrupted	=	TRUE		ignition on and basic enable conditions met:	=	TRUE see sheet enable tables	-	fail conditions exists for more than 1 event monitor runs once per driving cycle with 0.01 s rate whenever enable conditions	
Fuel Injector Calibration Not Programmed	P268A	Detects un-programmed Injector Calibration Data (IQA) in ECM	Path 1: the checksum of the injector adjustment code words is correct	=	FALSE	-	engine pre drive and basic enable conditions met:	=	TRUE see sheet enable tables	-	fail conditions exist for 1 s monitor runs once per driving cycle during predrive with	A

Component / System	Fault Code	Monitor Strategy Description	Primary Malfunction Criteria	Threshold Logic and Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
							1 s rate	
Cylinder 1 Injector Data Incorrect (IQA)	P268C	Detects a miss match in IQA values between ECM and GPCM	IQA (injection quantity adjustment) value of injector 1 transmitted via CAN from GPCM (glow plug module) match with the stored ECM value	= FALSE -	transmitted IQA data from GPCM (glow plug module) for cylinder 1 are valid and basic enable conditions met: and NO Pending or Confirmed DTCs:	= TRUE - = see sheet enable - tables = see sheet inhibit - tables	fail conditions exist for 1 s test performed continuously with 1 s rate	A
Cylinder 2 Injector Data Incorrect (IQA)	P268D	Detects a miss match in IQA values between ECM and GPCM	IQA (injection quantity adjustment) value of injector 2 transmitted via CAN from GPCM (glow plug module) match with the stored ECM value	= FALSE -	transmitted IQA data from GPCM (glow plug module) for cylinder 2 are valid and basic enable conditions met: and NO Pending or Confirmed DTCs:	= TRUE - = see sheet enable - tables = see sheet inhibit - tables	fail conditions exist for 1 s test performed continuously with 1 s rate	A
Cylinder 3 Injector Data Incorrect (IQA)	P268E	Detects a miss match in IQA values between ECM and GPCM	IQA (injection quantity adjustment) value of injector 3 transmitted via CAN from GPCM (glow plug module) match with the stored ECM value	= FALSE -	transmitted IQA data from GPCM (glow plug module) for cylinder 3 are valid and basic enable conditions met: and NO Pending or Confirmed DTCs:	= TRUE - = see sheet enable - tables = see sheet inhibit - tables	fail conditions exist for 1 s test performed continuously with 1 s rate	A
Cylinder 4 Injector Data Incorrect (IQA)	P268F	Detects a miss match in IQA values between ECM and GPCM	IQA (injection quantity adjustment) value of injector 4 transmitted via CAN from GPCM (glow plug module) match with the stored ECM value	= FALSE -	transmitted IQA data from GPCM (glow plug module) for cylinder 4 are valid and	= TRUE -	fail conditions exist for 1 s test performed continuously	A

Component / System	Fault Code	Monitor Strategy Description	Primary Malfunction Criteria	Threshold Logic and Value	Secondary Parameters	Enable Conditions		Time Required	MIL Illum.
					basic enable conditions met: and NO Pending or Confirmed DTCs:	<ul> <li>see sheet enable tables</li> <li>see sheet inhibit tables</li> </ul>	-	with 1 s rate	
Cylinder 5 Injector Data Incorrect (IQA)	P2690	Detects a miss match in IQA values between ECM and GPCM	IQA (injection quantity adjustment) value of injector 5 transmitted via CAN from GPCM (glow plug module) match with the stored ECM value	= FALSE -	transmitted IQA data from GPCM (glow plug module) for cylinder 5 are valid and basic enable conditions met: and NO Pending or Confirmed DTCs:	<ul> <li>TRUE</li> <li>see sheet enable tables</li> <li>see sheet inhibit tables</li> </ul>	-	fail conditions exist for 1 s test performed continuously with 1 s rate	A
Cylinder 6 Injector Data Incorrect (IQA)	P2691	Detects a miss match in IQA values between ECM and GPCM	IQA (injection quantity adjustment) value of injector 6 transmitted via CAN from GPCM (glow plug module) match with the stored ECM value	= FALSE -	transmitted IQA data from GPCM (glow plug module) for cylinder 6 are valid and basic enable conditions met: and NO Pending or Confirmed DTCs:	<ul> <li>TRUE</li> <li>see sheet enable tables</li> <li>see sheet inhibit tables</li> </ul>	-	fail conditions exist for 1 s test performed continuously with 1 s rate	A
Cylinder 7 Injector Data Incorrect (IQA)	P2692	Detects a miss match in IQA values between ECM and GPCM	IQA (injection quantity adjustment) value of injector 7 transmitted via CAN from GPCM (glow plug module) match with the stored ECM value	= FALSE -	transmitted IQA data from GPCM (glow plug module) for cylinder 7 are valid and basic enable conditions met: and NO Pending or Confirmed DTCs:	<ul> <li>TRUE</li> <li>see sheet enable tables</li> <li>see sheet inhibit tables</li> </ul>	-	fail conditions exist for 1 s test performed continuously with 1 s rate	A

Component / System	Fault Code	Monitor Strategy Description	Primary Malfunction Criteria		Threshold		Secondary Parameters		Enable Conditions		Time Required	MIL Illum
Cylinder 8 Injector Data Incorrect (IQA)	P2693	Detects a miss match in IQA values between ECM and GPCM	IQA (injection quantity adjustment) value of injector 8 transmitted via CAN from GPCM (glow plug module) match with the stored ECM value	=	FALSE	-	transmitted IQA data from GPCM (glow plug module) for cylinder 8 are valid and basic enable conditions met: and NO Pending or Confirmed DTCs:	=	TRUE see sheet enable tables see sheet inhibit tables	-	fail conditions exist for 1 s test performed continuously with 1 s rate	A
Exhaust Nox Concentration High - Unknown Reason	P2BAD	Compare EWMA filtered NOx conversion efficiency of SCR catalyst with a threshold value	EWMA filtered delta SCR catalyst efficiency of (a) - (b) where (a) measured SCR catalyst efficiency (b) offset-corrected modeled SCR catalyst efficiency (please see the general description for details)	<	0.00 calculated parameter calculated parameter	factor - -	NO Pending or Confirmed DTCs: for time Status of NOx signal of upstream NOx sensor (please see the definition) for time Status of NOx signal of downstream NOx sensor (please see the definition) for time ( Release of dosing strategy (please see the definition)	=	see sheet inhibit tables 300.00 Active 60.00 Active 60.00 TRUE	- sec - sec - sec -	fail conditions exists for more than 1 event monitor runs with 0.01 s rate whenever enable conditions are met	A
							for time (a) Turn on delay time 1 of status metering strategy (b) Turn on delay time 2 of status metering strategy ) ( Status for disabling SCR Efficiency monitoring following an SCR Adaptation completion (please see the definition) for time (a) Debounce time after pre controlled dosing over (b) delay time the status of disabling SCR Efficiency monitoring or integrated upstream NOx ) (	= ^ ^ ~	(a) + (b) 380.00 20.00 FALSE (a) + (b) 0.50 80.00 3276.70	sec sec - sec sec sec g		

Component / System	Fault Code	Monitor Strategy Description	Primary Malfunction Criteria	Threshold Logic and Value	Secondary Parameters		Enable Conditions		Time Required	MIL Illum.
					Status of pre controlled dosing (please	=	FALSE	-		
					see the definition)		(-) - ())			
					for time	>	(a) + (b)			
					(a) Debounce time after pre controlled dosing off (b) Delay time after pre controlled	=	180.00	sec		
					dosing off or					
					integrated upstream NOx ) (	>=	3276.70	g		
					Decrease of Reductant load level (please see the definition)	=	FALSE	-		
					for time )	>	300.00	sec		
					(					
					Average slow filtered NOx mass flow upstream SCR	<=	0.12	g/sec		
					for time	>	0.50	sec		
					Monitor disable time based on average NOx mass flow and the time (see Look- Up-Table #88)	>	0 to 85	sec		
					) for time with (/	>	15.00	sec		
					Delta SCR temperature (see Look-Up- Table #85)	<=	23.96 to 74.96	°C		
					Delta SCR temperature	>	524.96	°C		
					Delta SCR temperature or	<	199.96	°C		
					Initialization time of temperature gradient calculation	<	2.50	sec		
					) or					
					Delta SCR temperature or	<	229.96	°C		
					Delta SCR temperature	>	499.96	°C		
					for time )		10.00	sec		
					( normalized HC load in SCR catalyst )	>	21.00	factor		
					) ( ambient pressure	~-	74 80	kPa		
					ambient temperature	>=	-7.04	°C		
					) (	~-	1.01	Ũ		
					Stuck reductant dosing valve fault was healed	=	FALSE	-		
					last particulate filter regeneration successful )	=	TRUE	-		

Component / System	Fault Code	Monitor Strategy Description	Primary Malfunction Criteria	Threshold Logic and Value	Secondary Parameters		Enable Conditions		Time Required	MIL Illum.
					( Status of the SCR adaptation plausibility check active (please see the definition)	=	FALSE	-		
					for time	>	600.00	sec		
					) Reductant Delivery performance completed this drive cycle	=	FALSE	-		
					( engine speed engine speed for time	>= <= >	1000.00 3000.00 0.00	rpm rpm sec		
					)					
					SCR estimated current Reductant load (see Look-Up-Table #77)	>=	0.06 to 1.3	g		
					SCR estimated current Reductant load (see Look-Up-Table #76)	<=	0.2 to 2.7	g		
					Difference between nominal and estimated Reductant (see Look-Up-Table #79)	>=	-0.35 to -0.05	g		
					Difference between nominal and estimated Reductant (see Look-Up-Table	<=	0.05 to 0.2	g		
					SCR in Pre-Control State (please see the definition)	=	FALSE	-		
					Disable after adaptation	=	FALSE	-		
					for time )	>	600.00	sec		
					(( (a) - (b) (see Look-Up-Table #86) for time	<=	74.96 0.00	°C sec		
					) or (					
					( (a) - (b) (see Look-Up-Table #87) for time (a) upstream SCR catalyst	>= > =	-40.04 to -0.04 0.00 measured	°C sec		
					temperature (b) downstream SCR catalyst temperature	=	parameter measured parameter	-		
					))					
					Integrated NOx mass upstream SCR for time	> >	1.50 0.00	g sec		
					Average SCR Temperature Average SCR Temperature	<= >=	399.96 -3549.94	0° 0°		
					Downstream SCR catalyst temperature	<=	3003.56	°C		

Component /	Fault	Monitor Strategy	Primary Malfunction	Threshold	Secondary		Enable		Time	MIL
System	Code	Description	Criteria	Logic and value	Parameters		Conditions		Requirea	ilium.
					Downstream SCR catalyst temperature	>=	-3549.94	°C		
					Filtered and delayed upstream NOx raw	<=	750.00	ppm		
					Filtered and delayed upstream NOx raw	>=	100.00	ppm		
					Filtered and delayed NOx raw emission	<=	250.00	mg/s		
					Filtered and delayed NOx raw emission	>=	0.07	g/sec		
					Filtered exhaust gas mass flow	<=	236.11	q/sec		
					Filtered exhaust gas mass flow	>=	-910.22	g/sec		
					MAP for valid engine operation points for SCR efficiency monitoring (see Look-Up- Table #84)	=	0 to 1	factor		
					for time	>	0.00	sec		
					Inverse calculated accelerator pedal value	>	5.00	%		
					for time	>	0.00	sec		
					EWMA fast initialization mode:					
					filter coefficient for fast initialization	=	0.30	factor		
					number of SCR efficiency	>=	2.00	count		
					measurements for fast initialization mode					
					EWMA Rapid Response mode: EWMA filtered delta SCR catalyst	>	0.12	factor		
					(a) - (b)	<	-0.01	factor		
					(a) measured SCR catalyst	=	measured	-		
					efficiency		parameter			
					(b) offset-corrected modeled SCR	=	measured	-		
					catalyst efficiency (please see the general description for details)		parameter			
					offset-corrected modeled SCR catalyst efficiency (please see the	>	0.00	factor		
					filter coefficient for Rapid Response	=	0.10	factor		
					number of SCR efficiency measurements for Rapid Response	>=	6.00	count		
					mode					
					EWMA filtered value too small in Fast Init. And Rapid Response modes:					
					EWMA filtered delta SCR catalyst efficiency of (a) - (b)	<	0.00	factor		
					(a) measured SCR catalyst	=	measured	-		
				l	efficiency		parameter			

Component / System	Fault Code	Monitor Strategy Description	Primary Malfunction Criteria	Threshold Logic and Val	ue	Secondary Parameters		Enable Conditions		Time Required	MIL Illum.
						<ul> <li>(b) offset-corrected modeled SCR catalyst efficiency (please see the general description for details)</li> <li>EWMA stabilized mode: filter coefficient for stabilized mode number of SCR efficiency measurements for stabilized mode</li> <li>basic enable conditions met:</li> </ul>	=	measured parameter 0.05 1 see sheet enable tables	factor count		
CAN A BUS OFF	U0073	BUS A off monitoring	CAN A Bus-Off reported by CAN hardware	= TRUE	-	ignition on and basic enable conditions met:	=	TRUE see sheet enable tables	-	fail conditions exists for 5 s test performed continuously 0.01 s rate	В
CAN B BUS OFF	U0074	BUS B off monitoring	CAN B Bus-Off reported by CAN hardware	= TRUE	-	ignition on and basic enable conditions met:	=	TRUE see sheet enable tables		fail conditions exists for 5 s test performed continuously 0.01 s rate	В
Lost Communications with Transmission Control Module	U0101	Detects loss of communication between ECM (on-board control unit) and TCM (transmission control module)	time since last message from transmission control module was received	> 0.18	Sec	ignition on for time and battery voltage and battery voltage and basic enable conditions met: and	= >= >= <=	TRUE 3.00 9.00 16.00 see sheet enable tables	- sec V V	fail conditions exists for 10 s test performed continuously 0.01 s rate	В

Component / System	Fault Code	Monitor Strategy Description	Primary Malfunction Criteria	L	Threshold	le	Secondary Parameters		Enable Conditions		Time Required	MIL Illum.
							NO Pending or Confirmed DTCs:	=	see sheet inhibit tables	-		
Lost Communications with Glow Plug Control Module	U0106	Detects loss of communication between ECM (on-board control unit) and GPCM (Glow Plug Control Module)	time since last message from glow plug control module was received	Λ	0.25	sec	ignition on for time and battery voltage and battery voltage and basic enable conditions met: and NO Pending or Confirmed DTCs:	= >= <= =	TRUE 3.00 9.00 16.00 see sheet enable tables see sheet inhibit tables	- Sec V -	fail conditions exists for 10 s test performed continuously 0.02 s rate	В
Lost Communication with Reductant Control Module	U010E	CAN frame not received after the specified number of times	counts up when message is not received in the time out interval	>	40.00	counts	CAN Bus is Active Can Bus Initialized ( CAN Bus is Active ) consisting of: ignition for time battery voltage battery voltage	=	TRUE 5.00 16.00 9.00	- sec V V	fail conditions exists for more than 5 sec monitor runs with 0.1 s rate	A
		CAN message sliding window detection Check of level sensor CAN message sliding window detection Check of temperature sensor	DLS1 Sliding Window error counter within a number of message frames DLS2 Sliding Window error counter within a number of message frames	>= >=	8.00 9.00 8.00 9.00	counts counts counts counts	CAN Bus is Active Can Bus Initialized ( CAN Bus is Active ) consisting of: ignition for time battery voltage battery voltage CAN Bus is Active Can Bus Initialized ( CAN Bus is Active )	= =	TRUE 5.00 16.00 9.00 TRUE	- sec V V	monitor runs with 1 s rate monitor runs with 1 s rate	
							consisting of: ianition	=	TRUE	-		

Component / System	Fault Code	Monitor Strategy Description	Primary Malfunction Criteria	Lo	Threshold ogic and Val	ue	Secondary Parameters		Enable Conditions		Time Required	MIL Illum.
					-		for time batterv voltage batterv voltage	> < >	5.00 16.00 9.00	sec V V		
		CAN message sliding window detection Check of error states	DLS3 Sliding Window error counter within a number of message frames	>= =	8.00 9.00	counts counts	CAN Bus is Active Can Bus Initialized ( CAN Bus is Active )	=	TRUE	-	monitor runs with 1 s rate	
							consisting of: ignition for time batterv voltage batterv voltage	= > < >	TRUE 5.00 16.00 9.00	sec V V		
Lost Communications with Auxiliary Heater Control Module	U0166	Detects loss of communication between ECM (on-board control unit) and Auxiliary Heater Control Module	time since last message from auxiliary heater control module was received	>	2.50	Sec	ignition on	=	TRUE	-	fail conditions exists for 12 s test	Special C
							and battery voltage	>=	9.00	V	continuously 0.01 s rate	
							and battery voltage and	<=	16.00	V		
							basic enable conditions met:	=	see sheet enable tables	-		
							NO Pending or Confirmed DTCs:	=	see sheet inhibit tables	-		
Engine Out NOx Sensor Can Message #1	U029D	Detects a failure when a certain number of Engine Out NOx sensor relative NOx concentration messages within a defined message group checksum or rolling count values are incorrect	Error count for engine out NOx relative NOx concentration message group	>=	8.00	counts	Engine out NOx sensor CAN Message 1 Received and Inhibit Status ( no inhibiting faults ) ( No pending or stored DTC ) and	=	TRUE	•	fault exists for 1 message group ; monitor runs whenever enable conditions are met.	A
							Engine out NOx sensor CAN Message 1 Enabled and No rolling count or protection value errors. (sliding window errors)	=	TRUE	-		

Component / System	Fault Code	Monitor Strategy Description	Primary Malfunction Criteria	Threshold Logic and Value	Secondary Parameters		Enable Conditions	Time Requir	ed Illum.
					and ignition on	=	TRUE	-	
		Detects a failure when a certain number of Engine Out NOx sensor linear lambda messages within a defined message group checksum or rolling count values are incorrect	Error count for engine out NOx sensor status message group	>= 8.00 co	unts Engine out NOx sensor CAN Message 1 Received	=	TRUE	- fault ex for 1 messa group monitor whene enabl	sts ge ; uns er e
					and Inhibit Status ( no inhibiting faults ) ( No pending or stored DTC ) and Engine out NOx sensor CAN Message 1	=	FALSE	- are me	ins it.
					Enabled and No rolling count or protection value errors. (sliding window errors) and	=	TRUE	-	
					ignition on	=	TRUE		
		Engine out NOx sensor CAN message #1 frame not received after the specified number of times	counts up when message is not received in the base time interval	> 5.00 co	unts Can Bus Initialized ( CAN Bus is Active consisting of: ignition for time battery voltage battery voltage	= > > <	TRUE 3 9.8 18.1	fault ex for mo than 2 second monitor - every 0. whene sec enabl V conditio V are mo	sts re 0 s; uns 55 s re r er e ns it.
Engine out NOx Sensor CAN Message #2	U029D	Detects a failure when a certain number of Engine Out NOx sensor error messages within a defined message group checksum or rolling count values are incorrect	Error count for engine out NOx sensor error status message group	>= 8.00 co	and Inhibit Status ( no inhibiting faults ) ( No pending or stored DTC ) and	=	TRUE	- fault ex for 1 messa group monitor whene enabl conditio - are mo	ge ; uns ver e nns tt.

Component /	Fault	Monitor Strategy	Primary Malfunction	Threshold	Secondary Parameters	Enabl	le	Time Required	MIL
- Oyotom	0000	Beenhau	United at the second se		Engine out NOx sensor CAN Message 2 Enabled and No rolling count or protection value	= TRUE	= - = -	Roganou	
					and ignition on	= TRUE	E -		
		Detects a failure when a certain number of Engine Out NOx sensor linear lambda messages within a defined message group checksum or rolling count values are incorrect	Error count for engine out NOx linear lambda signal message group	>= 8.00 counts	Engine out NOx sensor CAN Message 2 Received	= TRUE	-	fault exists for 1 message group ; monitor runs whenever enable	
					and Inhibit Status ( no inhibiting faults ) ( No pending or stored DTC ) and	= FALS	E -	conditions are met.	
					Engine out NOx sensor CAN Message 2 Enabled and	= TRUE	E -		
					No rolling count or protection value errors. (sliding window errors) and	TRUE	-		
					ignition on	= 1806			
		NOx Sensor CAN Message #2 frame not received after the specified number of times	counts up when message is not received in the base time interval	> 5.00 counts	Can Bus Initialized ( CAN Bus is Active ) consisting of: ignition for time battery voltage battery voltage	= TRUE > 3 > 9.8 < 18.1	= - sec V V	fault exists for more than 20 seconds ; monitor runs every 5 ms whenever enable conditions are met.	
Engine out Nox Sensor CAN Message #3	U029D	Engine out NOx sensor CAN message #3 frame not received after the specified number of times	counts up when message is not received in the base time interval	> 5.00 counts	Can Bus Initialized ( CAN Bus is Active ) consisting of: ignition for	= TRUE	<u> </u>	fault exists for more than 20 seconds ; monitor runs every 5 ms whenever	

Component / System	Fault Code	Monitor Strategy Description	Primary Malfunction Criteria	Threshold Logic and Value	Secondary Parameters	Enable Conditions	F	Time Required	MIL Illum.
					time battery voltage battery voltage	> 3 > 9.8 < 18.1	sec V c V	enable conditions are met.	
		Detects a failure when a certain number of Engine Out NOx sensor oxygen concentration messages within a defined message group checksum or rolling count values are incorrect	Error count for engine out NOx oxygen concentration signal message group	>= 8.00 counts	Engine out NOx sensor CAN Message 3 Received	= TRUE	- fa	ault exists for 1 message group ; ionitor runs whenever enable conditions	
					Inhibit Status ( no inhibiting faults ) ( No pending or stored DTC ) and Engine out NOx sensor CAN Message 3	= FALSE	-	are met.	
					Enabled and No rolling count or protection value errors. (sliding window errors)	TRUE	-		
					and ignition on	= TRUE	-		
		Detects a failure when a certain number of Engine Out NOx sensor binary lambda messages within a defined message group checksum or rolling count values are incorrect	Error count for engine out NOx binary lambda signal message group	>= 8.00 counts	Engine out NOx sensor CAN Message 3 Received	= TRUE	- fa	ault exists for 1 message group ; ionitor runs whenever enable	
					Inhibit Status ( no inhibiting faults ) ( No pending or stored DTC ) and Engine out NOx sensor CAN Message 3	= FALSE	-	are met.	
					and No rolling count or protection value errors. (sliding window errors)	TRUE	-		
					ignition on	= TRUE	-		
Engine out Nox Sensor CAN Message #4	U029D	Engine out NOx sensor CAN message #4 frame not received after the specified number of times	counts up when message is not received in the base time interval	> 25.00 counts	Can Bus Initialized ( CAN Bus is Active )		fa	ault exists for more than 20 seconds ;	

Component / System	Fault Code	Monitor Strategy Description	Primary Malfunction Criteria	Threshold Logic and Value	Secondary Parameters	Enable Conditions	Time Require	MIL Illum.
					consisting of: ignition for time battery voltage battery voltage	= TRUE > 3 > 9.8 < 18.1	wonitor ru every 5 n wheneve sec enable V conditior V are met	ns s r s
		Detects a failure when a certain number of Engine Out NOx sensor heater resistance messages within a defined message group checksum or rolling count values are incorrect	Error count for engine out NOx heater resistance signal message group	>= 8.00 counts	Engine out NOx sensor CAN Message 4 Received Inhibit Status ( no inhibiting faults ) ( No pending or stored DTC ) and Engine out NOx sensor CAN Message 3 Enabled and No rolling count or protection value errors. (sliding window errors) and ignition on	= TRUE = FALSE = TRUE TRUE = TRUE	<ul> <li>fault exis for 1 messag group; monitor ru wheneve enable conditior</li> <li>are met</li> <li>-</li> </ul>	s ; r s
Engine out Nox Sensor CAN Message #5	U029D	Engine out NOx sensor CAN message #5 frame not received after the specified number of times	counts up when message is not received in the base time interval	> 25.00 counts	Can Bus Initialized ( CAN Bus is Active ) consisting of: ignition for time battery voltage battery voltage	= TRUE > 3 > 9.8 < 18.1	fault exis for more than 20 seconds monitor ru every 10 ms ec wheneve V enable V conditior are met	s , ns ) r s

Component / System	Fault Code	Monitor Strategy Description	Primary Malfunction Criteria	L	Threshold	9	Secondary Parameters		Enable Conditions		Time Required	MIL Illum.
Post Catalyst NOx Sensor CAN Message #1	U029E	Detects a failure when a certain number of Post Catalyst NOx sensor relative NOx concentration messages within a defined message group checksum or rolling count values are incorrect	Error count for post catalyst NOx sensor relative NOx concentration message group	>=	8.00	counts	Post Catalyst NOx sensor CAN Message 1 Received	=	TRUE	-	fault exists for 1 message group ; monitor runs whenever enable conditions	A
							and Inhibit Status ( no inhibiting faults ) ( No pending or stored DTC )	=	FALSE	-	are met.	
							NOx sensor CAN Message 1 Enabled and	=	TRUE	-		
							No rolling count or protection value errors. (sliding window errors) and	=	TRUE	-		
							ignition on	=	TRUE	-		
		Detects a failure when a certain number of Post Catalyst NOx sensor linear lambda messages within a defined message group checksum or rolling count values are incorrect	Error count for post catalyst NOx sensor status message group	>=	8.00	counts	Post Catalyst NOx sensor CAN Message 1 Received and	=	TRUE	-	fault exists for 1 message group ; monitor runs whenever enable conditions	
							Inhibit Status ( no inhibiting faults ) ( No pending or stored DTC ) and	=	FALSE	-	are met.	
							NOx sensor CAN Message 1 Enabled	=	TRUE	-		
							No rolling count or protection value errors. (sliding window errors) and	=	TRUE	-		
							ignition on	=	TRUE	-		
		Post Catalyst NOx sensor CAN message #1 frame not received after the specified number of times	counts up when message is not received in the base time interval	>	5.00	counts	Can Bus Initialized ( CAN Bus is Active ) consisting of: ignition for time battery voltage battery voltage	= > <	TRUE 3 9.8 18.1	- Sec V V	fault exists for more than 21 seconds ; monitor runs every 5 ms whenever enable conditions are met.	

Component / System	Fault Code	Monitor Strategy Description	Primary Malfunction Criteria		Threshold Logic and Valu	ie	Secondary Parameters		Enable Conditions		Time Required	MIL Illum.
Post Catalyst NOx Sensor CAN Message #2	U029E	Detects a failure when a certain number of Post Catalyst NOx sensor error messages within a defined message group checksum or rolling count values are incorrect	Error count for post catalyst NOx sensor error status message group	>=	8.00	counts	Post Catalyst NOx sensor CAN Message 2 Received Inhibit Status ( no inhibiting faults ) ( No pending or stored DTC ) and NOx sensor CAN Message 2 Enabled and No rolling count or protection value errors. (sliding window errors) and ignition on	=	TRUE FALSE TRUE TRUE TRUE	-	fault exists for 1 message group ; monitor runs whenever enable conditions are met.	
		Detects a failure when a certain number of Post Catalyst NOx sensor linear lambda messages within a defined message group checksum or rolling count values are incorrect	Error count for post catalyst NOx linear lambda signal message group	>=	8.00	counts	Post Catalyst NOx sensor CAN Message 2 Received Inhibit Status ( no inhibiting faults ) ( No pending or stored DTC ) and NOx sensor CAN Message 2 Enabled and No rolling count or protection value errors. (sliding window errors) and ignition on	=	TRUE FALSE TRUE TRUE TRUE	-	fault exists for 1 message group ; monitor runs whenever enable conditions are met.	
		NOx Sensor CAN Message #2 frame not received after the specified number of times	counts up when message is not received in the base time interval	>	5.00	counts	Can Bus Initialized ( CAN Bus is Active ) consisting of: ignition for time battery voltage battery voltage	= > > <	TRUE 3 9.8 18.1	- sec V V	fault exists for more than 21seconds ; monitor runs every 5 ms whenever enable conditions are met.	

Component / System	Fault Code	Monitor Strategy Description	Primary Malfunction Criteria	Threshold Logic and Value	Secondary Parameters	Enable Conditions	Time MIL Required Illum.
Post Catalyst Nox Sensor CAN Message #3	U029E	Post Catalyst NOx sensor CAN message #3 frame not received after the specified number of times	counts up when message is not received in the base time interval	> 5.00 counts	Can Bus Initialized ( CAN Bus is Active ) consisting of: ignition for time battery voltage battery voltage	= TRUE - > 3 sec > 9.8 V < 18.1 V	fault exists for more than 21 seconds ; monitor runs every 5 ms whenever enable conditions are met.
		Detects a failure when a certain number of Post Catalyst NOx sensor oxygen concentration messages within a defined message group checksum or rolling count values are incorrect	Error count for post catalyst NOx sensor oxygen concentration signal message group	>= 8.00 counts	Post Catalyst NOx sensor CAN Message 3 Received Inhibit Status ( no inhibiting faults ) ( No pending or stored DTC ) and NOx sensor CAN Message 3 Enabled and No rolling count or protection value errors. (sliding window errors) and ignition on	= TRUE - = FALSE - = TRUE - = TRUE - = TRUE -	fault exists for 1 message group ; monitor runs whenever enable conditions are met.
		Detects a failure when a certain number of Post Catalyst NOx sensor binary lambda messages within a defined message group checksum or rolling count values are incorrect	Error count for post catalyst NOx sensor binary lambda signal message group	>= 8.00 counts	Post Catalyst NOx sensor CAN Message 3 Received Inhibit Status ( no inhibiting faults ) ( No pending or stored DTC ) and NOx sensor CAN Message 3 Enabled and No rolling count or protection value errors. (sliding window errors) and ignition on	= TRUE - = FALSE - = TRUE - = TRUE - = TRUE -	fault exists for 1 message group ; monitor runs whenever enable conditions are met.

Component / System	Fault Code	Monitor Strategy Description	Primary Malfunction Criteria		Threshold Logic and Valu	ue	Secondary Parameters		Enable Conditions		Time Required	MIL Illum.
Post Catalyst Nox Sensor CAN Message #4	U029E	Post Catalyst NOx sensor CAN message #4 frame not received after the specified number of times	counts up when message is not received in the base time interval	>	25.00	counts	Can Bus Initialized ( CAN Bus is Active ) consisting of: ignition for time battery voltage battery voltage	= > > <	TRUE TRUE 3 9.8 18.1	- sec V V	fault exists for more than x seconds ; monitor runs every 5 ms whenever enable conditions are met.	
		Detects a failure when a certain number of Post Catalyst NOx sensor heater resistance messages within a defined message group checksum or rolling count values are incorrect	Error count for post catalyst NOx sensor heater resistance signal message group	>=	8.00	counts	Post Catalyst NOx sensor CAN Message 4 Received Inhibit Status ( no inhibiting faults ) ( No pending or stored DTC ) and NOx sensor CAN Message 4 Enabled and No rolling count or protection value errors. (sliding window errors) and ignition on	=	TRUE FALSE TRUE TRUE TRUE	-	fault exists for 1 message group ; monitor runs whenever enable conditions are met.	
Post Catalyst Nox Sensor CAN Message #5	U029E	Post Catalyst NOx sensor CAN message #5 frame not received after the specified number of times	counts up when message is not received in the base time interval	>	25.00	counts	Can Bus Initialized ( CAN Bus is Active ) consisting of: ignition for time battery voltage battery voltage	= > > <	TRUE TRUE 3 9.8 18.1	- sec V V	fault exists for more than 21 seconds ; monitor runs every 100 ms whenever enable conditions are met.	

Component / System	Fault Code	Monitor Strategy Description	Primary Malfunction Criteria		Threshold Logic and Value	e	Secondary Parameters		Enable Conditions		Time Required	MIL Illum.
Cold Start Emission Reduction Control System	P1400	Detects problems resulting in improper delivery of fuel for catalyst light off and after treatment system preparation	Path 1: Pilot Injection 1 is prohibited due to exceeding the allowed number of injections (see general description for details)	=	TRUE	-	engine operating mode	=	exhaust warm-up	-	fail conditions exists for 20 revs test performed	В
			or				which means: Cold Start Injection Monitoring and	=	ENABLED		continuousl y 0.01 s rate	
			Path 2: Pilot Injection 1 is prohibited due to collision (overlap) with Main Injection and Pilot Injection 2 (see general description for details)	=	TRUE	•	engine operating mode state transition and engine coolant temperature and engine coolant temperature	= > <	16.00 71.00	- °C °C		
			or									
			Path 3: Injector circuit or activation errors (setpoint deviation) occurred when the injector was being energized for Pilot Injection 1 (see general description for details)	=	TRUE	-						
			or									
			Path 4: Pilot Injection 2 is prohibited due to exceeding the allowed number of injections (see general description for details)	=	TRUE	-						
			or									
			Path 5: Pilot Injection 2 is prohibited due to collision (overlap) with Pilot Injection 1 (see general description for details)	=	TRUE	-						
			or									
			Path 6: Injector circuit or activation errors (setpoint deviation) occurred when the injector was being energized for Pilot Injection 2 (see general description for details)	=	TRUE	-						

Component / System	Fault Code	Monitor Strategy Description	Primary Malfunction Criteria		Threshold Logic and Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
			or Path 7: Injector circuit or activation errors (setpoint deviation) occurred when the injector was being energized for Main Injection (see general description for details) or	=	TRUE -				
			Path 8: Post Injection 2 is prohibited due to exceeding the allowed number of injections (see general description for details) or	=	TRUE -				
			Path 9: Post Injection 2 is prohibited due to collision (overlap) with Main Injection and Post Injection 1 (see general description for details) or	-	TRUE -				
			Path 10: Injector circuit or activation errors (setpoint deviation) occurred when the injector was being energized for Post Injection 2 (see general description for or	=	TRUE -				
Exhaust Gas Recirculation (EGR) Cooler Bypass Valve Control Circuit 2 Low Voltage	P1411	Diagnoses the EGR Cooler Bypass 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	( battery voltage for time and battery voltage for	> 11 V > 3 sec < 655.34 V	fail conditions exists for 3 s monitor runs with 0.01 s rate whenever enable conditions are met	В

Component / System	Fault Code	Monitor Strategy Description	Primary Malfunction Criteria	Threshold Logic and Value	Secondary Parameters		Enable Conditions		Time Required	MIL Illum.
					time ) and starter is active cranking for time and EGR Cooling Bypass Solenoid Control Circuit and basic enable conditions met:	> = > = =	3 FALSE 3 ACTIVE see sheet enable tables	sec - sec -		
Exhaust Gas Recirculation (EGR) Cooler Bypass Valve Control Circuit 2 High Voltage	P1412	Diagnoses the EGR Cooler Bypass high side driver circuit for circuit faults.	Voltage high during driver off state (indicates short to power )	<ul> <li>Short to power: ≤ 0.5 Ω impedance between signal and controller power</li> </ul>	( battery voltage for time and battery voltage for time ) and starter is active cranking for time and EGR Cooling Bypass Solenoid Control Circuit and basic enable conditions met:	^ ^ V A H A H H	11 3 655.34 3 FALSE 3 ACTIVE see sheet enable tables	V sec v sec - sec -	fail conditions exists for 3 s monitor runs with 0.01 s rate whenever enable conditions are met	В
Exhaust Gas Recirculation (EGR) Cooler Bypass Valve Control Circuit Shorted	P1413	Diagnoses the EGR Cooler Bypass high side driver circuit for circuit faults. This failure detects a short between the two output circuits	The ECM detects that the commanded state of the driver and the actual state of the control circuit do not match.		( battery voltage for time and battery voltage for	>	11 3 655.34	V sec V	fail conditions exists for 3 s monitor runs with 0.01 s rate whenever enable conditions are met	В

Component / System	Fault Code	Monitor Strategy Description	Primary Malfunction Criteria	Threshold Logic and Value	Secondary Parameters		Enable Conditions		Time Required	MIL Illum.
					time ) and starter is active cranking for time and EGR Cooling Bypass Solenoid Control Circuit and basic enable conditions met:	> = > =	3 FALSE 3 ACTIVE see sheet enable tables	sec - sec -		
Exhaust Gas Recirculation (EGR) Cooler Bypass Valve Current Performance	P1414	Electronic output driver circuitry determines circuit integrity on the EGR cooler bypass solenoid.	Voltage high during driver off state (open circuit)	= Open Circuit: ≥ - 200 K Ω impedance between ECU pin and load signal and controller ground	( battery voltage for time and battery voltage for time ) and starter is active cranking for time and EGR Cooling Bypass Solenoid Control Circuit and basic enable conditions met:	> > = = =	11 3 655.34 3 FALSE 3 ACTIVE see sheet enable tables	V sec V sec - sec -	fail conditions exists for 2 s monitor runs with 0.01 s rate whenever enable conditions are met	В
PTO Engine Speed Request Signal Message Counter Incorrect	P1598	If the number of communication errors in a calibrated number of frames exceeds a threshold a permanent error is detected	Number of errors in window	>= 4 counts	Number of frames received Can Bus Initialized consisting of: ignition on for time	>=	10 TRUE 3	counts	fail conditions exists for 0.1 s monitor runs once per trip with 0.1 s rate whenever	Special C

Component /	Fault	Monitor Strategy	Primary Malfunction		Threshold	0	Secondary		Enable		Time	MIL
bystem	oode	Description	Unterta				batterv voltage	> <	9.8 16	V V	conditions are met	indin.
Secondary Fuel Sensor Performance	P2066	Detects an error in the secondary fuel tank sensor performance by comparing the decrease of the fuel level for a certain driven mileage to a threshold.	(a) - (b) with	<	100	miles	Engine Running (see parameter definition) for	=	TRUE	-	fail conditions exists for 0.02s monitor runs 0.02 s rate	В
			(a) total vehicle distance and with (b) change in mileage	=	measured parameter measured	-	time and diagnosis tester connected	>=	60 FALSE	sec	whenever enable conditions are met	
			and (c) - (d) with (c) maximum volume of fuel reached in secondary tank during driving cycle	< =	parameter 2.64 measured parameter	%	and fuel transfer pump active means (	=	FALSE			
			and with (d) minimum volume of fuel reached in secondary tank during driving cycle and	=	measured parameter	-	( filtered fuel volume in primary tank or	>	88.80	%		
			filtered fuel volume in secondary tank	>	0	%	fultered fuel volume in secondary tank for time	~ >	6.61 300	% sec		
							and cumulative transfer pump on time in current ignition cycle ) and fuel level zone 1 means	>	32767	sec		
							( filtered fuel volume in primary tank and	>=	99.93	%		
							filtered fuel volume in secondary tank ) and	>=	1.32	%		
							basic enable conditions met:	=	see sheet enable tables	-		
							and NO Pending or Confirmed DTCs:	=	see sheet inhibit tables	-		
Fuel Level Sensor 2 Circuit Low	P2067	Detects low voltage readings in the fuel level sensor circuit, indicating an OOR low condition on the fuel level sensor circuit	voltage of fuel level sensor 2	<	0.2	V	ignition on	=	TRUE		fail conditions exists for 24 s test	В
Component / System	Fault Code	Monitor Strategy Description	Primary Malfunction Criteria		Threshold Logic and Value		Secondary Parameters		Enable Conditions		Time Required	MIL Illum.
--------------------------------------------	---------------	-----------------------------------------------------------------------------------------------------------------------------------------------	---------------------------------------------------------	---	------------------------------	--------	-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------	----------------------------------------	------------------------------------------------------------------------	-----------------------------------------------------------------	--------------------------------------------------------------------------------------------------------------------------------	---------------
			same as fuel level	>	100	%	and basic enable conditions met:	=	see sheet enable tables	-	performed continuousl y 0.1 s rate	
Fuel Level Sensor 2 Circuit High	P2068	Detects high voltage readings in the fuel level sensor circuit, indicating an OOR high condition on the fuel level sensor circuit	voltage of fuel level sensor 2 same as fuel level	>	4.8	V %	ignition on and basic enable conditions met:	=	TRUE see sheet enable tables	-	fail conditions exists for 24 s test performed continuousl y 0.1 s rate	В
Exhaust Gas (EGR) Cooler Performance	P2457	Performs a check of the EGR cooler performance by monitoring the EGR efficiency and comparing it to a threshold value	EGR cooler efficiency	<	0.65		( ( engine speed and engine speed ) and ( injection quantity and injection quantity and ( recirculated exhaust-gas mass flow downstream of the EGR cooler and ( recirculated exhaust-gas mass flow downstream of the EGR cooler and recirculated exhaust-gas mass flow downstream of the EGR cooler and EGR controller is active and DPF is not in regeneration mode and ( engine temperature and engine temperature and engine temperature and	>= <= <= >= <= >= <=	1100 2000 20 240 16.67 40.27 TRUE 69.96 122.96	rpm rpm mm^3/rev mm^3/rev g/sec g/sec - °C	fail conditions exists for 0.1 s monitor runs with 0.1 s rate whenever enable conditions are met	В

Component / System	Fault Code	Monitor Strategy Description	Primary Malfunction Criteria	Threshold Logic and Value	Secondary Parameters		Enable Conditions		Time Required	MIL Illum.
					and ( actual valve position of exhaust-gas recirculation )	>=	9.997558594	%		
					and ( control value provided for EGR cooling bypass	<=	5.004882813	%		
					/ and ambient pressure and	>=	74.8	kPa		
					ambient temperature and	>=	-7.04	°C		
					ambient temperature ) and	<=	3003.56	°C		
					diagnostic performed in current dc and	=	FALSE	-		
					NO Pending or Confirmed DTCs:	=	see sheet inhibit tables	-		
					, for time	>=	120	sec		
					and basic enable conditions met:	=	see sheet enable tables	-		
Exhaust Gas Recirculation (EGR) Cooler Bypass Valve	P245A	Diagnoses the EGR Cooler Bypass low side driver circuit for circuit faults.	Voltage low during driver off state (indicates open circuit)	= Open Circuit:≥ - 200 K Ω impedance between ECU pin	battery voltage	>	11	V	fail conditions exists for 3 s	В
Control Circuit		The faults of the output circuit, that are detected with this diagnosis, are an open circuit or an over temperature of the integrated circuit within the		and load	for time and	>	3	sec	runs with 0.01 s rate whenever enable conditions are met	
		ECM.			starter is active cranking	=	FALSE	-		
					time and	>	3	sec		
					EGR Cooling Bypass Solenoid Control Circuit and	=	ACTIVE	-		
					for time and	>	3	sec		

Component / System	Fault Code	Monitor Strategy Description	Primary Malfunction Criteria	Threshold Logic and Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
					( open load diagnostics is triggered after offset learning of valve is completed or NO Pending or Confirmed DTCs ) and basic enable conditions met:	<ul> <li>see sheet inhibit - tables</li> <li>see sheet enable - tables</li> </ul>		
Exhaust Gas Recirculation (EGR) Cooler Bypass Valve Control Circuit 1 Low Voltage	P245C	Diagnoses the EGR Cooler Bypass 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	( battery voltage for time and battery voltage for time ) and starter is active cranking for time and EGR Cooling Bypass Solenoid Control Circuit and basic enable conditions met:	<ul> <li>&gt; 11 V</li> <li>&gt; 3 sec</li> <li>&lt; 655.34 V</li> <li>&gt; 3 sec</li> <li>= FALSE -</li> <li>&gt; 3 sec</li> <li>= ACTIVE -</li> <li>= see sheet enable - tables</li> </ul>	fail conditions exists for 3 S monitor runs with 0.01 s rate whenever enable conditions are met	В
Exhaust Gas Recirculation (EGR) Cooler Bypass Valve Control Circuit 1 High Voltage	P245D	Diagnoses the EGR Cooler Bypass 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	( battery voltage for time and battery voltage for time	> 11 V > 3 sec < 655.34 V > 3 sec	fail conditions exists for 3 s monitor runs with 0.01 s rate whenever enable conditions are met	В

Component / System	Fault Code	Monitor Strategy Description	Primary Malfunction Criteria	Threshold Logic and Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
					) and starter is active cranking for time and EGR Cooling Bypass Solenoid Control Circuit and basic enable conditions met:	= FALSE - > 3 sec = ACTIVE - = see sheet enable - tables		
Exhaust Gas Recirculation (EGR) Cooler Bypass Valve Current Performance	P2493	Detects a controller deviation in EGR cooling bypass valve. Actual deviation readings are compared to a threshold.	controller deviation of EGR cooling bypass valve actuator calculated out of difference between desired and actual value or controller deviation of EGR cooling bypass valve actuator calculated out of difference between desired and actual value	> 10.00 %	engine coolant temperature and offset learning of EGR cooling bypass valve actuator active and offset learning in the previous driving cycle was complete and engine speed and EGR Cooler Bypass Valve Actuator and basic enable conditions met: and NO Pending or Confirmed DTCs:	<ul> <li>-7.04 °C</li> <li>= FALSE -</li> <li>= TRUE -</li> <li>&gt; 100 rpm</li> <li>= ACTIVE -</li> <li>= see sheet enable - tables</li> <li>= see sheet inhibit - tables</li> </ul>	fail conditions exists for 8 s monitor runs with 0.02 s rate whenever enable conditions are met	В
EGR Cooling Bypass Position Sensor Circuit Low Voltage	P2494	Detects low voltage readings on the EGR cooling bypass position circuit, indicating an OOR low condition on the EGR position circuit	voltage of EGR cooling bypass actuator position sensor same as EGR cooling bypass actuator position	< 0.25 V < -22.5 %	ignition on and NO Pending or Confirmed DTCs: and basic enable conditions met:	= TRUE - = see sheet inhibit - tables = see sheet enable - tables	fail conditions exists for 5 s test performed continuousl y 0.01 s rate when enable conditions are met	A

Component / System	Fault Code	Monitor Strategy	Primary Malfunction Criteria		Threshold		Secondary Parameters		Enable		Time Required	MIL
- Of Otom					Logio and Taldo				Containente		rioquirou	
EGR Cooling Bypass Position Sensor Circuit High Voltage	P2495	Detects high voltage readings on the EGR cooling bypass position circuit, indicating an OOR high condition on the EGR position circuit	voltage of EGR cooling bypass actuator position sensor same as EGR cooling bypass actuator position	>	4.8	V %	ignition on and NO Pending or Confirmed DTCs: and basic enable conditions met:	=	TRUE see sheet inhibit tables see sheet enable tables	-	fail conditions exists for 5 s test performed continuousl y 0.01 s rate when enable conditions are met	A
EGR Cooling Bypass Performance	P24C4	Detects adaptation values of EGR cooling bypass valve that are not plausible. Compares the difference between the maximum and minimum adaptation values to a threshold.	Path 1: difference between the max and min EGR cooler bypass valve offset values or Path 2: learned offset value for EGR cooler bypass valve in the present driving cycle or learned offset value for EGR cooler bypass valve in the present driving cycle or	>	50 16.00341797 -16.00341797	%	( active cleaning mode of EGR cooler bypass valve - no movement in EGR cooling bypass valve and engine post drive/ afterun and ( battery voltage	= =	FALSE TRUE 10	- - V	fail conditions exists for 0.5 s monitor runs with 0.01 s rate whenever enable conditions are met	В
			Path 3: mean value for EGR cooling bypass valve offset learned at the open end during the current driving cycle over multiple open-close cycles or mean value for EGR cooling bypass valve offset learned at the open end during the current driving cycle over multiple open-close cycles	~	13.00048828 -16.00341797	%	and battery voltage ) and ( engine coolant temperature and engine coolant temperature	>=	30 5.06 123.06	∨ °C °C		

Component /	Fault	Monitor Strategy	Primary Malfunction		Threshold		Secondary Parameters		Enable		Time	MIL
							) ) or offset learning active or diagnosis tester present ) and completion of offset learning and basic enable conditions met: and NO Pending or Confirmed DTCs:	= = =	TRUE FALSE TRUE see sheet enable tables see sheet inhibit tables	-		
		Detects a jammed EGR cooling bypass valve during opening or closing the valve.	Path 1:				EGR cooler bypass valve is opening	=	TRUE	-		
			EGR cooler bypass valve stuck during opening which means ( (a) + (b)	=	TRUE 75.01220703	- %	or EGR cooler bypass valve is closing and (	=	TRUE			
			with (a) position of the EGR cooling bypass valve	=	measured parameter	-	( active cleaning mode of EGR cooler bypass valve - no movement in EGR cooling bypass valve	=	FALSE	-		
			and with (b) learned offset value of EGR cooler bypass valve in the previous driving cycle	=	calculated parameter	-	and engine post drive/ afterun	=	TRUE	-		
			and (a) - (b) with (a) position of the EGR cooling bypass	>=	0.988769531 measured	%	and ( battery voltage and	>=	10	V		
			valve and with (b) position of the EGR cooling bypass valve of the previous process cycle	=	parameter calculated parameter	-	battery voltage )	<=	30	V		
			) for time	>	5	sec	and ( engine coolant temperature	>=	5.06	°C		
			or Path 2: EGR cooler bypass valve stuck during closing which means	=	TRUE	-	and engine coolant temperature )	<=	123.06	°C		
			( position of the EGR cooling bypass valve	<	(a) * (b)	-	/ or offset learning active	=	TRUE	-		
1	I	I	with				01	I			1 1	

Component /	Fault	Monitor Strategy	Primary Malfunction		Threshold		Secondary	Enable	Time	MIL
System	Code	Description	Criteria         (a) reference position of the EGR cooling bypass valve in open position and with         (b) calibrateable factor of the EGR cooling bypass valve close position and         (a) - (b)         with         (a) position of the EGR cooling bypass valve close position and         (a) - (b)         with         (b) position of the EGR cooling bypass valve and with         (b) position of the EGR cooling bypass valve of the previous process cycle	=	Logic and Value calculated parameter 0.150024414 0.024414063 measured parameter calculated parameter	- % -	Parameters diagnosis tester present ) and completion of offset learning and basic enable conditions met: and NO Pending or Confirmed DTCs:	Conditions         =       FALSE       -         =       TRUE       -         =       see sheet enable tables       -         =       see sheet inhibit tables       -	Required	Illum.
			) for time	>	5	sec				
Fuel Transfer Pump Relay Control Circuit	P2632	Diagnoses the Fuel Transfer Pump low side driver circuit for circuit faults.	Voltage low during driver off state (indicates open circuit)	=	Open Circuit: ≥ 200 K Ω impedance between ECU pin and load		ignition on and basic enable conditions met:	= TRUE - = see sheet enable - tables	fail conditions exists for 3 s monitor runs 0.02 s rate whenever enable conditions are met	В
Fuel Transfer Pump Relay Control Circuit Low	P2633	Diagnoses the Fuel Transfer Pump 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		ignition on and basic enable conditions met:	= TRUE - = see sheet enable - tables	fail conditions exists for 3 s monitor runs 0.02 s rate whenever enable conditions are met	В

Component / System	Fault Code	Monitor Strategy Description	Primary Malfunction Criteria		Threshold Logic and Value		Secondary Parameters		Enable Conditions		Time Required	MIL Illum.
Fuel Transfer Pump Relay Control Circuit High	P2634	Diagnoses the Fuel Transfer Pump 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		ignition on and basic enable conditions met:	=	TRUE see sheet enable tables	-	fail conditions exists for 3 s monitor runs 0.02 s rate whenever enable conditions are met	В
Fuel Transfer Pump Performance	P2636	Detects an error in the fuel tank transfer pump performance by comparing the decrease of the fuel level in both tanks.	Path 1: change in fuel volume in primary tank and change in fuel volume in secondary tank or Path 2: change in fuel volume in primary tank and change in fuel volume in secondary tank or Path 3: change in fuel volume in primary tank and change in fuel volume in secondary tank	< < < , , , , , , , , , , , , , , , , ,	0.90 0.53 0.90 0.53 0.90 0.53	% % %	( Engine Running (see parameter definition) and fuel transfer pump active means ( filtered fuel volume in primary tank or filtered fuel volume in secondary tank and time between activations of transfer pump and fuel level zone 5 means ( filtered fuel volume in primary tank and filtered fuel volume in primary tank and filtered fuel volume in secondary tank ) ) vehicle speed and diagnosis tester and NO Pending or Confirmed DTCs:	= = ~ ~ ~ ~ ~ ~	TRUE TRUE 71.94 6.61 5 99.93 1.32 0 FALSE see sheet inhibit	- - % sec % % mph -	fail conditions exists for 140s monitor runs 0.02 s rate whenever enable conditions are met	В

Component /	Fault	Monitor Strategy	Primary Malfunction	Threshold	Secondary		Enable		Time	MIL
System	Code	Description	Criteria	Logic and Value	Parameters		Conditions		Required	Illum.
					for time and basic enable conditions met:	> =	20 see sheet enable tables	sec -		
4WD Switch Circuit	P2771	Checks plausibility of the 4WD-Low switch with 4WD state based on 4WD state from transmission turbine speed, transmission output shaft speed, and transmission gear ratio.	Debounced value of 4WD-Lo switch	= FALSE -	Current Transmission Gear	!=	Park/Neutral		fail conditions exists for 0.05 s test performed continuousl y 0.02 s	В
			and 4WD-Lo active based on transmission turbine speed, output shaft speed, and gear ratio	= TRUE -	and Current Transmission Gear	!=	Reverse	-	rate	
					Torque converter clutch open and	=	FALSE	-		
					Engine is Running and	=	TRUE	-		
					vehicle speed and	>	12.43	mph		
					accelerator pedal position and	<	100	%		
					accelerator pedal position and	>	10.00	%		
					engine speed and engine speed	<	1000	rom		
					and basic enable conditions met:	=	see sheet enable	-		
					and		tables			
					NO Pending or Confirmed DTCs:	=	see sheet inhibit tables	-		
						-		_		

End of Table

Component / System	Fault Code	Monitor Strategy Description	Malfunction Criteria		Threshold Value		Secondary Parameters		Enable Conditions		Time Required	MIL Illum.
Glow Plug switch defect and open	P064C	Electronic circuitry determines fault with GP switch	Glow Plug Current and Glow plug is commanded and voltage at glow plug	< = =	6.6 On 0	A	glow plugs are commanded on DTCs P163E, P163C, P0671-P0678	=	True Not set		500ms (Internal) + 75% failure rate over 4 seconds. (Same as x out of y 75% failure out of 4 sec of sample time ie out of 8 samples 6 must fail to log a failure)	В
ROM error		Checksum error between calculated and stored values are compared	Checksums match	=	NO	-	Module power	=	On		1.5 seconds (internal)+7 5% failure rate over 4 seconds.	В
RAM error		Compariarson of read write values	Read write values match	=	NO	-	Module power	=	On		200ms (internal) + 75% failure rate over 4 seconds.	В
EEPROM error		Checksum error between calculated and stored values	Checksums match	=	NO	-	Module power	=	On		200ms (internal) + 75% failure rate over 4 seconds.	В
Charge Pump Under Voltage		measured voltage of charge pump is determined to be out of tolerance	Charge Pump Voltage	<=	Battery voltage at GPCM + 7	volts	Battery voltage at GPCM	>	6	volts	130ms (internal) + 75% failure rate over 4 seconds.	В
Charge Pump Over Voltage		measured voltage of charge pump is determined to be out of tolerance	Charge Pump Voltage	>=	Battery voltage at GPCM + 18	volts	Battery	<	19.9	volts	160ms (internal) + 75% failure rate over 4 seconds.	В

Component / System	Fault Code	Monitor Strategy Description	Malfunction Criteria		Threshold Value		Secondary Parameters		Enable Conditions		Time Required	MIL Illum.
GPCM reverse polarity switch "high voltage drop"		Elecrtonic circuitry determines that the reverse polarity protection voltage drop is in range	Path 1 [Battery voltage at GPCM - mean glow plug voltage value] Path 2 (Battery voltage at GPCM - mean glow plug voltage value with charge pump off) - (Battery - mean glow plug voltage value with charge pump on) ie. delta from charge pump on to charge p	~ <	2.3 300	volts	glow plugs are commanded Battery voltage at GPCM GP current GP current P0671,P0672, P0675, P0676 Battery voltage at GPCM stable for 30ms	= ^ ^ V = V	On 6 60 Not set 2	volts amps amps volts	path1 6000ms, path2 10 seconds + 75% failure rate over 4 seconds.	В
GPCM running reset		Internal and external Watchdogs are monitored for interuption Monitor for undefined instruction code interupt Monitor for osolation stop detection	number of running resets or undefined instruction code detected or Osolation stop detection	>	9 events in a row		none				2 seconds (internal) + 75% failure rate over 4 seconds.	В
difference between internal and external value of battery voltage too high		GMLAN Battery voltage from ECM is compared to GPCM internal measured battery voltage	abs[GPCM internal measured battery voltage - GMLAN Battery voltage]	'>	3	volts	glow plugs are commanded GMLAN battery signal glow command message Battery voltage at GPCM RPM RPM	= = > <= <=	On valid 6 10 400	volts	190ms (internal) + 75% failure rate over 4 seconds.	В
system basic chip VSUPLOW		monitor internal chip supply voltage	internal chip supply voltage	< =	5.8	volts	Intake Air Heater commanded Battery supply at GPCM	= >	On 9	volts	130ms (internal) + 75% failure rate over 4 seconds.	В
system basic chip (SBC) over temperature		measure temperature of the SBC	temperature of the high side switch inside the SBC	>	155	degC	Internal GPCM temperature	<	100	deg C	130ms (internal) + 75% failure rate over 4 seconds.	В
NOx sensor power supply fault		Electronic circuitry detects a failure in the NOx sensor power supply	Path1: DC/DC booster current. For Path 2: DC/DC booster current. Path 3: Voltage at main switch Path 4: (DC/DC Booster voltage - GPCM battery voltage)	> > > > = =	25 640 > 60 amps by hardware protection (time varies with temperature) 0	amps msec amps volts volts	Battery voltage at the GPCM Battery voltage at the GPCM	>	6 8 to 14	volts	6 seconds (internal) + 75% failure rate over 4 seconds.	В
					± 3							

Component / System	Fault Code	Monitor Strategy Description	Malfunction Criteria		Thresho Value	ld	Secondary Parameters		Enable Conditions		Time Required	MIL Illum.
DEF heater current not calibrated.		Checksum error between calculated and stored values	Checksums match	=	No		Ignition on				200ms (internal) + 75% failure rate over 4 seconds.	В
glow plug open	P0671- P0678	Electronic circuitry determines a fault exists on GP circuit	Glow Plug Current and Voltage at glow plug pin	< >	4.25 and 6.0	A Volt	Ignition - glow plugs are commanded on P163E,P163D,P163C Supply voltage	= > >	On 5 not set 6	secs volts	130ms (internal) + 66% failure rate over 1.5 seconds.	В
glow plug short		Electronic circuitry determines a fault exists on GP circuit	Path 1: Glow Plug Current Path 2: Hardware over current	>	60 80	A	Ignition glow plug command over temperature condition over voltage condition abs[Battery supply at GPCM - IGN voltage at GPCM]	= = = <	on on false false 6.0	Volts	Condition 1 : 130ms, Condition 2: 260ms (internal) + 66%failure over 1.5 seconds.	В
glow plug high resistance		Electronic circuitry determines a fault exists on GP circuit	Glow Plug Resistance AND Glow Plug Current	>	1.0 4.25	Ohm A	Ignition on Battery voltage at GPCM glow plugs are commanded on over temperature condition over voltage condition abs[Battery supply at GPCM - IGN voltage at GPCM]	= > = <	on 7.0 on false false 7.0	volts volts	160ms (internal) + 66% failure over 1.5 seconds.	В
Glow plug low resistance		Electronic circuitry determines a fault exists on GP circuit	Glow Plug Resistance	<	250	mOhm	glow plugs are commanded on over temperature condition over voltage condition- abs[Battery supply at GPCM - IGN voltage at GPCM]	= = = <	on false false 7.0	volts	160ms (internal) + 66% failure over 1.5 seconds.	В
Engine Calibration Information Not Programmed – GPCM	P160C	ECM monitors serial data from GPCM for P160C Error Message indicating GPCM is not programmed with injector trim values.	Glow Plug Control Module determines IQA data has <u>not</u> been programmed in the GPCM				Ignition		ON		200ms (internal) + 66% failure over 1.5 seconds.	A
Intake Air (IA) Heater Feedback Circuit	P154A	Electronic GPCM circuitry determines if faults related to the IA heater feedback circuit exist.	PATH1: IAH indicates its state is AND IAH current OR PATH2: IAH indicates its state is	>	OFF 20 ON	А	DTCs not active Path1 IAH Commanded and Battery Voltage at IAH OR Path2 IAH Commanded	= >	P0640, P154B, P154D, P154C, P166B ON 8.6 OFF	volts	650ms (internal) + 75% failure over 4 seconds.	В

Component / System	Fault Code	Monitor Strategy Description	Malfunction Criteria		Threshold Value		Secondary Parameters		Enable Conditions		Time Required	MIL Illum.
Intake Air (IA) Heater Voltage Signal Circuit	P154B	Electronic GPCM circuitry determines if faults related to the voltage level present at the IA heater exist.	PATH1: IAH Battery voltage AND GPCM Battery Voltage GPCM Battery Voltage OR	> > <	16.0 9.5 14.0	Volt volts Volt	DTCs not active Path 1 IAH Commanded	=	P0640, P154D, P154C, P166B ON		1s (internal) + 75% failure over 4 seconds.	В
			PATH2: Voltage signal line IAH Battery voltage	>	1.5	Volt	Path 2 IAH Commanded	=	OFF for more then 65 msec			
			PATH3: IAH Battery voltage AND GPCM IGN voltage AND GPCM Battery Voltage IAH Battery voltage	< >	6.9 6.9 16.0 9.5	Volt Volt Volt Volt	Path 3 DTCs not active IAH Commanded	=	P064C, P154D, P154C, P166B ON			
Intake Air (IA) Heater Current Signal Circuit	P154C	Electronic GPCM circuitry determines if faults related to the IA heater current signal circuit or heater grid exist.	PATH1: IAH current IAH voltage signal feedback to GPCM or	< >	20 0.9	Amps Volts	DTC's are not set IAH Commanded Battery Voltage at IAH GPCM Ignition voltage or	= > >=	P154B, P154D, P0640, P0154A ON 6.9 6.9	Volt Volt	up to 5000ms (internal) + 75% failure over 4 seconds.	В
			PATH2: IAH current IAH voltage signal feedback to GPCM or	< <	20 0.9	Amps Volts	DTC's are not set IAH Commanded Battery Voltage at IAH GPCM Ignition voltage	= > >=	P154B, P154D, P0640, P0154A ON 6.9 6.9	Volt Volt		
			PATH3:IAH current signal feedback to GPCM or	>	4.96	Volts	IAH Command or	=	off			
			PATH 4:IAH grid current IAH heater grid calculated resistance	> >	20 500	A mOhm	DTC's are not set IAH Commanded Battery Voltage at IAH	= >	P154B, P154D, P0640, P0154A ON 8.0	Volt		

Component / System	Fault Code	Monitor Strategy Description	Malfunction Criteria		Threshold Value		Secondary Parameters		Enable Conditions		Time Required	MIL Illum.
Intake Air (IA) Heater Temperature Signal Circuit	P154D	Electronic GPCM circuitry determines if faults related to the temperature feedback circuit of the IA heater exist.	PATH1: IAH temperature signal feedback line	<	0.156	Volt	DTC's are not set IAH Commanded Battery Voltage at IAH PWM IAH IAH running time or	= ^ ^ ^	P154B, P0640, P0154A, P154C, P166B ON 11.0 90.0 2	Volts % minutes	650ms (internal) + 75% failure over 4 seconds.	В
			or PATH2: IAH temperature AND GMLAN signal "IntakeAirTemperature"	< >	-20 +20	℃ ℃	DTC's are not set IAH Commanded Battery Voltage at IAH Engine General Status (engine sensor info) IntakeAirtemperature message from ECM	^	P154B, P0640, P0154A, P154C, P166B ON 11.0 valid valid	Volts		
			or PATH3:IAH temperature signal feedback line or	=	Open 4.96	Volt	or IAH Commanded act		OFF ON P154B, P0640,			
Intake Air (IA) Heater Switch/Control Circuit	P0640	Electronic GPCM circuitry determines if faults related to the control circuit of the IA heater exist.	Activation Reply signal (digital response) from IAH	=	high when heartbeat signal is activated		DTC's are not set IAH Commanded	=	P154A OFF		2000ms (internal) + 75% failure over 4 seconds.	В
Intake Air (IA) Heater Over Temperature	P166B	ECM monitors serial data from GPCM for P166B Error Message indicating GPCM detects IAH overtemperature	Internal Temperature of IAH module	>	80	°C	DTC's are not set IAH Commanded engine run time Battery Voltage at IAH	= ^ <	P154B,P154C, P0640, P154D ON 40 sec 6.9 Volt	sec Volt	650ms (internal) + 75% failure over 4 seconds.	В
Glow Plug Control Module Not Programed	P161A	ECM monitors serial data from GPCM for P161A. GPCM is configured as service part by calibration parameter	Glow Plug Control Module determines settings of configuration parameter located in calibration data set				IGNITION	=	ON		200ms (internal) + 75% failure over 4.0 seconds.	В

Component / System	Fault Code	Monitor Strategy Description	Malfunction Criteria		Threshold Value		Secondary Parameters		Enable Conditions		Time Required	MIL Illum.
Glow Plug Module Primary Circuit	P163C	Electronic GPCM circuitry determines the voltage supply to GPCM is out of range	PATH 1: Voltage supply to the GPCM or PATH 2: Voltage supply to GPCM	>	16.5 6.0	Volt volts	GPCM Ignition voltage or GPCM Ignition voltage	> < > <	9.0 14 9.0	Volts Volts Volts	1000ms (internal) + 75% failure over 4.0 seconds.	В
			or PATH 3: (IGN - Voltage supply to GPCM)	>	+/-5	volts	or GPCM Voltage supply GPCM Ignition Voltage	<	16 6.0 4.0	Volts Volt Volt		
			or PATH 4: (ECM reported voltage via CAN · Voltage supply to GPCM)	>	+/-3	volts	or GPCM supply voltage Engine speed	>	6 10< rpm >400	volts		
Glow Plug Module Secondary Circuit	P163D	Electronic GPCM circuitry determines serveral signal voltage levels to GPCM are out of range	Path 1 glow plug activation request from ECM or	=	ON		Path 1: Key state (Ign 1) or	=	OFF or		1000ms (internal) + 75% failure over 4.0	В
			Path 2: Electronic circuitry determines voltage at glow plug pin	>	6.0	Volt	Path 2 GP commanded	=	Off		seconds.	
			or Path 3: [GPCM ground - GP ground]	>	1.5	Volts	or Path 3 GP commanded DTCs not set IAH dutycycle	=	or ON P0671,P0675 0 or 100	%		
Glow Plug Module Overtemperature	P163E	ECM monitors serial data from GPCM for P163E Error Message indicating GPCM detects GPCM overtemperature	GPCM Temperature	>	85	C	GMLAN signal "coolant temperature"	<	60	°C	650ms (internal) + 75% failure over 4.0 seconds.	В
Reductant Heater 1 Control Circuit	P20B9	ECM monitors serial data from GPCM for P20B9 Error Message indicating GPCM detects reductant heater not connected to GPCM or an interruption	Active test function; Connected heater must discharge internal capicitor. Voltage at capacitor checked by GPCM				DTCs not set: reductan heater commanded: GPCM temperature GPCM battery supply voltage and	= < >	P220B ON 123 7.0	°C Volts	3440ms (internal) + 50% failure over 1.0 seconds.	В

Component / System	Fault Code	Monitor Strategy Description	Malfunction Criteria		Threshold Value		Secondary Parameters		Enable Conditions		Time Reguired	MIL Illum.
Reductant Heater 1 Control Circuit Low Voltage	P20BB	ECM monitors serial data from GPCM for P20BB Error Message indicating GPCM detects reductant heater output shorted to ground or an overload condition	Path 1: Glow Plug Current or Path 2: Hardware over current	>	25 or 80	A	reductan heater commanded: GPCM temperature GPCM Battery supply voltage or reductan heater commanded: GPCM temperature GPCM Battery supply voltage	= < < or = < >	ON 123 7.0 16.5 or ON 123 7.0 16.5	°C Volts Volts or °C Volts Volts	1000ms (internal) + 50% failure over 1.0 seconds.	В
Reductant Heater 1 Control Circuit High Voltage	P20BC	ECM monitors serial data from GPCM for P20BC Error Message indicating GPCM detects reductant heater to be shorted to battery	Electronic circuitry determines voltage at reductant heater pin	>	3.5	volts	reductan heater commanded:	=	OFF		2000ms (internal) + 50% failure over 1.0 seconds.	В
Reductant Heater 2 Control Circuit	P20BD	ECM monitors serial data from GPCM for P20BD Error Message indicating GPCM detects reductant heater not connected to GPCM or an interruption	Active test function; Connected heater must discharge internal capicitor. Voltage at capacitor checked by GPCM				DTCs not set: reductan heater commanded: GPCM temperature GPCM battery supply voltage and	= < > <	P20BF ON 123 7.0 16.0	°C Volts Volts	3440ms (internal) + 50% failure over 1.0 seconds.	В
Reductant Heater 2 Control Circuit Low Voltage	P20BF	ECM monitors serial data from GPCM for P20BF Error Message indicating GPCM detects reductant heater output shorted to ground or an overload condition	Path 1: Reductant Heater Plug Current or Path 2: Hardware over current	>	25 or 80	A	reductan heater commanded: GPCM temperature GPCM supply voltage KL30 or reductan heater commanded: GPCM temperature GPCM supply voltage KL30	= < < or = < >	ON 123 7.0 16.5 or ON 123 7.0 16.5	°C Volts Volts or °C Volts Volts	1000ms (internal) + 50% failure over 1.0 seconds.	В
Reductant Heater 2 Control Circuit High Voltage	P20C0	ECM monitors serial data from GPCM for P20C0 Error Message indicating GPCM detects reductant heater to be shorted to battery	Electronic circuitry determines voltage at reductant heater pin	>	3.5	volts	reductan heater commanded:	=	OFF		2000ms (internal) + 50% failure over 1.0 seconds.	В

Component / System	Fault Code	Monitor Strategy Description	Malfunction Criteria		Threshol Value	d	Secondary Parameters		Enable Conditions		Time Required	MIL Illum.
Reductant Heater 3 Control Circuit	P20C1	ECM monitors serial data from GPCM for P20C1 Error Message indicating GPCM detects reductant heater not connected to GPCM or an interruption	Active test function; Connected heater must discharge internal capicitor. Voltage at capacitor checked by GPCM				DTCs not set: reductan heater commanded: GPCM temperature GPCM battery supply voltage and	= < < <	P20C3 ON 123 7.0 16.0	°C Volts Volts	3440ms (internal) + 50% failure over 1.0 seconds.	В
Reductant Heater 3 Control Circuit Low Voltage	P20C3	ECM monitors serial data from GPCM for P20C3 Error Message indicating GPCM detects reductant heater output shorted to ground or an overload condition	Path 1: Glow Plug Current or	>	25 or	A	reductan heater commanded: GPCM temperature GPCM supply voltage KL30 or	= < > <	ON 123 7.0 16.5 or	°C Volts Volts or	1000ms (internal) + 50% failure over 1.0 seconds.	В
			Path 2: Hardware over current	>	80	A	reductan heater commanded: GPCM temperature GPCM supply voltage KL30	V N V	ON 123 7.0 16.5	°C Volts Volts		
Reductant Heater 3 Control Circuit High Voltage	P20C4	ECM monitors serial data from GPCM for P20C4 Error Message indicating GPCM detects reductant heater to be shorted to battery	Electronic circuitry determines voltage at reductant heater pin	>	3.5	volts	reductan heater commanded:	=	OFF		2000ms (internal) + 50% failure over 1.0 seconds.	В
Nox Sensor Supply Voltage Circuit Bank 1 Sensor 1	P220A	ECM monitors serial data from GPCM for P220A Error Message indicating GPCM detects DC/DC booster output shorted to ground or shorted to battery	PATH 1:GPCM Electronic circuitry determines voltage at DC/DC booster output pin or	>	5.0	Volt	status DC/DC booster or	=	OFF, power up procedure has started after reset		5000ms (internal) + 50% failure over 1.0 seconds.	В
			PATH 2: DC/DC booster output current duration or	> >	5.0 10	A ms	status DC/DC booster or	=	ON			
			PATH 3: DC/DC booster output current duration	> >	37.5 20	A µs	status Dc/DC booster	=	ON			

Component /	Fault	Monitor Strategy	Malfunction		Threshold		Secondary	Enable	Time	MIL
System	Code	Description	Criteria		Value		Parameters	Conditions	Required	Illum.
Nox Sensor Supply Voltage Circuit Bank 1 Sensor 2	P220B	ECM monitors serial data from GPCM for P220B Error Message indicating GPCM detects DC/DC booster output shorted to ground or shorted to battery	PATH 1:Electronic circuitry determines voltage at DC/DC booster output pin or PATH 2: DC/DC booster output current duration or PATH 3: DC/DC booster output current duration	>	5.0 5.0 10 37.5 20	Volt A ms A	or status DC/DC booster or status DC/DC booster or	= OFF, power up procedure has started after reset or = ON or	5000ms (internal) + 50% failure over 1.0 seconds.	B
			duration	>	20	μs	status Dc/DC booster	= UN		

Component /	State or Status	Description of State or Status	Defined by	Enable	Enable	Enable Units
System	Sub-Grouping	found in 12OBDG09	Defined by:	Logic	Values	
Battery Voltage		Battery Voltage Correction Factor	battery voltage correction factor = Nominal Declared Battery Voltage divided by measured battery voltage	=	13.6	V
Engine Cooling System States		Status of the Block Heater	active under following conditions			
			( engine speed	>	500	rpm
			for time and	>	60	sec
			(a) - (b) with	>	1.8	°C
			(a) reference temperature (engine coolant temperature) captured during start and with	=	measured parameter	-
			(b) engine coolant temperature	=	measured parameter	-
		status of Block Heater monitor time	active under following conditions			
			engine speed	>	500	rpm
			for time	>	60	sec
		Status of Sun Load Detection	active under following condition			
		( high thermal input from the sun which influences system behavior )	Vehicle speed for	>	14.92	mph
			time	>	300	sec
			engine speed (see Look-Up-Table #14)	>	600 to 850	rpm
			time	>	600	sec

Component /	State or Status	Description of State or Status	Defined by	Enable	Enable	Enable Units
System	Sub-Grouping	found in 12OBDG09	Defined by:	Logic	Values	
			and (a) - (b) with (a) intake at temperature at start	> =	4.5 measured	°C -
			and with (b) minimum intake air temperature value for the comparison with the reference temperature during driving cycle )	=	parameter measured parameter	-
		Status of Sun Load Detection time	active under following condition			
			( Vehicle speed for	>	14.92	mph
			time	>	300	sec
			and engine speed (see Look-Up-Table #14) for	>	600 to 850	rpm
			time )	>	600	sec
ECM Operating States		Engine Pre-Drive	processor operating normally ignition processor powerup boot initialization or key off bookkeeping cleanun	= = =	TRUE OFF complete	- - -
			( accessory, post-wake-up, pre-sleep)	_	complete	
		Engine Running (see Look-Up table #70)	ignition engine speed engine speed was at start	= >= >	ON 100 850	- rpm rpm
		Engine Post-Drive/ Afterun	processor operating normally	=	TRUE	-

Component /	State or Status	Description of State or Status	Defined by:	Enable	Enable	Enable Units
System	Sub-Grouping	found in 12OBDG09	Definited by:	Logic	Values	
		also includes "engine stopping" during engine spin down	ignition key off bookkeeping cleanup	=	OFF in process	-
Engine Operating Modes	Exhaust Operating Mode focus	Normal Mode Particulate Filter Regeneration Mode				
		Particulate Filter Regen Service Mode				
		Exhaust Gas Temperature (Active) Management Mode also known as Engine Operating Mode		=	Warm Up or Maintain Temperature Exhaust Warm- up	-
Exhaust Gas Recirculation (EGR)		Exhaust Gas Recirculation (EGR)	EGR controller is active			
		Control is enabled	continuously with exceptions for failures detected EGR controller is active Overrun Long Idle Transmission Gear Shift Cold Start extreme temperature or pressure Critical Regeneration Modes			
			Overrun			
			Gear Shifting			
			Overlong Idle			
			permanent control deviation			
			Demand of the drift compensation			
			System error			

Component /	State or Status	Description of State or Status	Defined by:	Enable	Enable	Enable Units
System	Sub-Grouping	found in 12OBDG09	Defined by:	Logic	Values	
			Error exhaust gas recirculation valve			
			Error throttle valve			
			Engine Brake Status			
			Atmospheric pressure too low			
			Battery voltage too low			
			Switch-off coordinator			
			Environmental temperature too low			
			Environmental temperature too high			
			Engine temperature too low			
			Engine temperature too high			
			Cold start			
			Injection quantity too large			
			Operating-mode coordinator			
			Rich Idle			
			External control intervention			
			Rich Idle Regen			
			Environmental Temperature too low in Regeneration			
			EGR Stroking			
			EGR controller is active in Overrun (warm exhaust system)			
			EGR controller is active in Overrun (Cold exhaust system)			
			AFS Faults			
			Request via SCR monitoring (NOx sensor plausibility check)			
			Atmospheric Pressure too low in Regeneration			
			Engine Temperature too low in Regeneration			

Component /	State or Status	Description of State or Status	Defined by:	Enable	Enable	Enable Units
System	Sub-Grouping	found in 12OBDG09		Logic	Values	
			Engine Temperature too high in Regeneration			
Engine Position Management		Engine Position Sync Complete	synchronization completed consisting of: crankshaft sensor pulses received camshaft sensor pulse received and aligned properly or sync via crank only invoked then crankshaft rotations	>=	4	counts
Fuel System		Fuel System is in Fuel Shut Off also known as Decel Fuel Shut Off or Over-Run	engine running required actual engine torque -	= < -	TRUE 1 -	- Nm -
		Status of Diesel Fuel Refill Detection	(( Filtered total fuel volume available (a) Amount of fuel volume change that indicates a refueling event occurred (b) captured remaining diesel fuel volume under the following conditions ( Vehicle speed time )) and ( Vehicle speed time ))) or at initialization of Diesel fuel level	> = = < > = = =	(a) + (b) 25.26 measured parameter 1.24 4 1.24 30 TRUE	- % - mph sec -
Idle Speed Control		Idle Speed Controller Active "normal" low idle speed governor	no overrides for: Gear-Shift Harmonization			

State or Status	Description of State or Status	Defined by	Enable	Enable	Enable Units
Sub-Grouping	found in 12OBDG09	Defined by.	Logic	Values	
		Intrusive Diagnosis Action Power Take Off or other working load handling			
	Engine Idling Time Ratio	= ( time accumulated at idle divided by time since engine start )			
	Status of NOx signal of upstream NOx sensor	,			
		( following condition met for time:	>	30	sec
		Integrated heat quantity (see Look-Up-Table #1)	>=	375 to 500	kJ
		NOx status signal received via CAN message (Please see the definition)	=	TRUE	-
		for time	>	0.5	sec
		calculated lambda value based on air mass flow and injection quantity	>	0.9	-
		for time	>	0.5	sec
		engine speed	>	100	rpm
		NO Pending or Confirmed DTCs:	> =	20 see sheet inhibit tables	sec -
	Lipstream Nov Sensor Signal Ready	following condition met for time:		30	590
	or Lambda signal from NOx sensor ready	Integrated heat quantity (see Look-Up-Table #1)	>=	375 to 500	kJ
	State or Status Sub-Grouping	State or Status       Description of State or Status         Sub-Grouping       found in 12OBDG09         Engine Idling Time Ratio       Engine Idling Time Ratio         Status of NOx signal of upstream NOx sensor       Status of NOx signal of upstream NOx sensor         Upstream Nox Sensor Signal Ready or Upstream Nox Sensor Dewpoint Reached or Lambda signal from NOx sensor ready       Image: Construction of the sensor of the sense sensor of the sensor of the sensensor of th	State or Status         Description of State or Status found in 12OBDG09         Defined by:           Sub-Grouping         found in 12OBDG09         Intrusive Diagnosis Action Power Take Off or other working load handling           Engine Idling Time Ratio         = (time accumulated at idle divided by time since engine start.)           Status of NOx signal of upstream NOx sensor         = (time accumulated at idle divided by time since engine start.)           NOx status signal received via CAN message (Please see the definition) for time calculated lambda value based on air mass flow and injection quantity for time NO Pending or Confirmed DTCs:           Upstream Nox Sensor Signal Ready or Upstream Nox Sensor Signal from NOx sensor ready         following condition met for time: ( following condition met fo	State or Status         Description of State or Status         Defined by:         Enable           Sub-Grouping         found in 120BDG09         Intrusive Diagnosis Action Power Take Off or other working load handling         Power Take Off or other working load handling         Intrusive Diagnosis Action           Engine Idling Time Ratio         = (time accumulated at idle divided by time since engine start)         Image: Status of NOx signal of upstream NOx sensor         = (time accumulated at idle divided by time since engine start)         >=           NOx status signal received via CAN message (Please see the definition) for time > calculated lambda value based on air mass flow and injection quantity or time > the speed integrated heat quantity (see Look-Up-Table #1)         >=           Upstream Nox Sensor Signal Ready or Lambda signal from NOx sensor ready         following condition met for time; are admiting condition met for time; are admiting to the speed integrated heat quantity (see Look-Up-Table #1)         >=	State or Status         Description of State or Status         Defined by:         Enable         Enable           Sub-Grouping         found in 120BDG09         Intrusive Diagnosis Action Power Take Off or other working load handling         Logic         Values           Engine Idling Time Ratio         = (time accumulated at idle divided by time since engine start)

Component / State or Status	Description of State or Status	Defined by:	Enable	Enable	Enable Units	
System	Sub-Grouping	found in 12OBDG09	Defined by.	Logic	Values	
		NOx sensor				
			( following condition met for time:	>	30	sec
			( Integrated heat quantity (see Look-Up-Table #2)	>=	0 to 350	kJ
			NOx status signal received via CAN message (Please see the definition)	=	TRUE	-
			for time	>	0.5	sec
			calculated lambda value based on air mass flow	>	0.9	-
			for time	>	0.5	sec
			engine speed	>	100	rpm
			for time	>	20	sec
			NO Pending or Confirmed DTCs:	=	see sheet	-
			))		innibit tables	
			))			
		Upstream Nox Sensor Signal Ready	following condition met for time:	>	30	sec
		Upstream Nox SensorDewpoint Reached	Integrated heat quantity (see Look-Up-Table #2)	>=	0 to 350	kJ
		or				
		Lambda signal from NOx sensor ready				
		Enabling Downstream NOx sensor heater diagnosis				
			) SCR Catalyst downstream temperature	>-	94 96	°C
			SCR Catalyst downstream temperature	<=	3003.56	°C
			battery voltage	>=	11	V
			battery voltage	<=	655.34	V
			and Integrated heat quantity (see Look-Up-Table #2)	>=	0 to 350	kJ

Component /	State or Status	Description of State or Status	Defined buy	Enable	Enable	Enable Units
System	Sub-Grouping	found in 12OBDG09	Defined by.	Logic	Values	
			for time ) and for time NO Pending or Confirmed DTCs:	> =	30 1 see sheet inhibit tables	sec sec -
		Enabling Downstream NOx sensor heater diagnosis				
			( SCR Catalyst upstream temperature SCR Catalyst upstream temperature battery voltage battery voltage and Integrated heat quantity (see Look-Up-Table #1) for time ) and for time NO Pending or Confirmed DTCs:	,	94.96 3003.56 11 655.34 375 to 500 30 1 see sheet inhibit tables	°C °C V kJ sec sec
Rail Pressure Control System Operating States		Rail Control at ECM Start	reset condition or NO Pending or Confirmed DTCs:	= =	TRUE see sheet inhibit tables	-
		Rail Pre-Control (Just after start)	Rail Control at ECU Start and engine speed and (	= <=	TRUE 300	- rpm

Component /	State or Status	Description of State or Status	Defined by:	Enable	Enable	Enable Units
System	Sub-Grouping	found in 12OBDG09	Defined by.	Logic	Values	
			rail pressure or	>=	15000	kPa
			(a) - (b)	<	5000	kPa
			(a)Fuel Rail Pressure Setpoint	=	measured paramter	-
			(b)Maximum Rail Pressure for last 10ms )	=	measured paramter	-
				_	_	
		Rail Control - PCV Closed Loop Control Only	(			
		PCV - Proceure Control Velve	Rail Pressure Precontrol (Just after start)	=	TRUE	-
			Number of Crankshaft revolutions since entering Rail Pressure Precontrol )	>=	10	revs
			or (			
			state machine rail pressure control transitioning pressure control valve mode and	=	TRUE	-
			setpoint volume flow of the metering unit out of rail pressure control (see Look-Up-Table #6)	>	60000 to 224000	mm^3/rev
			or (			
			Fuel system pressure and high pressure pump outlet	<	0	kPa
			engine status )	=	RUNNING	-
		Rail Control - Metering Unit Closed Loop Control	state machine rail pressure control equal transitioning to metering unit pressure control mode	=	TRUE	-
			and Controller for PCV not wound-up (large corrective control)	=	TRUE	-

Component /	State or Status	Description of State or Status	Defined by:	Enable	Enable	Enable Units
System	Sub-Grouping	found in 12OBDG09	Donnou Sy.	Logic	Values	
		Rail Control - Metering Unit + PCV Closed Loop Control	state machine rail pressure control transitioning to coupled pressure control mode (rail pressure is controlled by metering unit and pressure control valve)	=	TRUE	
			and (a) + (b) (see Look-Up-Table #7)	<	12 to 400	mm^3/rev
			(a)Torque Generating fuel injection quantity	=	calculated	-
			(b)Non-Torque generating fuel injection quantity	=	calculated	-
				_		_
		Switchover Between Metering Unit + PCV Closed Loop Control to Metering Unit Closed Loop Control only	(			
			state machine rail pressure control equal to pressure control valve			
			state machine rail pressure control transitioning pressure control valve mode			
			and (a) + (b) (a)Torque Generating fuel injection quantity	< =	(c) + (d) calculated	-
			(b)Non-Torque generating fuel injection quantity	=	calculated parametet	-
			(c) (see Look-Up-Table #7)	=	12 to 400	mm^3/rev
			(d)	=	12	mm^3/rev
			and NO Pending or Confirmed DTCs: or	=	see sheet inhibit tables	-

Component /	State or Status	Description of State or Status	Defined by	Enable	Enable	Enable Units
System	Sub-Grouping	found in 12OBDG09	Defined by.	Logic	Values	
			state machine rail pressure control equal to metering unit control mode or state machine rail pressure control equal transitioning to metering unit pressure control mode			
			and NO Pending or Confirmed DTCs: (	=	see sheet inhibit tables	-
			Fuel system pressure and high pressure pump outlet	<	0	kPa
			engine status )	=	RUNNING	-
			, and NO Pending or Confirmed DTCs: )	=	see sheet inhibit tables	-
		Switchover between PCV or Metering Unit closed loop control to Metering Unit + PCV Closed Loop Control	(			
			state machine rail pressure control equal to pressure control valve or	=	TRUE	-
			state machine rail pressure control equal coupled pressure control (rail pressure is controlled by metering unit and pressure control valve)	=	TRUE	-
			or state machine rail pressure control transitioning pressure control valve mode	=	TRUE	-
			state machine rail pressure control equal transitioning to metering unit pressure control mode )	=	TRUE	-
			and			

Component / Sta	State or Status	Description of State or Status	Defined by:	Enable	Enable	Enable Units
System	Sub-Grouping	found in 12OBDG09	Defined by.	Logic	Values	
			( ( exhaust gas system regeneration mode ) and NO Pending or Confirmed DTCs:	!=	REGEN see sheet inhibit tables	-
				_	_	
		Switchover Between Metering Unit + PCV Closed Loop Control to PCV Closed Loop Control only	( state machine rail pressure control equals coupled pressure control (rail pressure is controlled by metering unit and pressure control valve) or state machine rail pressure control transitioning to coupled pressure control mode (rail pressure is controlled by metering unit and pressure control valve) ) and (a) + (b) (see Look-Up-Table #7) where (a)Torque Generating fuel injection quantity (b)Non-Torque generating fuel injection quantity	= = < = =	TRUE TRUE 12 to 400 calculated parametet calculated parametet	- - mm^3/rev -
Regeneration of the Diesel Particulate Filter		Status thermal regeneration active	Reduced particle mass flow in simulation by thermal regeneration (a) * (b) * (c) (a) Correction factor for thermal soot burn-out dependent on lambda and oxygen mass flow (see Look-Up-Table #4) (b) Effect of temperature on regenerated particle mass (see Look-Un-Table #5)	> = =	0 0 to 4.0 0 to 2.97	- factor -

Component /	State or Status	Description of State or Status	Defined by	Enable	Enable	Enable Units
System	Sub-Grouping	found in 12OBDG09	Defined by.	Logic	Values	
			( c) Basis value of produced soot mass flow dependent on actual soot mass (see Look-Up- Table #3)	=	0.02 to 0.29	g/sec
SCR System NOx Redu Activ	NOx Control System Reductant Dosing Strategy Active State	Release of dosing of the dosing strategy	status of SCR control state (please see the definition) Reductant dosing is released Deactivation of dosing to execute the NOx Offset test (Please see the definition) since start for time gradient of exhaust gas temperature since start for time Average temperature inside the SCR catalyst: SCR catalyst wall temperature Vehicle speed engine speed NO Pending or Confirmed DTCs:	= = ;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;	Metering Control TRUE FALSE 0.02 300 0.01 179.96 89.96 -0.62 400 see sheet inhibit tables	- - °C/sec °C °C °C °C mph rpm -
	NOx Control System Reductant Dosing Pressure Control System States	State of Reductant Pressure Control System: Standby	ignition Dwell time in the state of standby NO Pending or Confirmed DTCs:	= < =	on 5 see sheet inhibit tables	- sec -
		State of Reductant Pressure Control System: No Pressure control	Old SCR control state (please see the definition) ignition Dwell time in the state of standby Dwell time in the state of no pressure control NO Pending or Confirmed DTCs:	= >= < =	Stand by on 5 2 see sheet inhibit tables	- Sec Sec -

Component /	State or Status	Description of State or Status	Defined but	Enable	Enable	Enable Units
System	Sub-Grouping	found in 12OBDG09	Defined by.	Logic	Values	
		State of Reductant Pressure Control	Old SCR control state (please see the definition)	=	NO Pressure	-
		System: Pressure control	ignition	_	Control	
			ignition engine speed	=	550	rom
			Dwell time in the state of no pressure control	>=	2	sec
			exhaust gas temperature Upstream SCR	>=	169.96	°C
			( Reductant Defrost check (please see the definition)	=	TRUE	-
			or The component protection release of the heater	=	TRUE	-
			or Preliminary release of the heater control for the	=	TRUE	-
			main state machine (please see the definition)			
			NO Pending or Confirmed DTCs:	=	see sheet inhibit tables	-
		State of Reductant Pressure Control System: Refilling Reductant in pressure line (substate of Pressure control)	SCR control state (please see the definition)	=	Pressure Control	-
			( Reductant filling state in the pressure line	<	50	%
			Reductant Pump Module Pressure	<	200	kPa
			Set-point duty cycle for Reductant dosing valve Set-point duty cycle for the Reductant Pump	= =	100 40.00	% %
			NO Pending or Confirmed DTCs:	=	see sheet inhibit tables	-
		State of Reductant Pressure Control System: Pressure build up (substate of Pressure control)	SCR control state (please see the definition)	=	Pressure Control	-
			( Reductant filling state in the pressure line	>=	50	%

Component /	State or Status	Description of State or Status	Defined by	Enable	Enable	Enable Units
System	Sub-Grouping	found in 12OBDG09	Defined by:	Logic	Values	
			or Reductant Pump Module Pressure for time )	>= >	200 0.5	kPa sec
			Reductant Pump Module Pressure Set-point duty cycle for Reductant dosing valve Set-point duty cycle for the Reductant Pump	< = =	350 0% 80.00	kPa % %
			NO Pending or Confirmed DTCs:	=	see sheet inhibit tables	
		State of Reductant Pressure Control System: Ventilation (substate of Pressure control)	SCR control state (please see the definition)	=	Pressure Control	-
			Reductant Pump Module Pressure	<	350	kPa
			Dwell time in Pressure Build up substate	>	10	sec
			system pressurizes in pressure buildup and	<	10	counts
			Set-point duty cycle for Reductant dosing valve	=	100	%
			Set-point duty cycle for the Reductant Pump pressure Motor actuator	=	80.00	%
			Dwell time in the sub state ventilation NO Pending or Confirmed DTCs:	< =	0.23 see sheet inhibit tables	sec -
		State of Reductant Pressure Control System: Metering control (substate of Pressure control)	SCR control state (please see the definition)	=	Pressure Control	-
			Reductant Pump Module Pressure	>=	350	kPa
			Set-point duty cycle for Reductant dosing valve	=	0	%
			NO Pending or Confirmed DTCs:	=	see sheet inhibit tables	-
		State of Reductant Pressure Control System: Pressure reduction	ignition	=	off	-
			dwell time in the state of pressure reduction Activation state of Reductant reverting valve power stage	< =	5 On	sec -

Component /	State or Status	Description of State or Status	Defined by	Enable	Enable	Enable Units
System	Sub-Grouping	found in 12OBDG09	Defined by.	Logic	Values	
			Set-point duty cycle for Reductant dosing valve Set-point duty cycle for the Reductant Pump pressure Motor actuator	=	0 15.00	% %
			NO Pending or Confirmed DTCs:	=	see sheet inhibit tables	-
	SCR Engine State required	SCR Engine State	Ignition on	=	TRUE	-
			engine speed	>	550	rpm
	Reductant Dosing Strategy based on DPF Fload	Status fill level decrease (please see the definition)				
			Particulate Filter Regeneration demand on	=	TRUE	-
			Reductant fill level of the SCR catalyst lowed to the target value under Particle filter Regeneration request (a) - (b)	>=	0	-
			(a) Nominal value of Reductant fill level in the catalyst (b) Estimated current Reductant load ( c) Reductant Dosing quantity limitation	=	100	factor
			or SCR catalyst temperature too high to convert Reductant under Particle filter Regeneration request		000 06	°C
			Average temperature inside the SCK tatalyst.	2	333.30	U
	Reductant Heater and Defrost System Control States and Status					
		Reductant Defrost check	status of reductant tank heater temperature (please see the definition)	=	TRUE	-

Component /	State or Status	Description of State or Status	Defined by	Enable	Enable	Enable Units
System	Sub-Grouping	found in 12OBDG09	Defined by.	Logic	Values	
			State of the defrosting check of pressure line (please see the definition) State of the defrosting check of supply module (please see the definition)	=	TRUE TRUE	-
			( duration, for which the conditions for a hydraulic release reset of pressure line heater circuit are satisfied	<=	1200	sec
			ambient temperature Release heater pressure line and	> =	-4.04 FALSE	°C -
			duration, for which the conditions for a hydraulic release reset of supply module heater circuit are satisfied	<=	1200	sec
			ambient temperature Release heater supply module )	> =	-4.04 FALSE	°C -
				_	_	
		Status of reductant tank heater temperature	status of reductant tank heater temperature (please see the definition) Reductant tank heat temperature at Standby state	>	-0.04	°C
			or Engine off Time Reductant tank heat temperature at Standby state	< >	2147483647 -9.04	sec °C
				_	_	
		line	time since pressure line heating on under pressure line defrost mode or line defrost mode or	>=	0 to 3276.7	sec
			status of SCR control state (please see the definition)	=	No Pressure Control	-
			Pressure line defrost timer or	=	0	sec
			ignition engine speed	= >	on 550	sec rpm

Component /	State or Status	Description of State or Status	Defined by:	Enable	Enable	Enable Units
System	Sub-Grouping	found in 12OBDG09	Defined by.	Logic	Values	
			( Pressure line defrost check in last driving cycle status of SCR control state (please see the definition) Engine off Time NO Pending or Confirmed DTCs:	II II A II	TRUE No Pressure Control 0 TRUE	- - Sec -
		State of the defrosting check of supply module	State of the defrosting check of supply module (please see the definition) time since supply module heating on under supply module defrost mode or	>=	0 to 3276.7	sec
			status of SCR control state (please see the definition)	=	No Pressure Control	-
			Supply module defrost timer or	=	0	sec
			ignition engine speed	= >	on 550	sec rpm
			Pressure line defrost check in last driving cycle status of SCR control state (please see the definition)	=	TRUE No Pressure Control	-
			Engine off Time NO Pending or Confirmed DTCs:	< =	0 TRUE	sec -
		The component protection release of the	Current time for heating / not heating of heater	>-	0 to 299	Sec
		heater control	circuit 1 (tank) Reductant Defrost check (please see the definition)	=	FALSE	-
		Preliminary release of the heater control for the main state machine	Preliminary release of the heater control for the main state machine (please see the definition)			
			Current time for heating / not heating of heater circuit 1 (tank)	>=	0 to 3276	sec
		1	status of reductant tank heater defrost	=	FALSE	-
Component /	State or Status	Description of State or Status	Defined by	Enable	Enable	Enable Units
-------------	-----------------	--------------------------------	-------------------------------------------------------------------------------	--------	------------	--------------
System	Sub-Grouping	found in 12OBDG09	Defined by.	Logic	Values	
			status of reductant tank heater temperature	=	FALSE	-
			(please see the definition)			
			State of the defrosting check of pressure line	=	TRUE	-
			(please see the definition) State of the defrosting check of supply module	_	TRUE	_
			(please see the definition)	_	III O E	
			)			
			or			
			( ignition	_	on	SPC
			engine speed	>	550	rom
			Engine off Time	<=	0	sec
			State of the defrosting check of pressure line	=	TRUE	-
			(please see the definition)			
			State of the defrosting check of supply module	=	TRUE	-
			(please see the definition)			
			and		TDUE	
			If the following conditions were met in previous	=	TRUE	-
			(			
			ignition	=	on	sec
			engine speed	>	550	rpm
			Engine off Time	<=	0	sec
			State of the defrosting check of pressure line	=	TRUE	-
			(please see the definition)			
			State of the defrosting check of supply module	=	TRUE	-
			(please see the definition)			
			))			
		Release of tank heater circuit	(			
			Requested defrosting time for Reductant tank	>=	0 to 14400	sec
			heater (see Look-Up-Table #16)			
			Of Requested besting time for Reductant tank bester		0 to 2277	
			(see Look-Un-Table #17)	>=	0 10 3277	Sec
			Í Í			
			or			
			((			
			Requested defrosting time for Reductant tank	>=	0 to 14400	sec
	1	I	heater (see Look-Up-Table #16)			

Component /	State or Status	Description of State or Status	Defined by:	Enable	Enable	Enable Units
System	Sub-Grouping	found in 12OBDG09	Defined by:	Logic	Values	
			or Requested heating time for Reductant tank heater (see Look-Up-Table #17)	>=	0 to 3277	sec
			and			
			Requested defrosting time for pressure line heater (see Look-Up-Table #18)	>=	0 to 3276.7	sec
			Requested heating time for pressure line heater (see Look-Up-Table #20) ))	>=	0 to 3276.7	sec
			or ((			
			Requested defrosting time for Reductant tank heater (see Look-Up-Table #16)	>=	0 to 14400	sec
			or Requested heating time for Reductant tank heater (see Look-Up-Table #17)	>=	0 to 3277	sec
			, and			
			Requested defrosting time for supply module heater (see Look-Up-Table #19) or	>=	0 to 3276.7	sec
			Requested heating time for supply module heater (see Look-Up-Table #21) ))	>=	0 to 3276.7	sec
			or ((			
			Requested defrosting time for Reductant tank heater (see Look-Up-Table #16)	>=	0 to 14400	sec
			Requested heating time for Reductant tank heater (see Look-Up-Table #17)	>=	0 to 3277	sec
			) and /			
			Requested defrosting time for pressure line heater (see Look-Up-Table #18) or	>=	0 to 3276.7	sec

Component /	State or Status	Description of State or Status	Defined buy	Enable	Enable	Enable Units
System	Sub-Grouping	found in 12OBDG09	Defined by:	Logic	Values	
			Requested heating time for pressure line heater (see Look-Up-Table #20) ) and	>=	0 to 3276.7	sec
			( Requested defrosting time for supply module heater (see Look-Up-Table #19)	>=	0 to 3276.7	sec
			Requested heating time for supply module heater (see Look-Up-Table #21) ))	>=	0 to 3276.7	sec
			and NO Pending or Confirmed DTCs:	=	TRUE	-
		Release of pressure line heater circuit	(			
			Requested defrosting time for pressure line heater (see Look-Up-Table #18)	>=	0 to 3276.7	sec
			Requested heating time for pressure line heater (see Look-Up-Table #20) )	>=	0 to 3276.7	sec
			or ((			
			Requested defrosting time for pressure line heater (see Look-Up-Table #18)	>=	0 to 3276.7	sec
			Requested heating time for pressure line heater (see Look-Up-Table #20) )	>=	0 to 3276.7	sec
			and			
			Requested defrosting time for supply module heater (see Look-Up-Table #19) or	>=	0 to 3276.7	sec
			Requested heating time for supply module heater (see Look-Up-Table #21) ))	>=	0 to 3276.7	sec

Component /	State or Status	Description of State or Status	Defined by:	Enable	Enable	Enable Units
System	Sub-Grouping	found in 12OBDG09	Defined by:	Logic	Values	
			and NO Pending or Confirmed DTCs:	=	see sheet inhibit tables	-
		Release of tank heater circuit	( Requested defrosting time for supply module heater (see Look-Up-Table #19)	>=	0 to 3276.7	sec
			Requested heating time for supply module heater (see Look-Up-Table #21)	>=	0 to 3276.7	sec
			, or ((			
			Requested defrosting time for Reductant tank heater (see Look-Up-Table #16) or	>=	0 to 14400	sec
			Requested heating time for Reductant tank heater (see Look-Up-Table #17)	>=	0 to 3277	sec
			and			
			( Requested defrosting time for supply module heater (see Look-Up-Table #19) or	>=	0 to 3276.7	sec
			Requested heating time for supply module heater (see Look-Up-Table #21) ))	>=	0 to 3276.7	sec
			or ((			
			Requested defrosting time for pressure line heater (see Look-Up-Table #18) or	>=	0 to 3276.7	sec
			Requested heating time for pressure line heater (see Look-Up-Table #20)	>=	0 to 3276.7	sec
			and			
			( Requested defrosting time for supply module heater (see Look-Up-Table #19)	>=	0 to 3276.7	sec

Component /	State or Status	Description of State or Status	Defined by:	Enable	Enable	Enable Units
System	Sub-Grouping	found in 12OBDG09	Defined by.	Logic	Values	
			or Requested heating time for supply module heater (see Look-Up-Table #21) )) or	>=	0 to 3276.7	sec
			() Requested defrosting time for Reductant tank heater (see Look-Up-Table #16)	>=	0 to 14400	sec
			Requested heating time for Reductant tank heater (see Look-Up-Table #17)	>=	0 to 3277	sec
			and			
			Requested defrosting time for pressure line heater (see Look-Up-Table #18)	>=	0 to 3276.7	sec
			Requested heating time for pressure line heater (see Look-Up-Table #20)	>=	0 to 3276.7	sec
			and			
			Requested defrosting time for supply module heater (see Look-Up-Table #19)	>=	0 to 3276.7	sec
			Requested heating time for supply module heater (see Look-Up-Table #21) ))	>=	0 to 3276.7	sec
			and NO Pending or Confirmed DTCs:	=	see sheet inhibit tables	-
		Status of the battery voltage being in the				
		valid working range for Reductant tank heater	battery voltage battery voltage for time	< > >	100 11 2	V V sec

Component /	State or Status	Description of State or Status	Defined by	Enable	Enable	Enable Units
System	Sub-Grouping	found in 12OBDG09	Defined by.	Logic	Values	
		Status of the battery voltage being in the valid working range for pressure line heater	battery voltage battery voltage for time	<	100 11 2	V V sec
		Status of Reductant Tank Heater Release				
			) status of reductant tank heater temperature (please see the definition)	=	TRUE	-
			Waiting time after tank heater release expired ) or	>	0	sec
			(( Waiting time before tank heater released started with	<	32767	sec
			status of reductant tank heater temperature (please see the definition) ) and	=	FALSE	-
			() status of reductant tank heater temperature (please see the definition)	=	TRUE	-
			Waiting time after tank heater release expired )) or	>	0	sec
			Waiting time before tank heater released started with	>	32767	sec
			status of reductant tank heater temperature (please see the definition) ) and	=	FALSE	-
			( status of reductant tank heater temperature (please see the definition)	=	TRUE	-

Component /	State or Status	Description of State or Status	Defined hus	Enable	Enable	Enable Units
System	Sub-Grouping	found in 12OBDG09	Defined by:	Logic	Values	
			Waiting time after tank heater release expired	>	0	sec
			))			
	Reductant Tank Level System States and Status	status of Reductant tank level	Tank level > full (100%)	=	Full	-
	-,		Warning (66.67%) < tank level < full (100%)	=	OK	-
			Restriction (33.33%) < tank level < Warning	=	Warning	-
			(66.67%) Empty < tank loval < Postriction (22.22%)	_	Postriction	
			Tank level $< Restriction (33.35%)$	=	Empty	-
		Status of Reductant tank level reset	(			
		when refilling is detected (please see the	, , , , , , , , , , , , , , , , , , ,			
		definition)				
			time since potential Reductant refill detection is set	>=	12	sec
			and with			
			Derivation of the PT1 filtered level signal (DT1)	>=	1.00	%/sec
			ignition on	=	TRUE	-
			engine speed	>	550	rpm
			time since engine started	>=	0.22 (a) * (b)	mpn
			(a) Time period for a positive slope to detect	=	12	sec
			refueling			
			(b) Factor for the extension of the detection time for	=	20	factor
			since the following conditions met:	=	TRUE	-
			Falling edge of ignition	=	TRUE	-
			Reductant Refill enabling conditions reset timers	=	TRUE	-
			)))			
			or			
			time since potential Reductant refill detection is set	>=	8	sec

Component /	State or Status	Description of State or Status	Defined by:	Enable	Enable	Enable Units
System	Sub-Grouping	found in 12OBDG09	Defined by.	Logic	Values	
			and with ( Derivation of the PT1 filtered level signal (DT1) filter release for Reductant tank level calculation at ignition on on (Please see the definition)	>= =	1.00 TRUE	%/sec -
			and with ( Frozen state is active during a certain warning level (please see the definition) and with	=	TRUE	-
			Reductant tank Temperature	>=	-100.04	°C
			Reductant low warning level (Please see the definition) )))	>=	0	level
		Status of Reductant Tank Level Release	status of reductant tank level release (please see the definition) Status of Filter release for reductant tank level calculation (please see the definition) and ((	=	TRUE	-
			ambient temperature	>=	-100.04	°C
			status of reductant tank heater temperature	=	FALSE	-
			Waiting time before tank heater released	<	32767	sec
			status of reductant tank heater temperature	=	TRUE	-
			Waiting time after tank heater release expired ) or	>	0	sec
			status of reductant tank heater temperature	=	FALSE	-
			Waiting time before tank heater released and	>=	32767	sec

Component /	State or Status	Description of State or Status	Defined by	Enable	Enable	Enable Units
System	Sub-Grouping	found in 12OBDG09	Defined by.	Logic	Values	
			status of reductant tank heater temperature (please see the definition) Waiting time after tank heater release expired	= >=	TRUE 0	- sec
			Frozen state is active during a certain warning level (please see the definition)	=	TRUE	-
			) Vehicle speed )	>=	6.22	mph
			or filter release for Reductant tank level calculation at ignition on on (Please see the definition)	=	TRUE	-
					_	_
		Status of Filter release for reductant tank level calculation				
			Reductant tank Temperature	>=	-100.04	°C
			Reductant low warning level (Please see the	>=	0	-
			NO Pending or Confirmed DTCs:	=	TRUE	-
			Frozen state is active during a certain warning level (please see the definition)	=	TRUE	-
		Filter release for Reductant tank level calculation at Ignition on	ignition	=	on	-
			Engine on timer is expired (please see the	=	FALSE	-
			Vehicle speed	>=	0.62	mph
			Reductant low warning level (Please see the definition) and with ((	>=	49	level
			Raw Reductant tank level and with	>=	33.3	%
			Remaining Reductant quantity (a) - (b):	<	(a) - (b)	

Component / State or Status	State or Status	Description of State or Status	Defined by	Enable	Enable	Enable Units
System	Sub-Grouping	found in 12OBDG09	Denned by.	Logic	Values	
			(a) Tank level for reserve mode (Restriction level)	=	2614	g
			in [g] (b) Tank level threshold range below Restriction threshold for ignition on refill detection release	=	1015	g
			) or Raw Reductant tank level	>=	66.7	%
			and with (			
			Remaining Reductant quantity (a) - (b): (a) Tank level for reserve mode (Warning level) in	< =	(a) - (b) 5279	g
			(b) Tank level threshold range below WARNING threshold for ignition on refill detection release	=	1617	g
			)			
			Raw Reductant tank level and with	>=	100	%
			Remaining Reductant quantity (a) - (b): (a) Tank level for reserve mode (Warning level) in [0]	>= =	(a) - (b) 5279	g
			(b) Tank level threshold range below WARNING threshold for ignition on refill detection release	=	1617	g
			))			
		Status of Refill detection of Reductant	Status of Refill detection of Reductant tank (please			
		tank	see the definition) Reductant tank level changed ((	=	TRUE	-
			Captured Reductant tank level at last tank level change	=	Empty	-
			Captured Reductant tank level at last tank level change	=	Restriction	-

Component /	State or Status	Description of State or Status	Defined by:	Enable	Enable	Enable Units
System	Sub-Grouping	found in 12OBDG09	Defined by.	Logic	Values	
			and (			
			one or more of following conditions are met status of Reductant tank level (please see the definition)	=	Warning	-
			status of Reductant tank level (please see the definition) or	=	OK	-
			status of Reductant tank level (please see the definition) ))	=	Full	-
			or ((			
			Captured Reductant tank level at last tank level change or	=	Warning	-
			Captured Reductant tank level at last tank level change )	=	OK	-
			and			
			( status of Reductant tank level (please see the definition)	=	Full	-
			or (			
			Captured Reductant tank level at last tank level	=	OK	-
			status of Reductant tank level (please see the definition) ))	=	Full	
		Engine on timer is expired	time since engine started	>=	(a) * (b) 12 20	sec sec
			and with (/			
	l	l	ignition	=	on	sec

Component /	State or Status	Description of State or Status	Defined by:	Enable	Enable	Enable Units
System	Sub-Grouping	found in 12OBDG09	Defined by.	Logic	Values	
			engine speed Vehicle speed )	> >=	550 6.22	rpm mph
			or ( Vehicle speed NO Pending or Confirmed DTCs: for time ))	>= = >	6.22 TRUE 1	mph sec
			and with timer reset conditions			
			Falling edge of ignition	=	TRUE	-
			or Reductant Refill enabling conditions reset timers	=	TRUE	-
			)			
	Reducant Tank Level Low Warning States	Normal_Operation_OK: 0 decimal, normal operation	Reductant tank level	=	Full	
			and with ( Warning level	<=	49	-
			or ( Previous warning level	>	49	-
			vehicle speed ))	<=	98.75	mph
			or Reductant Quality state	>	0	-
		Warning_Leve1: 1 decimal, Warning	Reductant tank level	<	Full	
			Remaining mileage and with	>	1558.75	miles
			( Warning level or	<=	49	Warning level

Component /	State or Status	Description of State or Status	Defined by:	Enable	Enable	Enable Units
System	Sub-Grouping	found in 12OBDG09	Defined by.	Logic	Values	
			( Previous warning level vehicle speed ))	> <=	49 98.75	Warning level mph
			and with Reductant Quality state	=	0	-
				_	_	
		Warning_Level2: 2 decimal, Warning level 2	Reductant tank level	<	Full	-
		Remaining mileage and with (	<=	1558.75	miles	
			Warning level or	<=	49	Warning level
			( Previous warning level vehicle speed ))	> <=	49 98.75	Warning level mph
			and with Reductant Quality state	=	0	-
		Warning_Level3: 16 decimal, Warning	Reductant tank level	<	Full	-
			Remaining mileage and with	>	855	miles
			( Warning level	=	2	Warning level
			Warning level	=	16	Warning level
			, and with initialization phase after Reductant refill event is active	=	TRUE	-
			Reductant Quality state	=	0	-
		Warning_Level4: 32 decimal, Warning level 4	Reductant tank level	<	Full	-

Component /	State or Status	Description of State or Status	Defined by	Enable	Enable	Enable Units
System	Sub-Grouping	found in 12OBDG09	Defined by.	Logic	Values	
			Remaining mileage and with (	<=	855	miles
			Warning level or	<=	49	Warning level
			Previous warning level vehicle speed	> <=	49 98.75	Warning level mph
			and with Reductant Quality state	=	0	-
		Manine La 15 40 la incluire				
		level 5	((			
			Reductant tank level Remaining mileage and with	< <=	Full 628.75	- miles
			( Warning level or	<=	49	Warning level
			( Previous warning level vehicle speed ))) or	> <=	49 98.75	Warning level mph
			( Warning level initialization phase after Reductant refill event is active ))	= =	48 TRUE	Warning level -
			and with Reductant Quality state	=	0	-
		Warning Level6: 49 decimal, Warning	((			
		level 6	Warning level initialization phase after Reductant refill event is active	= =	49 TRUE	Warning level -

Component /	State or Status	Description of State or Status	Defined by	Enable	Enable	Enable Units
System	Sub-Grouping	found in 12OBDG09	Defined by.	Logic	Values	
			) or ( Warning level Failed Reductant system pressure build up ))	< =	49 1	Warning level
			and with Reductant Quality state	=	0	
		Warning_Level8: 80 decimal,Vehicle	Warning level	=	80	Warning level
			initialization phase after Reductant refill event is active	=	TRUE	
			Reductant Quality state	=	0	
		Warning_Level10: 112 decimal,Vehicle speed restriction aggressive	Warning level	=	112	Warning level
			initialization phase after Reductant refill event is active and with	=	TRUE	-
			Reductant Quality state	=	0	-
		Warning Level12: 144 decimal Vehicle	Warning level	_	144	Warning level
		speed restriction severe	initialization phase after Reductant refill event is	=	TRUE	-
			and with Reductant Quality state	=	0	-
		Warning_Level14: 176 decimal, Vehicle speed restriction final	Warning level	=	176	Warning level
			Initialization phase after Reductant refill event is active	=	TRUE	-

Component /	State or Status	Description of State or Status	Defined by:	Enable	Enable	Enable Units
System	Sub-Grouping	found in 12OBDG09		Logic	Values	
			and with Reductant Quality state	=	0	
	Reductant frozen System States	Frozen state is active during a certain warning level	ignition for time Reductant tank Temperature Reductant low warning level (Please see the definition)	= > <= >=	On 5 -9.04 2	- °C level
		Status of Reductant tank as frozen	( Engine off Time Reductant tank Temperature ) or ( Engine off Time time since the following conditions are met ( status of reductant tank heater defrost Vehicle speed Status of urea tank as frozen (please see the definition) ))	> < <= = = > =	14400 -11.04 7200 7200 On or Defrost 6.22 TRUE	sec °C sec sec - mph -
	SCR System Pressure State	Status of Low Reductant Pump Pressure - Under Reductant warning level 3 - Main state 0x30	Reductant low warning level (Please see the definition) number of pressure build-up attempts and ( status of SCR control sub state (please see the definition)	>= >= =	64 2 Pressure Build up	- counts -

Component /	State or Status	Description of State or Status	Defined by	Enable	Enable	Enable Units
System	Sub-Grouping	found in 12OBDG09	Denned by.	Logic	Values	
			Reductant Pump Module Pressure Dwell time in Pressure Build up substate system pressurizes in pressure buildup and ventilation states Reductant Defrost check (please see the definition)	< > >= =	350 10 10 TRUE	kPa sec counts -
SCR System Diagnosis	SCR System Long Term	Long-term Adaption Triggered	)			
			underdosing detected (please see the definition) OR overdosing detected (please see the definition)	=	TRUE	-
			, , , , , , , , , , , , , , , , , , ,			
		Underdosing detected	Difference between the NOx mass of the sensor and of the model during first functional evaluation	>=	10	g
			OR Difference between the NOx mass of the sensor and of the model during second functional evaluation OR	>=	10	g
			Difference between the NOx mass of the sensor and of the model during third functional evaluation	>=	-0.25	g
		Overdosing detected	Difference between the NOx mass of the sensor and of the model during first functional evaluation OR	<=	-6	g

Component /	State or Status	Description of State or Status	Defined by	Enable	Enable	Enable Units
System	Sub-Grouping	found in 12OBDG09	Defined by.	Logic	Values	
			Difference between the NOx mass of the sensor and of the model during second functional evaluation OR Difference between the NOx mass of the sensor and of the model during third functional evaluation (see Look-Up-Table #9)	<= <=	-6 -0.8 to -0.6	g
		Status of the SCR adaptation plausibility check active	( Status of NOx signal of downstream NOx sensor (please see the definition)	=	TRUE	-
			NOx concentration downstream SCR catalyst for time	>	15 3	ppm sec
			Estimated SCR catalyst efficiency for time	>	0.3 3	factor sec
			NOx concentration deviation between sensor reading and modeled NOx concentration downstream SCR catalyst	>	measured parameter	-
			for time	>	10	sec
			Time since when the Reductant load level adaptation and the plausibility have been locked	>=	600	sec
			or Time since when the Reductant load level adaptation and the plausibility have been locked	>=	50	sec
			Integrated NOx mass since Reductant load level adaptation and plausibility have been locked )	>=	2	g
			Difference between nominal and estimated Reductant	<	0.125	g
			Difference between nominal and estimated Reductant	>=	-0.5	g

Component /	State or Status	Description of State or Status	Defined hur	Enable	Enable	Enable Units
System	Sub-Grouping	found in 12OBDG09	Defined by:	Logic	Values	
			Filtered Upstream NOx mass flow	>=	10	mg/sec
			Filtered Upstream NOx mass flow	<=	500	mg/sec
			Upstream Nox mass flow difference : (a) - (b)	>=	0	ma/sec
			Upstream Nox mass flow difference : (a) - (b)	<=	500	mg/sec
			and with			5
			(a) Filtered Upstream NOx mass flow			
			(b) Filtered actual upstream NOx mass flow			
			)			
			Status of pre controlled dosing (please see the	=	FALSE	-
			definition)			
			Difference between nominal and estimated	<	0.125	g
			Reductant		0.5	~
			Difference between norminal and estimated Reductant	>=	-0.5	g
			for time	>	5	sec
			HC load in SCR catalyst	<=	10	factor
			overall aging factor of the SCR catalyst	>=	0	factor
			for time	>	1	sec
			Temperature gradient of SCR	>=	-1	°C/sec
			Temperature gradient of SCR	<=	1	°C/sec
			for time	>	18	sec
			Integrated NOx mass flow after engine start	>=	5	q
			Release of Reductant dosing	=	active	-
			engine operating condition based on engine speed	>	0 to 1	factor
			and injection quantity (see Look-Up-Table #10)			
			(			
			Difference between nominal and estimated	>	-0.05	g
			Reductant		01.001	
			Reductant mass flow (see Look-Up-Table #8)	>	0 to 0.04	g
				>	20	Sec
			,			

Component /	State or Status	Description of State or Status	Defined by	Enable	Enable	Enable Units
System	Sub-Grouping	found in 12OBDG09	Defined by.	Logic	Values	
		State of the NH3 (Ammonia) slip detection	Reductant concentration downstream SCR	<	32767	ppm
			and (a) - (b) (a) Filtered NOx mass flow downstream SCR measured by the sensor (b) Filtered and delayed NOx raw emission mass flow upstream of SCR	< = =	0 measured parameter measured parameter	g/sec - -
		Deactivation of dosing to execute the NOx Offset test	SCR catalyst temperature SCR catalyst temperature time	> < >	400.06 999.96 60	°C °C Sec
			and Currently dosed Reductant mass flow time	<= >	0.005 30	g/sec sec
			and Feed ratio (a) / ((b) * (c)) (a) Currently dosed Reductant mass flow (b) NOx raw emission mass flow	<= = =	0.1 measured parameter measured	ratio - -
			( c) Stoichiometric conversion factor NOx to Reductant time	= >	parameter calculated parameter 10	- sec
			and Estimated current Reductant load time	<= >	0.3 10	g sec
		Release plausibility of Reductant Load				
			Release plausibility timer active	>=	600	sec

Component /	State or Status	Description of State or Status	Defined by	Enable	Enable	Enable Units
System	Sub-Grouping	found in 12OBDG09	Defined by.	Logic	Values	
			or ( Release plausibility timer active Integrated NOx raw emission since fill level adaptation and plausibility have been locked )	>= >=	50 2	sec g
		Status for disabling the SCR Efficiency monitor following an SCR Adaptation cycle completion	Maximum dosing quantity or (a) - (b) (a) Reductant Dosing quantity (b) Maximum Reductant Dosing quantity or (a) - (b)	<	0.6 0 measured parameter calculated parameter 0	g/sec - - -
			(a) Reductant Desired value (b) Reductant Dosing quantity limitation due to frozen tank	=	calculated parameter calculated parameter	-
		Request for pre controlled dosing	Filtered exhaust gas mass flow	>	(a) * (b)	-
			<ul> <li>(a) Correction factor for the upper hysteresis threshold for filtered exhaust-gas mass flow, dependent on HC- contamination</li> <li>(b) Upper hysteresis threshold for filtered exhaust- gas mass flow, dependent on thermal ageing</li> </ul>	=	5040.00	factor g/sec
			and Filtered NOx mass flow upstream SCR	>	(a) * (b)	-

Component /	State or Status	Description of State or Status	Defined by	Enable	Enable	Enable Units
System	Sub-Grouping	found in 12OBDG09	Defined by:	Logic	Values	
			<ul> <li>(a) Correction factor for the upper hysteresis threshold for filtered exhaust-gas mass flow, dependent on HC- contamination SCR</li> <li>(b) Upper hysteresis threshold for filtered exhaust- gas mass flow, dependent on thermal ageing SCR</li> </ul>	=	1 0.25	factor g/s
			and			
			Engine coolant temperature	<	(a) + (b)	-
			(a) Lower hysteresis threshold for engine	=	105.06	
			(b) Offset for lower hysteresis switch on threshold	=	50	к
			for engine temperature			
			Engine coolant temperature	>	108.06	°C
			and			
			ambient pressure	>	(a) + (b)	-
			(a) Upper hysteresis threshold for environment pressure	=	74.5	kPa
			(b) Offset for upper hysteresis switch on threshold for environment pressure	=	65.0	kPa
			ambient pressure	<	74.0	kPa
			and			
			Intake air temperature	>	(a) + (b)	-
			(a) Lower hysteresis switch on threshold for inlet air temperature	=	-6.54	°C
			(b) Offset for upper hysteresis switch on threshold for inlet air temperature	=	49.5	°C
			Intake air temperature	<	-8.04	°C
			and			
			( ambient temperature	>-	-7 04	°C
			ambient temperature ambient pressure	>=	74.8	kPa
			Selected temperature used for locking pre	>=	209.96	°C
			controlled mode Selected temperature used for locking pre	<=	309.96	°C
	1		controlled mode			

Component /	State or Status	Description of State or Status	Defined by	Enable	Enable	Enable Units
System	Sub-Grouping	found in 12OBDG09	Denned by.	Logic	Values	
			engine operation in normal mode	=	TRUE	-
			SCR Nox Catalyst Efficiency check was performed	=	FALSE	-
			Incorrect Reductant Composition check was	=	FALSE	-
			NO Pending or Confirmed DTCs:	=	TRUE	-
			(( (k) + (l) + ( m)	>	75	
			(k) = (a) * (b) (a) entry condition for pre controlled dosing at sea level (see Look-Up-Table #13)	=	0 to 100	-
			(b) Altitude multiplier factor for sea level	=	measured paramter	-
			<ul> <li>(l) = ( c) * (d) * (e)</li> <li>( c) entry condition for online dosing at Mid level (see Look-Up-Table #12)</li> </ul>	=	0 to 100	-
			(d) Multiplier to Mid Level enable speed load map	=	1	factor
			(e) Altitude multiplier factor for medium altitude	=	measured paramter	-
			(m) = ( f) * (g) * (h) (f) Entry condition for online dosing at Hi level (see Look-Up-Table #11)	=	0 to 100	-
			(g) Multiplier to Hi Level enable speed load map	=	1	factor
			(h) Altitude multiplier factor for high altitude	=	measured paramter	-
			, and Low pass filtered rNOxNSCDs signal )	>	2000	-
				_	_	_

Component /	State or Status	Description of State or Status	Defined hus	Enable	Enable	Enable Units
System	Sub-Grouping	found in 12OBDG09	Defined by:	Logic	Values	
	Reductant Tank Heater Performance Diagnosis Status	start temperature is captured in EERPOM if monitoring is active over several driving cycles	continuation of previously started tank temperature performance monitoring cycle (see definition)	=	1.56	°C
		or	(			
		start temperature is captured in EERPOM if monitoring is not active over several driving cycles	continuation of previously started tank temperature performance monitoring cycle (see definition)	=	FALSE	-
			ignition on for time	>	60	sec
			or	=	TRUE	
			(a) - (b)	<=	-0.14	°C
			(a) filtered current tank temperature	=	measured paramter	-
			(b) tank temperature captured at the beginning of current monitoring cycle )) or	=	measured paramter	-
			(a) - (b)	<=	-0.14	°C
			(a) filtered current tank temperature	=	measured paramter	-
			(b) tank temperature captured at the beginning of current monitoring cycle or	=	measured paramter	-
				_		
		continuation of previously started tank temperature performance monitoring cycle	temperature difference: (a) - (b)	<=	1.56	°C
			(a) filtered current tank temperature	=	measured paramter	-
			(b) tank temperature of the previous driving cycle	=	measured paramter	-
			temperature difference: (a) - (b)	<=	0	°C
			(a) tank temperature of the previous driving cycle	=	measured paramter	-

Component /	State or Status	Description of State or Status	Defined by	Enable	Enable	Enable Units
System	Sub-Grouping	found in 12OBDG09	Defined by:	Logic	Values	
			(b) filtered current tank temperature	=	measured	-
			temperature difference: (a) - (b)	~-	paramter	°C
			(a) tank temperature of the previous driving cycle	=	measured	-
			(.)		paramter	
			start tank temperature of current monitoring cycle	=	measured	-
			from EEPROM (see definition)	<-	paramter 2000	SPC
			This monitor was complete in the last driving cycle	=	FALSE	300
			ice detection by tank temperature difference:		0.14	*0
			(a) filtered current tank temperature	>	-0.14 measured	-
					paramter	
			(b) tank temperature captured at the beginning of	=	measured	-
			current monitoring cycle		paramter	
		State of Reductant injection valve	((			
		Component Protection	status of SCR control sub state (please see the	=	Meterina	_
			definition)	_	control	
			and with			
			(			
			PM Filter Regeneration	=	not active	_
				_	not donvo	
			Modeled Reductant injection valve tip temperature	>	100.96 to	°C
			based on its coil temperature (see Look-Up-Table		114.96	
			#15)			
			or			
			(			
			PM Filter Regeneration	=	active	°C
			Relaciant dosing valve modeled temperature	2	19.90	C
			))			
			or			
			) status of SCR control sub state (please see the	¥	Metering	
			definition)	7	control	-

Component /	State or Status	Description of State or Status	Defined by	Enable	Enable	Enable Units
System	Sub-Grouping	found in 12OBDG09	Denned by.	Logic	Values	
			and with ( PM Filter Regeneration Modeled Reductant injection valve tip temperature based on its coil temperature (see Look-Up-Table #15) ) or ( PM Filter Regeneration Modeled Reductant injection valve tip temperature based on its coil temperature )))	= > = >	not active 100.96 to 114.96 active 19.96	ů
Turbo Charger		Turbocharger (VNT) wiping active	The Variable Nozzle Turbocharger Control has an intrusive mode where: VNT wiping is a sweep of the vane position control throughout its range of motion which is used to: avoid a binding of the VNT vanes due to soot accumulation during long idle operation with a cold engine.			

Table no.	Fault Codes	Label (Internal M	lanufact	turer Ref	ference	)											
1	P0101	AFS_rAirThresCc	or_CUR														
	Intake Air Temperature (°C)	-100.04	-0.04	0.96	38.96	39.96	125.86										
	Correction Factor (factor)	0.05	0.05	0	0	0	0										
2	P2199	Air_tDiffMaxHiTA	FS_CUF	2													
	Engine Off Time (sec)	600	700	800	900	1000	2000	3000	4000	5000	8000	17999	18000	28799	28800	30000	32000
	Delta Temperature (°C)	999	999	999	999	999	999	999	999	999	999	999	999	999	100	100	100
3	P10CF	Air_tDiffMaxHiTC	ACDs_C	CUR													
	Engine Off Time (sec)	600	700	800	900	1000	2000	3000	4000	5000	8000	17999	18000	28799	28800	30000	32000
	Delta Temperature (°C)	999	999	999	999	999	999	999	999	999	999	999	999	999	100	100	100
4	P040F	Air_tDiffMaxHiTE	GRClr2E	Ds_CUR													
	Engine Off Time (sec)	600	700	800	900	1000	2000	3000	4000	5000	8000	10000	18000	28799	28800	30000	32000
	Delta Temperature (°C)	999	999	999	999	999	999	999	999	999	999	999	999	999	100	100	100
5	P2199	Air_tDiffMaxLoTA	FS_CUF	२													
	Engine Off Time (sec)	600	700	800	900	1000	2000	3000	4000	5000	8000	17999	18000	28799	28800	30000	32000
	Delta Temperature (°C)	999	999	999	999	999	999	999	999	999	999	999	999	999	20	20	20
6	P10CF	Air_tDiffMaxLoTC	ACDs_0	CUR													
	Engine Off Time (sec)	600	700	800	900	1000	2000	3000	4000	5000	8000	17999	18000	28799	28800	30000	32000
	Delta Temperature (°C)	999	999	999	999	999	999	999	999	999	999	999	999	999	35	35	35
7	P040F	Air_tDiffMaxLoTE	GRCIr2	Ds_CUR													
	Engine Off Time (sec)	600	700	800	900	1000	2000	3000	4000	5000	8000	17999	18000	28799	28800	30000	32000
	Delta Temperature (°C)	999	999	999	999	999	999	999	999	999	999	999	999	999	20	20	20
8	P0401	AirCtl_facEnvPres	sMinDvt_	_CUR													
	Ambient Pressure (kPa)	65	70	75	80	85	90	95	110								
	Correction Factor (-)	0.71	0.71	0.71	0.85	0.85	0.92	1	1								
9	P0401	AirCtl_mEGRMinl	DvtLim_0	CUR													

Table no.	Fault Codes	Label (Internal Manufacturer Reference)											
	Ambient Pressure (kPa)	67	70	73	76	79	82	85	88	91	94	97	100
	Air Mass Flow (g/rev)	0.8	0.8	0.8	0.8	0.85	0.9	0.95	1	1.05	1.1	1.15	1.2

Injection Qty (mm^3/rev) / Engine Speed (rpm)	550	1000	1200	1300	1400	1500	2000	3000
20	0.6	0.5	0.5	0.4	0.4	0.4	0.6	0.6
40	0.6	0.5	0.5	0.4	0.4	0.4	0.6	0.6
60	0.6	0.5	0.5	0.4	0.4	0.4	0.6	0.6
80	0.6	0.5	0.5	0.4	0.4	0.4	0.6	0.6
100	0.6	0.5	0.5	0.4	0.4	0.4	0.6	0.6
120	0.6	0.6	0.5	0.5	0.5	0.5	0.6	0.6
160	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6
200	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6

AirCtl\_mMaxDvt\_MAP

### 11 P0400

P0402

10

### AirCtl\_mMaxDvtPwr\_MAP

Injection Qty (mm^3/rev) / Engine Speed (rpm)	0	500	1000	1500	2000	2500	3000	3750
0	2	2	2	2	2	2	2	2
20	2	2	2	2	2	2	2	2
40	2	2	2	2	2	2	2	2
60	2	2	2	2	2	2	2	2
80	2	2	1.8	1.8	1.8	1.8	2	2
160	2	2	1.8	1.6	1.6	1.6	2	2
320	2	2	1.8	1.6	1.6	1.6	2	2
380	2	2	2	2	2	2	2	2

### 12 P0401

### AirCtl\_mMinDvt\_MAP

Injection Qty (mm^3/rev) / Engine Speed (rpm)	550	1000	1400	1800	2200	2600	3000	3750
0	-0.56	-0.56	-1	-1	-1	-1	-1.2	-1.2
20	-0.56	-0.56	-1	-1	-1	-1	-1.2	-1.2
40	-0.56	-0.56	-1	-1	-1	-1	-1.2	-1.2
60	-0.56	-0.56	-1	-1	-1	-1	-1.2	-1.2
80	-0.56	-0.56	-1	-1	-1	-1	-1.2	-1.2
100	-0.9	-0.9	-0.9	-0.9	-0.9	-0.9	-1.2	-1.2
120	-1	-1	-1	-1	-1	-1	-1.2	-1.2
150	-1	-1	-1	-1	-1	-1	-1.2	-1.2

#### 13 P2138

### APP\_uSync\_CUR

Accel Pedal Voltage (V)	0.5	2.1	2.5
Pedal Deviation (V)	0.12	0.18	0.18

#### 14 P057B

Brk\_facEWMASlowTest\_CUR

Brake Position Sensor Voltage (V)	0	0.0346	0.035	0.04	0.045	0.051	0.0512	5

Table no.	Fault Codes	Label (Internal	Manufa	cturer Re	ference	)											<u> </u>
	factor (-)	0	0	0	0	0	0	1	1								
15	P008F	CEngDsT_tDiff	MaxHi_C	UR													
	Engine Off Time (sec)	600	700	800	900	1000	2000	3000	4000	5000	8000	17999	18000	28799	28800	30000	32767
	Delta Temperature (°C)	999	999	999	999	999	999	999	999	999	999	999	999	999	100	100	100
16	P008F	CEngDsT_tDiff	MaxLo_C	CUR													
	Engine Off Time (sec)	600	700	800	900	1000	2000	3000	4000	5000	8000	17999	18000	28799	28800	30000	32767
	Delta Temperature (°C)	999	999	999	999	999	999	999	999	999	999	999	999	999	20	20	20
17	P0336	EpmCrS_facGa	apPlausH	igh_CA													
	-	8	5.8125	3.375	3.375												
10	D0226	EpmCrS faclor	Plaue	ah CA													
10	F0330	Epinero_lacine	riausi ilg	JII_CA													
	-	2	1 8125	15	15												
		2	1.0120	1.0	1.0												
19	P02CD, P02CF, P02D1, P02D3, P02D5, P02D7, P02D9, P02DB	ETClb_pRailSe	t_CA														
	Rail Pressure Setpoint (kPa)	30000	70000	90000													
20	P02CD, P02CF, P02D1, P02D3, P02D5, P02D7, P02D9, P02DB	ETClb_tiET_M/	AX_CA														
	Injector Energizing Time (usec)	670.8	384.4	353.2													
21	P01CD, P01CF, P01D1, P01D3, P01D5, P01D7, P01D9, P01DB	ETClb_tiETFbC	)fsMax_C	CA													
	Injector Energizing Time (usec)	16	12	10													
22	P01CD, P01CF, P01D1, P01D3, P01D5, P01D7, P01D9, P01DB	ETClb_tiETFbC	OfsMin_C	A													
	Injector Energizing Time (usec)	16	12	10													

#### Table no. Fault Codes

### Label (Internal Manufacturer Reference)

23 P144B

ETCtl\_stPOpCtVILopMax\_MAP

Injection Qty (mm^3/rev) / Engine Speed (rpm)	750	900	2250	3000
0	0	1	1	0
40	0	1	1	0
160	0	1	1	0
200	0	0	0	0

24 P144C

ETCtl\_stPOpCtVILopMin\_MAP

Injection Qty (mm^3/rev) / Engine Speed (rpm)	750	900	2250	3000
0	0	1	1	0
40	0	1	1	0
160	0	1	1	0
200	0	0	0	0

#### 25 P24A0

ETCtlHCI\_stPOpCtVHCILopMaxInjMs\_MAP

Injection Qty (mm^3/rev) / Engine Speed (rpm)		700	900	2250	3000
	0	0	1	1	1
	0	0	1	1	1
10	60	0	1	1	1
20	0	0	1	1	1

#### 26 P24A1

ETCtlHCl\_stPOpCtVHClLopMinInjMs\_MAP

Injection Qty (mm^3/rev) / Engine Speed (rpm)	700	900	2250	3000
0	0	1	1	1
40	0	1	1	1
160	0	1	1	1
200	0	1	1	1

#### 27 P11DC

#### Exh\_facLamStatNoCat2Ds\_CUR

-	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
-	0.2	0.4	0.6	0.8	1	1.2	1.4	1.6	1.8	2	2.2	2.4	2.6	2.8	3	3.2

#### 28 P11DB

### Exh\_facLamStatNSCDs\_CUR

-	0	3	4	5	6	7	8	9	10	15	16
-	0.1	0.1	1.25	1.5	3.848	3.889	4	6.484	10	10	10

29 P2080, P2084, P242B, P246F

Exh\_stPOpModPlausTMon\_MAP

Table no.	Fault Codes	Label (Interr	al Manuf	acturer F	Reference	e)	
	Injection Qty (mm^3/rev) / Engine Speed (rpm)	700	1000	1500	2000	3000	3300
	(	0	0	0	0	0	0
	20	255	255	255	255	255	0
	40	255	255	255	255	255	0
	100	255	255	255	255	255	0
	200	0	255	255	255	255	0
	320	0	0	0	0	0	0

#### 30 P20E2

### Exh\_tDiffMaxHiTOxiCatDs\_CUR

Engine Off Time (sec)	600	700	800	900	1000	2000	3000	4000	5000	8000	17999	18000	28799	28800	30000	32000
Delta Temperature (°C)	999	999	999	999	999	999	999	999	999	999	999	999	999	100	100	100

31 P20E2

### Exh\_tDiffMaxLoTOxiCatDs\_CUR

Engine Off Time (sec)	600	700	800	900	1000	2000	3000	4000	5000	8000	17999	18000	28799	28800	30000	32000
Delta Temperature (°C)	999	999	999	999	999	999	999	999	999	999	999	999	999	30	30	30

### 32 P0483 FanCtl\_facDiaDrvSpd\_CUR

Fan Speed (rpm)	400	1679	1680	1800	2000	2400	2800	3200	3600	4000	4400	4800	5200	5600	6000	6400	6800
factor (-)	0	0	1	1	1	1	1	1	0.9	0.8	0.7	0.6	0.4	0.2	0	0	0

33 P0483

### FanCtl\_facDiaDrvStab\_CUR

Fan Speed (rpm)	-1600	-1200	-700	-400	0	400	700	1200	1600
factor (-)	0	0	0.6	1	1	1	0.6	0	0

34 P0483

### FanCtl\_facDiaECT\_CUR

Engine Coolant Temperature (°C)	-20.04	-7.04	19.96	68.96	69.96	79.96	99.96	104.96	124.96
factor (-)	0	0	0	0	0.6	0.95	1	0.95	0.9

FanCtl\_facDialAT\_CUR

#### 35 P0483

Intake Air Temperature (°C)	-8.04	-7.04	-0.04	9.96	14.96	19.96	44.96	69.96	99.96
factor (-)	0	0.6	0.62	0.7	0.8	1	1	1	0.9

#### 36 P0495

### FanCtl\_nDiaHiSpd\_CUR

Fan Drive Speed (rpm)	400	1200	1500	1600	1800	2000	2400	2800	3200	3600	4000	4400	4800	5200	5600	6000	6800
Fan Speed (rpm)	400	1200	1450	1500	1500	1500	1500	1500	1500	1500	1500	1500	1500	1500	1500	1500	1500

37 P0495

FanCtl\_volClthDia\_CUR

Table no.	Fault Codes	Label (Intern	al Manufa	cturer Re	ference	)												
	Fan Drive Speed (rpm)	400	600	800	1000	1200	1400	1600	1800	2000	2200	2400	2600	2800	3000	3200	3400	3600
	Clutch Fluid Vol (L)	0.005	0.0055	0.006	0.011	0.011	0.011	0.011	0.011	0.011	0.0105	0.0105	0.0105	0.0105	0.0115	0.011	0.011	0.0105

### 38 P0263, P0266, P0269, P0272, P0275, P0278, P0281, P0284 FBC\_qLimNeg\_MAP

ECT (°C) / Inj. Qty (mm^3/rev)	0	8	52	76	448	464	472	480
-40.0	4 0	0	-12	-17	-17	-17	-17	-17
103.9	6 0	0	-12	-17	-17	-17	-17	-17
104.9	6 0	0	-12	-17	-17	-17	-17	-17
105.9	6 0	0	-12	-17	-17	-17	-17	-17
106.9	6 0	0	-12	-17	-17	-17	-17	-17
107.9	6 0	0	-12	-17	-17	-17	-17	-17
109.9	6 0	0	-12	-17	-17	-17	-17	-17
134.9	6 0	0	-12	-17	-17	-17	-17	-17

### 39 P0263, P0266, P0269, P0272, P0275, P0278, P0281, P0284 FBC\_qLimPos\_MAP

ECT (°C) / Inj. Qty (mm^3/rev)	0	8	52	76	448	464	472	480
-40.04	0	0	12	17	17	17	17	17
103.96	0	0	12	17	17	17	17	17
104.96	0	0	12	17	17	17	17	17
105.96	0	0	12	17	17	17	17	17
106.96	0	0	12	17	17	17	17	17
107.96	0	0	12	17	17	17	17	17
109.96	0	0	12	17	17	17	17	17
134.96	0	0	12	17	17	17	17	17

### 41 P111F FIPmpT\_tDiffMaxHi\_CUR

Engine Off Time (sec)	600	700	800	900	1000	2000	3000	4000	5000	8000	17999	18000	28799	28800	30000	32000
Delta Temperature (°C)	999	999	999	999	999	999	999	999	999	999	999	999	999	100	100	100

### 42 P111F FIPmpT\_tDiffMaxLo\_CUR

Engine Off Time (sec)	600	700	800	900	1000	2000	3000	4000	5000	8000	17999	18000	28799	28800	30000	32000
Delta Temperature (°C)	999	999	999	999	999	999	999	999	999	999	999	999	999	20	20	20

### 43 P0171, P0172, P026C, P026D

### FMO\_facObsvrCmpnProtnRels\_MAP

Injection Qty (mm^3/rev) / Engine Speed (rpm)	500	600	1200	1600	2200	2400	3000	3200
(	0 0	1	1	1	1	1	1	1
28	8 0	1	1	1	1	1	1	1
280	0 0	1	1	1	1	1	1	1
300	0	0	0	1	1	1	1	1
320	0 0	0	0	1	1	1	0	0

Table no.	Fault Codes	Label (Internal Manufacturer Reference)									
		340	0	0	0	1	1	1	0	0	
		360	0	0	0	0	1	1	0	0	
		380	0	0	0	0	0	0	0	0	

44 P026D

FMO\_qFlSysThresMax\_MAP

Injection Qty (mm^3/rev) / Engine Speed (rpm)	400	450	500	550	700	750	800	850
12	19.6	19.6	19.6	19.6	22.4	22.4	25.6	24
16	16	19.2	19.2	19.2	23.2	23.2	26	24
24	23.2	23.2	25.2	25.2	25.2	25.2	26	28
40	23.2	23.2	25.2	25.2	25.2	25.2	26	28
56	23.2	23.2	25.2	25.2	25.2	25.2	26	28
72	23.2	23.2	25.2	25.2	25.2	25.2	26	28
84	34.8	34.8	34.8	34.8	34.8	34.8	34.8	34.8
100	34.8	34.8	34.8	34.8	34.8	34.8	34.8	34.8

45 P026C

### FMO\_qFlSysThresMin\_MAP

Injection Qty (mm^3/rev) / Engine Speed (rpm)	400	450	500	550	700	750	800	850
12	-34.8	-34.8	-34.8	-34.8	-34.8	-34.8	-34.8	-34.8
16	-34.8	-34.8	-34.8	-34.8	-34.8	-34.8	-34.8	-34.8
24	-34.8	-34.8	-34.8	-34.8	-34.8	-34.8	-34.8	-34.8
40	-27.6	-27.6	-27.2	-21.6	-24.4	-24.4	-24.4	-25.2
56	-27.6	-27.6	-27.2	-21.6	-24.4	-24.4	-24.4	-25.2
72	-27.6	-27.6	-27.2	-21.6	-24.4	-24.4	-24.4	-25.2
84	-27.6	-27.6	-27.2	-21.6	-24.4	-24.4	-24.4	-25.2
100	-26	-26	-26	-21.6	-21.2	-21.2	-21.2	-20

46 P0172

### FMO\_qOBDMax\_MAP

Injection Qty (mm^3/rev) / Engine Speed (rpm)	500	700	900	1000	1100	1200	1300	1500
40	46.12	52.44	58.72	65.04	68.16	71.32	77.64	109.12
80	54.04	60.36	66.64	72.96	76.12	79.24	85.56	117.04
120	62	68.28	74.6	80.88	84.04	87.2	93.48	125
160	65.96	72.24	78.56	84.84	88	91.16	97.44	128.96
180	69.92	76.2	82.52	88.8	91.96	95.12	101.4	132.92
200	73.88	80.16	86.48	92.76	95.92	99.08	105.36	136.88
240	77.84	84.12	90.44	96.72	99.88	103.04	109.32	140.84
280	101.64	107.92	114.24	120.52	123.68	126.84	133.12	164.64

47 P0171

### FMO\_qOBDMin\_MAP

Injection Qty (mm^3/rev) / Engine Speed (rpm)	500	700	900	1000	1100	1200	1300	1500
40	-46.12	-52.44	-58.72	-65.04	-68.16	-71.32	-77.64	-109.12
80	-54.04	-60.36	-66.64	-72.96	-76.12	-79.24	-85.56	-117.04
120	-62	-68.28	-74.6	-80.88	-84.04	-87.2	-93.48	-125
160	-65.96	-72.24	-78.56	-84.84	-88	-91.16	-97.44	-128.96
180	-69.92	-76.2	-82.52	-88.8	-91.96	-95.12	-101.4	-132.92

Table no	Fault	Codes
	I MMIN	00000

	Label (Intern	al Manuf	acturer R	eference	e)			
200	-73.88	-80.16	-86.48	-92.76	-95.92	-99.08	-105.36	-136.88
240	-77.84	-84.12	-90.44	-96.72	-99.88	-103.04	-109.32	-140.84
280	-101.64	-107.92	-114.24	-120.52	-123.68	-126.84	-133.12	-164.64

48 P0171, P0172, P026C, P026D

FMO\_stOutObsvr\_MAP

Injection Qty (mm^3/rev) / Engine Speed (rpm)	500	600	1000	1200	1600	2200	2400	2800	3000	3200
0	0	0	0	0	0	0	0	0	0	0
16	0	1	1	1	1	1	1	1	1	1
240	0	1	1	1	1	1	1	1	1	1
260	0	1	1	1	1	1	1	1	1	1
280	0	1	1	1	1	1	1	1	1	1
300	0	0	0	0	1	1	1	1	1	1
320	0	0	0	0	1	1	1	1	0	0
340	0	0	0	0	1	1	1	0	0	0
360	0	0	0	0	0	1	1	0	0	0
380	0	0	0	0	0	0	0	0	0	0

#### 49 P11B4, P11B5

Hegn\_facLamDiaFdbk\_CUR

-	0	3	5	6	7	8	9	10
factor (-)	0.1	0.1	1.25	3.848	3.889	4	6.484	10

#### 50 P054F

### InjCtl\_qDesGearMonMax\_MAP

ECT (°C) / Engine Speed (rpm)	0	400	600	800	1000	5000
-20.04	57.7	57.7	57.7	57.7	57.7	57.7
-10.04	50	50	50	50	50	50
-0.04	44.2	44.2	44.2	44.2	44.2	44.2
19.96	38.7	38.7	38.7	38.7	38.7	38.7
39.96	33.8	33.8	33.8	33.8	33.8	33.8
69.96	31.7	31.7	31.7	35.1	35.1	35.1

54 P0606

### MoFCoOfs\_rTrqPtdOfs\_MAP

Engine Speed (rpm) / Torque (%)	0	10.156	19.922	30.078	39.844	50	60.156	69.922
840	99.609375	99.609	99.609	99.609	99.609	99.609	99.609	99.609
880	11.71875	11.719	11.719	11.719	11.719	11.719	11.719	11.719
2000	11.71875	11.719	11.719	11.719	11.719	11.719	11.719	11.719
3000	11.71875	11.719	11.719	11.719	11.719	11.719	11.719	11.719
4000	11.71875	11.719	11.719	11.719	11.719	11.719	11.719	11.719
5000	11.71875	11.719	11.719	11.719	11.719	11.719	11.719	11.719
6000	11.71875	11.719	11.719	11.719	11.719	11.719	11.719	11.719
7000	11.71875	11.719	11.719	11.719	11.719	11.719	11.719	11.719

55 P0606

MoFInjQnt\_tiZFCETMax\_CUR

Table no.	. Fault Codes	Label (Interna	al Manufa	acturer R	eference	.)			
	Rail Pressure (kPa)	20000	30400	70400	90400	120000	120800		
	Energizing Time (us)	500	500	300	256	50	50		
56	P0606	MoFInjQnt_tiZ	2FCETMin	LCUR					
	Rail Pressure (kPa)	20000	30400	70400	90400	120000	120800		
	Energizing Time (us)	-500	-500	-300	-256	-50	-50		
57	P0606	MoFOvR_nEr	ngStrtThre	s_CUR					
	ECT (°C)	-40	-30.4	-16	-10.4	9.6	20	29.6	40
	Engine Speed (rpm)	1080	1040	960	960	960	960	920	840
58	P0606	MoFOvR_tiLir	nET_CUF	2					
	Engine Speed (rpm)	0	2000	2040	4000				
	Energizing Time (us)	6000	6000	200	200				
59	P2263	PCR_facMaxU	JndrBstD\	/t_CUR					
	Environmental Pressure (kPa)	70	75	80	85	90	95	100	112.5
	factor (-)	0.67004395	0.67	0.67	0.67	1	1	1	1
60	P0234	PCR_facPres	D∨tCorMir	ו_CUR					
	Environmental Pressure (kPa)	70	75	80	85	90	95	100	112.5
	factor (-)	0.65002441	0.65	0.75	0.75	1	1	1	1
61	P0299	PCR_pMaxDv	∕t_MAP						
	Injection Qty (mm^3/rev) / Engine Speed (rpm)	550	1000	1600	1800	2000	2500	3000	4500
		<b>0</b> 20	15	15	15	17.5	20	20	40
	1	<b>60</b> 20	15	20	20	20	30	35	40
	2	<b>00</b> 20	17.5	25	25	25	30	35	40
	2	40 25 80 25	20	30	30	30	35	40	40
	3	<b>20</b> 25	25	25	25	30	30	40	40
	3	<b>60</b> 30	30	30	30	30	30	40	40

62 P0234

PCR\_pMinDvt\_MAP

Injection Qty (mm^3/rev) / Engine Speed (rpm)	550	1200	1700	2000	2500	3000	3500	5500
4	-12.5	-12.5	-12.5	-15	-20	-25	-40	-40
14	-12.5	-12.5	-12.5	-15	-20	-25	-40	-40

#### Table no. Fault Codes

no.	Fault Codes	Label (Intern	al Manuf	acturer R	Reference	e)			
	26	-12.5	-12.5	-12.5	-15	-20	-25	-40	-40
	40	-12.5	-12.5	-12.5	-15	-20	-25	-40	-40
	60	-12.5	-12.5	-12.5	-15	-20	-25	-40	-40
	80	-12.5	-12.5	-12.5	-15	-20	-25	-40	-40
	100	-12.5	-12.5	-12.5	-15	-20	-25	-40	-40
	120	-12.5	-12.5	-12.5	-15	-20	-25	-40	-40

#### 63 P2263

#### PCR\_pOvrBstDvt\_MAP

Injection Qty (mm^3/rev) / Engine Speed (rpm)	500	750	1000	1500	2000	2500	3000	3500
	-50	-50	-50	-50	-50	-50	-50	-50
6	<b>)</b> -50	-50	-50	-50	-50	-50	-50	-50
12	-50	-50	-50	-50	-50	-50	-50	-50
18	-50	-50	-50	-50	-50	-50	-50	-50
24	-50	-50	-50	-50	-50	-50	-50	-50
30	-50	-50	-50	-50	-50	-50	-50	-50
36	-50	-50	-50	-50	-50	-50	-40	-40
48	-50	-50	-50	-50	-50	-40	-40	-40

#### P2263 64

### PCR\_pUndrBstDvt\_MAP

Injection Qty (mm^3/rev) / Engine Speed (rpm)	500	750	1000	1500	2000	2500	3000	3500
0	100	100	100	100	100	100	100	100
60	100	100	100	100	100	100	100	100
120	100	100	100	100	100	100	100	100
180	100	100	100	100	100	100	100	100
240	100	100	100	100	100	80	80	80
300	100	100	100	100	80	80	80	80
360	100	100	100	100	80	80	80	80
480	100	100	100	100	80	80	80	80

65 P2459

### PFlt\_mSotThresRgnFreq\_CUR

g	0	5	10	20	30	45
Soot Mass (g)	0	50	100	200	300	450

67 P128E Rail\_pCPCFltMin\_CUR

Engine Speed (rpm)	580	630
Rail Pressure (kPa)	0	15000

#### 68 P0087

### Rail\_pMeUnDvtMax\_CUR

Engine Speed (rpm)	580	630
Rail Pressure (kPa)	80000	11000
Table no.	Fault Codes	Label (Internal Manufacturer Reference)
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69	P0088	Rail_pMeUnDvtMin_CUR
	Engine Speed (rpm)	580 630
	Rail Pressure (kPa)	-80000 -10000
70	D129E	Roil pMoLipEltMin CLIP
70	FIZOE	Rall_pivieOnFillviin_COR
	Engine Speed (rpm)	580 630
	Rail Pressure (kPa)	0 15000
71	P0087	Rail_pPCVDvtMax_CUR
	Engine Speed (rpm)	580 630
	Rail Pressure (kPa)	80000 11000
70	D129E	Boil pDCV/EHMin CLIP
12	FIZOE	Rail_provritiviii1_cor
	Engine Speed (rpm)	580 630
	Rail Pressure (kPa)	0 15000
73		SCRChk_facNOxUsDynMax_CUR

Nox Concentration (ppm)	0	400
factor (-)	0.51257324	1.025

#### 74 P11CB

### SCRChk\_idcPOpMaxNOxUsPlaus\_GMAP

Injection Qty (mm^3/rev) / Engine Speed (rpm)	500	600	700	800	900	1000	1100	1200	1400	1600	1800	2000	2001	2500	2600	3000
40	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
60	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
80	0	0	0	0	0	0	0	1	1	1	1	1	0	0	0	0
120	0	0	0	0	0	0	0	1	1	1	1	1	0	0	0	0
160	0	0	0	0	0	0	0	1	1	1	1	1	0	0	0	0
200	0	0	0	0	0	0	0	1	1	1	1	1	0	0	0	0
200.4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
220	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
240	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
260	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

#### 75 P11CC

### SCRChk\_idcPOpMinNOxUsPlaus\_GMAP

Injection Qty (mm^3/rev) / Engine Speed (rpm)	500	600	700	800	900	1000	1100	1200	1400	1600	1800	2000	2001	2500	2600	3000
40	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
60	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
80	0	0	0	0	0	0	0	1	1	1	1	1	0	0	0	0
120	0	0	0	0	0	0	0	1	1	1	1	1	0	0	0	0

Table no.	Fault Codes	Label (Inter	nal Manu	acturer R	eference	e)											
		6 <b>0</b> (	) 0	0	0	0	0	0	1	1	1	1	1	0	0	0	0
		00 (	0 0	0	0	0	0	0	1	1	1	1	1	0	0	0	0
	20	.4 (	) 0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	2	20 (	) 0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	2	40 (	) 0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
		6 <b>0</b> (	) 0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

### 76 P20EE

SCRChk\_mEstNH3LdMax\_CUR

SCR Temperature (°C)	199.96	249.96	274.96	299.96	324.96	349.96	399.96	439.96
Ammonia Load (g)	2.7	2.7	2.7	1.65	1.45	1.35	0.53	0.2

### 77 P20EE

SCRChk\_mEstNH3LdMin\_CUR

SCR Temperature (°C)	199.96	249.96	274.96	299.96	324.96	349.96	399.96	439.96
Ammonia Load (g)	1.3	1.15	1.05	0.75	0.6	0.16	0.1	0.06

### 78 P20EE

### SCRChk\_mNH3LdDvtMax\_CUR

SCR Temperature (°C)	199.96	248.96	274.96	299.96	324.96	349.96	399.96	439.96
Ammonia Load (g)	0.2	0.2	0.2	0.18	0.15	0.15	0.08	0.05

### 79 P20EE

### SCRChk\_mNH3LdDvtMin\_CUR

SCR Temperature (°C)	199.96	249.96	274.96	299.96	324.96	349.96	399.96	439.96
Ammonia Load (g)	-0.35	-0.35	-0.35	-0.25	-0.15	-0.125	-0.1	-0.05

### 80 P11CC

### SCRChk\_rNOxDiffThresBasMinUs\_GMAP

Injection Qty (mm^3/rev) / Engine Speed (rpm)	800	900	1000	1200	1400	1600	1800	2000	2001	2400
40	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1
60	-1	-1	-1	-0.4924	-0.4916	-0.4932	-0.4795	-0.4905	-0.4905	-1
80	-1	-1	-1	-0.4924	-0.4916	-0.4932	-0.4795	-0.4905	-0.4905	-1
120	-1	-1	-1	-0.4862	-0.4645	-0.4934	-0.4974	-0.4832	-0.4832	-1
160	-1	-1	-1	-0.4923	-0.5088	-0.4922	-0.4971	-0.4718	-0.4718	-1
200	-1	-1	-1	-0.5188	-0.4822	-0.4965	-0.507	-0.4894	-0.4894	-1
200.4	-1	-1	-1	-0.5188	-0.4822	-0.4965	-0.507	-0.4894	-0.4894	-1
220	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1
240	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1
260	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1

### 81 P11CB, P11CC

SCRChk\_stExhTempRlsUsPlaus\_CUR

Exhaust Temp (°C)	-0.04	88.96
factor (-)	0	1

Table no. Fault Codes

### Label (Internal Manufacturer Reference)

82 P11CB, P11CC

SCRChk\_stInjCharNOxUsPlaus\_CA

Fuel Injector Pattern (-)	24	56	58	26	0	0	0	0

83 P20EE

### SCRChk\_stPOpSelEta1\_MAP

Filtered Exh Mass Flow (g/s) / SCR Upstream Temp (°C)	219.96	239.96	244.96	249.96	254.96	259.96	264.96	269.96	274.96	279.96	284.96	289.96	294.96	299.96	314.96	329.96
61.11	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
69.44	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
80.56	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
83.33	0	1	1	1	1	1	1	1	1	1	1	0	0	0	0	0
97.22	0	1	1	1	1	1	1	1	1	1	1	0	0	0	0	0
102.78	0	1	1	1	1	1	1	1	1	1	1	0	0	0	0	0
111.11	0	1	1	1	1	1	1	1	1	1	1	0	0	0	0	0
119.44	0	1	1	1	1	1	1	1	1	1	1	0	0	0	0	0
127.78	0	1	1	1	1	1	1	1	1	1	1	0	0	0	0	0
136.11	0	1	1	1	1	1	1	1	1	1	1	0	0	0	0	0
144.44	0	1	1	1	1	1	1	1	1	1	1	0	0	0	0	0
152.78	0	1	1	1	1	1	1	1	1	1	1	0	0	0	0	0
161.11	0	1	1	1	1	1	1	1	1	1	1	0	0	0	0	0
169.44	0	1	1	1	1	1	1	1	1	1	1	0	0	0	0	0
177.78	0	1	1	1	1	1	1	1	1	1	1	0	0	0	0	0
186.11	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

### 84 P2BAD

### SCRChk\_stPOpSelEta2\_MAP

Filtered Exh Mass Flow (g/s) / SCR Upstream Temp (°C)	219.96	239.96	244.96	249.96	254.96	259.96	264.96	269.96	274.96	279.96	284.96	289.96	294.96	299.96	314.96	329.96
61.11	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
69.44	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
83.33	0	1	1	1	1	1	1	0	0	0	0	0	0	0	0	0
97.22	0	1	1	1	1	1	1	1	1	1	1	0	0	0	0	0
100.00	0	1	1	1	1	1	1	1	1	1	1	0	0	0	0	0
102.78	0	1	1	1	1	1	1	1	1	1	1	0	0	0	0	0
111.11	0	1	1	1	1	1	1	1	1	1	1	0	0	0	0	0
119.44	0	1	1	1	1	1	1	1	1	1	1	0	0	0	0	0
127.78	0	1	1	1	1	1	1	1	1	1	1	0	0	0	0	0
136.11	0	1	1	1	1	1	1	1	1	1	1	0	0	0	0	0
144.44	0	1	1	1	1	1	1	1	1	1	1	0	0	0	0	0
152.78	0	1	1	1	1	1	1	1	1	1	1	0	0	0	0	0
161.11	0	1	1	1	1	1	1	1	1	1	1	0	0	0	0	0
175.00	0	1	1	1	1	1	1	0	0	0	0	0	0	0	0	0
177.78	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
186.11	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

### 85 P20EE

SCRChk\_tDeltaTempSCRMax\_CUR

Filtered SCR Temp (°C)

-50.04 199.96 249.96 299.96 349.96 399.96 499.96 999.96

Table no. Fault Codes	Label (Interna	al Manufa	cturer R	eference	)			
Delta SCR Temp (°C)	69.96	74.96	65.96	55.16	47.96	29.96	23.96	23.96

86 P20EE, P2BAD

SCRChk\_tDiffSCRCatMax\_CUR

Filtered SCR Temp (°C)	-0.04	99.96	149.96	199.96	239.96	259.96	264.96	399.96
Delta SCR Temp (°C)	74.96	74.96	74.96	74.96	74.96	74.96	74.96	74.96

### 87 P20EE, P2BAD

SCRChk\_tDiffSCRCatMin\_CUR

Filtered SCR Temp (°C)	-0.04	99.96	149.96	199.96	249.96	259.96	349.96	399.96
Delta SCR Temp (°C)	-0.04	-0.04	-0.04	-0.04	-40.04	-40.04	-40.04	-40.04

### 88 P20EE, P2BAD

SCRChk\_tiAddDisbl\_MAP

Nox Peak Duration (s) / Nox Mass Flow (g/s)	0	0.04	0.08	0.12	0.16	0.2	0.24	0.3
0	0	0	0	0.5	1	4	20	40
1	0	0	0.3	0.8	1.5	15	30	47
3	1	1.5	1.8	2	3	20	40	55
4	2	3	4	5	10	40	55	60
6	5	7.5	15	20	25	60	65	70
10	18	25	35	35	45	65	70	75
20	25	40	45	50	60	70	75	80
60	40	45	50	55	65	75	80	85

89 P229F

SCRChk\_tiPeakMaxDly\_CUR

Exhaust Mass Flow (g/sec)	83.33	111.11	125.00	138.89	152.78	166.67	194.44	277.78
Delay Time (sec)	5.5	5	5	4.5	4.5	4.5	4.5	4.5

90 P10D0

### SCRPOD\_tMaxDiff\_CUR

Engine Off Time (sec)	0	299	300	28799	28800	32000	32500	32767
Delta Temperature (°C)	3276.7	3276.7	3276.7	3276.7	30	30	30	30

### 91 Engine Running

### StSys\_nStrtCutOut\_MAP

BARO Pressure (kPa) / ECT at Start (°C)	-40.04	-30.04	-16.04	-10.04	9.96	19.96	29.96	39.96
65	850	800	735	735	735	735	675	600
70	850	800	735	735	735	735	675	600
75	850	800	735	735	735	735	675	600
80	850	800	735	735	735	735	675	600
85	850	800	735	735	735	735	675	600
90	834	790	720	720	720	720	660	600
95	834	790	720	720	720	720	660	600
100	834	790	720	720	720	720	660	600

### Table no. Fault Codes

### Label (Internal Manufacturer Reference)

92 P2598, P2599 TrbCh\_tiDiaEnblDly\_CUR

ECT (°C)	-30.04	-20.04	-0.04	9.96	19.96	39.96	59.96	79.96
Delay Time (sec)	327.67	210	120	100	60	50	30	30

### 93 P01CB, P01CD, P01D7, P01D9, P01D1, P01D3, P01D5, ZFC\_stGearRls\_CA P01CF, P01CC, P01CE, P01D8, P01DA, P01D2, P01D4, P01D6, P01D0

Gear (-)	0	1	2	3	4	5	6	7	8
-	0	0	0	1	1	1	1	0	0

94 P01CB, P01CD, P01D7, P01D9, P01D1, P01D3, P01D5, ZFC\_tiCldCham\_CUR P01CF, P01CC, P01CE, P01D8, P01DA, P01D2, P01D4, P01D6, P01D0

ECT (°C)	0.06	9.96	16.86	26.86	36.86	46.86	56.86	66.86	76.86	86.86	96.86	106.86
Time (sec)	5	15	20	27	30	30	30	30	30	30	30	30

### 95 P113A

Engine Off Time (sec)	0	299	300	28799	28800	32000	32500	32767
Delta Temperature (°C)	3276.7	3276.7	3276.7	3276.7	30	30	30	30

### 96 P054E

InjCtl\_qDesGearMonMin\_MAP

ECT (°C) / Engine Speed (rpm	0	400	600	800	1000	5000
-20.04	148	148	148	148	148	148
-10.04	117.2	117.2	117.2	117.2	117.2	117.2
-0.04	94	94	94	94	94	94
19.96	72	72	72	72	72	72
39.96	52.4	52.4	52.4	52.4	52.4	52.4
69.96	44	44	44	57.6	57.6	57.6

end S1-14OBDG10 - Calibration Tables

**Calibration Parameter Definition - Calibration Tables** 

### Table no. Fault Codes

Status and State Calibration Tables

Label (Internal Manufacturer Reference)

### Table no. Status or State

Label (Internal Manufacturer Reference)

1 Status of NOx signal of upstream NOx sensor DewDet\_wThresLSU0\_MAP

ECT at Start (°C) / Modeled Exhaust Wall Temp (°C)	-40.14	-20.14	-10.14	-0.14	2.86	6.86	9.86	59.96	99.96	149.96
-40.14	500	500	500	500	500	500	500	375	375	375
-20.14	500	500	500	500	500	500	500	375	375	375
-10.14	500	500	500	500	500	500	500	375	375	375
-0.14	500	500	500	500	500	500	500	375	375	375
2.86	500	500	500	500	500	500	500	375	375	375
6.86	500	500	500	500	500	500	500	375	375	375
9.86	500	500	500	500	500	500	500	375	375	375
19.86	500	500	500	500	500	500	500	375	375	375
39.86	500	500	500	500	500	500	500	375	375	375
59.86	500	500	500	500	500	500	500	375	375	375

### 2 Status of NOx signal of downstream NOx sensor DewDet\_wThresLSU1\_MAP

ECT at Start (°C) / Modeled Exhaust Wall Temp (°C)	-40.14	-30.04	-20.04	-10.04	-0.04	19.96	39.96	59.96	89.96	109.96
-40.14	350	350	250	250	200	200	200	200	200	200
-30.04	350	350	250	200	150	150	150	150	150	150
-20.04	250	250	250	200	150	100	100	100	100	100
-10.04	200	200	200	200	150	100	100	100	100	100
-0.04	200	200	200	175	125	75	75	75	75	75
9.96	200	200	200	125	100	50	50	50	50	50
19.96	200	200	200	125	75	50	50	25	25	25
39.96	200	200	200	125	75	50	25	25	25	25
59.96	200	200	200	125	75	25	25	25	25	25
79.96	200	200	200	125	75	25	25	25	25	0

3 Status thermal regeneration active

### PFltLd\_dmSotSimRgnBas\_CUR

DPF Soot Mass (g)	0	10	20	30	40	50	55	60	65	70	75	80
Mass Flow (g/s)	0.01	0.03	0.05	0.09	0.12	0.13	0.14	0.15	0.16	0.18	0.19	0.20

### 4 Status thermal regeneration active

PFltLd\_facO2SimRgn\_MAP

Exhaust Mass Flow (g/s) / Lambda (-)	1	1.2	1.35	1.5	2	2.5	3	25
0.00	0	0.53	0.83	1.07	1.62	1.96	2.19	3.21
2.78	0	0.55	0.87	1.12	1.70	2.05	2.29	3.37
5.56	0	0.55	0.87	1.12	1.70	2.05	2.29	3.37
8.33	0	0.55	0.87	1.12	1.70	2.05	2.29	3.37
11.11	0	0.58	0.91	1.18	1.79	2.16	2.41	3.40
13.89	0	0.58	0.91	1.18	1.79	2.16	2.41	3.40

Table no.	Fault Codes	Label (Interr	al Manuf	acturer R	eference	e)			
	25.00	0	0.58	0.91	1.18	1.79	2.16	2.41	3.40
	36.11	0	0.62	0.97	1.26	1.91	2.30	2.57	3.40

Particulate Filter Surface Temp (°C) 49.96 199.96 299.96 499.96 524.96 549.96 574.96 599.96 624.96 649.96 674.96 699.96 Temperature Factor (-) 0 0 0 0.02 0.05 0.10 0.20 0.34 0.60 1.03 1.72

PFltLd\_facTempSimRgn\_CUR

#### Rail Control - PCV Closed Loop Control Only Rail\_dvolMeUnCtlUpLim\_CUR 6

Engine Speed (rpm)	0	480	2250	5000	5005	5010	5015	5020	5025	5030	5035	5040	5045	5050	5055	5060
Rail Volume Flow (mm^3/sec)	15000	15000	56000	56000	56000	56000	56000	56000	56000	56000	56000	56000	56000	56000	56000	56000

2.81

#### 7 Rail Control - Metering Unit + PCV Closed Loop Control Rail\_qMeUnCtlType\_CUR

Engine Speed (rpm)	900	901	1200	1400	1600	1800	2000	4800
Injection Qty (mm^3/rev)	100	15	15	15	3	3	3	3

#### Status of the SCR adaptation plausibility check active SCRAd\_mNH3MinTrg\_MAP 8

SCR Modeled Efficieny (- )/ SCR Temp (°C)	249.96	299.96	349.96	399.96	449.96	499.96
	0 0	0	0	0.04	0.04	0.04
0.	2 0	0	0	0.04	0.04	0.04
0.	4 0	0	0	0.04	0.04	0.04
0.	6 0	0	0	0.04	0.04	0.04
0.	<b>B</b> 0	0	0	0.04	0.04	0.04
	1 0	0	0	0.04	0.04	0.04

#### **Overdosing detected** 9

5

Status thermal regeneration active

### SCRAd\_mNOxOvrMetPh3\_CUR

SCR Avg. Temp (°C)	249.96	299.96	349.96	424.96
Nox Mass (g)	-0.7	-0.6	-0.6	-0.6

#### 10 Status of the SCR adaptation plausibility check active SCRAd\_stSpdLd\_MAP

Engine Speed (rpm) / Injection Qty. (mm^3/rev)	0	80	100	120	160	200	240	280	320	360	400	480
600	0	0	0	1	1	1	1	1	1	1	1	1
800	0	0	0	1	1	1	1	1	1	1	1	1
900	1	1	1	1	1	1	1	1	1	1	1	1
1200	1	1	1	1	1	1	1	1	1	1	1	1
1400	1	1	1	1	1	1	1	1	1	1	1	1
1600	1	1	1	1	1	1	1	1	1	1	1	1

Table no.	Fault Codes	Label (Intern	al Manuf	acturer F	Reference	e)							
	1800	1	1	1	1	1	1	1	1	1	1	1	1
	2000	1	1	1	1	1	1	1	1	1	1	1	1
	2200	1	1	1	1	1	1	1	1	1	1	1	1
	2400	1	1	1	1	1	1	1	1	1	1	1	1
	2800	1	1	1	1	1	1	1	1	1	1	1	1
	3100	1	1	1	1	1	1	1	1	1	1	1	1

11	Request for pre controlled dosing	SCRFFC_stN	QntCurrF	li_MAP									
		104	136	160	192	216	256	320	408	480	720	800	801.6
	Engine Speed (rpm) / Injection Qty. (mm^3/rev)	26	34	40	48	54	64	80	102	120	180	200	200.4
	800	7	7	7	7	7	7	7	7	7	7	7	7
	1200	7	7	7	7	7	7	7	7	7	7	7	7
	1400	7	7	7	7	7	7	7	7	7	7	7	7
	1475	7	7	7	7	7	7	7	7	7	7	7	7
	1700	7	7	7	7	7	7	7	7	7	7	7	7
	2000	7	7	7	7	7	7	7	7	7	7	7	7
	2200	7	7	7	7	7	7	7	7	7	7	7	7
	2400	7	7	7	7	7	7	7	7	7	7	7	7
	2600	7	7	7	7	7	7	7	7	7	7	7	7
	2800	7	7	7	7	7	7	7	7	7	7	7	7
	3000	7	7	7	7	7	7	7	7	7	7	7	7
	3200	7	7	7	7	7	7	7	7	7	7	7	7

### 12 Request for pre controlled dosing

### SCRFFC\_stNQntCurrMid\_MAP

Engine Speed (rpm) / Injection Qty. (mm^3/rev)	26	34	40	48	54	64	80	102	120	180	200	200.4
800	2	2	2	2	3	10	10	10	10	10	10	10
1200	10	10	10	10	10	10	10	10	10	10	10	10
1400	10	10	10	10	10	10	10	10	10	10	10	10
1475	10	10	10	8	7	4	4	2	2	2	2	10
1700	10	10	10	8	7	4	2	2	2	2	2	10
2000	10	10	10	8	7	4	2	2	2	2	2	10
2200	10	10	8	6	4	2	2	2	2	2	2	10
2400	10	10	8	6	4	2	2	2	2	2	2	10
2600	10	8	6	4	3	2	2	2	2	2	2	10
2800	10	8	5	4	3	2	2	2	2	2	2	10
3000	10	8	5	4	3	2	2	2	2	2	2	10
3200	10	8	7	5	4	4	4	4	4	4	5	10

### 13 Request for pre controlled dosing

### SCRFFC\_stNQntCurrSeaLvl\_MAP

Engine Speed (rpm) / Injection Qty. (mm^3/rev)	26	34	40	48	54	64	80	102	120	180	200	200.4
800	0	0	0	0	3	10	10	10	10	10	10	10
1200	10	10	10	10	10	10	10	10	10	10	10	10
1400	10	10	10	10	10	10	10	10	10	10	10	10
1475	10	10	10	8	7	4	4	0	0	0	0	3
1700	10	10	10	8	7	4	0	0	0	0	0	3
2000	10	10	10	8	7	4	0	0	0	0	0	3

Table no.	Fault Codes	Label (Intern	al Manuf	acturer F	eference	e)							
	220	<b>10</b> 10	10	8	6	4	2	0	0	0	0	0	3
	24	<b>1</b> 0	10	8	6	4	2	0	0	0	0	0	3
	260	<b>1</b> 0	8	6	4	3	0	0	0	0	0	0	3
	280	<b>1</b> 0	8	5	4	3	0	0	0	0	0	0	3
	300	10	8	5	4	3	0	0	0	0	0	0	3
	32	<b>0</b> 10	8	7	5	4	4	4	4	4	4	4	4

#### 14 Engine Running StSys\_nStrtCutOut\_MAP

BARO Pressure (kPa) / ECT at Start (°C)	-40.04	-20.04	-10.04	-0.04	9.96	19.96	34.96	59.96
65	850	770	755	755	755	680	600	600
70	850	770	755	755	755	680	600	600
75	850	770	755	755	755	680	600	600
80	850	770	755	755	755	680	600	600
85	850	770	755	755	755	680	600	600
90	850	770	755	755	755	680	600	600
95	834	740	720	720	720	650	600	600
100	834	740	720	720	720	650	600	600

#### 15 State of Reductant injection valve Component Protection UDC\_tUDosVIvCoPrActv\_MAP

Vehicle Speed (mph) / SCR Upstream Temp (°C)	99.96	199.96	299.96	399.96	499.96	599.96
0	104.96	104.96	104.96	104.96	95.46	89.96
20	109.96	109.96	109.96	107.96	100.26	94.96
50	109.96	109.96	109.96	108.96	107.96	103.96
60	109.96	109.96	109.96	109.96	109.96	105.96
100	109.96	109.96	109.96	109.96	109.96	107.96
150	109.96	109.96	109.96	109.96	109.96	109.96

#### Release of tank heater circuit 16

### UHC\_tiC1Dfrst\_CUR

Reductant Tank Temp. (°C)	-30.04	-18.04	-15.04	-11.04	-8.04	-0.04	4.96	5.06
Reductant Heater Time (sec)	3277	3277	3277	3277	300	300	300	0

#### 17 Release of tank heater circuit

### UHC\_tiC1On\_CUR

Reductant Tank Temp. (°C)	-30.04	-18.04	-15.04	-11.04	-7.04	-0.04	4.96	5.06
Reductant Heater Time (sec)	3277	3277	3277	3277	600	300	300	0

#### Release of tank heater circuit 18

### UHC\_tiDfrstC2\_CUR

Reductant Tank Temp. (°C)	-35.04	-25.04	-18.04	-10.04	-8.04	-5.04	-0.14	-0.04
Reductant Heater Time (sec)	3276.7	3276.7	3000	600	300	300	200	0

# Table no.Fault Codes19Release of tank heater circuit

Reductant Tank Temp. (°C)	-35.04	-25.04	-18.04	-10.04	-8.04	-5.04	-0.14	-0.04
Reductant Heater Time (sec)	3276.7	3276.7	3000	600	300	300	200	0

UHC\_tiDfrstC3\_CUR

Label (Internal Manufacturer Reference)

### 20 Release of tank heater circuit

Reductant Tank Temp. (°C)	-30.04	-18.04	-15.04	-11.04	-7.04	-0.04	4.96	5.06
Reductant Heater Time (sec)	3276.7	3276.7	3276.7	3276.7	600	300	90	0

UHC\_tiOnC2\_CUR

### 21 Release of tank heater circuit

Reductant Tank Temp. (°C)	-30.04	-18.04	-15.04	-11.04	-7.04	-0.04	4.96	5.06
Reductant Heater Time (sec)	3276.7	3276.7	3276.7	3276.7	600	300	90	0

UHC\_tiOnC3\_CUR

end Calibration Parameter Definition - Calibration Tables

## 14 OBDG10 ECM Inhibit Tables

Active DTC				Inhibited DTCs										
P0016 - Crankshaft to Camshaft	P0191 - Fuel Rail Pressure Sensor	P0315 - Crankshaft Position System												
P0045 - Turbocharger Boost	Performance P0234 - Turbocharger Engine	P0299 - Turbocharger Engine	P0401 - Exhaust Gas Recirculation	P0402 - Exhaust Gas Recirculation										
Control Circuit 20047 - Turborbarger Boort	Overboost 20224 - Turbocharger Engine	Underboost P0299 - Turbocharger Eccipe	Flow Insufficient P0401 - Exhaust Cast Registration	Flow Excessive P0402 - Exhaust Gas Regimulation										
Control Circuit Low Voltage	Overboost	Underboost	Flow Insufficient	Flow Excessive										
P0048 - Turbocharger Boost Control Circuit High Voltage	P0234 - Turbocharger Engine Overboost	P0299 - Turbocharger Engine Underboost	P0401 - Exhaust Gas Recirculation Flow Insufficient	P0402 - Exhaust Gas Recirculation Flow Excessive										
P006E - Turbocharger Boost High Control Circuit Low Voltage	P0234 - Turbocharger Engine Overhoost	P0299 - Turbocharger Engine	P0401 - Exhaust Gas Recirculation Flow Insufficient	P0402 - Exhaust Gas Recirculation Elow Excessive										
P006F - Turbocharger Boost High	P0234 - Turbocharger Engine	P0299 - Turbocharger Engine	P0401 - Exhaust Gas Recirculation	P0402 - Exhaust Gas Recirculation	P2510 - ECM Power Relay Circuit									
Control Circuit High Voltage	Overboost	Underboost	Flow Insufficient	Flow Excessive	Performance				-					
P007C - CAC Temperature Sensor Circuit Low Voltage	P0234 - Turbocharger Engine Overboost	P0299 - Turbocharger Engine Underboost	P0401 - Exhaust Gas Recirculation Flow Insufficient	P0402 - Exhaust Gas Recirculation Flow Excessive	P2080 - Exhaust Temperature Sensor 1 Performance	P2084 - Exhaust Temperature Sensor 2 Performance	P242B - Exhaust Temperature Sensor 3 Performance	P246F - Exhaust Temperature Sensor 4 Performance						
P007D - CAC Temperature Sensor Circuit High Voltage	P0234 - Turbocharger Engine Overhoost	P0299 - Turbocharger Engine	P0401 - Exhaust Gas Recirculation Flow Insufficient	P0402 - Exhaust Gas Recirculation	P2080 - Exhaust Temperature Sensor 1 Performance	P2084 - Exhaust Temperature Sensor 2 Performance	P242B - Exhaust Temperature Sensor 3 Performance	P246F - Exhaust Temperature Sensor 4 Performance						
P008F - Engine Coolant	P0101 - Mass Air Flow Sensor								-					
Temperature Not Plausible	Performance	Deset E L . X		Data E. L. X.	1									
Sensor 2 Circuit Low	Sensor 1 Performance	Sensor 2 Performance	Sensor 3 Performance	P246F - Exhaust Temperature Sensor 4 Performance										
P0098 - Intake Air Temperature Sensor 2 Circuit High	P2080 - Exhaust Temperature Sensor 1 Performance	P2084 - Exhaust Temperature Sensor 2 Performance	P242B - Exhaust Temperature Sensor 3 Performance	P246F - Exhaust Temperature Sensor 4 Performance										
P00CA - Fuel Pressure Regulator	P2510 - ECM Power Relay Circuit													
1 High Control Circuit High Votage	Performance								P2453 - Diesel Particulate Filter			P249D - Closed Loop Reductant	P249E - Closed Loop Reductant	1
P0101 - Mass Air Flow Sensor Performance	P0401 - Exhaust Gas Recirculation Flow Insufficient	P0402 - Exhaust Gas Recirculation Flow Excessive	P11CB - NOx Sensor Performance - Signal High Bank 1 Sensor 1	P11CC - NOx Sensor Performance - Signal Low Bank 1 Sensor 1	(DPF) Low Efficiency	P2080 - Exhaust Temperature Sensor 1 Performance	P2084 - Exhaust Temperature Sensor 2 Performance	P242B - Exhaust Temperature Sensor 3 Performance	Differential Pressure Sensor	P2459 - Diesel Particulate Filter Regeneration Frequency	P246F - Exhaust Temperature Sensor 4 Performance	Injection Control At Limit - Flow Too	Injection Control At Limit - Flow Too	
P0102 - Mass Air Flow Sensor	P0101 - Mass Air Flow Sensor	P0234 - Turbocharger Engine	P0299 - Turbocharger Engine	P0401 - Exhaust Gas Recirculation	P0402 - Exhaust Gas Recirculation	P2080 - Exhaust Temperature	P2084 - Exhaust Temperature	P242B - Exhaust Temperature	P246F - Exhaust Temperature			E.M.		4
P0103 - Mass Air Flow Sensor	Performance P0101 - Mass Air Flow Sensor	Overboost P0234 - Turbocharger Engine	P0299 - Turbocharger Engine	Flow Insufficient P0401 - Exhaust Gas Recirculation	Flow Excessive P0402 - Exhaust Gas Recirculation	P2080 - Exhaust Temperature	P2084 - Exhaust Temperature	P242B - Exhaust Temperature	P246F - Exhaust Temperature					
Circuit High P0105 - Manifold Absolute	Performance P0101 - Mass Air Flow Sensor	Overboost P0234 - Turbocharger Engine	Underboost P0299 - Turbocharger Engine	Flow Insufficient P0401 - Exhaust Gas Recirculation	Flow Excessive P0402 - Exhaust Gas Recirculation	Sensor 1 Performance	Sensor 2 Performance	Sensor 3 Performance	Sensor 4 Performance					
Pressure Sensor Performance P0107 - Manifold Abrokite	Performance	Overboost	Underboost	Flow Insufficient	Flow Excessive		-				-	1		
Pressure (MAP) Sensor Circuit	P0101 - Mass Air Flow Sensor Performance	P0106 - Manifold Absolute Pressure Sensor Performance	P0234 - Turbocharger Engine Overboost	P0299 - Turbocharger Engine Underboost	P0401 - Exhaust Gas Recirculation Flow Insufficient	P0402 - Exhaust Gas Recirculation Flow Excessive	P2080 - Exhaust Temperature Sensor 1 Performance	P2084 - Exhaust Temperature Sensor 2 Performance	P2263 - Turbo Boost System Performance	P2428 - Exhaust Temperature Sensor 3 Performance	P246F - Exhaust Temperature Sensor 4 Performance			
P0108 - Manifold Absolute	P0101 - Mass Air Flow Sensor	P0106 - Manifold Absolute Pressure	P0234 - Turbocharger Engine	P0299 - Turbocharger Engine	P0401 - Exhaust Gas Recirculation	P0402 - Exhaust Gas Recirculation	P2080 - Exhaust Temperature	P2084 - Exhaust Temperature	P2263 - Turbo Boost System	P242B - Exhaust Temperature	P246F - Exhaust Temperature	1		
Pressure (MAP) Sensor Circuit High Voltage	Performance	Sensor Performance	Overboost	Underboost	Flow Insufficient	Flow Excessive	Sensor 1 Performance	Sensor 2 Performance	Performance	Sensor 3 Performance	Sensor 4 Performance	J		
P0112 - Intake Air Temperature	P0101 - Mass Air Flow Sensor	P0401 - Exhaust Gas Recirculation	P0402 - Exhaust Gas Recirculation	P040F - Exhaust Gas Recirculation (EGR) Temperature Sensor 1-2	P2080 - Exhaust Temperature	P2084 - Exhaust Temperature	P20E2 - Exhaust Gas Temperature	P242B - Exhaust Temperature	P246F - Exhaust Temperature					
Sensor 1 Circuit Low	Performance	Flow Insufficient	Flow Excessive	Correlation P040E - Exhaust Gas Recipculation	Sensor 1 Performance	Sensor 2 Performance	(EGT) Sensors 1-2 not plausible	Sensor 3 Performance	Sensor 4 Performance					
P0113 - Intake Air Temperature Sensor 1 Circuit High	P0101 - Mass Air Flow Sensor Performance	P0401 - Exhaust Gas Recirculation Flow Insufficient	P0402 - Exhaust Gas Recirculation Flow Excessive	(EGR) Temperature Sensor 1-2	P2080 - Exhaust Temperature Sensor 1 Performance	P2084 - Exhaust Temperature Sensor 2 Performance	P20E2 - Exhaust Gas Temperature (EGT) Sensors 1-2 not plausible	P242B - Exhaust Temperature Sensor 3 Performance	P246F - Exhaust Temperature Sensor 4 Performance					
P0117 - Engine Coolant	P0106 - Manifold Absolute Pressure	P0191 - Fuel Rail Pressure Sensor	P0234 - Turbocharger Engine	P0263 - Cly 1 Balance Sustern	P0266 - Cly 2 Balance Sustern	P0269 - Cly 3 Balance System	P0272 - Cly 4 Ralance System	P0275 - Cly 5 Balance System	P0278 - Cly 6 Ralance System	P0281 - Clv 7 Balance System	P0284 - Cly 8 Balance Sustem	P0299 - Turbocharger Engine	P0300 - Engine Mistire Detected	P0301 - Cylinder 1 Micfire Detected
Temperature Sensor Circuit Low P0117 - Engine Coolant	Sensor Performance	Performance	Overboost					P0401 - Exhaust Gas Recirculation	P0402 - Exhaust Gas Recirculation	Paren 11 0		Underboost P2080 - Exhaust Temperature	P2084 - Exhaust Temperature	P242B - Exhaust Temperature
Temperature Sensor Circuit Low P0117 - Engine Coplant	P0302 - Cylinder 2 Mistire Detected P246E - Exhaust Temperature	P0303 - Cylinder 3 Mistire Detected	P0304 - Cylinder 4 Mistire Detected	P0305 - Cylinder 5 Mistire Detected	P0306 - Cylinder 6 Mistire Detected	P0307 - Cylinder 7 Mistire Detected	P0308 - Cylinder 8 Mistire Detected	Flow Insufficient	Flow Excessive	PUSU6 - Idle Speed Low	PUSU7 - Idle Speed High	Sensor 1 Performance	Sensor 2 Performance	Sensor 3 Performance
Temperature Sensor Circuit Low	Sensor 4 Performance											r		
P0118 - Engine Coolant Temperature Sensor Circuit High	P0106 - Manifold Absolute Pressure Sensor Performance	P0191 - Fuel Rail Pressure Sensor Performance	P0234 - Turbocharger Engine Overboost	P0263 - Cly 1 Balance System	P0266 - Cly 2 Balance System	P0269 - Cly 3 Balance System	P0272 - Cly 4 Balance System	P0275 - Cly 5 Balance System	P0278 - Cly 6 Balance System	P0281 - Cly 7 Balance System	P0284 - Cly 8 Balance System	P0299 - Turbocharger Engine Underboost	P0300 - Engine Misfire Detected	P0301 - Cylinder 1 Misfire Detected
P0118 - Engine Contant								P0401 - Exhaurt Gar Regirculation	P0402 - Extraust Gas Regimulation			P2090 - Exhaurt Temperature	P2084 - Exhaurt Temperature	P242B - Exhaurt Temperature
Temperature Sensor Circuit High	P0302 - Cylinder 2 Mistire Detected	P0303 - Cylinder 3 Mistire Detected	P0304 - Cylinder 4 Misfire Detected	P0305 - Cylinder 5 Misfire Detected	P0306 - Cylinder 6 Mistire Detected	P0307 - Cylinder 7 Misfire Detected	P0308 - Cylinder 8 Misfire Detected	Flow Insufficient	Flow Excessive	P0506 - Idle Speed Low	P0507 - Idle Speed High	Sensor 1 Performance	Sensor 2 Performance	Sensor 3 Performance
P0118 - Engine Coolant	P246F - Exhaust Temperature													
Temperature Sensor Circuit High P0128 - Engine Coolant	Sensor 4 Performance													
Temperature Below Thermostat	P0101 - Mass Air Flow Sensor Performance													
Treasing to Terrison of														
P014C - HO2S Slow Response	P0171 - Fuel Trim System Lean	P0172 - Fuel Trim System Rich	P026C - Injection Quantity Too Low	P026D - Injection Quantity Too High	P11CB - NOx Sensor Performance -	P11CC - NOx Sensor Performance -								
P014C - H02S Slow Response Rich to Lean Sensor 1	P0171 - Fuel Trim System Lean P11CB - NOx Sensor Performance -	P0172 - Fuel Trim System Rich P11CC - NOx Sensor Performance -	P026C - Injection Quantity Too Low	P026D - Injection Quantity Too High	P11CB - NOx Sensor Performance - Signal High Bank 1 Sensor 1	P11CC - NOx Sensor Performance - Sional Low Bank 1 Sensor 1								
P014C - H02S Slow Response Rich to Lean Sensor 1 P0171 - Fuel Trim System Lean	P0171 - Fuel Trim System Lean P11CB - NOx Sensor Performance - Signal High Bank 1 Sensor 1 P11CB - NOx Sensor Performance -	P0172 - Fuel Trim System Rich P11CC - NOx Sensor Performance - Sional Low Bank 1 Sensor 1 P11CC - NOx Sensor Performance -	P026C - Injection Quantity Too Low	P026D - Injection Quantity Too High	P11CB - NOx Sensor Performance - Sianal High Bank 1 Sensor 1	P11CC - NOx Sensor Performance - Signal Low Bank 1 Sensor 1	l							
P014C - HO2S Slow Response Rich to Lean Sensor 1 P0171 - Fuel Trim System Lean P0172 - Fuel Trim System Rich P0192 - Suel Temperature Sensor	P0171 - Fuel Trim System Lean P11CB - NOx Sensor Performance - Signal High Bank 1 Sensor 1 P11CB - NOx Sensor Performance - Signal High Bank 1 Sensor 1 P11CB - Oxford 1 Higher Learning	P0172 - Fuel Trim System Rich P11CC - NOx Sensor Performance - Sional Low Bank 1 Sensor 1 P11CC - NOx Sensor Performance - Signal Low Bank 1 Sensor 1 P11CC - Quietar 1 Juersor 1	P026C - Injection Quantity Too Low	P026D - Injection Quantity Too High	P11CB - NOx Sensor Performance - Signal High Bank 1 Sensor 1	P11CC - NOx Sensor Performance - Signal Low Bank 1 Sensor 1	P0101 - Oxinter 4 Injection Turning	P0102 - Oxforder 4 Injurgion	P0102 - Cylinder & Injection Timing	RMD4 - Coleder & Injection Timing	P01D5 - Cuindar E Injection Timina	POIDE - Culoder & Injuriou	P0107 - Crieder 7 Injuries	P0108 - Cylinder 7 biecton Turing
P014C - H02S Slow Response Richto Lean Sensor 1 P0171 - Fuel Trim System Lean P0172 - Fuel Trim System Rich P0182 - Fuel Temperature Sensor 1 Circuit Low	P0171 - Fuel Trim System Lean P11CB - NOX Sensor Performance - Sional Hich Bank 1 Sensor 1 P11CB - NOX Sensor Performance - Signal High Bank 1 Sensor 1 P01CB - Cylinder 1 Injection Timing Retarded	P0172 - Fuel Trim System Rich P11CC - NOx Sensor Performance - <u>Sicnal Low Bark 1 Sensor 1</u> P11CC - NOx Sensor Performance - <u>Signal Low Bark 1 Sensor 1</u> P01CC - Cylinder 1 Injection Timing Advanced	P026C - Injection Quantity Too Low P01CD - Cylinder 2 Injection Timing Retarded	P026D - Injection Quantity Too High P01CE - Cylinder 2 Injection Timing Advanced	P11CB - NOX Sensor Performance - Sianal High Bank 1 Sensor 1 P01CF - Cylinder 3 Injection Timing Retarched	P11CC - NOx Sensor Performance - Signal Low Bank 1 Sensor 1 P01D0 - Cylinder 3 Injection Timing Advanced	P01D1 - Cylinder 4 Injection Timing Retardod	P01D2 - Cylinder 4 Injection Timing Advanced	P01D3 - Cylinder 5 Injection Timing Retarded	P01D4 - Cylinder 5 Injection Timing Advanced	P01D5 - Cylinder 6 Injection Timing Retarded	P01D6 - Cylinder 6 Injection Timing Advanced	P01D7 - Cylinder 7 Injection Timing Retarded	P01D8 - Cylinder 7 Ibjection Timing Advanced
P0140 - H02S Siow Response Richt to Lean Sensor 1 P0171 - Fuel Trim System Lean P0172 - Fuel Trim System Rich P0182 - Fuel Temperature Sensor 1 Circuit Low P0182 - Fuel Temperature Sensor 1 Circuit Low	P0171 - Fuel Trim System Lean P11CB - NOx Sensor Performance - Sional Hich Bank 1 Sensor 1 P11CB - NOx Sensor Performance - Signal High Bank 1 Sensor 1 P01CB - Cylinder 1 Injection Timing Retarded P01D9 - Cylinder 8 Injection Timing Retarded	P0172 - Fuel Trim System Rich P117C - NOx Sensor Performance - Signal Low Bank 1 Sensor 1 P117C - NOX Sensor Performance - Signal Low Bank 1 Sensor 1 P017C - Oylinder 1 hipction Timing Advanced P01DA - Oylinder 8 hipction Timing Advanced	P026C - Injection Quantity Too Low P01CD - Cylinder 2 Injection Timing Retarded	P026D - Injection Quantity Too High P01CE - Cylinder 2 Injection Timing Advanced	P11CB - NOx Sensor Performance - Sianal High Bank 1 Sensor 1 P01CF - Cylinder 3 Injoction Timing Retarded	P11CC - NOx Sensor Performance - Sional Low Bank 1 Sensor 1 P01D0 - Cylinder 3 Injection Timing Advanced	P01D1 - Cylinder 4 Injection Timing Retarded	P01D2 - Cylinder 4 Injection Timing Advanced	P01D3 - Cylinder 5 Injection Timing Retarded	P01D4 - Cylinder 5 Injection Timing Advanced	P01D5 - Cylinder 6 Injection Timing Retarded	P01D6 - Cylinder 6 Injection Timing Advanced	P01D7 - Cylinder 7 Injection Timing Retarded	P01D8 - Cylinder 7 Injection Timing Advanced
P014C - H02S Slow Response Rich to Lean Sensor 1 P0171 - Fuel Trim System Lean P0172 - Fuel Trim System Rich P0182 - Fuel Temperature Sensor 1 Circuit Low P0182 - Fuel Temperature Sensor 1 Circuit Low P0183 - Fuel Temperature Sensor 1 Circuit Hoh	P0171 - Fuel Trim System Lean P11CB - NOX Sensor Performance - Signal Hick Bank 1 Sensor 1 P11CB - NOX Sensor Performance - Signal High Bank 1 Sensor 1 P01CB - Cylinder 1 Injection Timing Retarded P01D9 - Cylinder 1 Injection Timing Retarded P01CB - Cylinder 1 Injection Timing Retarded	P0172 - Fuel Trim System Rich P11CC - NOx Sensor Performance - Sinal Low Bark 1 Sensor 1 P11CC - NOx Sensor Performance - Signal Low Bark 1 Sensor 1 P01CC - Cylinder 1 hijecton Timing Advanced P01DA - Cylinder 8 hijecton Timing Advanced P01CC - Cylinder 1 hijecton Timing Advanced	P026C - Injection Quantity Too Low P01CD - Cylinder 2 Injection Timing Retarded P01CD - Cylinder 2 Injection Timing P01CD - Cylinder 2 Injection Timing Retarded	P026D - Injection Quantity Too High P01CE - Cylinder 2 Injection Timing Advanced P01CE - Cylinder 2 Injection Timing Advanced	P11CB - NOx Sensor Performance - Stanal High Bank 1 Sensor 1 P01CF - Cylinder 3 Injection Timing Relarded P01CF - Cylinder 3 Injection Timing Relarded	P11CC - NOx Sensor Performance - Signal Low Bank 1 Sensor 1 P01D0 - Cylinder 3 Injection Timing Advanced P01D0 - Cylinder 3 Injection Timing Advanced	P01D1 - Cylinder 4 Injection Timing Retarded P01D1 - Cylinder 4 Injection Timing Retarded	P01D2 - Cylinder 4 Injection Timing Advanced P01D2 - Cylinder 4 Injection Timing Advanced	P01D3 - Cylinder 5 Injection Timing Retarded P01D3 - Cylinder 5 Injection Timing Retarded	P01D4 - Cylinder 5 lejection Timing Advanced P01D4 - Cylinder 5 lejection Timing Advanced	P01D5 - Cylinder 6 Injection Timing Retarded P01D5 - Cylinder 6 Injection Timing Retarded	P01D6 - Cylinder 6 Injuction Timing Advanced P01D6 - Cylinder 6 Injuction Timing Advanced	P01D7 - Cylinder 7 Injection Timing Retarded P01D7 - Cylinder 7 Injection Timing Retarded	P01D8 - Cylinder 7 Injection Tirring Advanced P01D8 - Cylinder 7 Injection Tirring Advanced
P0140 - H025 Slow Response Rich Le Lan Sensor 1 P0171 - Fuel Trim System Lean P0172 - Fuel Trim System Rich P0182 - Fuel Temperature Sensor 1 Circuit Low P0182 - Fuel Temperature Sensor 1 Circuit Low P0183 - Fuel Temperature Sensor 1 Circuit Hoh	P0171 - Fuel Trim System Lean P11GB - NO's Sensor Parlomanaco - Signal Hish Bank 1. Sensor 1. P11GB - NO's Sensor Parlomanaco - Signal High Bank 1. Sensor 1. P01GB - Cylned 1. Injection Timing Resarded P01GB - Cylned 1. Bigetton Timing P01GB - Cylned 1. Bigetton Timing P01GB - Cylned 1. Bigetton Timing P01DB - Cyclade 1. Bigetton Timing P01DB - Cyclade 1. Bigetton Timing	P0172 - Fuel Trim System Rich P110C - NOX Sensor Performance- Simal Lore Bank 1 Sensor 1 P110C - NOX Sensor Performance- Signal Lore Bank 1 Sensor 1 P010C - Oyinder 8 Injection Timing Advanced P01DA - Oyinder 8 Injection Timing Advanced P01DA - Oyinder 8 Injection Timing Advanced	P026C - Injection Quantity Too Low P01CD - Cylender 2 Injection Timing Retarded P01CD - Cylender 2 Injection Timing Retarded	P026D - Injection Quantity Too High P01CE - Cylinder 2 bijection Timing Advanced P01CE - Cylinder 2 bijection Timing Advanced	P11CB - NOx Sensor Performance - Sianal High Bank 1 Sensor 1 P01CF - Cylinder 3 Injection Timing Retarded P01CF - Cylinder 3 Injection Timing Retarded	P11CC - NOX Sensor Performance - Sional Low Bank 1 Sensor 1 P01D0 - Cylinder 3 Nejection Timing Advanced P01D0 - Cylinder 3 Nejection Timing Advanced	P01D1 - Cylinder 4 hjoction Timing Retarded P01D1 - Cylinder 4 hjoction Timing Retarded	P01D2 - Cylinder 4 Injection Timing Advanced P01D2 - Cylinder 4 Injection Timing Advanced	P01D3 - Cylinder 5 Injection Timing Retarded P01D3 - Cylinder 5 Injection Timing Retarded	P01D4 - Cylinder 5 Injection Timing Advanced P01D4 - Cylinder 5 Injection Timing Advanced	P01D5 - Cylinder & Injection Timing Retarded P01D5 - Cylinder & Injection Timing Retarded	P01DE - Cylinder 6 Injection Timing Advanced P01DE - Cylinder 6 Injection Timing Advanced	P01D7 - Cylinder 7 Jajaction Timing Retarded P01D7 - Cylinder 7 Jajaction Timing Retarded	P01D8 - Cylinder 7 hijociton Timing Advanced P01D8 - Cylinder 7 hijociton Timing Advanced
P014C + 1022 Staw Response Rich Leas Sensor 1 P0171 - Fuel Tim System Lean P0172 - Fuel Tim System Rich P0182 - Fuel Tem System Rich P0182 - Fuel Tempature Sensor 1 Circuit Low P0183 - Fuel Tempature Sensor P0183 - Fuel Tempature Sensor	P0171 - Fuil Trim System Lean P11CB + ND, searce Performance Signal High Bank 1 Searce P11CB + ND, searce Performance P11CB + ND, searce Performance Retarded P01DB - Opticet P Injection Timing P01DB - Opticet P Injection Timing Retarded P01DB - Opticet P Injection Timing	P0172 - Fuel Trim System Rich P11CC - NOX Sensor Performance- Simal Low Bark 1 Sensor 1 P11CC - NOX Sensor Performance- Signal Low Bark 1 Sensor 1 P01CC - Cyntext 1 Nector Trimg Advanced P01CA - Cyntext 1 Nector Trimg Advanced P01CA - Cyntext 1 Nector Trimg Advanced P01CA - Cyntext 8 Nector Trimg Advanced	P026C - Injection Quantity Too Low P01CD - Cylinder 2 Hijocilon Timing Retarded P01CD - Cylinder 2 Hijocilon Timing Retarded	P026D - Injection Quantity Too High P01CE - Cyfinder 2 bijection Timing Advanced P01CE - Cyfinder 2 bijection Timing Advanced	P11CB: NOr Sensor Performance - Storal High Bank 1 Sensor 1 P01CF - Cylinder 3 Injection Timing Retarded P01CF - Cylinder 3 Injection Timing Retarded	P110C - NDr. Sensor Parlomance - Sonal Low Berk 1 Sensor 1 P01D0 - Cyfnder 3 Hijection Timing Advanced P01D0 - Cyfnder 3 Hijection Timing Advanced	P01D1 - Cylinder 4 Isjection Timing Retarded P01D1 - Cylinder 4 Isjection Timing Retarded	P01D2 - Cylinder 4 linjection Timing Advanced P01D2 - Cylinder 4 linjection Timing Advanced	P01D3 - Cylnder 5 ligoction Timing Retarated P01D3 - Cylnder 5 ligoction Timing Retarated	Po1D4 - Cylinder 5 Injection Timing Advanced Po1D4 - Cylinder 5 Injection Timing Advanced	P01D5 - Cylinder 6 Injection Timing Retarded P01D5 - Cylinder 6 Injection Timing Retarded	PoTDE - Cylinder 6 Injection Timing Advanced PoTDE - Cylinder 6 Injection Timing Advanced	P01D7 - Cylinder 7 linjection Timing Retarded P01D7 - Cylinder 7 linjection Timing Retarded	P01D8 - Cylinder 7 hjecšon Timing Advanced P01D8 - Cylinder 7 hjecšon Timing Advanced
P014C + 10225 Stov Response Rich Leas Ressor 1 P0171 - Fuel Tim System Rich P0182 - Fuel Tem System Rich P0182 - Fuel Temperature Sensor 1Circuit Lew P0183 - Fuel Temperature Sensor 1-Circuit Lew P0183 - Fuel Temperature Sensor P0192 - Fuel Temperature Sensor Circuit Lew P0192 - Fuel Temperature Sensor Circuit Lew P0193 - Fuel Rel Pressure Sensor Circuit Lew P0193 - Fuel Rel Pressure	P0171 - Full Trim System Laan P11CB - NOS some Performance Signal High Bank 1 Sarons 1 P11CB - NOS some Performance Signal High Bank 1 Sarons 1 P01CB - Oyleker 1 hysiciton Timing P01CB - Oyleker 1 hysiciton Timing P01DB - Oyleker 1 hysiciton Timing P01DB - Oyleker 1 hysiciton Timing P01DB - P01B - Henster Stresser P01DB - Full Rahessare Stresser P01DB - Full Rahessare Stresser	P0172 - Fuel Trim System Rich P11C2 - NOX Sensor Performance- mediate States - Sensor Performance- Bical Low Bank 1 Sensor Sensor 1 Sensor 1 P01C2 - Cylinder 1 Sjection Triming Advanced P01C2 - Cylinder 1 Sjection Triming P01C2 - Cylinder 1 Sjection Triming Advanced P01DA - Cylinder 8 Sjection Triming Advanced	P028C - Injection Quantity Too Low P01CD - Cylinder 2 lejection Timing Returbed P01CD - Cylinder 2 lejection Timing Retarded	P028D - Injection Quartity Too High P010E - Cylinder 2 Njection Timing Advanced P010E - Cylinder 2 Njection Timing Advanced	P11CB - NOx Sensor Patromence Sional High Bank 1 Sensor 1 F01CF - Cylinder 3 trijection Timing Retarded P01CF - Cylinder 3 trijection Timing Retarded	P11CC - NOV Service Performance Signal Low Back 1 Service 1 P01D2 - Cylinder 3 bijection Timing Advanced P01D0 - Cylinder 3 bijection Timing Advanced	P01D1 - Cylinder 4 bjection Timing Retarded P01D1 - Cylinder 4 bjection Timing Retarded	P0102 - Cyleder 4 Injection Terring Advanced P0102 - Cyleder 4 Injection Terring Advanced	P01D3 - Cyleder 5 lejection Timing Retarded P01D3 - Cyleder 5 lejection Timing Retarded	Po1D4 - Cylinder 5 Injection Timing Advanced Po1D4 - Cylinder 5 Injection Timing Advanced	P01D5 - Cylnder 6 Injection Timing Retarded P01D5 - Cylnder 6 Injection Timing Retarded	P01DE - Cylinder 6 ligication Trenng Advanced P01DE - Cylinder 6 ligication Trenng Advanced	P01D7 - Cylinder 7 ligection Timing Retarded P01D7 - Cylinder 7 ligection Timing Retarded	P01D8 - Cylinder 7 Hysotion Timing Advanced P01D8 - Cylinder 7 Hysotion Timing Advanced
PO142 - HO2S Silv Response Rich to Land Stema 1 PO177 - Fuel Tim System Land PO172 - Fuel Tim System Rich PO172 - Fuel Time System Rich PO172 - Fuel Time Presenter Sensor 1 - Cross Land PO175 - Fuel Time Poster Sensor 1 - Cross Land PO175 - Fuel Time Poster PO175 - Fuel Time Presenter Sensor Circuit Hoh PO175 - Coalt Presenter BO175 - Coalt Presenter BO175 - Coalt Presenter BO175 - Coalt Response	P0171 - Fuil Trim System Lean P11CB - NOS serve Performance - Storad Hink Back 1 Search - P11CB - NOS serve Performance - P11CB - NOS serve Performance - P11CB - Opticate 1 Spectra Triming P01CB - Opticat	P0172 - Fuel Tim System Rech. = P1102 - NoX Sensor Performance Sensi Lon Bako Honor 1 = Particle Sensor 1 = Particle Sensor 1 = Particle - Oydenet Hespiton Timing P102-0-Oydened B Rejection Timing P0102Oydened B Rejection Timing P0102Oydened B Rejection Timing Advanced P0102Oydened B Rejection Timing Advanced	POSE - Injection Duarity Too Low POTCD - Cylecter 2 Injection Timing Retarded POTCD - Cylecter 2 Injection Timing Retarded	P22ED - Injection Quarity Too High P01CE - Cylinder 2 Trycolon Triming Advanced P01CE - Cylinder 2 Injection Timing Advanced	PTCB-NOA Sense Performance- Sinna Hinh Bank 1 Sensor 1 POTCF- Cylnder 3 Tryection Timing Retarded POTCF- Cylnder 3 Tryection Timing Retarded	P11C2 - NDA Senser Performance - Signal Lee Bark 1 Sensor 1 P01D0 - Ophder 3 Tepesten Timerg Advanced P01D0 - Ophder 3 Septem Timerg Advanced	Po1D1 - Cylinder 4 hycclion Timing Retarded Po1D1 - Cylinder 4 hycclion Timing Betarded	Po102 - Cylinder 4 hycoton Timing Advanced Po102 - Cylinder 4 hycoton Timing Advanced	P0103 - Cylinder & Nycoten Timing Retarded P0103 - Cylinder & Nycoten Timing Retarded	PotD4 - Cylinder 5 leycdon Timing Advanced PotD4 - Cylinder 5 leycdon Timing Advanced	Po1Ds - Cyl-sor 6 Najcobo Treng Retarded Po1Ds - Cyl-dar 6 Najcobo Treng Potostas	P01D6 - Cylinder & Nylection Timing Advanced P01D6 - Cylinder & Nylection Timing Advanced	Po1D7 - Cylinder 7 Nycchon Timing Retarded Po1D7 - Cylinder 7 Nycchon Timing Peterolexi	P01D8 - Cylinder 7 hysolion Timing Advanced P01D8 - Cylinder 7 hysolion Timing Advanced
POId: - HACS Shork Response Technis Later Stream La POIT: - Fuel Tran System Lan POIT: - Fuel Tran System Run POIT: - Fuel Transportance Stream Control Later Control Later POIT: - Fuel Transportance Stream Control Later POIT: - Fuel Transportance Stream Control Later POIT: - Fuel Transportance Stream Control Later POIT: - Fuel Transport Stream Control Later POIT: - Fuel Transport Stream Control Later POIT: - Fuel Transport POIT: - Fuel Transport Stream Control Later POIT: - Fuel Transport POIT: - Fue	P011-1-Leal T/m System Lass P112-3-HC Secret Performance- Secret Hellis High Bark 1 Secret P112-3-HC Secret P112-3-HC Secret P112-3-HC Secret P112-3-HC Secret P112-3-HC Secret P112-3-Cyfeidr 8 Section Triling P113-5-Cyfeidr 8 Section Triling P113-5-Cyfeidr 8 Section Triling P113-1-Faceback P113-1-Faceback P113-1-Faceback P113-1-Faceback P113-1-Faceback P113-1-Faceback P113-1-Faceback P113-1-Faceback P113-1-Faceback P113-1-Faceback P113-1-Faceback P113-1-Faceback P113-1-Faceback P113-1-Faceback P113-1-Faceback P113-1-Faceback P113-1-Faceback P113-1-Faceback P113-1-Faceback P113-1-Faceback P113-1-Faceback P113-1-Faceback P113-1-Faceback P113-1-Faceback P113-1-Faceback P113-1-Faceback P113-1-Faceback P113-1-Faceback P113-1-Faceback P113-1-Faceback P113-1-Faceback P113-1-Faceback P113-1-Faceback P113-1-Faceback P113-1-Faceback P113-1-Faceback P113-1-Faceback P113-1-Faceback P113-1-Faceback P113-1-Faceback P113-1-Faceback P113-1-Faceback P113-1-Faceback P113-1-Faceback P113-1-Faceback P113-1-Faceback P113-1-Faceback P113-1-Faceback P113-1-Faceback P113-1-Faceback P113-1-Faceback P113-1-Faceback P113-1-Faceback P113-1-Faceback P113-1-Faceback P113-1-Faceback P113-1-Faceback P113-1-Faceback P113-1-Faceback P113-1-Faceback P113-1-Faceback P113-1-Faceback P113-1-Faceback P113-1-Faceback P113-1-Faceback P113-1-Faceback P113-1-Faceback P113-1-Faceback P113-1-Faceback P113-1-Faceback P113-1-Faceback P113-1-Faceback P113-1-Faceback P113-1-Faceback P113-1-Faceback P113-1-Faceback P113-1-Faceback P113-1-Faceback P113-1-Faceback P113-1-Faceback P113-1-Faceback P113-1-Faceback P113-1-Faceback P113-1-Faceback P113-1-Faceback P113-1-Faceback P113-1-Faceback P113-1-Faceback P113-1-Faceback P113-1-Faceback P113-1-Faceback P113-1-Faceback P113-1-Faceback P113-1-Faceback P113-1-Faceback P113-1-Faceback P113-1-Faceback P113-1-Faceback P113-1-Faceback P113-1-Faceback P113-1-Faceback P113-1-Faceback P113-1-Faceback P113-1-Fa	P012- Fuel Tim System Rich P110- Ti4O Sector Performance P100- Ti4O Sector Performance P100- FAO Sector Performance Segret Los Bast 1 Sector 1 P100- Optice H Sector Timing P1010- Optice H Sector Timing P1010- Optice H Sector Timing P1010- Optice H Sector Timing Advanced	POSEC - Specton Davrity Too Law POTCD - Cylleder 2 Hyscion Timing Retrieves POTCD - Cylleder 2 Hyscion Timing POTCD - Cylleder 2 Hyscion Timing	P202D - Njecton Quertity Too High P01CE - Cylinder 2 lijection Timmig Advanced P01CE - Cylinder 2 lijection Timmig Advanced	PTCB ND Sensor Performance Small Him Bark 1 Sensor 1 P01CF - Cylholar 3 ligicilion Timing Retarduo P01CF - Cylholar 3 ligicilion Timing Retarduo	PTIC: HOL Sense Performance - Sional certification - Sional Certification - Cylinder 3 Injection Timing Advanced P01D0 - Cylinder 3 Injection Timing Advanced	PotD1 - Oyleder 4 kycolon Timing Reserved PotD1 - Oyleder 4 kycolon Timing PotD1 - Oyleder 4 kycolon Timing	P01D2 - Cylinder 4 kijection Timing Advanced P01D2 - Cylinder 4 kijection Timing Advanced	P01D3 - Cylender 5 Ngietton Timing Restored P01D3 - Cylender 5 Ngietton Timing Restored	POID4 - Cylinder S legicilion Timing Advanced POID4 - Cylinder S legiclion Timing Advanced	POTDS - Oyleder & legetion Timerg Retarded PotDS - Oyleder & legetion Timerg Retarded	PUDE-Cyleder & legiction Timing Advanced PUDE-Cyleder & legiction Timing Advanced	Po1D7 - Cylinder 7 Ingesten Timing Postaded Po1D7 - Cylinder 7 Ingesten Timing Postade	Po108 - Cylender 7 hijocton Timing Abaread Po108 - Cylender 7 hijocton Timing Abaread
Profit - Profit Silva Response Profit - Profit Silva Response Profit - Fact Tran System Laure Profit - Carl Temperature Sensor 1 - Crossi Lear 1 - Crossi Lear	P011-F. Fall T Im System Later FIG3 - NG-Steer References- Face And Steer Con- Steer Control (1998) - 100 Steer Control (1998) - 100 P010-Control (1998	19172 - Fuel Tim System Rich, 19172 - Wol Sware Performance Send Loc Tables 4 Sense 1 19102 - NOL Sware Performance 19102 - NOL Sware Performance Performance Performance Performance Performance Performance Performance Performance Performance Performance Performance Performance Performance Performance Performance Performance Performance Performance Performance Performance Performance Performance Performance Performance Performance Performance Performance Performance Performance Performance Performance Performance Performance Performance Performance Performance Performance Performance Performance Performance Performance Performance Performance Performance Performance Performance Performance Performance Performance Performance Performance Performance Performance Performance Performance Performance Performance Performance Performance Performance Performance Performance Performance Performance Performance Performance Performance Performance Performance Performance Performance Performance Performance Performance Performance Performance Performance Performance Performance Performance Performance Performance Performance Performance Performance Performance Performance Performance Performance Performance Performance Performance Performance Performance Performance Performance Performance Performance Performance Performance Performance Performance Performance Performance Performance Performance Performance Performance Performance Performance Performance Performance Performance Performance Performance Performance Performance Performance Performance Performance Performance Performance Performance Performance Performance Performance Performance Performance Performance Performance Performance Performance Performance Performance Performance Performance Performance Performance Performance Performance Performance Performance Performance Performance Performance Performance Performanc	POSE - Hjecton Owerfty Too Lee PortCD - Cyfeder 2 Hjecton Treing PortCD - Cyfeder 2 Hjecton Treing PostCD - Cyfeder 2 Hjecton Treing PostCe - Cyfeder 1 Hjecton Treing PostCe - Cyfeder 1 Hjecton Treing PostCe - Cyfeder 1 Hjecton Treing	PODED - Hypoten Guerdly Too High PODEE - Cylonder 2 Naccion Timerg Advanced POTCE - Cylonder 2 Naccion Timerg Advanced POTCE - Cylonder 1 Naccion Timerg Advanced	PTCE NOL Search Performance Small Heim Bark 1 Search 1 PolCF - Clyder's Hypothen Traing Retarded PolCF - Clyder's Hypothen Traing Retarded	PTIC: NOL Same Performance- Social Los Berk 1 Serior 1 PTID: - Cyclinder 3 Serior 1 PTID: - Cyclinder 3 Septime Trans Advanced PTID: - Cyclinder 3 Septime Trans Advanced	PotD1 - Cyleder 4 kyection Timing Retarded PotD1 - Cyleder 4 kyection Timing Retarded PotD5 - Cyleder 3 kyection Timing Retarded	FotD2 - Cyloder 4 kycetion Treng Advanced FotD2 - Cyloder 4 kycetion Treng Advanced	P0103 - Cyleder 5 Rejection Timing Retarcted P0103 - Cyleder 5 Rejection Timing Retarcted P010 1 - Cyleder 4 Rejection Timing Regarded	POID4 - Cylnder & Hyndlen Timerg Advanced POID4 - Cylnder & Hyndlen Timerg Advanced POID2 - Cylnder & Hyndlen Timerg Advanced	PotDs - Cyleder & Rejection Timing Retarded PotDs - Cyleder & Rejection Timing Retarded PotDs - Cyleder & Rejection Timing Retarded	P0106: Cyleder 6 lejecton Tening Advanced P0106: Cyleder 6 lejecton Tening Advanced P0104: Cyleder 5 lejecton Tening Advanced	POID? - Cylinder 7 Egection Timeng Relateded POID? - Cylinder 7 Egection Timeng Relateded POID: - Cylinder 6 Egection Timeng Related	FotDs - Oylear 7 Synches Tening Advanced PotDs - Oylear 7 Synches Tening Advanced FotDs - Oylear 8 Synches Tening Advanced
POINT - HOCS Silve Response Technis Lata Xong Spean Lan POINT - Hard Tim System Lan POINT - Hard Tim System Rich POINT - Hard Tim System Rich POINT - Hard Tim System Rich POINT - Hard Timpsonian POINT - Construct Hard POINT - Despiner Hard POINT - Despiner Hard POINT - Despiner Hard POINT - Despiner Hard Timpsonian POINT	P017-Fall Tim System Later P1163-140 Seerer P1163-140 Seerer P1111-160 Seerer P111-160 Seerer P1111-160 Seerer P111-160 Seerer P111-160 Seerer P111-160 Seerer P1	19172 - Fuel Tim System Rich 19172 - HO Server Performance- Server Line Risk / Server 1 19172 - HO Server 1 19172 - Andrew Performance 19172 - Oxford B System Tim Addressed P0172 - Fuel Tim System Rich P0172 - Gard Tim System Rich P0172 - Gard Tim System Rich P0172 - Gard Tim System Rich	POSIC - Hypoten Quartity Too Lee POTCD - Cyl-de 2 Hapoten Triming Resarded POTCD - Cyl-de 2 Hypoten Triming Resarded POTCB - Cylinder 1 Hypoten Triming POTCB - Cylinder 1 Hypoten Triming	PO2ED - Necton Duently Too High PO2ED - Recton Duently Too High Advanced PO2EC - Cylinder 2 Necton Timing Advanced PO2EC - Cylinder 1 Necton Timing PO2EC - Cylinder 1 Necton Timing	PTCD: VAD, Sensor Performance Simal Holt Back I Sensor 1 POTCF - Cylinde 3 Najcolan Timing Retarded POTCF - Cylinder 3 Najcolan Timing Retarded POTCD - Cylinder 3 Najcolan Timing Retarded POTCD - Cylinder 3 Najcolan Timing Retarded	PTICE - Kylenkar Stream Sinal Los Bark 1 Serect 1 PtiDo - Cylinkar 3 Najeston Timing Advanced PtiDo - Cylinkar 3 Ingeston Timing Advanced PtiDo - Cylinkar 3 Ingeston Timing PtiDo - Cylinkar 2 Ingeston Timing PtiDo - Cylinkar 2 Ingeston Timing PtiDo - December Too Hayh	Po1D1 - Cylinder & Nacidan Timing Betaclad Po1D1 - Cylinder 4 Spection Timing Betaclad Po1CF - Cylinder 3 Injection Training Retaclad	PotD2 - Cylinder 4 byccton Treing Advances PotD2 - Cylinder 4 byccton Treing Advanced PotD2 - Cylinder 3 byccton Treing Advanced	P0103 - Cylinder 5 Hjection Timing Besister P0103 - Cylinder 5 Hjection Timing Besister P0101 - Cylinder 4 Hjection Timing Besister	PPTD4 - Cylinder 5 lejacilion Timing Advanced PPTD4 - Cylinder 5 lejacilion Timing Advanced PPTD2 - Cylinder 4 lejacilion Timing Advanced	Po1D5 - Cylinder E lejacdion Timing Po1D5 - Cylinder & lejacdion Timing Betacided Po1D5 - Cylinder 5 lejacdion Timing Retarcled	P01De - Cyleder E legicilon Treing Advanced P01De - Cyleder E legicilon Treing Advanced P01De - Cyleder 5 legicilon Treing Advanced	P0107 - Cylinder 7 Jejection Timing Basedon P0107 - Cylinder 7 Jejection Timing Beantied P0105 - Cylinder 6 Jejection Timing Restartion	PIDB - Cylinder Y Nycolan Treinig Adverses PIDB - Cylinder Y Nycolan Treinig Advanced PIDB - Cylinder & Nycolan Treinig Advanced
Profits - Hot23 Silva Response Profits - Hot23 Silva Response Profits - Leal Transpaces Law Profits - Leal Transpaces Second Profits - And Transpaces Second Profits - And Transpaces Second Profits - And Transpaces Profits - Cockets Transpaces Profits - Lockets Transpaces	P017-1-Fall T/m System Later P11G3 - NO-Seere Professional- Enter 1148 Bits Al Seere 1 For 1148 - NO-Seere Professional Sere 1149 Bits Al Seere 1 P11G3 - Oysket 1 Seere 1 P11G3 - Oysket 1 P11G - Oysket 1 P	P0122 - Fuel Tim System Rich, P1105 - 1403 Second Performance P105 - 1403 Second Performance P105 - 0404 Second Performance Segret Los Bast 1 Second 1 P105 - 0404 Performance P012 - Potente P012 - P012 - P01	POSEC - Specton Quartity Too Law POSEC - Specton Timeg PostCD - Cylinder 2 Specton Timeg PostCD - Cylinder 2 Specton Timeg PostCD - Cylinder 1 Specton Timeg	P22ED - Bjecton Quertly Too High P22ED - Bjecton Timerg Advanced P27EE - Cylinder 2 Bjecton Timerg Advanced P27EE - Cylinder 1 Bjecton Timerg P27EC - Cylinder 1 Bjecton Timerg P27EA - Cylinder 1 Bjecton Timerg P27EA - Cylinder 1 Bjecton Timerg	PTCB 4000 Senser Performance Simal Hon Bark 1 Sensor 1 PoTCF - Cylinder 3 Injection Timing Retarded PoTCF - Cylinder 3 Injection Timing Retarded PoTCF - Cylinder 2 Injection Timing Retarded PoTCF - Cylinder 2 Injection Timing PoTCF - Department of the Core Retarded PoTCF - Cylinder 2 Injection Timing	PHIC: HVID: Sense: Performance - Simal Los Bark 1 Sensor 1     PHID: - Cylinder 3 legicilon Timing Advanced     PHID: - Cylinder 3 legicilon Timing Advanced     PHID: - Cylinder 2 legicilon Timing Advanced     PHID: - Cylinder 2 legicilon Timing PHID: - Cylinder 2 legicilon Timing PHID: - Cylinder 2 legicilon Timing PHID: - Cylinder 2 legicilon Timing     PHID: - Cylinder 2 legicilon Timing     PHIC: - Cylinder 2 legicilon Timing     PHID: - Cylinder 2 legicilon Timing     PHIC: - Cylinder 2 legicilon Timing     PHID: - Cylinder 2 legicon Timing     PHID: - Cylinder 2 legicon Timing     PHID: - Cyli	Po1D1 - Oyleder 4 kyecton Timing Relatedor Po1D1 - Oyleder 4 kyecton Timing Po1D5 - Oyleder 3 kyecton Timing Relatedor Po1C6 - Oyleder 3 kyecton Timing Po1C6 - Oyleder 3 kyecton Timing	Po1D2 - Cylinder 4 kijection Timing Advanced Po1D2 - Cylinder 4 kijection Timing Advanced Po1D0 - Cylinder 3 kijection Timing Advanced Po1D0 - Cylinder 3 kijection Timing	P01D3 - Cyledio 5 Ngictlon Tining Restricted P01D3 - Cyledio 5 Ngictlon Tining Potential P01D1 - Cyledio 4 Ngictlon Tining Basticled P01D1 - Cyledio 4 Ngictlon Tining	POID4 - Oyleder 5 legicilion Timing Advanced POID4 - Oyleder 5 legicilion Timing Advanced POID2 - Oyleder 4 legicilion Timing Advanced POID2 - Oyleder 4 legicilion Timing	POTDS - Oyleder & legection Timery Retarded POTDS - Oyleder & legection Timery Retarded POTDS - Oyleder & legection Timery Betarded POTDS - Oyleder & legection Timery POTDS - Oyleder & legection Timery	PUIDE - Cyleder 6 legetion Treing Advanced PUIDE - Cyleder 6 legetion Treing Advanced PUID4 - Cyleder 5 legetion Treing Advanced PUID4 - Cyleder 5 legetion Treing	Po1D7 - Cylinder 7 Ingesten Timerg Resided Po1D7 - Cylinder 7 Ingesten Timerg Resided Po1D5 - Cylinder 6 Ingesten Timerg Resided Po1D5 - Cylinder 6 Ingesten Timerg Po1D5 - Cylinder 6 Ingesten Timerg	Po1D8 - Cylender 7 tejaction Timing Advanced Po1D8 - Cylender 7 tejaction Timing Advanced Po1D6 - Cylender 6 tejaction Timing Advanced Po1D6 - Cylender 6 tejaction Timing
POINT - HOUSS Box Response POINT - HOUSS Box Response POINT - HAIT The System Law POINT - HAIT The System Rich POINT - HAIT The System Rich Point - HAIT The System Rich Point Rich Point - HAIT The Rich Point - HAIT The Rich Point Rich Point - HAIT The Rich Point - HAIT The Rich Point Rich Point - HAIT The Rich - HAI	P017-Fall Tim System Laar P1163-NG Seere Seere P1163-NG Seere Seere P1163-NG Seere Seere P1163-NG Seere P1163-Cychek 1 Seere P1163-Cychek 1 Seere P1163-Cychek 1 Seere P1163-Cychek 1 Seere P1163-Cychek 1 Seere P1163-Cychek 1 Seere P111-Fall Rail Parsons Senre P111-Fall Rail Parsons Senre P1117-Fall Tim System Laar	19172 - Fuel Tim System Rich 19172 - Wild Smart Performance Brand Loc Bield V Series 1 19172 - Kill Series 1 19172 - Kill Series 1 19172 - Cycled T Species Tring Advanced Poll C - Cycled T Species Tring Poll C - Cycled T Species Tring	POTCB - Lytecton Querely Too Low POTCD - Cythide 2 Paperton Tening Reserved POTCB - Cythide 2 Paperton Tening Reserved POTCB - Cythide 3 Paperton Tening POTCB - Cythide 3 Paperton Tening POTCB - Cythide 5 Paperton Tening	Pottb - Hection Guardy Too High PottB - Cylondr 2 Neptition Timing <u>Advanced</u> PottB - Cylondr 2 Neptition Timing <u>Advanced</u> PottB - Cylondr 2 Neptition Timing PottB - Cylondr 2 Neptition Timing	PTCD: AND, Sancer Performance- Simal Holin Back 1 Series 1     POLCP - Optice's Taylordon Timing Restanded     POLCP - Optice's Taylordon Timing Restanded     POLCP - Optice's Taylordon Timing POLCP - POLCP - Optice's Taylordon Timing POLCP - Optice's	PHICE: NOL Samer Performance Simulton Bink 1 Sereon 1     PHIDD: Option 2 Sereon 1     PHIDD: Option 2 Sereon 1     PHIDD: Option 2 Sereon 1 Tring     Advanced     PHIDD: Option 2 Sereon 1 Tring     PHIDD: Option 2 S	PotD1 - Oylnder 4 Spectan Timing Retarded PotD1 - Cylinder 4 Spectan Timing Retarded PotCF - Cylinder 3 Spectan Timing PotCF - Oylnder 3 Spectan Timing PotCF - Oylnder 3 Spectan Timing Retarded	Po102 - Cylinder 4 tejection Triving Advanced Po102 - Cylinder 4 tejection Triving Advanced Po100 - Cylinder 3 tejection Triving Advanced Po100 - Cylinder 3 tejection Triving Advanced	P1D3 - Cylinde 5 Nector Trining Records P0D3 - Cylinde 5 Nector Records P0D1 - Cylinder 4 Nector Records P1D1 - Cylinder 4 Nector Trining Records	P0154 - Cylinder 5 Nacional Timing Advanced P0154 - Cylinder 5 Nacional Timing Advanced P0152 - Cylinder 4 Nacional Timing Advanced	PortDs - Cylinder & Neckton Timing Betarded PortDs - Cylinder & Neckton Timing Betarded PortDs - Cylinder & Nejkolon Timing Betarded PortDs - Gylinder & Nejkolon Timing Resinded	P0106 - Cyleder & Isgolion Treing Adviced P0106 - Cyleder & Specion Treing Adviced P0104 - Cyleder 5 Isgolion Treing Adviced P0104 - Cyleder 5 Isgolion Treing Adviced	PoTD7 - Cyll-der 7 Najecton Timing Retacted PoTD7 - Cyll-der 7 Najecton Timing Retacted PoTD5 - Cyll-der 6 Injecton Timing Retacted PoTD5 - Cyll-der 6 Injecton Timing Retacted	PotDa: Ophdar 7 Ryschen Timing Advanced PotDa: Ophdar 7 Ryschen Timing Advanced PotDa: Ophdar 5 Ryschen Timing Advanced PotDa: Ophdar 8 Ryschen Timing Advanced
Politic - HO23 Silva Response Technica Lata Xina, Spatien Latan POTT - Hard Yina, Spatien Latan POTT2 - Spatien Lata	P017-Fell Tim System Lass P1163-140 Seere F1163-140 Seere P1163-140 Seere P1111-160 Seere P111-160 Seere P111-	19172 - Fuel Tim System Rich 19172 - HOS Seere Performance- 1902 - HOS Seere Performance- 1910 - FuE Seere Performance- Sere Lon Back 1 Sere 1 1910 - Oyder B System Rich 1910 - Oyder B System Timing Addresses 1910 - Oyder B System Timing Addresses 1910 - Oyder B System Timing Addresses 1910 - Oyder B System Rich 1910 - Oyde	POSE - Hypecton Quartity Too Lew PostCo - Opt-dor 2 hypecton Timing Restanded POTCO - Opt-dor 2 hypecton Timing Restanded POTCO - Opt-dor 2 hypecton Timing POSCO - Opt-dor 8 hypecton Timing POSCO - Opt-dor 8 hypecton Timing POSCO - Opt-dor 1 hypecton Timing	PO2ED - Recton Duently Too High PO2ED - Recton Duently Too High Advanced PO2EC - Cylinder 2 Nepton Timing Advanced PO2EC - Cylinder 2 Nepton Timing PO2EC - Cylinder 1 Nepton Timing	PFICE: NON Sensor Performance Simal Him Bark I Sensor 1     PRICE: Cylindu 3 Igiction Timing Retardid     PRICE: Cylindu 3 Igiction Timing     Retardid	PHICE - Note: Server Performance Simul conflict 1 Server 1     PHIDD - Ophidur 3 Injection Timing <u>Advanced</u> PHIDD - Ophidur 3 Injection Timing <u>Advanced</u> PHIDD - Ophidur 3 Injection Timing <u>Advanced</u> PHIDE - Ophidur 3 Injection Timing - Advanced PHIDE - Ophidur 3 Injection Timing - Advan	PortD1 - Cylinder & Nacional Timing Betander PortD1 - Cylinder & Nacional Timing Betanded PortCF - Cylinder 3 Nacional Timing Betanded PortCF - Cylinder 3 Nacional Timing Relateded PortCF - Cylinder 3 Nacional Timing	PotD2 - Cyleder 4 Ngction Treing Advances PotD2 - Cyleder 4 Ngction Treing Advanced PotD2 - Cyleder 3 Ngction Treing Advanced PotD2 - Cyleder 3 Ngction Treing Advanced PotD2 - Cyleder 3 Ngction Treing	P11D3 - Cylinder 5 Hyscion Timing P4150-1-Cylinder 5 Hyscion Timing Beander P11D1 - Cylinder 4 Hyscion Timing Beander P11D1 - Cylinder 4 Hyscion Timing P11D1 - Cylinder 4 Hyscion Timing P11D1 - Cylinder 4 Hyscion Timing	P01D4 - Cylender 5 lejection Timing Advanced P01D4 - Cylender 5 lejection Timing Advanced P01D2 - Cylender 4 lejection Timing Advanced P01D2 - Cylender 4 lejection Timing Advanced	PotDS - Cylinder 6 legicolon Timing Reterided PotDS - Cylinder 6 legicolon Timing Reterided PotDS - Cylinder 5 legicolon Timing Reterided PotDS - Cylinder 5 legicolon Timing Reterided 5 legicolon Timing Reterided 5 legicolon Timing	P01D6 - Cylinder 6 Nijection Treing Advecced P01D6 - Cylinder 6 Nijection Treing Advecced P01D4 - Cylinder 5 Nijection Treing Advecced P01D4 - Cylinder 5 Nijection Treing Advecced P01D4 - Cylinder 5 Nijection Treing	Po1D7 - Cylleder 7 Hyscion Timing Hesteries Po1D7 - Cylleder 7 Hyscion Timing Bisender Po1D5 - Cylleder 5 Hyscion Timing Bisender Po1D5 - Cylleder 6 Hyscion Timing Reserved Po1D5 - Cylleder 6 Hyscion Timing	POIDS - Cylinder Y Isjacdon Timing Anteness POIDS - Cylinder Y Isjacdon Timing Anteness POIDS - Cylinder Y Isjacdon Timing Anteness POIDS - Cylinder & Isjacdon Timing Anteness POIDS - Cylinder & Byacton Timing Anteness
Profit - Fudd3 Silva Response Profit - Fudd3 Silva Response Profit - Fudd3 Silva Response Profit - Fudd Tree System Rich Profit - Fudd Trees System Rich Profit - Fudd Treespondure Sensor Profit - Fudd Treespondure Profit - Fudd Treespondure Profit - Fudd Treespondure Despond Bellev Despondi Montonia Terrotentia Despond Selevit - Despondi Montonia Terrotentia Montonia Terrotentia Montonia Montonia Terrotentia Montonia Terrotentia Montonia Montonia Terrotentia Montonia Montonia Terrotentia Montonia Montonia Montonia Montonia Montonia Montonia Montonia Montonia Montonia Montonia Montonia Montonia Montonia Montonia Montonia Montonia Montonia Montonia Montonia Montonia Montonia Montonia Montonia Montonia Montonia Montonia Montonia Montonia Montonia Montonia Montonia Montonia Montonia Montonia Montonia Montonia M	P017-1-Fall T/m System Later           P1163-14-O Searce           P1163-14-O Searce           P1163-14-O Searce           P1163-10-O Searce           P1111-17-Searce           P1111-17-Sea	19172 - Fuel Ten System Rich 19172 - Wol Sweet Performance Senal Loca Risk 1 Senael 19102 - Wol Sweet Performance 19102 - Not Sweet Performance 19103 - Oxford Performance 19103 - Oxford 1 System Rich 19103 - O	POSE - Hyroton Dwerthy Too Low PortCD - Cyleder 2 Rejection Transg Reserved POTCD - Cyleder 2 Rejection Transg Reserved POTCD - Cyleder 1 Rejection Transg Reserved POTCD - Cyleder 1 Rejection Transg PotCD - Cyleder T Rejection Transg	Potto - Hjockin Guerdy Too High Potto - Cylodia 2 Tajockin Timeg Advanced Potto - Cylodia 2 Tajockin Timeg Advanced Potto - Cylodia 1 Highesh Timeg Advanced Potto - Cylodia 1 Highesh Timeg Potto - Cylodia 1 Highesh Timeg Potto - Cylodia 2 Highesh Timeg	PTCE 3400 Senser Performance Simal Hole Bark 1 Sensor 1 PDTCF - Cylinder 3 Injection Timing Retardul PDTCF - Cylinder 3 Injection Timing Retardul PDTCF - Cylinder 3 Injection Timing Retardul PDTCF - Cylinder 2 Injection Timing PDTCF - Cylinder 2 Injection Timing PDTCF - Cylinder 2 Injection Timing PDTCF - Cylinder 2 Injection Timing	PHIC: HVID: Senser Performance - Simal Los Bark 1 Sensor 1     PHID: - Cylinder 3 Injection Timing Advanced     PHID: - Cylinder 3 Injection Timing Advanced     PHID: - Cylinder 3 Injection Timing Advanced     PHID: - Cylinder 2 Injection Timing Advanced     PHID: - Cylinder 2 Injection Timing Advanced     PHID: - Cylinder 2 Injection Timing PHID: - Specino Quantity Too High PHICE: - Cylinder 2 Injection Timing PHID: - Specino Quantity Too High PHICE: - Cylinder 2 Injection Timing PHID: - Specino Quantity Too High PHICE: - Cylinder 2 Injection Timing PHID: - Specino Quantity Too High PHID: - Specino	Po1D1 - Oyleder 4 kyecton Timing Reserved Po1D1 - Oyleder 4 kyecton Timing Po1D5 - Oyleder 3 kyecton Timing Reserved Po1C6 - Oyleder 3 kyecton Timing Reserved Po1C6 - Oyleder 3 kyecton Timing Po1C6 - Oyleder 3 kyecton Timing Po1C6 - Oyleder 3 kyecton Timing Po1C6 - Oyleder 3 kyecton Timing	Po1D2 - Cyleder 4 kijection Treing Advanced Po1D2 - Cyleder 4 kijection Treing Advanced Po1D0 - Cyleder 3 kijection Treing Advanced Po1D0 - Cyleder 3 kijection Treing Advanced Po1D0 - Cyleder 3 kijection Treing Advanced	P01D3 - Cylindur S Ngietton Timing Restanded P01D3 - Cylindur S Ngietton Timing Potential P01D1 - Cylindur 4 Ngietton Timing Potential P01D1 - Cylindur 4 Ngietton Timing Potential P01D1 - Cylindur 4 Ngietton Timing Potential	POID4 - Cylinder 5 legicilion Timing Advanced POID4 - Cylinder 5 legicilion Timing Advanced POID2 - Cylinder 4 legicilion Timing Advanced	POTDS - Oyleder & legection Timerg Retarded POTDS - Oyleder & legection Timerg Retarded POTDS - Oyleder & legection Timerg Retarded POTDS - Oyleder & legection Timerg Potented POTDS - Oyleder & legection Timerg Potented	P01DE - Cyleder & legetion Timing Advanced P01DE - Cyleder & legetion Timing Advanced P01D4 - Cyleder & legetion Timing Advanced P01D4 - Cyleder & legetion Timing Advanced P01D4 - Cyleder & legetion Timing Advanced	Po1D7 - Cylinder 7 Ingesten Timerg Resided Po1D7 - Cylinder 7 Ingesten Timerg Resided Po1D5 - Cylinder 6 Ingesten Timerg Resided Po1D5 - Cylinder 6 Ingesten Timerg Potented Po1D5 - Cylinder 6 Ingesten Timerg Potented Po1D5 - Cylinder 6 Ingesten Timerg Potented	Po1D8 - Cylender 7 hijocton Timing Advanced Po1D8 - Cylender 7 hijocton Timing Advanced Po1D6 - Cylender 8 hijocton Timing Advanced
POILE - HOLS Silve Response POILE - HOLS Silve Response POILT - Hall The System Law POILT - Fault The System Rich POILT - Fault The System POILT - Fault T	P017-Fear T-m System Later P1163-NO-Steer Settomarce- sand High Back 1 Second - High Back 1 Second - P1020-Cycles 4 Second - P1021-Fear Back P1021-Fear Back P1021-Fear Back P1021-Fear Back P1021-Fear Back P1021-Fear Back P1021-Fear Back P1021-Fear Back P1027-Fear T-m System Later P1027-Fear T-m System Later P1027-Fear Drageton Timug P1027-Fear Drageton Timug	19172 - Fuel Tim System Rich 19172 - NG Smort Performance - Band Los Bark 1 Sensol 19172 - NG Smort Performance - Bard Los Bark 1 Sensol 19173 - State Performance - Bardened Pol D- Cycled # Specton Timing Advanced Pol D- Cycled # Specton Timing Advanced	POSE - Hysten Guerthy Tou Lee PostCB - Opt-der 2 Najecton Triming Restricted POTCD - Opt-der 2 Najecton Triming Restricted POTCB - Opt-der 2 Najecton Triming POTCB - Opt-der 1 Najecton Triming	POID - Hydder Dawrlly Too Hyb. POID - Cyfeder 2 Hyddon Thring Advanced POIDE - Cyfeder 2 Hyddon Thring Advanced POIDE - Cyfeder 2 Hyddon Thring POIDE - Cyfeder 1 Hyddon Thring	PFICE AND, Senser Performance- Simal Holm Back 1 Sensor 1     POTCP - Ophedra 3 Sensor 1	PHICE: NAU Sensor Performance - Simultice Bink 1 Sensor 1     PHIDE: Ophers 3 Sequence Triming Advanced     PHIDE: Ophers 3 Sequence Triming PHIDE: Ophers 3	PoTD1 - Cylindar 4 hycdaon Tining Retarded PoTD1 - Cylindar 4 hyccaon Tining Retarded PoTCF - Cylindar 3 hyccaon Tining Retarded PoTCF - Cylindar 3 hyccaon Tining Retarded PoTCF - Cylindar 3 hyccaon Tining Retarded	Po1D2 - Cylinder 4 Nacion Timing Advanced Po1D2 - Cylinder 4 Nacion Timing Advanced Po1D0 - Cylinder 3 Nacion Timing Advanced Po1D0 - Cylinder 3 Nacion Timing Advanced Po1D0 - Cylinder 3 Nacion Timing Advanced	Po103 - Cylinde 3 Nation Timing Beantide Po105 - Cylinde 4 National Timing Beantide Po101 - Cylinder 4 National Po101 - Cylinder 4 National	PPTD4 - Cylender 5 lajacidon Timing Advanced PPTD4 - Cylender 5 lajacidon Timing Advanced PPTD2 - Cylender 4 lajacidon Timing Advanced	PortDS - Cylinder & Injection Timing PortBS - Cylinder & Injection Timing Belanded PortD3 - Cylinder & Injection Timing Relateded PortD3 - Cylinder & Injection Timing PortD3 - Cylinder & Injection Timing	P1DE - Oyleder E legicilion Treing Advances P1DE - Oyleder E legicilion Treing Advanced P1D4 - Oyleder 5 legicilion Treing Advanced P1D4 - Oyleder 5 legicilion Treing Advanced P1D4 - Oyleder 5 legicilion Treing Advanced	P0107 - Cylindur 7 Nancion Timing Belandia P0107 - Cylindur 7 Nancion Timing Belandiad P0105 - Cylindur 6 Najection Timing Belandiad P0105 - Cylindur 6 Najection Timing Petersbel P0105 - Cylindur 6 Najection Timing Petersbel P0105 - Cylindur 6 Najection Timing	PotDa - Oyfeder 7 hytecten Timing Advanced PotDa - Oyfeder 7 hytecten Timing Advanced PotDa - Oyfeder 8 hytecten Timing Advanced
Profits - Fueld's Sine Response Profits - Fueld's Sine Response Profits - Fuel Trans System Rich Profits - Fuel Trans System Rich Profits - Fuel Transpostance Sensor Profits - Fuel Transpostance Sensor Description Fuel Transpostance Sensor Costal Homes Profits - Occusion Homeson Beard Costal Homeson Beard	P0171 - Fail T the System Later FIGE 3-NO Seems Professional Con- Entropy of the Second T Second T Second Link Back 1 Second T Second Link Back 1 Second T P016B - Optical 1 Second T P0176 - Op	P9172 - Fuel Tim System Rich P102-0140 Server Performance- Server 100-0140 Server 1 P102-0140 Server 1	POSE - Hypoten Quartity Too Law POSE - Spector Quartity Too Law POSE - Cylinder 2 hypoten Triming Restanded POSE - Cylinder 2 hypoten Triming Restanded POSE - Cylinder 3 hypoten Triming POSE - Cylinder 8 hypoten Triming	PO2ED - Rejection Quertity Too High PO2ED - Rejection Triming Advanced PO2EC - Cylinder 2 Nejection Triming Advanced PO2EC - Cylinder 1 Nejection Triming Advanced PO2EC - Cylinder 8 Nejection Triming PO2EC - Cylinder 1 Nejection Triming PO2EC - Cylind	PTCD: ADD. Senser Performance Simal Holm Bark Lisenant I PortCF: Cylindu 3 lipicition Timing Research PortCF: Cylindu 3 lipicition Timing Research PortCD: Cylindu 7 lipicition Research PortCD: Cylindu 7 lipicition Research Research Research Research Research Research Research Research Research Research Research Research Research Research Research Research Research Research Research Research Research Research Research Research Research Research Research Research Research Research Research Research Research Research Research Research Research Research Research Research Research Research Research Research Research Research Research Research Research Research Research Research Research Research Research Research Research Research Research Research Research Research Research Research Research Research Research Research Research Research Research Research Research Research Research Research Research Research Research Research Research Research Research Research Research Research Research	PHICE - Note Search Performance - Simul Loss Bank 1 Sereor 1     POIDO - Cylindar 3 legiction Timing <u>Advanced</u> POIDO - Cylindar 3 legiction Timing <u>Advanced</u> POIDO - Cylindar 3 legiction Timing <u>Advanced</u> POIDO - Cylindar 2 legiction Tim	PorD1 - Cylinder & Pjection Timing Paraidet PorD1 - Cylinder & Pjection Timing Betacided PorD2 - Cylinder 3 Synchron Timing Betacided PorD2 - Cylinder 3 Synchron Timing Relateded PorD2 - Cylinder 3 Synchron Timing Relateded PorD2 - Cylinder 3 Synchron Timing Relateded	Po102 - Cyleder 4 Naciona Advector Po102 - Cyleder 4 Naciona Marcosi Po100 - Cyleder 3 Naciona Advector Po100 - Cyleder 3 Naciona Treng Advector Po100 - Cyleder 3 Naciona Treng Advector	P11D3 - Oyleder 5 Ngecton Timing Relations P11D3 - Oyleder 5 Ngecton Timing Beanties P11D1 - Oyleder 4 Ngecton Timing Relations P11D1 - Oyleder 4 Ngecton Timing Relations P11D1 - Oyleder 4 Ngecton Timing Relations	PDTD4 - Cylender 5 legection Timing Advanced PDTD4 - Cylender 5 legection Timing Advanced PDTD4 - Cylender 4 legection Timing Advanced PDTD2 - Cylender 4 legection Timing Advanced PDTD2 - Cylender 4 legection Timing Advanced	PortDs - Cylinder 6 legicetion Timing Retarded PortDs - Cylinder 6 legicetion Timing Postancia PortDs - Cylinder 5 legicetion Timing Retarded PortDs - Cylinder 5 legicetion Timing Retarded PortDs - Cylinder 5 legicetion Timing Retarded PortDs - Cylinder 5 legicetion Timing Retarded	P01D6 - Cyloder 6 Ngetton Theirg Advanced P01D6 - Cyloder 6 Ngetton Theirg Advanced P01D4 - Cyloder 6 Ngetton Theirg	Po1D7 - Cylinder 7 Hyscion Timing Networks Po1D7 - Cylinder 7 Hyscion Timing Po1D8 - Cylinder 8 Hyscion Timing Resarded Po1D8 - Cylinder 6 Hyscion Timing Resarded Po1D9 - Cylinder 6 Hyscion Timing Resarded Po1D9 - Cylinder 6 Hyscion Timing Resarded Po1D9 - Cylinder 6 Hyscion Timing Resarded	POIDS - Cylinder 7 Ispecton Timing Advanced POIDS - Cylinder 7 Hystoin Timing Advanced POIDS - Cylinder 8 Hystoin Timing Advanced
Profits - Fueld's Bios Response Profits - Fueld's Bios Response Profits - Fuel Trans System Laura Profits - Fuel Trans System Rich Profits - Fuel Transportante Sensor To Constitute - Cons	P017- F-lat T-m System Later F102-B-VG-Steer Settlemane- Steer F102-B-VG-Steer Settlemane- Steer F102-B-VG-Steer Settlemane- Settlemane-Steer Settlemane- Settlemane-Steer Settlemane- P012-B-Cycleck T-Steer Settlemane- P012-B-Cycleck T-Steer Settlemane- P012-B-Cycleck T-Steer Settlemane- P012-B-Cycleck T-Steer Settlemane- P012-F-Steer Settlemane	19172 - Fuel Tim System Rich 19172 - Wol Smark Performance Brond Loc Rick 4 Series 1 19162 - NAS Series 7 19162 - NAS Series 7 19172 - Fuel Tim Performance Pril Co-Oxford 1 System Timing Advanced POLCO-Oxford 1 System Rich POLCO-Oxford 1 System Rich POLCO-Oxford 1 System Rich POLCO-Oxford 1 System Rich POLCO-Oxford 1 System Rich POLT2 - Fuel Tim System Rich POLT3 - Fuel Tim System Rich POLT3 - Cycledr 7 Spectro Timing POLT3 - Cycledr 7 Spectro Timing POLT3 - Fuel Tim System Rich POLT3 - Cycledr 7 Spectro Timing POLT3 - Cycledr 7 Spectro Timing	POICE - Hyroton Querthy Tou Low PorCD - Opticate 2 hyroton Transg Reserved POICE - Cyclede 2 hyroton Transg Reserved POICE - Cyclede 2 hyroton Transg Reserved POICE - Cyclede 1 hyroton Transg POICE - Cyclede 8 hyroton Transg POICE - Cyclede 1 hyroton Transg	PODED - Hypothen Guerrely Too High PODED - Hypothen Throng <u>Advanced</u> POTCE - Cylonder 2 Hypothen Throng <u>Advanced</u> POTCE - Cylonder 2 Hypothen Throng POTCE - Cylonder 1 Hypothen Throng POTCE - Cylonder 1 Hypothen Throng POTCE - Cylonder Begleton Throng	PTCD: AND Senser Performance- Simal Holin Back I Sensor 1     POTCP - Optimer 3 Reaction     POTCP - Optimer 3 Reactio	PHICE: NAD, Samer Performance- Sional Los Bark 1 Sereor 1     PHIDO: Option: Stream 1 Sereor 1     PHIDO: Option: Str	Po1D1 - Oylndur 4 hyscian Timing Retarded Po1D1 - Cylindur 4 hyscian Timing Retarded Po1CF - Cylindur 3 hyscian Timing Retarded	Po102 - Cylinder 4 tejection Triming Advanced Po102 - Cylinder 4 tejection Triming Advanced Po100 - Cylinder 3 tejection Triming Advanced	P103 - Cylinde 5 Nector Trining Resaded P0103 - Cylinde 5 Nector Trining Resarded P0101 - Cylinder 4 Nector Trining Resarded	P0104 - Cylinder 5 Nacional Timing Antorceat P0104 - Cylinder 5 Nacional Timing Antorceat P0102 - Cylinder 4 Nacional Timing Antorceat P0102 - Cylinder 4 Nacional Timing Antorceat P0102 - Cylinder 4 Nacional Timing Antorceat	PoTDS - Cylinder & Nacional Trining Betardad PoTDS - Cylinder & Spection Trining Betardad PoTDS - Cylinder & Injection Trining Restanded PoTDS - Cylinder & Injection Trining Restanded PoTDS - Cylinder & Spection Trining Restanded PoTDS - Cylinder & Spection Trining Restanded	P0106 - Cyledar & Isgotion Treing Adversed P0106 - Cyledar & Isgotion Treing Adversed P0104 - Cyledar & Isgotion Treing Adversed	POTD7 - Cyll-der 7 Najecton Timing Retarded POTD7 - Cyll-der 7 Najecton Timing Retarded POTD5 - Cyll-der 8 Najecton Timing Retarded	POIDs:         Optical: 7 Expection Timing Advanced
Profit - Public Service Response Profit - Public Service Response Profit - Public Response Lance Profit - Public Response Lance Profit - Public Response Response Profit - Public Response Response Profit - Public Response Response Profit - Public Response Profit - Concel Lance Profit - Concel Lance Response Profit - Concel Concel Profit - Spectral Control Concel	P017-Fear T-m System Later P1163-14-05 server Server 14:8 Beat 15 server 1-103-1405 Beat 16 serv	19172 - Fuel Tim System Rich 19172 - NG Smort Performance- Smort Los Biol 1 Series 1 19172 - NG Smort Performance- Biord Los Biol 1 Series 1 19173 - Ochder Biol 1 19175 - Ochder Biol 1 19175 - Ochder Biol 1 19175 - Ochder Biologian Rich 19172 - Fuel Tim System Rich	POSIC - Hyston Querthy Tou Lew PostCB - Optical 2 Repetion Timing Restander POTCB - Optical 2 Repetion Timing Restander POTCB - Optical 2 Repetion Timing Restander POTCB - Optical 1 Repton Timing Restander POTCB - Optical 1 Repton Timing POTCB - Optical 1 Repton Timing	POID - Hjecton Duertly Too High PoID - Cyclindr 2 Hajecton Timing Advanced POID - Cyclindr 2 Hajecton Timing Advanced POID - Cyclindr 1 Hajecton Timing POID - Cyclindr 8 Hajecon Timing	PF1CE: AND, Senser Performance- Simal Holm Back 1 Sensor 1     P01CE - Cylinder 3 Najection Timing Retarded     P01CE - Cylinder 3 Najection Timing P01CE - System Market You E Among P01CE - Cylinder 2 Najection Timing P01CE - Cylinder 2 Najection	PHICE - NUL Search Performance - Simulation Bink 1 Serear 1     PHIDD - Ophers 3 September 1     PHIDD - Ophers 3     PhIDD - Ophers     PhIDD - Ophers 3	PoTD1 - Cylinder 3 Nacion Timing Relateded PoTD1 - Cylinder 4 Nacion Timing Relateded PoTCF - Cylinder 3 Nacion Timing Relateded PoTCF - Cylinder 3 Nacion Timing PotCF - Cylinder 3 Nacion Timing Relateded PotCF - Cylinder 3 Nacion Timing Relateded	Po102 - Cylinder 4 Najesten Treing Advanced Po102 - Cylinder 4 Najesten Treing Advanced Po100 - Cylinder 3 Najesten Treing Advanced	P0103 - Cylindar 5 Najcolon Timing Besinitia           P0103 - Cylindar 4 Najcolon Timing Besinitia           P0101 - Cylindar 4 Najcolon Timing Besinitia	PPTD4 - Cylinder 5 lejacilion Timing Advances PPTD4 - Cylinder 5 lejacilion Timing Advances PPTD2 - Cylinder 4 lejacilion Timing Advances	Po1D5 - Cylinder & Hyscolon Timing Politicitie Po1D5 - Cylinder & Hyscolon Timing Betacided Po1D5 - Cylinder & Hyscolon Timing Retarded Po1D5 - Cylinder & Hyscolon Timing Po1D5 - Cylinder & Hyscolon Timing Retarded	P01De - Cyleder & Hajedion Timing Advanced P01De - Cyleder & Hajedion Timing Advanced	Po1D7 - Cylinder 7 Jejection Timing Besolder Po1D7 - Cylinder 7 Jejection Timing Besolded Po1D6 - Cylinder 8 Injection Timing Relation Po1D6 - Cylinder 8 Injection Timing Po1D6 - Cylinder 8 Injection Timing Po1D6 - Cylinder 6 Injection Timing Po1D6 - Cylinder 6 Injection Timing Besolded Po1D6 - Cylinder 6 Injection Timing Besolded	PIDB - Cylinder 7 Hydotan Treinig Advanced PIDB - Cylinder 7 Hydotan Treinig Advanced PIDB - Cylinder 8 Hydotan Treinig Advanced
Politik - HO23 Silva Response Politik - HO23 Silva Response Politik - HO23 Silva Response Politik - Ho23 Silva Response Politik - Ho24 Temperatura Sensor Politik - Fuel Temperatura Sensor Politik - Fuel Temperatura Sensor Politik - Fuel Temperatura Politik - Ho24 Temperatura Politik - Ho26	P017-1-Fall Tim System Late P102-1-02-See Performance- Binot High Bind X Second - Part High Bind X Second - Part High Bind X Second - P102-02-02-02-02-02-02-02-02-02-02-02-02-0	19172 - Fuel Ten System Rich 19172 - Wol Sweet Performance Brand Loc Table At Sensor 1 19162 - Not Sweet Performance 19162 - Not Sweet Performance 19163 - Oxford Performance 19163 - Oxford Performance 19164 - Oxford Performance 19164 - Oxford Performance 19172 - Fuel Ten System Rich 19172 - Fuel Ten System Rich 19173 - Fuel	POSE - Hyroton Owendy Too Low PortCo - Cylecker 2 Rejection Transg Research POTCO - Cylecker 2 Rejection Transg Research POTCO - Cylecker 1 Rejection Transg Research POTCO - Cylecker 1 Rejection Transg POTCO - Cylecker 1 Rejection Transg	PO2ED - Rection Querty Too High PO2ED - Rection Querty Too High Advanced PO2EC - Cylinder 1 Najection Timing Advanced PO2EC - Cylinder 1 Najection Timing PO2EC - Cylinder 1 Najection Timing Advanced PO2EC - Cylinder 1 Najection Timing PO2EC - Cyli	PF1CB: NOU Searce Performance- Simal Holm Bark L Service 1     P01CF - Cylinder 3 Injection Timing Restances     P01CF - Cylinder 3 Injection Timing Restances     P01CF - Cylinder 3 Injection Timing Restances     P01CF - Cylinder 3 Payestein Timing Restances     Restances     P01CF - Cylinder 3 Payestein Timing Restances     P01CF - Cylinder 3 Payestein Timing Restances     Restances	PHIC:: NUL Search Performance - Sincel Long Bank 1 Serrico 1     Philippi - Cylinder 3 legicilion Timing <u>Advanced</u> Philippi - Cylinder 2 legicilion Timing <u>Advanced</u> Philippi - Cylinde	Po1D1 - Cylinder & Hjoction Timing Patender Po1D1 - Cylinder & Hjoction Timing Betander Po1CF - Cylinder & Hjoction Timing Betander Po1CF - Cylinder & Hjoction Timing Retarded Po1CF - Cylinder & Hjoction Timing Retarded Po1CF - Cylinder & Hjoction Timing Retarded Po1CF - Cylinder & Hjoction Timing Retarded	Po1D2 - Cyleder 4 Naccion Timing Advanced Po1D2 - Cyleder 4 Naccion Timing Advanced Po1D0 - Cyleder 3 Naccion Timing Advanced	P01D3 - Cylinder & Najection Timing P01D3 - Cylinder & Najection Timing P01D3 - Cylinder & Najection Timing P01D1 - Cylinder & Najection Timing Resarded P01D1 - Cylinder & Najection Timing Resarded	POTD4 - Cylinder 5 legicilion Timing Advanced POTD4 - Cylinder 5 legicilion Timing Advanced POTD2 - Cylinder 4 legicilion Timing Advanced	PortDs - Cylinder 6 legedion Timmp Peterded PortDs - Cylinder 6 legedion Timmp Peterded PortDs - Cylinder 5 legedion Timmg Betarded PortDs - Cylinder 5 legedion Timmg Retarded PortDs - Cylinder 5 legedion Timmg Retarded	P01D6 - Cyleder 6 legetion Timing Advanced P01D6 - Cyleder 6 legetion Timing Advanced P01D4 - Cyleder 5 legetion Timing Advanced	Po1D7 - Cylinder 7 Ingection Timing Reservice Po1D7 - Cylinder 7 Ingection Timing Po1D7 - Cylinder 6 Ingection Timing Reservice Po1D5 - Cylinder 6 Ingection Timing Reservice	POIDS - Cylinder Y Ispecton Timing Advanced POIDS - Cylinder Y Hyscion Timing Advanced POIDS - Cylinder & Hyscion Timing Advanced
Politik - Holds Skow Response Politik - Holds Skow Response Politik - Holds Skow Response Politik - Holds Teles Skow Holds - Holds - Holds - Holds - Holds - Holds - Holds - Holds - Holds - Fuel Teleparature Skow Holds - Fuel Teleparature Skow Holds - Hold Teleparature Skow Holds - Holds - Holds - Holds - Holds - Holds - Holds - Holds - Hold	P017-1-Fall T/m System Later           P1163-14-OS server           F1163-14-OS server           F1163-14-OS server           F1163-14-OS server           F1163-14-OS server           F1163-14-OS server           F1161-14-OS server           F1161-14-OS server           F1161-14-OS server           F1161-14-OS server           F1161-14-14-14-14-14-14-14-14-14-14-14-14-14	19172 - Fuel Tim System Rich 19172 - Wild Smart Performance Brief C- Wild Smart Performance 19172 - Wild Smart Performance 19172 - Fuel Tim System Rich 19172 - Gyldet 1 Species Timing Advanced 19172 - Fuel Tim System Rich 19172 - Fuel Tim System Rich 19103 - Gylder 7 Spector Timing Advanced 19172 - Fuel Tim System Rich 19103 - Gylder 7 Spector Timing 19172 - Fuel Tim System Rich 19103 - Gylder 7 Spector Timing 19172 - Fuel Tim System Rich 19103 - Gylder 7 Spector Timing 19172 - Fuel Tim System Rich 19103 - Gylder 7 Spector Timing 19172 - Fuel Tim System Rich 19172 - Fuel Tim System Rich 19172 - Fuel Tim System Rich 19172 - Fuel Tim System Rich	POTEC - Hysten Owenty Tou Lee PoTEC - Sylecton Terring Reserved POTEC - Cyclede 2 Payeton Terring Reserved POTEC - Cyclede 2 Payeton Terring Reserved POTEC - Cyclede 2 Payeton Terring POTEC - Cyclede 2 Payeton Terring Reserved POTEC - Cyclede 2 Payeton Terring PotEC - Cyclede 7 Payeton Terring	PODE - Hypoten Duenty Too Hyp. PODE - Hypoten Duenty Too Hyp. PODE - Cycled 2 Payetion Timing <u>Advanced</u> PODE - Cycled 2 Payetion Timing <u>Advanced</u> PODE - Cycled 2 Payetion Timing PODE - Cycled 8 Payetion Timing PODE - Cycled 7 Payetion Timing	PTCD: NOL Search Performance Simal Holm Back 1 Second 1 POTCP: Opt-dec 3 Second 1 POTCP: Opt-dec	PHICE - Nous Search Performance - Simultice Bink 1 Serear 1     PHIDE - Opherker 3 Separation Timing <u>Advanced</u> PHIDE - Opherker 3 Separation Timi	PoTD1 - Oylinder 4 Spection Timing Retarded PoTD1 - Oylinder 4 Spection Timing Retarded PoTCF - Oylinder 3 Spection Timing	Po102 - Cylinder 4 tejection Treing       Advanced       Po102 - Cylinder 4 tejection Treing       Advanced       Po100 - Cylinder 3 tejection Treing	P113 - Cylinde 5 Nector Timig Bearload           P113 - Cylinder 5 Nector Timig Bearload           P110 - Cylinder 4 Nector Timig Bearload	P01D4 - Cylender 5 lajocilon Timing Activities of the species Timing Advanced P01D2 - Cylender 4 lajocilon Timing Advanced	PortDa - Cylindur & Sejacidon Timing <u>Betandea</u> PortDa - Cylindur & Sejacidon Timing <u>Betandea</u>	P01D6 - Oyleder & legicition Treing Advances           P01D8 - Oyleder & legicition Treing Advanced           P01D4 - Oyleder & legicition Treing Advanced	P01D7 - Cylleder 7 Naciolar Timing Betaclad           P01D7 - Cylleder 7 Spectical Timing Betaclad           P01D7 - Cylleder 7 Spectical Timing Betaclad           P01D5 - Cylleder 6 Naciolar Timing Betaclad           P01D5 - Cylleder 6 Naciona Timing Betaclade           P01D5 - Cylleder 6 Naciona Timing Betaclade	PDDB:         Opfider 7 hysician Timing Adapted           PDDB:         Opfider 7 hysician Timing Adapted           PDDB:         Opfider 7 hysician Timing Adapted           PDDB:         Opfider 8 hysician Timing Adapted
Policit - Hold's Base Response Policit - Fund States Response Policit - Fund Trans System Rich Policit - Card Trans System Rich Policit - Card Trans System Rich Policit - Fund Transpostance Sensor 1 - Card Law Policit - Fund Transpostance Sensor Policit - Fund Transpostance Sensor Policit - Fund Transpostance Sensor Card Law Policit - Expector 1 Cardrol Card Policit - Fund Transpost Policit - Fund Transpost Policit - Law Policit - Cardrol Card Policit - Law Control Card Policit	P0171-Fall Tim System Later P11G3-140, See References P11G3-140, See References P11G3-140, See References P11G3-140, See References P11G3-140, See References P1111-Fall References P111-Fall References	19172 - Fuel Tim System Rich. 19172 - NG Smort Performance- tion of the Rich Series 1 19172 - NG Smort Performance- Barolica Biol 1 Series 1 19172 - Oxford B Species Thirds Partic - Oxford B Species Thirds Adarcad Politic - Oxford B Species Thirds Politic - Oxford B Species Thirds P	POSE - Hystein Quartity Tou Lee PostCB - Cylinder 2 Hystein Timing Resards POTCD - Cylinder 2 Hystein Timing Resards POTCB - Cylinder 1 Hystein Timing POTCB - Cylinder 1 Hystein Timing POTCB - Cylinder 1 Hystein Timing POTCB - Cylinder 1 Hystein Timing Resards POTCB - Cylinder 1 Hystein Timing POTCB - Cylinder 1 Hystein Timing	POID - Recton Duenty Too High POID - Conder 2 teactor Timing Advanced POID - Conder 2 teactor Timing Advanced POID - Conder 2 teactor Timing POID - Conder 1 teactor Timing	PF1CB: AND, Senser Performance Simal Holin Bark I Sensor 1     PP1CF: Cylinde 3 Najection Timing Retarded     PP1CF: Cylinde 3 Najection Timing Retarded     PP1CF: Cylinder 3 Najection Timing Retarded     P1CF: Cylinder 3 Najection Timing Najection Timing Retarded     P1CF: Cylinder 3 Najection Timing Najection Timi	PHICE - NULL Search Performance - Simulation Bink 1 Serear 1     PHIDD - Ophick 3 Najeston Timing <u>Advanced</u> PHIDE - Ophick 2 Najeston Timing <u>Advanced</u> PHIDE - PHIDE - PHIDE - PH	Po1D1 - Cylinder 3 Nection Timing Betaclad Po1D1 - Cylinder 4 Spection Timing Betaclad Po1CF - Cylinder 3 Nection Timing Retaclad Po1CF - Cylinder 3 Nection Timing Retaclad Po1CF - Cylinder 3 Nection Timing Po1CF - Cylinder 3 Nection Timing Betaclad	Po102 - Cylinder 4 Sigection Treing Advanced Po102 - Cylinder 4 Sigection Treing Advanced Po100 - Cylinder 3 Sigection Treing Advanced	P1103 - Cylinder & Hyscion Timing Resisted P1103 - Cylinder & Systemon Timing Beacted P1101 - Cylinder & Hyscion Timing Beacted P1101 - Cylinder & Hyscion Timing Resisted P1101 - Cylinder & Hyscion Timing Resisted	P01D4 - Cylinder 5 lejicdion Timing Advanced P01D4 - Cylinder 5 lejicdion Timing Advanced P01D2 - Cylinder 4 lejicdion Timing Advanced	PortDs - Cylinder & Rejection Timing Reservices PortDs - Cylinder & Rejection Timing Besizedes PortDa - Cylinder & Rejection Timing Reservices PortDa - Cylinder & Rejection Timing Reservices	P01D6 - Cyleder 6 legedon Treing Adacced P01D6 - Cyleder 6 legedon Treing Adacced P01D4 - Cyleder 6 legedon Treing Adacced	Po1D7 - Cylleder 7 Hyscolon Timing Po1D7 - Cylleder 7 Hyscolon Belanded Po1D5 - Cylleder 7 Hyscolon Timing Belanded Po1D5 - Cylleder 8 Hyscolon Timing Resided Po1D5 - Cylleder 8 Hyscolon Timing Resided	PDDB - Cylinder 7 hijection Thering Advanced       PDDB - Cylinder 7 hijection Thering Advanced       PDDB - Cylinder 6 hijection Thering Advanced
P0161:-P1023 Silva Response P0172: - Full Tree System Rain P0172: - Full Tree System Rain P0172: - Full Tree System Rain P0172: - Full Treependure Sensor P0173: - Full Sensor P0173: - Full Sensor P0173: - Full Treependure P0174: - Full Treependure P0175: - Full Sensor P0175: - Full Senso	P017-F.ell Tim System Lase P102-3-05 Sees Performance- Band High Back Userson Final High Back Userson Final High Back P102-5 Cycles 1 Sees 1 P102-5 Cycles 1 Sees 1 P102-5 Cycles 2 Sees 1 P102-5 Cycles 2 Sees 1 P103-7 Sees	19172 - Fuel Tim System Rich 19172 - Wol Smark Performance Smark (1976 - Wol Smark Performance) 19102 - Nol Server Performance) 19102 - Oxford F Homoson Perform State (1976) 19103 - Oxford F Homoson 19103 - Oxford F Homoson 19113 - Oxford F Hom	POIRC - Hyroton Owendy Too Low PortCD - Ophidae 2 Tapeston Training Resided POICD - Ophidae 2 Tapeston Training Resided POICD - Ophidae 1 Specton Training Resided POICD - Ophidae 1 Specton Training POICD - Ophidae 1 Specton Training	POSED - Hjocken Guerdy Too High POSED - Hjocken Throng Advanced POSEC - Cylonic 2 Hypoten Timing Advanced POSEC - Cylonic 1 Hypoten Timing POSEC - Cylonic 1 Hypoten Timing	PTCE: NOL Searce Performance     Simal Helm Back 1 Second 1     PPICE: Polycelex 3 Repetion Training     Betacket     PPICE: Cyclede 3 Repetion Training     Betacket     PPICE: Cyclede 3 Repetion Training     Betacket     POLO: Cyclede 2 Repetion Training     Betacket     POLO: Cyclede 2 Repetion Training     Researchet     POLO: Cyclede 2 Rep	PHIC: Nub. Same: Performance- Simal loss Birck 1 Serenz 1     PHID: Optimized Serenz 1     PHID: O	Po1D1 - Cylinder 4 hyccleon Triming <u>Retarcleon</u> Po1D1 - Cylinder 4 hyccleon Triming <u>Retarcleon</u> Po1D7 - Cylinder 3 hyccleon Triming <u>Retarcleon</u>	Po102 - Cylinder 4 Vajection Timing <u>Advanced</u> Po102 - Cylinder 4 Vajection Timing <u>Advanced</u> Po100 - Cylinder 3 Vajection Timing <u>Advanced</u>	P0103 - Cylindia 5 Najection Timing Recordsd           P0103 - Cylindia 5 Najection Timing Beacted           P0103 - Cylindia 4 Najection Timing Beacted           P0101 - Cylindia 4 Najection Timing Beacted	P01D4 - Cythdar 5 Ngodon Timing Advanced P01D4 - Cythdar 5 Ngodon Timing Advanced P01D2 - Cythdar 4 Ngodon Timing Advanced	PoTDS - Cylinder & Nacional Training Retarclast PoTDS - Cylinder & Expection Training Retarclast PoTDS - Cylinder & Spipcion Training Retarclast	P01D6 - Cyleder 6 legetlan Tinteg Advanced P01D6 - Cyleder 6 legetlan Tinteg Educated P01D4 - Cyleder 5 legetlan Tinteg Advanced P01D4 - Cyleder 5 legetlan Tinteg	PoTD7 - Cylinder 7 tejection Timing Recardiad PoTD7 - Cylinder 7 tejection Timing Recardiad PoTD5 - Cylinder 6 tejection Timing Recardiad	POIDE - Cylinder 7 Elyscian Timing Advanced       POIDE - Cylinder 7 Elyscian Timing Advanced       POIDE - Cylinder 8 Elyscian Timing Advanced       POIDE - Cylinder 6 Elyscian Timing Advanced
PD162 - H2023 Silve Response PD172 - Fait Table System Laure PD172 - Fait Table System Rich PD172 - Fait Table System Rich PD172 - Fait Table System Rich PD172 - Fait Table System Rich PD173 - Fait Table System Rich PD173 - Fait Table System Rich PD174 - Fait Table System PD175 - F	P017-F. Feal T /m System Laser           P1163-HO.Steward           F1163-HO.Steward           Steward           F1163-HO.Steward           Steward	19172 - Fuel Tim System Rich 19172 - NG Smort Performance Band Los Back 1 Sensol 19172 - NG Smort Performance Bard Los Back 1 Sensol 19173 - Johnson Hannesson Bard Los Back 1 Sensol 19175 - Johnson Hannesson Adarcad POTZ - Fuel Tim System Rich POTZ - Fuel Tim System	POSE - Hjecton Quertij Tou Lee Postel- Besteld PortCD - Oyl-de Z Pajecton Timing Resorted PortCD - Oyl-de Z Pajecton Timing Resorted PortCD - Oyl-de Z Pajecton Timing PortCD - Oyl-de Z Pajecon Timing Page-Oyl-de Z Pajecon Timing PortCD - Oyl-de Z Pajecon Timing Page-Oyl-de Z Pajecon Timing PortCD - Oyl-de Z Pajecon Timing PortCD - Oyl-de Z Pajecon Timing Page-Oyl-De Z Pajecon Timing Page-Oyl-De Z Pajecon Timing Page-Oyl-De Z Pajecon Timing Page-Oyl-De Timing Pajecon Timing Pajecon Pajecon Timing Pajecon Pajecon Timing Page-Oyl-De Timing Pajecon Timing Page-Oyl-De Timing Pajecon Timing Pajecon Pajecon Timing Pajecon Pajecon Timing Pajecon Pajecon Timing Pajecon Pajecon Timing Pajecon Pajecon Timing Pajecon Pajecon Paje	POID - Hector Duerty Too High PoID - Conder 2 Spector Timing Advanced POID - Cylinder 2 Spector Timing Advanced POID - Cylinder 2 Spector Timing POID - Cylinder 1 Spector Timing	PFICE: AND, Senser Performance - Simal Holm Bark I Sensor 1     POTCE - Cylinder 3 Najection Timing Retarded     POTCE - Cylinder 3 Najecti	PHICE - NULL Searce Performance - Simulation Bink 1 Series 1     PHIDE - Ophicks 3 Separation Timing <u>Advanced</u> PHIDE - Ophicks 3 Separation Timing <u>Advanced</u> PHIDE - Ophicks 3 Separation Timing <u>Advanced</u> PHIDE - Ophicks 2 Separation Tim	PoTCF - Cylender 3 kyceton Timing Retacted PoTCF - Cylender 3 kyceton Timing Retacted	Po1D2 - Cylinder 3 Nacional Training Advanced Po1D2 - Cylinder 3 Nacional Training Advanced Po1D0 - Cylinder 3 Nacional Training Advanced	P01D3 - Cylinde 3 bijetion Timing Beander           P01D3 - Cylinde 4 bijetion Timing Beander           P01D1 - Cylinde 4 bijetion Timing Beander	PPTD4 - Cylender 5 lajoclion Timing Advanced PPTD2 - Cylender 5 lajoclion Timing Advanced PPTD2 - Cylender 4 lajoclion Timing Advanced	PortD3 - Cylinder & Rejection Timing PortD3 - Cylinder & Rejection Timing <u>Betarchiol</u> PortD3 - Cylinder & Spection Timing <u>Betarchiol</u>	P1DE - Oyledar E Rejection Treing Adveced P1DE - Oyledar E Rejection Treing Adveced	POID7 - Cyledur 7 Isjection Timing Beander POID7 - Cyledur 7 Isjection Timing Beander POID5 - Cyledur 6 Isjection Timing Relative POID5 - Cyledur 6 Isjection Timing Relative POID5 - Cyledur 6 Isjection Timing Beander POID5 - Cyledur 6 Isjection Timing Beander	PDDB - Oylvar P hysician Timing Addressed PDDB - Oylvar P hysician Timing Addressed
Profits - Fub23 Silva Response Profits - Fub23 Silva Response Profits - Fub23 Silva Response Profits - Fub2 Tempsohana Senso Profits - Fub2 Tempsohana Senso Profits - Fub2 Tempsohana Senso Profits - Fub2 Tempsohana Profits - F	P017-F. Fall T Im System Later P11G-3 H-OC Seeres Professional- Enterthing Back Visional - Ford H-OC Professional - Seres H-Discourse - P11G-3 C-Order 1 Sector - P11G-3 C-Order	19172 - Fuel Ten System Rich 19172 - Wild Sweet Performance Senal Loc Table Start 19102 - Wild Sweet Performance 19102 - Not Sweet Performance 19103 - Oxford Performance 19103 - Oxford Performance 19103 - Oxford Performance 19103 - Oxford Performance 19102 - Oxford Performance 19103 - Oxford Perform	POSE - Hystein Quartity Too Lee PortCa - Cylinder 2 Hayeton Triming Restricts POTCa - Cylinder 2 Hayeton Triming Restricts POTCa - Cylinder 2 Hystein Triming PortCa - Cylinder 1 Hystein Triming POTCa - Cylinder 8 Hystein Triming	POID - Recton Duerty Too High POID - Specton Duerty Too High Advanced POID - Cylinder 2 typecton Timing Advanced POID - Cylinder 2 typecton Timing POID - Cylinder 2 typecton Timing POID - Cylinder 1 typecton Timing POID - Cylinder 8 typecon Timing	PFICE: AND, Senser Performance Simal Holin Bark I Sensor 1     PRICE: Cylinde 3 higkstonia PRICE: Cylinde 3 hightstonia PRICE: Cylinde 3 hightstoni	PHICE - Nuclei Server Performance - Simul Loss Bank 1 Server 1     PHIDE - Optical 2 Server 1     PHIDE - Optical	Po1D1 - Cylindur & Yajection Timing Betanded Po1D1 - Cylindur & Yajection Timing Betanded Po1CF - Cylindur 3 Spection Timing Relateded Po1CF - Cylindur 3 Spection Timing	Po102 - Cyleder & Ngection Treing Advances Po102 - Cyleder & Ngection Treing Advanced Po100 - Cyleder 3 Ngection Treing Advanced	P11D3 - Cylinder 5 Hysciton Timing P11D3 - Cylinder 5 Hysciton Timing Biologia P11D3 - Cylinder 5 Hysciton Timing Biologia P11D1 - Cylinder 4 Hysciton Timing P11D1 - Cylinder 4 Hysciton Timing	P01D4 - Cylender 5 lejection Timing Advanced P01D4 - Cylender 5 lejection Timing Advanced P01D2 - Cylender 4 lejection Timing Advanced	PotDs - Cylinder 6 legicelon Timing Reserved PotDs - Cylinder 6 legicelon Timing PotDs - Cylinder 6 legicelon Timing Reserved PotDs - Cylinder 5 legicelon Timing	P01D4 - Cyleder E Ngetton Treing <u>Adversed</u> P01D4 - Cyleder E Ngetton Treing <u>Adversed</u>	Po1D7 - Cylleder 7 Hysclon Timing Postode Po1D7 - Cylleder 7 Hysclon Timing Beanded Po1D5 - Cylleder 5 Hysclon Timing Beanded Po1D5 - Cylleder 6 Hysclon Timing Restoled Po1D5 - Cylleder 6 Hysclon Timing Po1D5 - Cylleder 6 Hysclon Timing	POIDS - Cylinder Y Isjacion Timing Advanced POIDS - Cylinder Y Isjacion Timing Advanced POIDS - Cylinder & Isjacion Timing Advanced
Profit - Profit S Since Response Profit - Fund S Since Response Profit - Fund S Since Response Profit - Fund Trans System Rich Profit - Fund Trans System Rich Profit - Fund Trans System Rich Profit - Fund Transportance Stream Profit - Fund Transportance Profit - Fund Transportance Profit - Fund Transport Profit - Fund Transport Profi	P017- F.ell Tim System Later P102-3-05 General Performance- Band High Back Series 1 P102-3-05 General Performance- Band High Back Series 1 P102-05 Cynder 1 Signation Trimp Backdod P101-5-Cynder 1 Signation Trimp P102-05 Cynder 1 Signation Trimp P102-05 Cynder 1 Signation Trimp P102-05 Cynder 1 Signation P1011-5-6 Backdod P1011-5-6 Backdod P1011-5-8 Backdod P	19172 - Fual Tim System Rich 19172 - Wol Smark Performance- Smark Loc Rick 4 Series 1 19102 - Wol Smark Performance- 19102 - Wold Berger Performance- 19102 - Oxford 1 System Rich POLC - Divers 1 System Rich POLC	POICE - Hyston Ownethy Too Low POICE - Cyclede 2 Specton Transg Resorted POICE - Cyclede 3 Specton Transg Resorted POICE - Cyclede 3 Specton Transg Resorted POICE - Cyclede 3 Specton Transg Resorted POICE - Cyclede 1 Specton Transg Resorted Resorted Specton Transg Resorted Resorted Specton Transg Resorted POICE - Cyclede 1 Specton Transg Resorted POICE - Cyclede 1 Specton Transg Resorted Resorted Resona Transg Resorted Resona Transg R	PODE - Hecter Querty Too High PODE - Hecter Querty Too High PODE - Cyclick 2 Newton Timing Advanced POTCE - Cyclick 2 Newton Timing POTCE - Cyclick 2 Newton Timing POTCE - Cyclick 1 Newton Timing POTCE - POTCE - POTCE POTCE POTCE - POTCE POTCE POTCE POTCE	PITCE - NOUS Senser Performance Simal Holm Back 1 Sensor 1     PITCE - Opherics 3 Impedian Timing Betanded     PITCE - Opherics 3 Impedian Timing PITCE - Opherics 2 Impedian Time PITCE - Op	PHICE: NAD, Samuel Performance - Simultices Birch 1 Series 1     PHIDE: Opherics 3 legislation 1 Immig Advanced     PHIDE: Opherics 3 legislation 1 Immig PHIDE: Opherics 3 legislation 1 Immig PHIDE: Opherics 2 legislation 1 Immig PHIDE: PHIDE: PHIDE: PHIDE:	P01D1 - Oylndur 4 Spection Timing Retarched           P01D1 - Cylleder 4 Spection Timing Retarched           P01D2 - Cylleder 4 Spection Timing Retarched           P01D2 - Cylleder 3 Spection Timing Retarched	Po102 - Cylinder 4 tejection Timing Advanced       Po102 - Cylinder 4 tejection Timing Advanced       Po100 - Cylinder 3 tejection Timing Advanced	P113 - Cylinde 5 Nacion Timing Readed     P113 - Cylinder 5 Nacion     P113 - Cylinder 5 Nacion     P113 - Cylinder 4 Nacion Timing     Readed     P115 - Cylinder 4 Nacion     Timing     Readed     P115 - Cylinder 4 Nacion     Timing     Readed     P115 - Cylinder 4 Nacion     Timing     Readed     P115 - Cylinder 4 Nacion     Timing     Readed     P115 - Cylinder 4 Nacion     Timing     Readed     P115 - Cylinder 4 Nacion     Timing     Readed	P01D4 - Cylinder 5 lejection Timing Advanced P01D4 - Cylinder 5 lejection Timing Advanced P01D2 - Cylinder 4 lejection Timing Advanced	PortDa - Cylindur & Najación Triming Betarcibia PortDa - Cylindur & Najación Triming Betarcibia	P01D6 - Cyleder & legiciton Treing Advances           P01D6 - Cyleder & legiciton Treing Advanced           P01D6 - Cyleder & legiciton Treing Advanced           P01D4 - Cyleder & legiciton Treing Advanced	Po1D2 - Cylinder 7 Najecton Timing Related Po1D2 - Cylinder 7 Najecton Timing Related Po1D3 - Cylinder 8 Injecton Timing Related Po1D5 - Cylinder 6 Injecton Timing Related	POIDE         Ophilar 7 Eyection Timing Address           POIDE         Ophilar 7 Eyection Timing Address           POIDE         Ophilar 6 Species Timing Address
Politik - Hold Silva Response Politik - Hold Silva Response Politik - Hold Silva Response Politik - Hold Trans System Rich Politik - And Trans System Rich Politik - And Transpositura Sensor I - Constant Silva Politik - And Transpositura Sensor I - Constant Silva Politik - And Transpositura Sensor I - Constant Silva Politik - And Transpositura Politik - And Transpositura Sensor Constant Sensor Politik - And Transpositura Politik - And Transpositura Sensor Constant Sensor Politik - And Transpositura Politik - And Transpositura Polit	P0171-Fall Tim System Later P1028-140, See Professional P1028-140, See Professional P1028-04 (See Professional P1028) P1028-04 (See P1028) P1029-04 (	19172 - Fuel Tim System Rich 19172 - NG Smort Performance- Smort Core Risk Stream 19172 - NG Smort Performance- Barriel Los Biot X Smort 1 19172 - Net Smort 2 19172 - Stream Stream 19172 - Ochdard E Specton Timing Adarcad POTZ - Fuel Tim System Rich POTZ - Fuel Tim S	POSIC - Hysten Quartity Tou Lew PostCB - Optical 2 Systems Timing Restands POTCD - Optical 2 Systems Timing Restands POTCB - Optical 2 Systems Timing Restands POTCB - Optical 2 Systems Timing POTCB - Optical 2 Systems Timing POTCB - Optical 1 Systems Timing POTCB	POID - Hjecton Duerity Too High PoID - Coledar 2 tayston Timing Advanced POID - Coledar 2 tayston Timing Advanced POID - Coledar 2 tayston Timing Advanced POID - Coledar 1 tayston Timing POID - Coledar 1 tayston Timing	PFICE: AND, Senser Performance - Simal Heim Back I Sensor 1     POTCE - Cylinder 3 Najection Timing Retarded     POTCE - System Timing Retarded     POTCE - Cylinder 3 Najection Timing Retarded     POTCE - C	PHICE - NULL Search Performance - Simulation Bink 1 Service 1     PHIDD - Ophers 3 September 1     PHIDD - Ophers 3     PHIDD - Ophers	POTD1 - Cylinder 3 Najection Timing Retached POTD1 - Cylinder 3 Najection Timing Retached POTCF - Cylinder 3 Najection Timing Retached POTCF - Cylinder 3 Najection Timing POTCF - Cylinder 3 Najection Timing Retached POTCF - Cylinder 3 Najection Timing Retached	Po102 - Cyleder 3 lejection Treing Advanced Po102 - Cyleder 3 lejection Treing Advanced Po100 - Cyleder 3 lejection Treing Advanced	P01D3 - Cylinder 5 Najoclion Timing Besinities           P01D3 - Cylinder 4 Najoclion Timing Besinities           P01D1 - Cylinder 4 Najoclion Timing Besinities	PPTD4 - Cylinder 5 lejection Timing Advanced PPTD4 - Cylinder 5 lejection Timing Advanced PPTD2 - Cylinder 4 lejection Timing Advanced	Po1Ds - Cylinder & Hyscolon Timing Potototo Po1Ds - Cylinder & Hyscolon Timing Betacided Po1Ds - Cylinder & Hyscolon Timing Relateded Po1Ds - Cylinder & Hyscolon Timing Relateded	P01De - Cyledar 6 legicdion Timing Advanced P01De - Cyledar 6 legicdion Timing Advanced	POID7 - Cylinder 7 Jejection Timing Besolder POID7 - Cylinder 7 Jejection Timing Besolder POID5 - Cylinder 6 Injection Timing Besolder POID5 - Cylinder 6 Injection Timing Pointer 6 Spection Timing Pointer 6 Spection Timing Besolder POID5 - Cylinder 6 Injection Timing Besolder	PIDB - Cylinder 7 Hydotin Theirig Advanced PIDB - Cylinder 7 Hydotin Theirig Advanced PIDB - Cylinder 7 Hydotin Theirig Advanced PIDB - Cylinder 8 Hydoin Theirig Advanced
Politik - Holds Sko Response Politik - Holds Sko Response Politik - Holds Sko Response Politik - Hold The System Rich Politik - And Temperature Sensor Politik - Full Temperature Sensor Politik - Full Temperature Sensor Politik - Full Temperature Sensor Politik - Full Temperature Politik - Full Temper	P017-F.ell Tim System Late P102-3-05 Sees Performance- Enter 1045 Bits All Sees C1 Final Clash All Sees C1 Final Clash All Sees C1 P102-5 Cyclesh 2 Segment Training P102-5 Cyclesh 2 Seg	19172 - Fuel Ten System Rich 19172 - Wol Smark Performance Smark (1996) - 1917 - 1917 19162 - 1905 Second Performance 19162 - 1905 Second Performance 19162 - 1906 Second Performance 19162 - 094det 1 Specific Timing 19163 - 094det 1 Specific Timing 19164 - 094det 1 Specific Timing 19164 - 094det 1 Specific Timing 19164 - 094det 1 Specific Timing 19172 - Fuel Ten System Rich 19173 - Fuel Ten System Rich 19174 - Fuel Ten System Rich 19175 -	POSEC - Hjecton Duerdy Too Low PortCD - Opticate 2 Tapeston Transg Resided POTCD - Opticate 2 Tapeston Transg Resided POTCD - Opticate 3 Spectro Transg Resided POTCD - Opticate 3 Spectro Transg PotCD - Opticate 3 Spectro PotCD - Opticate 3 Spectro PotCD - Opticate 1 Spectro PotCD - Opticate	POSED - Hjochen Guerdy Too High POSED - Hjochen Street, Stree	PTCE: NOL Searce Performance- Simal Hein Back 1 Service 1     PPICE: A Dispetition Transg Betachel     PPICE: Cylinder 3 Payection Transg Betachel     PPICE: Dispetition Transg PPICE: DispetPICE: DispetPICE: DispetPICE: DispetPICE: DispetPICE: DispetPICE	PTIC: NUD. Samer Performance- Simal Los Bark 1 Sereor 1     PTID: - Optical Sereor 1     PTID: - Optical Separation Transg <u>Advanced     PTID: - Optical Separation Transg     <u>Advanced     PTID: - Optical Separation Transg     <u>Advanced     PTID: - Optical Separation Transg     <u>Advanced     PTID: - Optical Separation     PTID: - Optical     PTID: - Optical   </u></u></u></u>	Po1D1 - Cylinder 4 Spection Timerg <u>Retarded</u> Po1D1 - Cylinder 4 Spection Timerg <u>Retarded</u> Po1D7 - Cylinder 3 Spection Timerg <u>Retarded</u>	P1102 - Cylinder 4 Vajection Timing <u>Advanced</u> P0102 - Cylinder 4 Vajection Timing <u>Advanced</u> P0100 - Cylinder 3 Vajection Timing <u>Advanced</u>	P0103 - Cylinde 5 Najecton Timing Reanded       P0103 - Cylinde 5 Najecton Timing Beanted       P0101 - Cylinder 4 Najecton Timing Beanted       P0101 - Cylinder 4 Najecton Timing Reanted	PPID4 - Cylinder Stejection Timing Advanced PPID4 - Cylinder Stejection Timing Advanced PPID2 - Cylinder 4 bejection Timing Advanced	PortD3 - Cylinder 6 legicetion Timing Peterdad PortD3 - Cylinder 6 legicetion Timing Paterdad PortD3 - Cylinder 6 legicetion Timing <u>Restanded</u> PortD3 - Cylinder 6 legicetion Timing <u>Restanded</u>	P11D6 - Cyloder 6 Ngetton Thring Advanced P11D6 - Cyloder 6 Ngetton Thring Advanced P11D4 - Cyloder 6 Ngetton Thring Advanced	PoTD7 - Cylinder 7 Najecton Timing Retarded PoTD7 - Cylinder 7 Papeton Timing Retarded PoTD5 - Cylinder 6 Najecton Timing Retarded	POIDs - Oylear 7 System Trining Advanced       POIDs - Oylear 8 System Trining Advanced
Profits - HoldS Silva Response Profits - HoldS Silva Response Profits - Fast Trans Spream Laura Profits - Fast Trans Spream Laura Profits - Fast Transportante Sensor - International Transportante Sensor - International Transportante Sensor - International Transportante Sensor - International Transportante Profits - Fast Transportante Sensor - International Transportante Profits - Fast Transportante - Sensor Const Heart - North - Heart Transportante - Sensor Const Heart - North - Heart - Heart - North - Heart - Const Heart - North - Heart - Heart - Heart - North - Heart - Heart - Heart - North - Heart - Heart - Heart - North - Heart - Heart	P017-1-Fall Tim System Later FIG3-1-0C Sector Sect	19172 - Fuel Tim System Rich 19172 - NG Smart Performance Brond Loc Biest V Serect 1 19172 - NG Smart Performance 19172 - Coldwell V Serect 1 19172 - Gyddel T Species Time Adversed 19172 - Gyddel T Species Time Adversed 19172 - Fuel Tim System Rich 19172 - Fuel Tim	POICE - Hysolan Quartity Tou Law PoiCE - Syladar 2 Nysolan Terring Resarded PoiCE - Cyladar 2 Nysolan Terring Resarded PoiCE - Cyladar 2 Nysolan Terring PoiCE - Cyladar 2 Nysolan Terring PoiCE - Cyladar 8 Sysolan Terring	Potto - Hecter Querty Too High Potto - Hecter Querty Too High Potto - Cylinder 2 Newton Timing Advanced Potto - Cylinder 1 Newton Timing Potto - Cylinder 1 Newton Timing Advanced	PFICE - NOL Senser Performance Simal Holm Back 1 Sensor 1     POTCE - Optimize 3     POT	PHICE - Nucl. Searce Reformance - Simultices Bink 1 Searce 1     PHIDE - Ophekr 3     PHIDE	Po1D1 - Cylinder 4 Spection Timing Retardisd Po1D1 - Cylinder 4 Spection Timing Retardisd Po1CF - Cylinder 3 Spection Timing Retardisd	Po102 - Cyleder 4 tejecten Treing Advanced       Po102 - Cyleder 4 tejecten Treing Advanced       Po100 - Cyleder 3 tejecten Treing Advanced	P113 - Cylinder 5 Nerkon Timing Besolder           P113 - Cylinder 5 Nerkon Timing Besolder           P113 - Cylinder 4 Nerkon Timing Besolder           P115 - Cylinder 4 Nerkon Timing Besolder	PPID4 - Cylinder 5 legicilion Timing Addresse PPID4 - Cylinder 5 legicilion Timing Addresse PPID2 - Cylinder 4 legicilion Timing Addresse	PortDa - Cylinder & Sejection Timing Bateridia PortDa - Cylinder & Sejection Timing Bateridia	P1D4- Cyleder E legicolon Treing Advances P1D4- Cyleder E legicolon Treing Advanced P1D4- Cyleder E legicolon Treing Advanced	P0107 - Cyllider 7 Nacion Trining Bestalder P0107 - Cylleder 7 Spectron Trining Bestalder       P0107 - Cylleder 7 Spectron Trining Bestalder       P0108 - Cylleder 8 Nacion Cylleder 8 Nacion P0105 - Cylleder 8 Nacion Reserved	PDDB:         Ophder 7 hysician Timing Adarced           PDDB:         Ophder 7 hysician Timing Adarced           PDDB:         Ophder 7 hysician Timing Adarced           PDDB:         Ophder 8 hysician Timing Adarced
Politici - NCISS Silve Response Politici - NCISS Silve Response POTT - Teal Trans System Rich POTT - Teal Trans System Rich POTT - Teal Trans System Rich POTT - Teal Trans Transmission POTT - Teal Transmission POTT - Teal Transmission POTT - Teal Teal POTT - Tea	P017-1-Fall Tim System Later P1163 - NO Sees Professional P1163 - NO Sees Professional P1163 - NO Sees Professional P1163 - NO Sees Professional P1163 - Organizational P1163 - Organizational P1163 - Organizational P1163 - Organizational P1163 - Organizational P1164 - Organizational P1167 - Organizational P1167 - Organizational P1167 - Organizational P117 - Fall Tim System Later P117 - Organizational P117 - Organizational P111 - Organizational P111 - Organi	19172 - Joal Ten System Roh. 19172 - Joseph Ten System Roh. 19102 - NOS Seere Performance 19102 - NOS Seere Performance 19102 - NOS Seere Performance 19103 - Oxford Performance 19103 - Oxford Performance 19103 - Oxford Performance 19102 - Oxford Performance 19103 - Oxford Performance 19104 - Oxford Performance 19105 - Oxford	POSE - Hysten Quertly Too Lee Post - Besteld Post - Control - Street - Tring Resards Post - Control - Street - Tring Resards Post - Control - Tringenon Tring Resards	POID - Recton Duerty Too High POID - Recton Duerty Too High POID - Control Program - Advanced POID - Control Program - Program - Advanced POID - Control Program - Program - Advanced POID - Control Program -	PFICE: AND, Senser Performance Simal Holin Bark I Sensor 1     PRICE: Cylinder 3 Najoclan Timing Retardat	PHICE - NULL Sensor Performance - Simul Loss Back 1 Sensor 1     PHIDE - Cylinder 3 Nijestein Timing <u>Advanced</u> PHIDE - Cylinder 2 Nijestein Timing <u>Advanced</u> PHIDE - Nijestein Caustrift Toe High. PHIDE - Nijestein Caustrift Toe High. PHIDE - Nijestein Caustrift Toe High. PHIDE - Nijestein Caustrift Toe High.	Po1D1 - Cylinder 3 Nacion Timing Betaclad Po1D2 - Cylinder 3 Nacion Timing Betaclad Po1CF - Cylinder 3 Nacion Timing Po1CF - Cylinder 3 Nacion Timing Po1CF - Cylinder 3 Nacion Timing Po1CF - Cylinder 3 Nacion Timing Betaclad Po1CF - Cylinder 3 Nacion Timing Betaclad	Po102 - Cylinder 4 Signation Treing Advanced Po102 - Cylinder 3 Signation Treing Advanced Po100 - Cylinder 3 Signation Treing Advanced	P01D3 - Cylinder & Hjection Timing Besisted           P01D3 - Cylinder & Systemon Timing Besisted           P01D1 - Cylinder & Hjection Timing Besisted	PPTD4 - Cylinder 5 lejicdion Timing Advanced PPTD4 - Cylinder 5 lejicdion Timing Advanced PPTD2 - Cylinder 4 lejicdion Timing Advanced	Po1Ds - Cylinder & Rejection Timing Po1Ds - Cylinder & Rejection Timing Besizedia Po1Ds - Cylinder & Rejection Timing Besizedia Po1Ds - Cylinder & Rejection Timing Relatedia Po1Ds - Cylinder & Rejection Timing Relatedia	P01D6 - Cyleder 6 legedon Treing Adecodo P01D6 - Cyleder 6 legedon Treing Adecodo P01D4 - Cyleder 6 legedon Treing Adecodo	Po1D7 - Cylleder 7 Hyscolon Timing Postscher Bestander Po1D7 - Cylleder 7 Hyscolon Timing Bestanded Po1D5 - Cylleder 8 Hyscolon Timing Restanded Po1D5 - Cylleder 8 Hyscolon Timing Restanded	PIDB - Cylinder 7 Hyddian Theirg       Advanced       PIDB - Cylinder 7 Hyddian Theirg       Advanced       PIDB - Cylinder 8 Hyddian Theirg       Advanced       PIDB - Cylinder 8 Hyddian Theirg       Advanced       PIDB - Cylinder 8 Hyddian Theirg       Advanced       PIDB - Cylinder 6 Hyddian Theirg       Advanced
Polici - HoldS Silve Response Polici - HoldS Silve Response Polici - HoldS Silve Response Polici - Facil Ten System Rein Polici - Ten Ten System Rein Polici - Ten Ten System Rein Polici - Facil Tenperature Sensor 1 - Econol Law Polici - Facil Tenperature Sensor Polici - Facil Tenperature Sensor Polici - Facil Tenperature Polici - Caclar Tenperature Polici - Caclar Tenperature Polici - Caclar Tenperature Polici - Caclar Tenperature Polici - Facil - Tennet Cenal Polici - Tennet Angel - Facil - Tennet Polici - Facil - Tennet Cenal Polici - Facil - Tennet Cenal Poli	P017-F.ell Tim System Lase P102-3-05 Sees Performance- Band High Back Sees CI Find B-NG Sees Performance- Band High Back Sees CI P102-05 Cynker 1 System Timing P103-05 Cynker 1 System Timing P103-05 Cynker 1 System Timing P103-15 Fack Back P103-15 Fac	19172 - Fuel Tim System Rich 19172 - Hull Smore Performance- Smore Lice - Not Server 1 19102 - Not Server Performance- 19102 - Not Server Performance- 19102 - Oxideal Tapaciton Timing Advanced POLC2 - Oxideal Tapaciton Timing POLC2 - Ox	POIRC - Hyroton Quartity Tou Low PortCD - Cyclude 2 Tayecton Transg Reserved POICD - Cyclude 2 Tayecton Transg Reserved POICD - Cyclude 1 Tayecton Transg Reserved POICD - Cyclude 1 Tayecton Transg Reserved POICD - Cyclude 1 Tayecton Transg POICD - Cyclude 1 Secton Transg	POSED - Hecter Querty Too Helt. POSED - Hecter Querty Too Helt. POSED - Queder 2 Newton Timing Advanced POTCE - Cycleder 1 Newton Timing POTCE - Newton Timing POTCE - Newton Timing POTCE - Newton Timing	PFLCB - NOL Searce Performance Simal Holm Back 1 Second 1     PPLCP - Optimer 3 Reaction     PLCP - Optimer 3 Reaction     PLCP - Optimer 3 React	PHICE: NAD, Samer Performance Simult cas Birch 1 Series 1     PHIDD: Optimer 3 Registers Triining Advanced     PHIDD: Optimer 3 Registers Tri	P01D1 - Oylndur 4 hyscion Timing Retarched P01D1 - Cylledur 4 hyscion Timing Retarched P01D2 - Cylledur 3 hyscion Timing Retarched P01D2 - Oyledur 3 hyscion Timing Retarched	P0102 - Ophide 4 System Trining Advanced       P0102 - Ophide 4 System Trining Advanced       P0100 - Ophide 3 System Trining Advanced	P113 - Cylinde 5 Nacion Timing Resarded     P113 - Cylinder 6 Nacional Bearded     P113 - Cylinder 6 Nacional P113 - Cylinder 6 Nacional P113 - Cylinder 4 Nacional Timing Resarded     P113 - Cylinder 4 Nacional Timing     Resarded     Resarded	P01D4 - Cylinder 5 Najoción Timing Advancesi           P01D4 - Cylinder 6 Najoción Timing Advancesi           P01D2 - Cylinder 4 Najoción Timing Advancesi	PortDS - Cylindur & Nejschon Timing Bestandes PortDS - Cylindur & Nejschon Timing Bestandos PortDS - Cylindur & Signation Timing Bestandos	P01D4 - Cyleder & legislan Treing Advanced           P01D5 - Cyleder & Septem Treing Advanced           P01D4 - Cyleder S legislan Treing Advanced	POID7 - Cyll-der 7 Najecton Timing Retarded POID7 - Cyll-der 7 Najecton Timing Retarded POID5 - Cyll-der 6 Najecton Timing Retarded	POIDS:     Cylinder 7 Feyscien Timing Advanced       POIDS:     Cylinder 6 Heyscien Timing Advanced       POIDS:     Cylinder 6 Heyscien Timing Advanced       POIDS:     Cylinder 6 Heyscien Timing Advanced
Politic - HOTS Size Response POTT - Full Ten System Kan POTT - Full Tensor POTT - Full Tens	P011-1-Fail Tim System Late P112-3 - NO, Seek Stream Compared P112-3 - NO, Seek Stream Compared P112-3 - NO, Seek Stream Compared P112-5 - Optical T- Stream Compared P113-5 -	19172 - Fuel Tim System Rich 19172 - NG Smort Performance Beneficies Rest Stream 19172 - NG Smort Performance 19172 - NG Smort Performance 19172 - Note Smort Performance 19172 - Note Smort Performance 19172 - Note Smort Performance 19172 - Note Smort Performance 19172 - Fuel Tim System Rich 19172 - Fuel Rich Rich Rest Fuel 19172 - Fuel Rich Rest Fuel 1	POTCE - Specton Quertly Tou Low PoTCE - Specton Quertly Tou Low PoTCE - Optical 2 Specton Timing Restricts POTCE - Optical 2 Specton Timing Restricts POTCE - Optical 2 Specton Timing POTCE - Optical 1 Specton Timing POTCE - Optical 2 Specton Timing POTCE - Optical 8 Specton Timing POTCE - Optical	POID - Hjecton Duerity Too High POID - Conduct 2 Specton Timing Advanced POID - Cycled 2 Specton Timing POID - Cycled 2 Specton Timing POID - Cycled Begloon Timing POID - Cycled Flagstoon Timing POID - Cycled Begloon Timing	PFICE: AND, Senser Performance Simal Holm Back 1 Sensor 1     POTCE: Ophetic 3 Repetition Timing Retarded     POTCE: Ophetic 3 Repetition Timing Retarded     POTCE: Ophetic 3 Repetition Timing Retarded     POTCE: Ophetic 2 Repetition Timing Retarded     POTCE: Ophetic	PHICE - NULL Search Performance - Simultice Birch 1 Serect 1     PHICE - Ophers 3 Separation Timing <u>Advanced</u> PHICE - Ophers 2 Separation Timing <u>Advan</u>	PoTD1 - Cylinder 4 tyjection Timing PotD1 - Cylinder 4 tyjection Timing Petachol PotD2 - Cylinder 3 tyjection Timing Petachol	Po1D2 - Cylinder 3 Nycolan Timing Advanced       Po1D2 - Cylinder 3 Nycolan Timing Advanced       Po1D2 - Cylinder 3 Nycolan Timing Advanced       Po1D0 - Cylinder 3 Nycolan Timing Advanced	P0103 - Cylinder 3 bjelden Timing Beander           P0103 - Cylinder 4 bjelden Timing Beanded           P0101 - Cylinder 4 bjelden Timing Beanded	PPTD4 - Cylinder 5 lejection Timing Advanced PPTD2 - Cylinder 5 lejection Timing Advanced PPTD2 - Cylinder 4 lejection Timing Advanced	Po1D5 - Cylinder & Hajcolon Timing Potencia Po1D5 - Cylinder & Hajcolon Timing <u>Belanded</u> Po1D3 - Cylinder & Hajcolon Timing <u>Relateded</u> Po1D3 - Cylinder & Hajcolon Timing <u>Relateded</u>	P1DE - Oyleder E Hajedon Theirg Adveced P1DE - Oyleder E Hajedon Theirg Adveced	P0107 - Cyledur 7 lajodon Timing Belandez       P0107 - Cyledur 7 lajodon Timing Belandez       P0105 - Cyledur 6 lajodon Timing Belandez	PDDB - Oylvár P hysicism Timing Addisocial
Politik - HO25 Sike Response Politik - HO25 Sike Response Politik - HO25 Sike Response Politik - HO25 Sike Response Politik - HO25 - Ho2 Ho25 Sike Response Politik - HO25 - HO25 HO25 Sike Response Politik - HO25 HO25 HO25 Sike Response Politik - HO25 HO25 HO25 HO25 HO25 HO25 HO25 HO25	P017-1-Fail Tim System Late P102-1-0-Coster Steparts Partners P102-1-0-Coster Steparts Partners P102-0-Cyster 1 System Late P102-0-Cyster 1 System Late P102-0-Cystem 1 System Late P102-0-System 2 System 1 System 1	19172 - Fuel Ten System Rich 19172 - Not Server Performance Server 19162 - Not Server Performance 19162 - Not Server Performance 19162 - Not Server Performance 19162 - Oxfeed T Spectra Ten 20163 - Oxfeed T Spectra Ten 20162 - Oxfeed T Spectra Ten 20162 - Oxfeed T Spectra Ten 20162 - Oxfeed T Spectra Ten 20172 - Fuel Ten System Rich 20172 - Fuel Ten Syst	POIRC - Hyroton Duerdy Too Loe PortCD - Cyledie 2 Tapeston Trining Resided POICD - Cyledie 1 Specton Trining Resided POICD - Cyledie 1 Specton Trining Resided POICD - Cyledie 1 Specton Trining Poict - Cyledie 1 Specton Trining	POSED - Hjocken Guardy Too High POSED - Hjocken Street Advanced POTCE - Cylinder 2 Hyorken Timerg Advanced POTCE - Cylinder 2 Hyorken Timerg Advanced POTCE - Cylinder 1 Hyorken Timerg POTCE - Cylinder 4 Hyorken Timerg	PTCE: NOL Searce Performance- Simal Heim Back 1 Service 1     PTCE: Projection Training Retarded     PTCE: Cylonder 3 Spection Training PTCE: Cylonder 3 Spection Training PTCE: Cylonder 3 Spection Training PTCE: Cylonder 3 Spection Training PTCE: Cylonder 3 Spection Training Retarded     PTCE: Cylonder 3 Spection Training PTCE: Cylonder 3 Spection Training Retarded     PTCE: Cylonder 3 Spection Training	PTIC: NUD. Samer Performance- Sional Los Bark 1 Sereor 1     PTID: - Optimize 1     PTID: - Opt	POID-1 - Cylinder 4 Spection Timerg Restanted POID-1 - Cylinder 3 Spection Timerg Restanted POID-7 - Cylinder 3 Spection Timerg	P1102 - Cylinder 4 Najection Timing <u>Advanced</u> P0102 - Cylinder 4 Najection Timing <u>Advanced</u> P0100 - Cylinder 3 Najection Timing <u>Advanced</u>	P1103 - Cylindu 5 Najecton Timing Recircled       P0103 - Cylindu 5 Najecton Timing Bearded       P0101 - Cylindu 4 Najecton Timing Bearded	P01D4 - Cylender 5 lejection Timing Advanced P01D4 - Cylender 5 lejection Timing Advanced P01D2 - Cylender 4 lejection Timing Advanced	PotDs - Cylinder 6 legicolon Timing Reserviced PotDs - Cylinder 6 legicolon Timing Baserden PotDs - Cylinder 5 legicolon Timing Reserviced PotDs - Cylinder 5 legicolon Timing Reserviced	Pt1DE - Cyleder E legeton Treing <u>Advecced</u> Pt1DE - Cyleder E legeton Treing <u>Advecced</u>	PD1D7 - Cylleder 7 Najection Timing Recardinal       P01D7 - Cylleder 7 Najection Timing Recardinal       P01D5 - Cylleder 6 Najection Timing Recardinal	POIDE - Cylefer 7 System Torrig Advanced       POIDE - Cylefer 7 System Torrig Advanced       POIDE - Cylefer 7 System Torrig Advanced       POIDE - Cylefer 8 System Torrig Advanced       POIDE - Cylefer 6 System Torrig Advanced
Politic - HO23 Silva Response Politic - HO23 Silva Response Politi	P017-1-Fall Tim System Later FIGLS - NG-Seere Stream - Final Files - NG-Seere File - NG-Seere File - NG-Seere File - NG-Seere File - Seere - File - File - Seere - File - File - Seere - File - File - Seere - File - Fi	19172 - Fuel Tim System Rich 19172 - Will Smore Performance Brond Lore Back 1 Series 1 19172 - Fuel Carl Market Performance 19172 - Fuel Carl Market Performance 19172 - Cyclick 11 species Timing Advanced 19172 - Fuel Tim System Rich 19172	POICE - Vijecton Querdij Tou Loe POICE - Vijecton Stauerdij Tou Loe POICE - Opkede 2 Pajecton Trang Resarded POICE - Opkede 2 Pajecton Trang Resarded POICE - Opkede 2 Pajecton Trang POICE - Opkede 3 Pajecton Trang POICE - Opkede 3 Pajecton Trang POICE - Opkede 3 Pajecton Trang Resarded POICE - Opkede 1 Pajecton Trang Resar	PODD - Hecter Duerty Too High PODD - Hecter Duerty Too High PODD - Optical 2 System Timing Advanced PODD - Optical 2 System Timing PODD - Optical 2 System Timing PODD - Optical 3 System Timing PODD - Optical 4 Syste	PITCE - NOL Searce Performance - Simal Holm Back 1 Second 1     POTCE - Optimize 3	PHICE - NUL Samor Performance - Simultices Bink 1 Service 1     PHIDE - Optimer 3 Sequences Triming Advanced     PHIDE - Sequences Triming Advanced     PH	Po1D1 - Cylinder 4 Spection Timing Retarded Po1D1 - Cylinder 4 Spection Timing Retarded Po1D7 - Cylinder 3 Spection Timing Retarded	Po102 - Cylede 4 System Tring Aderson       Po102 - Cylede 3 System Tring Aderson       Po100 - Cylede 3 System Tring Aderson	P113 - Cylinde 5 Nector Trinig Beaching     P113 - Cylinder 5 Nector Trinig Beaching     P113 - Cylinder 4 Nector Trinig Beaching     P115 - Cylinder 4 Nector Trinig     Beaching     P15 - Cylinder 4 Ne	PPID4 - Cylinder 5 legicilion Timing Advanced PPID4 - Cylinder 5 legicilion Timing Advanced PPID2 - Cylinder 4 legicilion Timing Advanced	POTDS - Cylinde & Sejection Triving Betardiad POTDS - Cylinder & Sejection Triving Betardiad POTD3 - Cylinder & Sejection Triving Betardiad	P01D4 - Cyleder & Hajection Timing Advanced P01D4 - Cyleder & Hajection Timing Advanced	P0107 - Cyllider 7 Naciola       P0108 - Cyllider 6 Naciola       P0109 - Cyllider 6 Naciola	PDDB: Opheter F byschen Timing Advanced           PDDB: Opheter F byschen Timing Advanced           PDDB: Opheter E byschen Timing Advanced

## 14 OBDG10 ECM Inhibit Tables

Active DTC				Inhibited DTCs					
P02E9 - Diesel Intake Air Flow Position Sensor Circuit High	P0234 - Turbocharger Engine Overboost	P0299 - Turbocharger Engine Underboost	P0401 - Exhaust Gas Recirculation Flow Insufficient	P0402 - Exhaust Gas Recirculation Flow Excessive	P122D - Diesel Intake Air Flow Position Sensor Exceeded Learning	P2080 - Exhaust Temperature Sensor 1 Performance	P2084 - Exhaust Temperature Sensor 2 Performance	P242B - Exhaust Temperature Sensor 3 Performance	P246F - Exhaust Temperature Sensor 4 Performance
P02EB - Intake Air Flow Valve Control Motor Current	P0234 - Turbocharger Engine Overboost	P0299 - Turbocharger Engine Underboost	P0401 - Exhaust Gas Recirculation Flow Insufficient	P0402 - Exhaust Gas Recirculation Flow Excessive	P122D - Diesel Intake Air Flow Position Sensor Exceeded Learning				
P0335 - Crankshaft Position Sensor Circuit	P0102 - Mass Air Flow Sensor Circuit Low	P0103 - Mass Air Flow Sensor Circuit High	P0191 - Fuel Rail Pressure Sensor Performance	P0315 - Crankshaft Position System Variation Not Learned	P0506 - Idle Speed Low	P0507 - Idle Speed High	1		
P0336 - Crankshaft Position Sensor Performance	P0102 - Mass Air Flow Sensor Circuit Low	P0103 - Mass Air Flow Sensor Circui High	P0191 - Fuel Rail Pressure Sensor Performance	P0315 - Crankshaft Position System Variation Not Learned	P0506 - Idle Speed Low	P0507 - Idle Speed High			
P0340 - Carrshaft Position Sensor Circuit P0341 - Carrshaft Position	P0191 - Fuel Rail Pressure Sensor Performance P0191 - Fuel Rail Pressure Sensor	P0315 - Crankshaft Position System Variation Not Learned P0315 - Crankshaft Position System	-						
Sensor Performance P0400 - Exhaust Gas Registration (EGP) Down	Performance P11CB - NOx Sensor Performance -	Variation Not Learned P11CC - NOx Sensor Performance -	P249D - Closed Loop Reductant	P249E - Closed Loop Reductant	1				
P0401 - Exhaust Gas	Signal High Bank 1 Sensor 1 P11CB - NOx Sensor Performance -	Signal Low Bank 1 Sensor 1 P11CC - NOx Sensor Performance -	P2080 - Exhaust Temperature	High P2084 - Exhaust Temperature	P242B - Exhaust Temperature	P2459 - Diesel Particulate Filter	P246F - Exhaust Temperature	P249D - Closed Loop Reductant	P249E - Closed Loop Reductant
Recirculation Flow Insufficient	Signal High Bank 1 Sensor 1	Signal Low Bank 1 Sensor 1	Sensor 1 Performance	Sensor 2 Performance	Sensor 3 Performance	Regeneration Frequency	Sensor 4 Performance	Injection Control At Limit - Flow Too Low P249D - Closed Loop Reductant	Injection Control At Limit - Flow Too High P249E - Closed Loop Reductant
P0402 - Exhaust Gas Recirculation Flow Excessive	Signal High Bank 1 Sensor 1	Signal Low Bank 1 Sensor 1	Sensor 1 Performance	Sensor 2 Performance	Sensor 3 Performance	Regeneration Frequency	Sensor 4 Performance	Injection Control At Limit - Flow Too Low	Injection Control At Limit - Flow Too High
Recirculation Position Sensor Circuit Low	P0401 - Exhaust Gas Recirculation Flow Insufficient	P0402 - Exhaust Gas Recirculation Flow Excessive	P049D - EGR Control Position Not Learned	P2080 - Exhaust Temperature Sensor 1 Performance	P2084 - Exhaust Temperature Sensor 2 Performance	P242B - Exhaust Temperature Sensor 3 Performance	P246F - Exhaust Temperature Sensor 4 Performance		
Recirculation Position Sensor Circuit High	P0401 - Exhaust Gas Recirculation Flow Insufficient	P0402 - Exhaust Gas Recirculation Flow Excessive	P049D - EGR Control Position Not Learned	P2080 - Exhaust Temperature Sensor 1 Performance	P2084 - Exhaust Temperature Sensor 2 Performance	P242B - Exhaust Temperature Sensor 3 Performance	P246F - Exhaust Temperature Sensor 4 Performance		
P040C - Exhaust Gas Recirculation (EGR) Temperature Sensor 2 Circuit Low Voltage	P040F - Exhaust Gas Recirculation (EGR) Temperature Sensor 1-2 Correlation								
P040D - Exhaust Gas Recirculation (EGR) Temperature Sensor 2 Circuit High Voltage	P040F - Exhaust Gas Recirculation (EGR) Temperature Sensor 1-2 Correlation								
P041C - Exhaust Gas Recirculation (EGR) Temperature Sensor 1 Circuit Low Voltage	P040F - Exhaust Gas Recirculation (EGR) Temperature Sensor 1-2 Correlation								
P041D - Exhaust Gas Recirculation (EGR) Temperature Sensor 1 Circuit High Voltage	P040F - Exhaust Gas Recirculation (EGR) Temperature Sensor 1-2 Correlation		-						
P0420 - NMHC Catalyst Efficiency Below Threshold Bank 1	P249D - Closed Loop Reductant Injection Control At Limit - Flow Too Low	P249E - Closed Loop Reductant Injection Control At Limit - Flow Too High						_	
P046C - Exhaust Gas Recirculation(EGR) Position Sensor Performance	P0101 - Mass Air Flow Sensor Performance	P0234 - Turbocharger Engine Overboost	P0299 - Turbocharger Engine Underboost	P2080 - Exhaust Temperature Sensor 1 Performance	P2084 - Exhaust Temperature Sensor 2 Performance	P242B - Exhaust Temperature Sensor 3 Performance	P246F - Exhaust Temperature Sensor 4 Performance		
P0545 - Exhaust Gas Temperature (EGT) Sensor 1 Circuit Low Voltage	P2080 - Exhaust Temperature Sensor 1 Performance	P2084 - Exhaust Temperature Sensor 2 Performance	P20E2 - Exhaust Gas Temperature (EGT) Sensors 1-2 not plausible	P2428 - Exhaust Gas High Temperature					
P0546 - Exhaust Gas Temperature (EGT) Sensor 1 Circuit Hinb Voltage	P2080 - Exhaust Temperature Sensor 1 Performance	P2084 - Exhaust Temperature Sensor 2 Performance	P20E2 - Exhaust Gas Temperature (EGT) Sensors 1-2 not plausible	P2428 - Exhaust Gas High Temperature					
P0575 - Cruise Control Input Circuit	P0567 - Cruise Control Resume Switch Circuit	P0568 - Cruise Control Set Switch Circuit	j		•				
P057C - Brake Pedal Position Sensor Circuit High Voltage P057D - Brake Pedal Position	P057D - Brake Pedal Position Sensor Circuit Low Voltage P057C - Brake Pedal Position								
Sensor Circuit Low Voltage P0606 - Control Module Internal	Sensor Circuit High Voltage P2146 - Injector Positive Voltage	P2149 - Injector Positive Voltage	P2152 - Injector Positive Voltage	P2155 - Injector Positive Voltage	1				
Performance P064C - Glow Plug Control Module Performance	P11DB - NOx Sensor Current Performance Bank 1 Sensor 1	P2209 - N0x Heater Performance Bank 1 Sensor 1	Control Circuit Group 3	Control Circuit Group 4	1				
P0651 - 5 Volt Reference 2 Circuit	P2127 - Accelerator Pedal Position Sensor 2 Circuit Low	P2128 - Accelerator Pedal Position (APP) Sensor 2 Circuit High Voltage							
P0697 - 5 Volt Reference 3 Circuit	P2122 - Accelerator Pedal Position Sensor 1 Circuit Low	P2123 - Accelerator Pedal Position Sensor 1 Circuit High	1						
P0851 - Park/Neutral Position (PNP) Switch Circuit Low Voltage	P0852 - Park/Neutral Position (PNP) Switch Circuit High Voltage								
P0852 - Park/Neutral Position (PNP) Switch Circuit High Voltage	P0851 - Park/Neutral Position (PNP) Switch Circuit Low Voltage								
P1048 - Reductant Injector High Control Circuit Low Voltage P1049 - Reductant Injector High	P202E - Reductant Injector Performance	P2610 - ECM Power Relay Circuit	7						
Control Circuit High Voltage	Performance P249D - Closed Loop Reductant	Performance P249E - Closed Loop Reductant	-						
Performance Bank 1 Sensor 1	Injection Control At Limit - Flow Too Low P249D - Closed Loop Reductant	Injection Control At Limit - Flow Too High	-						
P11DC - NOx Sensor Current Performance Bank 1 Sensor 2	Injection Control At Limit - Flow Too Low	Injection Control At Limit - Flow Too High							
P1224 - Injector 1 Control Circuit Shorted P1227 - Injector 2 Control Circuit	P0201 - Injector 1 Control Circuit	P0606 - Control Module Internal Performance P0606 - Control Module Internal	P2146 - Injector Positive Voltage Control Circuit Group 1 P2152 - Injector Positive Voltage						
Shorted P122A - Injector 3 Control Circuit	P0202 - Injector 2 Control Circuit P0203 - Injector 3 Control Circuit	Performance P0606 - Control Module Internal	Control Circuit Group 3 P2155 - Injector Positive Voltage	-					
P122D - Diesel Intake Air Flow Position Sensor Exceeded	P0234 - Turbocharger Engine	P0299 - Turbocharger Engine	P0401 - Exhaust Gas Recirculation	P0402 - Exhaust Gas Recirculation	]				
P1233 - Injector 4 Control Circuit Shorted	P0204 - Injector 4 Control Circuit	P0606 - Control Module Internal Performance	P2146 - Injector Positive Voltage Control Circuit Group 1		1				
P1236 - Injector 5 Control Circuit Shorted	P0205 - Injector 5 Control Circuit	P0606 - Control Module Internal Performance	P2152 - Injector Positive Voltage Control Circuit Group 3						
P1239 - Injector 6 Control Circuit Shorted P1242 - Injector 7 Control Circuit	P0206 - Injector 6 Control Circuit	P0606 - Control Module Internal Performance P0606 - Control Module Internal	P2149 - Injector Positive Voltage Control Circuit Group 2 P2149 - Injector Positive Voltage						
Shorted P1247 - Injector 8 Control Circuit	P0207 - Injector 7 Control Circuit P0208 - Injector 8 Control Circuit	Performance P0606 - Control Module Internal	Control Circuit Group 2 P2155 - Injector Positive Voltage						
P125B - Fuel Pressure Regulator 2 High Control Circuit High Voltage	P2510 - ECM Power Relay Circuit	Performance	Control Circuit Gloup 4	1					
P1408 - Exhaust Gas Recirculation Slow Response-	P11CB - NOx Sensor Performance - Signal High Bank 1 Sensor 1	P11CC - NOx Sensor Performance - Signal Low Bank 1 Sensor 1	P249D - Closed Loop Reductant Injection Control At Limit - Flow Too	P249E - Closed Loop Reductant Injection Control At Limit - Flow Too	]				
P140C - Exhaust Gas Recirculation Slow Response-	P11CB - NOx Sensor Performance - Signal High Bank 1 Sensor 1	P11CC - NOx Sensor Performance - Signal Low Back 1 Sensor 1	P249D - Closed Loop Reductant Injection Control At Limit - Flow Too	P249E - Closed Loop Reductant Injection Control At Limit - Flow Too					
P140F - Exhaust Gas Recirculation (EGR) Motor	P0101 - Mass Air Flow Sensor	P0234 - Turbocharger Engine	Low P0299 - Turbocharger Engine	High P0401 - Exhaust Gas Recirculation	P0402 - Exhaust Gas Recirculation	P049D - EGR Control Position Not	]		
Current Performance P1414 - Exhaust Gas Recirculation (EGR) Cooler Bypass Valve Current	Periormance P0401 - Exhaust Gas Recirculation Flow Insufficient	P0402 - Exhaust Gas Recirculation Flow Excessive	P140A - EGR Cooler BY Pass Position Sensor Exceeded Learning	Powingunden	PDWERDBSWE	Learned	1		
Performance P163C - Glow Plug Control Module Primary Circuit P2002 - Diesel Particulate Filter	P11DB - NOx Sensor Current Performance Bank 1 Sensor 1 P2459 - Diesel Particulate Filter	P2209 - N0x Heater Performance Bank 1 Sensor 1	Line	1					
(DPF) Low Efficiency P2032 - Exhaust Gas Temperature (EGT) Sensor 2	Receneration Frequency P2080 - Exhaust Temperature	P2084 - Exhaust Temperature	P20E2 - Exhaust Gas Temperature	P2428 - Exhaust Gas High	P242B - Exhaust Temperature	1			
Circuit Low Voltage P2033 - Exhaust Gas	Sensor 1 Performance P2080 - Exhaust Temperature	Sensor 2 Performance P2084 - Exhaust Temperature	(EGT) Sensors 1-2 not plausible P20E2 - Exhaust Gas Temperature	Temperature P2428 - Exhaust Gas Hidh	Sensor 3 Performance P242B - Exhaust Temperature	1			
Circuit High Voltage	Sensor 1 Performance	Sensor 2 Performance	(EGT) Sensors 1-2 not plausible	Temperature	Sensor 3 Performance	]			

Active DTC				Inhibited DTCs									
2047 - Reductant Injector Control Circuit	P202E - Reductant Injector Performance												
2048 - Reductant Injector Control	P202E - Reductant Injector												
2049 - Reductant Injector Control	Performance P202E - Reductant Injector	P2510 - ECM Power Relay Circuit											
Circuit High Voltage	Performance P204F - Reductant System	Performance	Page Batata 19 C	1									
Pressure Sensor Performance	Performance Bank 1 (cannot build	Low	High										
P204C - Reductant Pump	P204B - Reductant Pump Pressure	P20A1 - Reductant Purge Valve		•									
Pressure Sensor Circuit Low P204D - Reductant Pump	P204B - Reductant Pump Pressure	Performance P20A1 - Reductant Purge Valve											
Pressure Sensor Circuit High P205C - Reductant Tank	Sensor Performance P20BA - Reductant Heater 1	Performance											
emperature Sensor Circuit Low	Performance		1										
P205D - Reductant Tank emperature Sensor Circuit High	P205B - Reductant Tank Temperature Sensor Performance	P20BA - Reductant Heater 1 Performance											
208A - Reductant Pump Control	P204F - Reductant System	P20A1 - Reductant Purce Valve	P20E8 - Reductant Pressure Too	P20E9 - Reductant Pressure Too									
Circuit	Performance Bank 1 (cannot build pump pressure)	Performance	Low	High									
208D - Reductant Pump Control	P204F - Reductant System Performance Back 1 (cannot build	P20A1 - Reductant Purge Valve	P20E8 - Reductant Pressure Too	P20E9 - Reductant Pressure Too	P2510 - ECM Power Relay Circuit								
Circuit High Voltage	pump pressure)	Performance	Low	High	Performance								
20A0 - Reductant Purge Valve Control Circuit	Performance Bank 1 (cannot build	P20A1 - Reductant Purge Valve Performance	P20E8 - Reductant Pressure Too	P20E9 - Reductant Pressure Too High									
	pump pressure) P204F - Reductant System												
Control Circuit Low Voltage	Performance Bank 1 (cannot build pump pressure)	P20A1 - Reductant Purge Valve Performance	P20E8 - Reductant Pressure Too Low	High									
0A3 - Reductant Purge Valve	P204F - Reductant System	P20A1 - Reductant Purge Valve	P20E8 - Reductant Pressure Too	P20E9 - Reductant Pressure Too	P2510 - ECM Power Relay Circuit								
Control Circuit High Voltage	pump pressure)	Performance	Low	High	Performance								
UB - Exhaust Aftertreatment	P2510 - ECM Power Relay Circuit Performance												
DCE - Exhaust Aftertreatment	P2510 - ECM Power Relay Circuit												
Voltage	Performance			1		1							
nperature (EGT) Sensors 1-2	P0101 - Mass Air Flow Sensor Performance	P2080 - Exhaust Temperature Sensor 1 Performance	P2084 - Exhaust Temperature Sensor 2 Performance	P242B - Exhaust Temperature Sensor 3 Performance	P246F - Exhaust Temperature Sensor 4 Performance								
not plausible	Perionance	Sensor i Performance	Jensol z Periormance	Jersol 3 Periornance	Jersor + Performance	l							
z1zz - Accelerator Pedal sition Sensor 1 Circuit Low	P2138 - Accelerator Pedal Position (APP) Sensor 1-2 Correlation												
2123 - Accelerator Pedal	P2138 - Accelerator Pedal Position												
sition Sensor 1 Circuit High	(APP) Sensor 1-2 Correlation												
2127 - Accelerator Pedal	P2138 - Accelerator Pedal Position												
stion Sensor 2 Circuit Low	(APP) Sensor 1-2 Correlation												
tion (APP) Sensor 2 Circuit	P2138 - Accelerator Pedal Position (APP) Sensor 1-2 Correlation												
High Voltage 6 - Injector Positive Voltage	P0606 - Control Module Internal												
Control Circuit Group 1	Performance P0606 - Control Module Internal												
Control Circuit Group 2	Performance Doctor Control Matrix Internal												
Control Circuit Group 3	Performance												
Injector Positive Voltage     Control Circuit Group 4	P0606 - Control Module Internal Performance	P2146 - Injector Positive Voltage Control Circuit Group 1	P2149 - Injector Positive Voltage Control Circuit Group 2	P2152 - Injector Positive Voltage Control Circuit Group 3									
- N0x Sensor Circuit Bank	P11DB - NOx Sensor Current	P2209 - N0x Heater Performance	P249D - Closed Loop Reductant Injection Control At Limit - Flow Too	P249E - Closed Loop Reductant Injection Control At Limit - Flow Top									
1 Sensor 1	Performance Bank 1 Sensor 1	Bank 1 Sensor 1	Low	High									
- N0x Sensor Circuit Low Bank 1 Sensor 1	P249D - Closed Loop Reductant Injection Control At Limit - Flow Too	P249E - Closed Loop Reductant Injection Control At Limit - Flow Too											
No Const i	Low P249D - Closed Loop Reductant	High P249E - Closed Loop Reductant											
Bank 1 Sensor 1	Injection Control At Limit - Flow Too Low	Injection Control At Limit - Flow Too High											
205 - N0x Heater Control	P11DB - NOx Sensor Current	P2209 - N0x Heater Performance	P249D - Closed Loop Reductant	P249E - Closed Loop Reductant									
Circuit Bank 1 Sensor 1	Performance Bank 1 Sensor 1	Bank 1 Sensor 1	Low	High									
N0x Heater Performance Bank 1 Sensor 1	Injection Control At Limit - Flow Too	r 2496 - Closed Loop Reductant Injection Control At Limit - Flow Too											
20A - N0x Sensor Supply	Low	High											
tage Out Of Range Bank 1 Sensor 1	Performance Bank 1 Sensor 1	P2209 - N0x Heater Performance Bank 1 Sensor 1											
20B - N0x Sensor Supply	P11DB - NOx Sensor Current	P2209 - N0x Heater Performance											
age Out Of Range Bank 1 Sensor 2	Performance Bank 1 Sensor 1	Bank 1 Sensor 1											
228 - Barometric Pressure Sensor Circuit Low	P0106 - Manifold Absolute Pressure Sensor Performance	P0234 - Turbocharger Engine Overboost	P0299 - Turbocharger Engine Underboost	P0401 - Exhaust Gas Recirculation Flow Insufficient	P0402 - Exhaust Gas Recirculation Flow Excessive	P11CB - NOx Sensor Performance - Signal High Bank 1 Sensor 1	P11CC - NOx Sensor Performance - Signal Low Bank 1 Sensor 1	P2002 - Diesel Particulate Filter (DPF) Low Efficiency	P2080 - Exhaust Temperature Sensor 1 Performance	P2084 - Exhaust Temperature Sensor 2 Performance	P242B - Exhaust Temperature Sensor 3 Performance	P246F - Exhaust Temperature Sensor 4 Performance	
9 - Barometric Pressure Sensor Circuit Mich	P0106 - Manifold Absolute Pressure	P0234 - Turbocharger Engine	P0299 - Turbocharger Engine	P0401 - Exhaust Gas Recirculation	P0402 - Exhaust Gas Recirculation	P11CB - NOx Sensor Performance - Sizeal High Back 1 Second 4	P11CC - NOx Sensor Performance - Signal Low Back 1 Serson 1	P2002 - Diesel Particulate Filter	P2080 - Exhaust Temperature	P2084 - Exhaust Temperature	P242B - Exhaust Temperature	P2459 - Diesel Particulate Filter	P246F - Exhaust Temperature
53 - Turbo Boost System	P0101 - Mass Air Flow Sensor	P0106 - Manifold Absolute Pressure	P0234 - Turbocharger Engine	P0299 - Turbocharger Engine	P0401 - Exhaust Gas Recirculation	P0402 - Exhaust Gas Recirculation	Southal Low Dates 1 dec60f 1	OFFICOW ENGUNCY	Jensor i Penormande	Server 2 Performance	whore a remainlence	AND REAL PROPERTY OF THE CARDON	aerou + renomânce
Performance	Performance P11AF - HO2S Performance - Signal	Sensor Performance P11B2 - HO2S Performance - Signal	Overboost P249D - Closed Loop Reductant	Underboost P249E - Closed Loop Reductant	Flow Insufficient	Flow Excessive	1						
1 Sensor 2	High During Moderate Load Bank 1 Sensor 2	Low During Moderate Load Bank 1 Sensor 2	Injection Control At Limit - Flow Too Low	Injection Control At Limit - Flow Too High									
229F - NOx Sensor	P249D - Closed Loop Reductant	P249E - Closed Loop Reductant											
rmance Bank 1 Sensor 2	Low	High		Present OL 11 Dr. (									
A3 - NOx Heater Control	H11AF - H02S Performance - Signal High During Moderate Load Bank 1	P11B2 - HO2S Performance - Signal Low During Moderate Load Bank 1	H249D - Closed Loop Reductant Injection Control At Limit - Flow Too	H249E - Closed Loop Reductant Injection Control At Limit - Flow Too									
NOn Hantes Destants	Sensor 2 P249D - Closed Loop Reductant	Sensor 2 P249E - Closed Loop Reductant	Low	High									
Bank 1 Sensor 2	Injection Control At Limit - Flow Too Low	Injection Control At Limit - Flow Too High											
P2413 - Exhaust Gas	P11CB - NOx Sensor Performance -	P11CC - NOx Sensor Performance -	P249D - Closed Loop Reductant	P249E - Closed Loop Reductant									
Performance	Signal High Bank 1 Sensor 1	Signal Low Bank 1 Sensor 1	Low	High									
P242C - Exhaust Gas perature (EGT) Sensor 3	P2428 - Exhaust Gas High	P242B - Exhaust Temperature	P246F - Exhaust Temperature										
Circuit Low Voltage 242D - Exhaust Gas	i emperature	Sensor 3 Performance	Jensor 4 Performance										
Derature (EGT) Sensor 3	P2428 - Exhaust Gas High Temperature	P242B - Exhaust Temperature Sensor 3 Performance	P246F - Exhaust Temperature Sensor 4 Performance										
Diesel Particulate Filter	P0234 - Turborharger Engine	P0299 - Turbocharner Engine	P0401 - Exhaust Gas Regimination	P0402 - Exhaust Gas Recirculation	P2002 - Diesel Particulate Filter	P2459 - Diesel Particulate Filese	1						
Performance	Overboost	Underboost	Flow Insufficient	Flow Excessive	(DPF) Low Efficiency	Regeneration Frequency	]						
4 - Diesel Particulate Filter	P2002 - Diesel Particulate Filter	P2453 - Diesel Particulate Filter Differential Pressure Service	P2455 - Diesel Particulate Filter Differential Pressure Sensor Cleruit	P2459 - Diesel Particulate Filter									
Circuit Low Voltage	(DPF) Low Efficiency	Performance	High Voltage	Regeneration Frequency									
155 - Diesel Particulate Filter Ifferential Pressure Sensor	P2002 - Diesel Particulate Filter	P2453 - Diesel Particulate Filter Differential Pressure Sensor	P2454 - Diesel Particulate Filter Differential Pressure Sensor Circuit	P2459 - Diesel Particulate Filter									
Circuit High Voltage P245A - Exhaust Gas	(DPF) Low Emclency	Performance	Low Voltage P140A - EGR Cooler BY Pare	Regeneration Frequency					I				
circulation (EGR) Cooler	P0401 - Exhaust Gas Recirculation Flow Insufficient	P0402 - Exhaust Gas Recirculation Flow Excessive	Position Sensor Exceded Learning	P2080 - Exhaust Temperature Sensor 1 Performance	P2084 - Exhaust Temperature Sensor 2 Performance	P242B - Exhaust Temperature Sensor 3 Performance	P246F - Exhaust Temperature Sensor 4 Performance	P2510 - ECM Power Relay Circuit Performance					
3 - Diesel Particulate Filter -	P2002 - Diesel Particulate Filter		LINK				1		I				
Soot Accumulation P2470 - Exhaust Gas	(DPF) Low Efficiency	Date: Edward T											
erature (EGT) Sensor 4	P2428 - Exnaust Gas High Temperature	F246F - Exhaust Temperature Sensor 4 Performance											
2471 - Exhaust Gas	P2428 - Exhaust Gas High	P246F - Exhaust Temperature											
Circuit High Voltage	Temperature	Sensor 4 Performance											
#3 - EGR Cooler BY Pass sition Sensor Performance	P0401 - Exhaust Gas Recirculation Flow Insufficient	P0402 - Exhaust Gas Recirculation Flow Excessive											

## 14 OBDG10 ECM Inhibit Tables

Active DTC				Inhibited DTCs										
P2494 - EGR Cooler BY Pass Position Sensor Circuit Low	P0234 - Turbocharger Engine Overboost	P0299 - Turbocharger Engine Underboost	P0401 - Exhaust Gas Recirculation Flow Insufficient	P0402 - Exhaust Gas Recirculation Flow Excessive	P140A - EGR Cooler BY Pass Position Sensor Exceded Learning Limit	P2080 - Exhaust Temperature Sensor 1 Performance	P2084 - Exhaust Temperature Sensor 2 Performance	P242B - Exhaust Temperature Sensor 3 Performance	P246F - Exhaust Temperature Sensor 4 Performance					
P2495 - EGR Cooler BY Pass Position Sensor Circuit High	P0234 - Turbocharger Engine Overboost	P0299 - Turbocharger Engine Underboost	P0401 - Exhaust Gas Recirculation Flow Insufficient	P0402 - Exhaust Gas Recirculation Flow Excessive	P140A - EGR Cooler BY Pass Position Sensor Exceded Learning Limit	P2080 - Exhaust Temperature Sensor 1 Performance	P2084 - Exhaust Temperature Sensor 2 Performance	P242B - Exhaust Temperature Sensor 3 Performance	P246F - Exhaust Temperature Sensor 4 Performance					
P249D - Closed loop Reductant Injection Control at Limit-Flow too high	P20EE - SCR Nox Catalyst Efficiency Below Threshold Bank 1									-				
P249E - Closed loop Reductant Injection Control at Limit-Flow too low	P20EE - SCR Nox Catalyst Efficiency Below Threshold Bank 1													
P2564 - Turbocharger Boost Control Position Sensor Circuit Low	P0234 - Turbocharger Engine Overboost	P0299 - Turbocharger Engine Underboost	P0401 - Exhaust Gas Recirculation Flow Insufficient	P0402 - Exhaust Gas Recirculation Flow Excessive										
P2565 - Turbocharger Boost Control Position Sensor Circuit High	P0234 - Turbocharger Engine Overboost	P0299 - Turbocharger Engine Underboost	P0401 - Exhaust Gas Recirculation Flow Insufficient	P0402 - Exhaust Gas Recirculation Flow Excessive										
P2598 - Turbocharger Boost Control Position Sensor "A" Circuit Range/Performance - Stuck Low	P0101 - Mass Air Flow Sensor Performance													
P2599 - Turbocharger Boost Control Position Sensor "A" Circuit Range/Performance - Stuck High	P0101 - Mass Air Flow Sensor Performance													
U0073 - CAN A BUS OFF	P0851 - Park/Neutral Position (PNP) Switch Circuit Low Voltage	P0852 - Park/Neutral Position (PNP) Switch Circuit High Voltage												
U0101 - Lost Communications With Transmission Control System	P0851 - Park/Neutral Position (PNP) Switch Circuit Low Voltage	P0852 - Park/Neutral Position (PNP) Switch Circuit High Voltage		_										
U0106 - Lost Communication With Glow Plug Control Module	P11DB - NOx Sensor Current Performance Bank 1 Sensor 1	P249D - Closed Loop Reductant Injection Control At Limit - Flow Too Low	P249E - Closed Loop Reductant Injection Control At Limit - Flow Too High	]										
U029D - N0x 1 loss of comm	P249D - Closed Loop Reductant Injection Control At Limit - Flow Too Low	P249E - Closed Loop Reductant Injection Control At Limit - Flow Too High		•										
U029E - N0x 2 loss of comm	P11DB - NOx Sensor Current Performance Bank 1 Sensor 1	P249D - Closed Loop Reductant Injection Control At Limit - Flow Too Low	P249E - Closed Loop Reductant Injection Control At Limit - Flow Too High	]										
Fuel Level less than 15%	P0087 - Fuel Rail Pressure Too Low	P0088 - Fuel Rail Pressure Too High	P0191 - Fuel Rail Pressure Sensor Performance	P0263 - Cly 1 Balance System	P0266 - Cly 2 Balance System	P0269 - Cly 3 Balance System	P0272 - Cly 4 Balance System	P0275 - Cly 5 Balance System	P0278 - Cly 6 Balance System	P0281 - Cly 7 Balance System	P0284 - Cly 8 Balance System	P0300 - Engine Misfire Detected	P0301 - Cylinder 1 Misfire Detected	P0302 - Cylinder 2 Misfire Detected
Fuel Level less than 15%	P0303 - Cylinder 3 Misfire Detected	P0304 - Cylinder 4 Misfire Detected	P0305 - Cylinder 5 Misfire Detected	P0306 - Cylinder 6 Misfire Detected	P0307 - Cylinder 7 Misfire Detected	P0308 - Cylinder 8 Misfire Detected	P11AF - HO2S Performance - Signal High During Moderate Load Bank 1 Sensor 2	P11B2 - HO2S Performance - Signal Low During Moderate Load Bank 1 Sensor 2	P128E - Fuel Rail Pressure Performance					

DTC		Additional Basic Enable Conditions						
P0016 - Crankshaft to Camshaft Correlation	Engine not in afterrun mode (defined as engine speed greater than 0 rpm) engine size occurs after ECM initialization or following afterrun)	Engine is running which means the engine speed is greater than 600 to 850 rpm	engine is not in ready state (which is active when the ignition is on or following a stall of the engine)					
P003A - Turbocharger Boost Control Position Not Learned	Engine not in afterrun mode (defined as engine speed greater than 0 rpm) Engine speed greater than 600 to 850 rpm	engine is not in standby state (standby state occurs after ECM initialization or following after-run)	battery voltage is above 11 V for at least 3s	Engine is running which means the engine speed is greater than 600 to 850 rpm	engine is not in ready state (which is active when the ignition is on or following a stall of the engine)			
P0045 - Turbocharger Boost Control Circuit	Engine not in afterrun mode (defined as engine speed greater than 0 rpm) following after FCM initialization or following after run)	battery voltage is above 11 V for at least 3s	Engine is running which means the engine speed is greater than 600 to 850 rpm			•		
P0047 - Turbocharger Boost Control Circuit Low Voltage	Engine not in afterrun mode (defined as engine speed greater than 0 rpm) state occurs after ECM initialization or following after-run)	battery voltage is above 11 V for at least 3s	Engine is running which means the engine speed is greater than 600 to 850 rpm					
P0048 - Turbocharger Boost Control Circuit High Voltage	Engine not in afterrun mode (defined as engine speed greater than 0 rpm) engine is not in standby state (standby state occurs after ECM initialization or following after-run)	battery voltage is above 11 V for at least 3s	Engine is running which means the engine speed is greater than 600 to 850 rpm					
P006E - Turbocharger Boost High Control Circuit Low Voltage	Engine not in afterrun mode (defined as engine speed greater than 0 rpm) engine speed greater than 0 rpm)	battery voltage is above 11 V for at least 3s	Engine is running which means the engine speed is greater than 600 to 850 rpm					
P006F - Turbocharger Boost High Control Circuit High Voltage	engine is not in standby state (standby state occurs after ECM initialization or following after-pup)							
P007C - CAC Temperature Sensor Circuit Low Voltage	Engine not in afterrun mode (defined as engine speed greater than 0 pm) Engine speed greater than 600 to 850 rpm	engine is not in standby state (standby state occurs after ECM initialization or following after-run)	battery voltage is above 11 V for at least 3s	Engine Run Time greater than 10 seconds (engine speed greater than 600 to 850 rpm to indicate the engine is running)	Engine is running which means the engine speed is greater than 600 to 850 rpm	engine is not in ready state (which is active when the ignition is on or following a stall of the engine)		
P007D - CAC Temperature Sensor Circuit High Voltage	Engine not in afterrun mode (defined as engine speed greater than 600 to 850 rpm	engine is not in standby state (standby state occurs after ECM initialization or following after-run)	battery voltage is above 11 V for at least 3s	Engine Run Time greater than 10 seconds (engine speed greater than 600 to 850 rpm to indicate the engine is running)	Engine is running which means the engine speed is greater than 600 to 850 rpm	engine is not in ready state (which is active when the ignition is on or following a stall of the engine)		
P0087 - Fuel Rail Pressure Too Low	ambient air temperature is above -7 deg C ambient pressure is above 74.8kPa	engine is not in ready state (which is active when the ignition is on or following a stall of the engine)						
P0088 - Fuel Rail Pressure Too High	ambient air temperature is above -7 deg C ambient pressure is above 74.8kPa	engine is not in ready state (which is active when the ignition is on or following a stall of the engine)			1			
P008F - Engine Coolant Temperature (ECT)-Fuel Temperature Not Plausible	Engine not in afterrun mode (defined as engine speed greater than 0 rpm) Engine speed greater than 600 to 850 rpm	engine is not in standby state (standby state occurs after ECM initialization or following after-run)	Engine is running which means the engine speed is greater than 600 to 850 rpm	engine is not in ready state (which is active when the ignition is on or following a stall of the engine)				
P0090 - Fuel Pressure Regulator 1 Control Circuit/Open	Engine not in afterrun mode (defined as engine speed greater than 0 rpm) following after-run)	battery voltage is above 11 V for at least 3s	Engine is running which means the engine speed is greater than 600 to 850 rpm					
P0091 - Fuel Pressure Regulator 1 Control Circuit Low	Engine not in afterrun mode (defined as engine speed greater than 0 rpm) state occurs after ECM initialization or following after-run)	battery voltage is above 11 V for at least 3s	Engine is running which means the engine speed is greater than 600 to 850 rpm					
P0092 - Fuel Pressure Regulator 1 Control Circuit High	Engine not in afterrun mode (defined as engine speed greater than 0 rpm) state occurs after ECM initialization or followino after-run)	battery voltage is above 11 V for at least 3s	Engine is running which means the engine speed is greater than 600 to 850 rpm					
P0097 - Intake Air Temperature Sensor 2 Circuit Low	Engine not in afterrun mode (defined as engine speed greater than 600 to 850 rpm	engine is not in standby state (standby state occurs after ECM initialization or following after-run)	battery voltage is above 11 V for at least 3s	Engine Run Time greater than 10 seconds (engine speed greater than 600 to 850 rpm to indicate the engine is running)	Engine is running which means the engine speed is greater than 600 to 850 rpm	engine is not in ready state (which is active when the ignition is on or following a stall of the engine)		
P0098 - Intake Air Temperature Sensor 2 Circuit High	Engine not in afterrun mode (defined as engine speed greater than 600 to 850 rpm	engine is not in standby state (standby state occurs after ECM initialization or following after-run)	battery voltage is above 11 V for at least 3s	Engine Run Time greater than 10 seconds (engine speed greater than 600 to 850 rpm to indicate the engine is running)	Engine is running which means the engine speed is greater than 600 to 850 rpm	engine is not in ready state (which is active when the ignition is on or following a stall of the engine)		
P00C9 - Fuel Pressure Regulator 1 High Control Circuit Low Voltage	Engine not in afterrun mode (defined as engine speed greater than 0 pm) state occurs after ECM initialization or following after-run)	battery voltage is above 11 V for at least 3s	Engine is running which means the engine speed is greater than 600 to 850 rpm					
P00CA - Fuel Pressure Regulator 1 High Control Circuit High Voltage	engine is not in standoy state (standoy state occurs after ECM initialization or following after-run)							
P00EA - Intake Air Temperature (IAT) Sensor 3 Circuit Low Voltage	Engine not in afterrun mode (defined as engine speed greater than 0 rpm) Engine speed greater than 600 to 850 rpm	engine is not in standby state (standby state occurs after ECM initialization or following after-run)	battery voltage is above 11 V for at least 3s	Engine Run Time is greater than 10 seconds (engine speed greater than 600 to 850 rpm to indicate the engine is running)	Engine is running which means the engine speed is greater than 600 to 850 rpm	engine is not in ready state (which is active when the ignition is on or following a stall of the engine)		
P00EB - Intake Air Temperature (IAT) Sensor 3 Circuit High Voltage	Engine not in afterrun mode (defined as engine speed greater than 600 to 850 rpm	engine is not in standby state (standby state occurs after ECM initialization or following after-run)	battery voltage is above 11 V for at least 3s	Engine Run Time is greater than 10 seconds (engine speed greater than 600 to 850 rpm to indicate the engine is running)	Engine is running which means the engine speed is greater than 600 to 850 rpm	engine is not in ready state (which is active when the ignition is on or following a stall of the engine)		
P00F4 - Humidity Sensor Circuit Low	Engine not in afterrun mode (defined as engine speed greater than 0 rpm) Engine speed greater than 600 to 850 rpm	engine is not in standby state (standby state occurs after ECM initialization or following after-run)	battery voltage is above 11 V for at least 3s	Engine Run Time is greater than 10 seconds (engine speed greater than 600 to 850 rpm to indicate the engine is running)	Engine is running which means the engine speed is greater than 600 to 850 rpm	engine is not in ready state (which is active when the ignition is on or following a stall of the engine)		
P00F5 - Humidity Sensor Circuit High	Engine not in afterrun mode (defined as engine speed greater than 0 rpm) Engine speed greater than 600 to 850 rpm	engine is not in standby state (standby state occurs after ECM initialization or following after-run)	battery voltage is above 11 V for at least 3s	engine Run Time is greater than 10 seconds (engine speed greater than 600 to 850 rpm to indicate the engine is running)	Engine is running which means the engine speed is greater than 600 to 850 rpm	engine is not in ready state (which is active when the ignition is on or following a stall of the engine)		
P00F6 - Humidity Sensor Circuit Intermittent/Erratic	Engine not in afterrun mode (defined as engine speed greater than 0 rpm) Engine speed greater than 600 to 850 rpm	engine is not in standby state (standby state occurs after ECM initialization or following after-run)	battery voltage is above 11 V for at least 3s	Engline Run Time is greater than 10 seconds (engine speed greater than 600 to 850 rpm to indicate the engine is running)	Engine is running which means the engine speed is greater than 600 to 850 rpm	engine is not in ready state (which is active when the ignition is on or following a stall of the engine)		
P0101 - Mass Air Flow Sensor Performance	Engine not in afterrun mode (defined as engine speed greater than 0 pm) Engine speed greater than 600 to 850 rpm	engine is not in standby state (standby state occurs after ECM initialization or following after-run)	ambient air temperature is above -7 deg C	ambient pressure is above 74.8kPa	battery voltage is above 11 V for at least 3s	Engine Run Time greater than 10 seconds (engine speed greater than 600 to 850 rpm to indicate the engine is running)	Engine is running which means the engine speed is greater than 600 to 850 rpm	engine is not in ready state (which is active when the ignition is on or following a stall of the engine)
P0102 - Mass Air Flow Sensor Circuit Low	Engine not in afterrun mode (defined as engine speed greater than 0 rpm) Engine speed greater than 600 to 850 rpm	engine is not in standby state (standby state occurs after ECM initialization or following after-run)	battery voltage is above 11 V for at least 3s	Engine Run Time greater than 10 seconds (engine speed greater than 600 to 850 rpm to indicate the engine is running)	Engine is running which means the engine speed is greater than 600 to 850 rpm	engine is not in ready state (which is active when the ignition is on or following a stall of the engine)		
P0103 - Mass Air Flow Sensor Circuit High	Engine not in afterrun mode (defined as engine speed greater than 0 rpm) Engine speed greater than 600 to 850 rpm	engine is not in standby state (standby state occurs after ECM initialization or following after-run)	battery voltage is above 11 V for at least 3s	Engine Run Time greater than 10 seconds (engine speed greater than 600 to 850 rpm to indicate the engine is running)	Engine is running which means the engine speed is greater than 600 to 850 rpm	engine is not in ready state (which is active when the ignition is on or following a stall of the engine)		
P0106 - Manifold Absolute Pressure Sensor Performance	Engine speed greater than 600 to 850 rpm Engine speed greater than 600 to 850 rpm	battery voltage is above 11 V for at least 3s	Engine is running which means the engine speed is greater than 600 to 850 rpm	active when the ignition is on or following a stall of the engine)				
P0107 - Manifold Absolute Pressure (MAP) Sensor Circuit Low Voltage	Engine not in afterrun mode (defined as engine speed greater than 0 rpm) Engine speed greater than 600 to 850 rpm	engine is not in standby state (standby state occurs after ECM initialization or following after-run)	battery voltage is above 11 V for at least 3s	Engine Run Time greater than 10 seconds (engine speed greater than 600 to 850 rpm to indicate the engine is running)	Engine is running which means the engine speed is greater than 600 to 850 rpm	engine is not in ready state (which is active when the ignition is on or following a stall of the engine)		
P0108 - Manifold Absolute Pressure (MAP) Sensor Circuit High Voltage	Engine not in afterrun mode (defined as engine speed greater than 0 rpm) Engine speed greater than 600 to 850 rpm	engine is not in standby state (standby state occurs after ECM initialization or following after-run)	battery voltage is above 11 V for at least 3s	Engine Run Time greater than 10 seconds (engine speed greater than 600 to 850 rpm to indicate the engine is running)	Engine is running which means the engine speed is greater than 600 to 850 rpm	engine is not in ready state (which is active when the ignition is on or following a stall of the engine)		
P0112 - Intake Air Temperature Sensor 1 Circuit Low	Engine not in afterrun mode (defined as engine speed greater than 600 to 850 rpm	engine is not in standby state (standby state occurs after ECM initialization or following after-run)	battery voltage is above 11 V for at least 3s	Engine Run Time greater than 10 seconds (engine speed greater than 600 to 850 rpm to indicate the engine is running)	Engine is running which means the engine speed is greater than 600 to 850 rpm	engine is not in ready state (which is active when the ignition is on or following a stall of the engine)		
P0113 - Intake Air Temperature Sensor 1 Circuit High	Engine not in afterrun mode (defined as engine speed greater than 600 to 850 rpm	engine is not in standby state (standby state occurs after ECM initialization or following after-run)	battery voltage is above 11 V for at least 3s	Engine Run Time greater than 10 seconds (engine speed greater than 600 to 850 rpm to indicate the engine is running)	Engine is running which means the engine speed is greater than 600 to 850 rpm	engine is not in ready state (which is active when the ignition is on or following a stall of the engine)		
P0117 - Engine Coolant Temperature Sensor Circuit Low	engree is not in standby state (standby state occurs after ECM initialization or following after-run) battery voltage is above 11 V for at least 3s							
P0118 - Engine Coolant Temperature Sensor Circuit High	engine is not in standby state (standby state occurs after ECM initialization or following after-run) battery voltage is above 11 V for at least 3s				1			
P0128 - Engine Coolant Temperature Below Thermostat Regulating Temperature	Engine not in afterrun mode (defined as engine speed greater than 0 rpm) Engine speed greater than 600 to 850 rpm	engine is not in standby state (standby state occurs after ECM initialization or following after-run)	Engine is running which means the engine speed is greater than 600 to 850 rpm	engine is not in ready state (which is active when the ignition is on or following a stall of the engine)	]			

DTC			Additional Basic Enable Conditions						
P0131 - HO2S Bank 1 Sensor 1 circuit low	Engine not in afterrun mode (defined as engine speed greater than 0 rpm)	Engine speed greater than 600 to 850 rpm	engine is not in standby state (standby state occurs after ECM initialization or following after-run)	Manufacturer Enable Counter is zero (value of 0 means ECM is locked and out of assembly plant mode)	battery voltage is above 11 V for at least 3s	Engine Run Time greater than 10 seconds (engine speed greater than 600 to 850 rpm to indicate the engine is running)	Engine is running which means the engine speed is greater than 600 to 850 rpm	engine is not in ready state (which is active when the ignition is on or following a stall of the engine)	
P0132 - HO2S Bank 1 Sensor 1 circuit high	Engine not in afterrun mode (defined as engine speed greater than 0 rpm)	Engine speed greater than 600 to 850 rpm	engine is not in standby state (standby state occurs after ECM initialization or following after-run)	Manufacturer Enable Counter is zero (value of 0 means ECM is locked and out of assembly plant mode)	battery voltage is above 11 V for at least 3s	Engine Run Time greater than 10 seconds (engine speed greater than 600 to 850 rpm to indicate the engine is running)	Engine is running which means the engine speed is greater than 600 to 850 rpm	engine is not in ready state (which is active when the ignition is on or following a stall of the engine)	
P0137 - HO2S Bank 1 Sensor 2 circuit low	Engine not in afterrun mode (defined as engine speed greater than 0 rpm)	Engine speed greater than 600 to 850 rpm	engine is not in standby state (standby state occurs after ECM initialization or following after-run)	Manufacturer Enable Counter is zero (value of 0 means ECM is locked and out of assembly plant mode)	battery voltage is above 11 V for at least 3s	Engine Run Time greater than 10 seconds (engine speed greater than 600 to 850 rpm to indicate the engine is running)	Engine is running which means the engine speed is greater than 600 to 850 rpm	engine is not in ready state (which is active when the ignition is on or following a stall of the engine)	
P0138 - HO2S Bank 1 Sensor 2 circuit high	Engine not in afterrun mode (defined as engine speed greater than 0 rpm)	Engine speed greater than 600 to 850 rpm	engine is not in standby state (standby state occurs after ECM initialization or following after-run)	Manufacturer Enable Counter is zero (value of 0 means ECM is locked and out of assembly plant mode)	battery voltage is above 11 V for at least 3s	Engine Run Time greater than 10 seconds (engine speed greater than 600 to 850 rpm to indicate the engine is running)	Engine is running which means the engine speed is greater than 600 to 850 rpm	engine is not in ready state (which is active when the ignition is on or following a stall of the engine)	
P014C - HO2S Slow Response Rich to Lean Sensor 1	Engine not in afterrun mode (defined as engine speed greater than 0 rpm)	Engine speed greater than 600 to 850 rpm	engine is not in standby state (standby state occurs after ECM initialization or following after-run)	Manufacturer Enable Counter is zero (value of 0 means ECM is locked and out of assembly plant mode)	battery voltage is above 11 V for at least 3s	Engine Run Time is greater than 10 seconds (engine speed greater than 600 to 850 rpm to indicate the engine is running)	System is not in active regeneration mode	Engine is running which means the engine speed is greater than 600 to 850 rpm	engine is not in ready state (which is active when the ignition is on or following a stall of the engine)
P0171 - Fuel Trim System Lean	System is not in active regeneration mode								
P0172 - Fuel Trim System Rich	System is not in active regeneration mode								
P0182 - Fuel Temperature Sensor 1 Circuit Low	Engine not in afterrun mode (defined as engine speed greater than 0 rpm)	Engine speed greater than 600 to 850 rpm	engine is not in standby state (standby state occurs after ECM initialization or following after-run)	battery voltage is above 11 V for at least 3s	Engine Run Time greater than 10 seconds (engine speed greater than 600 to 850 rpm to indicate the engine is running)	Engine is running which means the engine speed is greater than 600 to 850 rpm	engine is not in ready state (which is active when the ignition is on or following a stall of the engine)		
P0183 - Fuel Temperature Sensor 1 Circuit High	Engine not in afterrun mode (defined as engine speed greater than 0 rpm)	Engine speed greater than 600 to 850 rpm	engine is not in standby state (standby state occurs after ECM initialization or following after-run)	battery voltage is above 11 V for at least 3s	Engine Run Time greater than 10 seconds (engine speed greater than 600 to 850 rpm to indicate the engine is running)	Engine is running which means the engine speed is greater than 600 to 850 rpm	engine is not in ready state (which is active when the ignition is on or following a stall of the engine)		
P0191 - Fuel Rail Pressure Sensor	engine is not in ready state (which is active when the ignition is on or following			·	·				
Performance	a stall of the engine) engine is not in standby state (standby	hotton units as is shown 11 V. for at least							
Circuit Low	state occurs after ECM initialization or following after-run)	3s							
P0193 - Fuel Rail Pressure Sensor Circuit High	engine is not in standby state (standby state occurs after ECM initialization or	battery voltage is above 11 V for at least 3s							
P01CB - Cylinder 1 Injection Timing Retarded	ambient air temperature is above -7 deg C	ambient pressure is above 74.8kPa	engine is not in ready state (which is active when the ignition is on or following a stall of the engine)	]					
P01CC - Cylinder 1 Injection Timing Advanced	ambient air temperature is above -7 deg C	ambient pressure is above 74.8kPa	engine is not in ready state (which is active when the ignition is on or following						
P01CD - Cylinder 2 Injection Timing Retarded	ambient air temperature is above -7 deg C	ambient pressure is above 74.8kPa	a stall of the engine) engine is not in ready state (which is active when the ignition is on or following a stall of the engine)						
P01CE - Cylinder 2 Injection Timing Advanced	ambient air temperature is above -7 deg C	ambient pressure is above 74.8kPa	engine is not in ready state (which is active when the ignition is on or following a stall of the engine) angine is not in ready state (which is						
P01CF - Cylinder 3 Injection Timing Retarded	ambient air temperature is above -7 deg C	ambient pressure is above 74.8kPa	active when the ignition is on or following a stall of the engine)						
P01D0 - Cylinder 3 Injection Timing Advanced	ambient air temperature is above -7 deg C	ambient pressure is above 74.8kPa	engine is not in ready state (which is active when the ignition is on or following a stall of the engine)						
P01D1 - Cylinder 4 Injection Timing Retarded	ambient air temperature is above -7 deg C	ambient pressure is above 74.8kPa	engine is not in ready state (which is active when the ignition is on or following						
P01D2 - Cylinder 4 Injection Timing Advanced	ambient air temperature is above -7 deg C	ambient pressure is above 74.8kPa	a stall of the engine) engine is not in ready state (which is active when the ignition is on or following a stall of the engine)						
P01D3 - Cylinder 5 Injection Timing	ambient air temperature is above -7 deg C	ambient pressure is above 74.8kPa	engine is not in ready state (which is active when the ignition is on or following						
P01D4 - Cylinder 5 Injection Timing Advanced	ambient air temperature is above -7 deg C	ambient pressure is above 74.8kPa	a stall of the engine) engine is not in ready state (which is active when the ignition is on or following a stall of the engine)						
P01D5 - Cylinder 6 Injection Timing Retarded	ambient air temperature is above -7 deg C	ambient pressure is above 74.8kPa	engine is not in ready state (which is active when the ignition is on or following						
P01D6 - Cylinder 6 Injection Timing Advanced	ambient air temperature is above -7 deg C	ambient pressure is above 74.8kPa	a stall of the engine) engine is not in ready state (which is active when the ignition is on or following a stall of the engine)						
P01D7 - Cylinder 7 Injection Timing Retarded	ambient air temperature is above -7 deg C	ambient pressure is above 74.8kPa	engine is not in ready state (which is active when the ignition is on or following a stall of the station)						
P01D8 - Cylinder 7 Injection Timing	ambient air temperature is above -7 deg C	ambient pressure is above 74.8kPa	engine is not in ready state (which is active when the ignition is on or following						
Advanced			a stall of the engine) engine is not in ready state (which is						
Retarded	ambient air temperature is above -7 deg C	ambient pressure is above 74.8kPa	active when the ignition is on or following a stall of the engine)						
P01DA - Cylinder 8 Injection Timing Advanced	ambient air temperature is above -7 deg C	ambient pressure is above 74.8kPa	engine is not in ready state (which is active when the ignition is on or following a stall of the engine)						
P01F0 - Coolant Temperature Dropped Below Diagnostic Monitoring Temperature	Engine not in afterrun mode (defined as engine speed greater than 0 rpm)	Engine speed greater than 600 to 850 rpm	engine is not in standby state (standby state occurs after ECM initialization or following after-run)	Engine is running which means the engine speed is greater than 600 to 850 rpm	engine is not in ready state (which is active when the ignition is on or following a stall of the engine)				, <b>1</b>
P0234 - Turbocharger Engine Overboost	Engine not in afterrun mode (defined as engine speed greater than 0 rpm)	Engine speed greater than 600 to 850 rpm	engine is not in standby state (standby state occurs after ECM initialization or following after-run)	ambient air temperature is above -7 deg C	ambient pressure is above 74.8kPa	battery voltage is above 11 V for at least 3s	Engine Run Time greater than 10 seconds (engine speed greater than 600 to 850 rpm to indicate the engine is running)	Engine is running which means the engine speed is greater than 600 to 850 rpm	engine is not in ready state (which is active when the ignition is on or following a stall of the engine)
P0263 - Cly 1 Balance System P0266 - Cly 2 Balance System	Power Take-Off (PTO) is not engaged Power Take-Off (PTO) is not engaged								
P0269 - Clv 3 Balance System	Power Take-Off (PTO) is not engaged		ennine is not in standhy state (standhy				Enrine Run Time greater than 10 eccords		ennina je not in readu etata (which je
P026A - CAC Efficcientcy Below Threshold	Engine not in afterrun mode (defined as engine speed greater than 0 rpm)	Engine speed greater than 600 to 850 rpm	state occurs after ECM initialization or following after-run)	ambient air temperature is above -7 deg C	ambient pressure is above 74.8kPa	battery voltage is above 11 V for at least 3s	(engine speed greater than 600 to 850 rpm to indicate the engine is running)	Engine is running which means the engine speed is greater than 600 to 850 rpm	active when the ignition is on or following a stall of the engine)
P026C - Injection Quantity Too Low P026D - Injection Quantity Too	ambient air temperature is above -7 deg C	ambient pressure is above 74.8kPa	Power Take-Off (PTO) is not engaged	System is not in active regeneration mode	-				
High P0272 - Cly 4 Palance Sustern	ambient air temperature is above -7 deg C Power Take-Off (PTO) is not encount	ambient pressure is above 74.8kPa	Power Take-Off (PTO) is not engaged	System is not in active regeneration mode	J				
P0275 - Cly 5 Balance System P0278 - Cly 6 Balance System P0281 - Cly 7 Balance System	Power Take-Off (PTO) is not engaged Power Take-Off (PTO) is not engaged Power Take-Off (PTO) is not engaged								
Puzel4 - Cly 8 Isatance System P0299 - Turbocharger Engine Underboost	Engine not in afterrun mode (defined as engine speed greater than 0 rpm)	Engine speed greater than 600 to 850 rpm	engine is not in standby state (standby state occurs after ECM initialization or following after-run)	ambient air temperature is above -7 deg C	ambient pressure is above 74.8kPa	battery voltage is above 11 V for at least 3s	Engine Run Time greater than 10 seconds (engine speed greater than 600 to 850 rpm to indicate the engine is running)	Engine is running which means the engine speed is greater than 600 to 850 rpm	engine is not in ready state (which is active when the ignition is on or following a stall of the engine)
P02E0 - Intake Air Flow Valve	engine is not in standby state (standby state occurs after ECM initialization or	battery voltage is above 11 V for at least							
Control Circuit P02E2 - Intake Air Flow Valve Control Circuit 1 Low Voltage	following after-run) engine is not in standby state (standby state occurs after ECM initialization or	3s battery voltage is above 11 V for at least 3s							

DTC			Additional Basic Enable Conditions							
P02E3 - Intake Air Flow Valve Control Circuit 1 High Voltage	engine is not in standby state (standby state occurs after ECM initialization or following after-run)	battery voltage is above 11 V for at least 3s								
P02E7 - Diesel Intake Air Flow Position Sensor Circuit Range Performance	Engine not in afterrun mode (defined as engine speed greater than 0 rpm)	Engine speed greater than 600 to 850 rpm	engine is not in standby state (standby state occurs after ECM initialization or following after-run)	battery voltage is above 11 V for at least 3s	Engine Run Time greater than 10 seconds (engine speed greater than 600 to 850 rpm to indicate the engine is running)	Engine is running which means the engine speed is greater than 600 to 850 rpm	engine is not in ready state (which is active when the ignition is on or following a stall of the engine)			
P02E8 - Diesel Intake Air Flow Position Sensor Circuit Low	Engine not in afterrun mode (defined as engine speed greater than 0 rpm)	Engine speed greater than 600 to 850 rpm	engine is not in standby state (standby state occurs after ECM initialization or following after-run)	battery voltage is above 11 V for at least 3s	Engine Run Time greater than 10 seconds (engine speed greater than 600 to 850 rpm to indicate the engine is running)	Engine is running which means the engine speed is greater than 600 to 850 rpm	engine is not in ready state (which is active when the ignition is on or following a stall of the engine)			
P02E9 - Diesel Intake Air Flow Position Sensor Circuit High	Engine not in afterrun mode (defined as engine speed greater than 0 rpm)	Engine speed greater than 600 to 850 rpm	engine is not in standby state (standby state occurs after ECM initialization or following after-run)	battery voltage is above 11 V for at least 3s	Engine Run Time greater than 10 seconds (engine speed greater than 600 to 850 rpm to indicate the engine is running)	Engine is running which means the engine speed is greater than 600 to 850 rpm	engine is not in ready state (which is active when the ignition is on or following a stall of the engine)			
P02EB - Intake Air Flow Valve Control Motor Current Performance	engine is not in standby state (standby state occurs after ECM initialization or following after-run)	battery voltage is above 11 V for at least 3s								
P0300 - Engine Misfire Detected	engine is not in ready state (which is active when the ignition is on or following a stall of the engine)									
P0301 - Cylinder 1 Misfire Detected	engine is not in ready state (which is active when the ignition is on or following a stall of the engine)									
P0302 - Cylinder 2 Misfire Detected	engine is not in ready state (which is active when the ignition is on or following a stall of the engine)	ļ								
P0303 - Cylinder 3 Misfire Detected	engine is not in ready state (which is active when the ignition is on or following a stall of the engine)	ļ								
P0304 - Cylinder 4 Misfire Detected	engine is not in ready state (which is active when the ignition is on or following a stall of the engine)	ļ								
P0305 - Cylinder 5 Misfire Detected	engine is not in ready state (which is active when the ignition is on or following a stall of the engine)	ļ								
P0306 - Cylinder 6 Misfire Detected	engine is not in ready state (which is active when the ignition is on or following a stall of the engine)	ļ								
P0307 - Cylinder 7 Misfire Detected	active when the ignition is on or following a stall of the engine	ļ								
P0308 - Cylinder 8 Misfire Detected	active when the ignition is on or following a stall of the engine)	opping in part in standing state (standing		engine is not in reach, state furbish is	7					
P0335 - Crankshaft Position Sensor Circuit	Engine not in afterrun mode (defined as engine speed greater than 0 rpm)	engine is not in standoy state (standoy state occurs after ECM initialization or following after-run)	Engine is running which means the engine speed is greater than 600 to 850 rpm	active when the ignition is on or following a stall of the engine)						
P0336 - Crankshaft Position Sensor Performance	Engine not in afterrun mode (defined as engine speed greater than 0 rpm)	state occurs after ECM initialization or following after-run)	Engine is running which means the engine speed is greater than 600 to 850 rpm	active when the ignition is on or following a stall of the engine)						
P0340 - Camshaft Position Sensor Circuit	Engine not in afterrun mode (defined as engine speed greater than 0 rpm)	engine is not in standoy state (standoy state occurs after ECM initialization or following after-run)	Engine is running which means the engine speed is greater than 600 to 850 rpm	active when the ignition is on or following a stall of the engine)	-					
P0341 - Camshaft Position Sensor Performance	Engine not in afterrun mode (defined as engine speed greater than 0 rpm)	state occurs after ECM initialization or following after-run)	Engine is running which means the engine speed is greater than 600 to 850 rpm	active when the ignition is on or following a stall of the engine)	1					
P0381 - Wait to Start Lamp Control Circuit	Engine not in afterrun mode (defined as engine speed greater than 0 rpm)	engine is not in standby state (standby state occurs after ECM initialization or following after-run)	battery voltage is above 11 V for at least 3s	Engine is running which means the engin speed is greater than 600 to 850 rpm	ė					
P0400 - Exhaust Gas Recirculation (EGR) Flow Incorrect	Engine not in afterrun mode (defined as engine speed greater than 0 rpm)	Engine speed greater than 600 to 850 rpm	engine is not in standby state (standby state occurs after ECM initialization or following after-run)	ambient air temperature is above -7 deg 0	C ambient pressure is above 74.8kPa	battery voltage is above 11 V for at least 3s	Engine Run Time greater than 10 seconds (engine speed greater than 600 to 850 rpm to indicate the engine is running)	Engine is running which means the engine speed is greater than 600 to 850 rpm	engine is not in ready state (which is active when the ignition is on or following a stall of the engine)	
P0401 - Exhaust Gas Recirculation Flow Insufficient	Engine not in afterrun mode (defined as engine speed greater than 0 rpm)	Engine speed greater than 600 to 850 rpm	engine is not in standby state (standby state occurs after ECM initialization or following after-run)	ambient air temperature is above -7 deg (	ambient pressure is above 74.8kPa	battery voltage is above 11 V for at least 3s	Engine Run Time greater than 10 seconds (engine speed greater than 600 to 850 rpm to indicate the engine is running)	System is not in active regeneration mode	Engine is running which means the engine speed is greater than 600 to 850 rpm	engine is not in ready state (which is active when the ignition is on or following a stall of the engine)
P0402 - Exhaust Gas Recirculation Flow Excessive	Engine not in afterrun mode (defined as engine speed greater than 0 rpm)	Engine speed greater than 600 to 850 rpm	engine is not in standby state (standby state occurs after ECM initialization or following after-run)	ambient air temperature is above -7 deg 0	ambient pressure is above 74.8kPa	battery voltage is above 11 V for at least 3s	Engine Run Time greater than 10 seconds (engine speed greater than 600 to 850 rpm to indicate the engine is running)	System is not in active regeneration mode	Engine is running which means the engine speed is greater than 600 to 850 rpm	engine is not in ready state (which is active when the ignition is on or following a stall of the engine)
P0403 - Exhaust Gas Recirculation (EGR) Motor Control Circuit	engine is not in standby state (standby state occurs after ECM initialization or following after-run)	battery voltage is above 11 V for at least 3s						_		
P0405 - Exhaust Gas Recirculation Position Sensor Circuit Low	Engine not in afterrun mode (defined as engine speed greater than 0 rpm)	Engine speed greater than 600 to 850 rpm	engine is not in standby state (standby state occurs after ECM initialization or following after-run)	battery voltage is above 11 V for at least 3s	Engine Run Time greater than 10 seconds (engine speed greater than 600 to 850 rpm to indicate the engine is running)	Engine is running which means the engine speed is greater than 600 to 850 rpm	engine is not in ready state (which is active when the ignition is on or following a stall of the engine)			
P0406 - Exhaust Gas Recirculation Position Sensor Circuit High	Engine not in afterrun mode (defined as engine speed greater than 0 rpm)	Engine speed greater than 600 to 850 rpm	engine is not in standby state (standby state occurs after ECM initialization or following after-run)	battery voltage is above 11 V for at least 3s	Engine Run Time greater than 10 seconds (engine speed greater than 600 to 850 rpm to indicate the engine is running)	Engine is running which means the engine speed is greater than 600 to 850 rpm	engine is not in ready state (which is active when the ignition is on or following a stall of the engine)			
P040C - Exhaust Gas Recirculation (EGR) Temperature Sensor 2 Circuit Low Voltage	Engine not in afterrun mode (defined as engine speed greater than 0 rpm)	Engine speed greater than 600 to 850 rpm	engine is not in standby state (standby state occurs after ECM initialization or following after-run)	battery voltage is above 11 V for at least 3s	Engine Run Time greater than 10 seconds (engine speed greater than 600 to 850 rpm to indicate the engine is running)	Engine is running which means the engine speed is greater than 600 to 850 rpm	engine is not in ready state (which is active when the ignition is on or following a stall of the engine)			
P040D - Exhaust Gas Recirculation (EGR) Temperature Sensor 2 Circuit High Voltage	Engine not in afterrun mode (defined as engine speed greater than 0 rpm)	Engine speed greater than 600 to 850 rpm	engine is not in standby state (standby state occurs after ECM initialization or following after-run)	battery voltage is above 11 V for at least 3s	Engine Run Time greater than 10 seconds (engine speed greater than 600 to 850 rpm to indicate the engine is running)	Engine is running which means the engine speed is greater than 600 to 850 rpm	engine is not in ready state (which is active when the ignition is on or following a stall of the engine)			
P040F - Exhaust Gas Recirculation (EGR) Temperature Sensor 1-2 Correlation	Engine not in afterrun mode (defined as engine speed greater than 0 rpm)	Engine speed greater than 600 to 850 rpm	engine is not in standby state (standby state occurs after ECM initialization or following after-run)	Engine is running which means the engin speed is greater than 600 to 850 rpm	e engine is not in ready state (which is active when the ignition is on or following a stall of the engine)					
P041C - Exhaust Gas Recirculation (EGR) Temperature Sensor 1 Circuit Low Voltage	Engine not in afterrun mode (defined as engine speed greater than 0 rpm)	Engine speed greater than 600 to 850 rpm	engine is not in standby state (standby state occurs after ECM initialization or following after-run)	battery voltage is above 11 V for at least 3s	Engine Run Time greater than 10 seconds (engine speed greater than 600 to 850 rpm to indicate the engine is running)	Engine is running which means the engine speed is greater than 600 to 850 rpm	engine is not in ready state (which is active when the ignition is on or following a stall of the engine)			
P041D - Exhaust Gas Recirculation (EGR) Temperature Sensor 1 Circuit High Voltage	Engine not in afterrun mode (defined as engine speed greater than 0 rpm)	Engine speed greater than 600 to 850 rpm	engine is not in standby state (standby state occurs after ECM initialization or following after-run)	battery voltage is above 11 V for at least 3s	Engine Run Time greater than 10 seconds (engine speed greater than 600 to 850 rpm to indicate the engine is running)	Engine is running which means the engine speed is greater than 600 to 850 rpm	engine is not in ready state (which is active when the ignition is on or following a stall of the engine)		_	
P0420 - NMHC Catalyst Efficiency Below Threshold Bank 1	Engine not in afterrun mode (defined as engine speed greater than 0 rpm)	Engine speed greater than 600 to 850 rpm	engine is not in standby state (standby state occurs after ECM initialization or following after-run)	ambient air temperature is above -7 deg 0	ambient pressure is above 74.8kPa	Engine Run Time greater than 10 seconds (engine speed greater than 600 to 850 rpm to indicate the engine is running)	Engine is running which means the engine speed is greater than 600 to 850 rpm	engine is not in ready state (which is active when the ignition is on or following a stall of the engine)		
P0461 - Fuel Level Sensor Performance	Engine not in afterrun mode (defined as engine speed greater than 0 rpm)	Engine speed greater than 600 to 850 rpm	engine is not in standby state (standby state occurs after ECM initialization or following after-run)	battery voltage is above 11 V for at least 3s	Engine Run Time greater than 10 seconds (engine speed greater than 600 to 850 rpm to indicate the engine is running)	Engine is running which means the engine speed is greater than 600 to 850 rpm	engine is not in ready state (which is active when the ignition is on or following a stall of the engine)			
P0462 - Fuel Level Sensor Circuit Low	Engine not in afterrun mode (defined as engine speed greater than 0 rpm)	Engine speed greater than 600 to 850 rpm	engine is not in standby state (standby state occurs after ECM initialization or following after-run)	battery voltage is above 11 V for at least 3s	Engine Run Time greater than 10 seconds (engine speed greater than 600 to 850 rpm to indicate the engine is running)	Engine is running which means the engine speed is greater than 600 to 850 rpm	engine is not in ready state (which is active when the ignition is on or following a stall of the engine)			
P0463 - Fuel Level Sensor Circuit High	Engine not in afterrun mode (defined as engine speed greater than 0 rpm)	Engine speed greater than 600 to 850 rpm	engine is not in standby state (standby state occurs after ECM initialization or following after-run)	battery voltage is above 11 V for at least 3s	Engine Run Time greater than 10 seconds (engine speed greater than 600 to 850 rpm to indicate the engine is running)	Engine is running which means the engine speed is greater than 600 to 850 rpm	engine is not in ready state (which is active when the ignition is on or following a stall of the engine)			
P046C - Exhaust Gas Recirculation(EGR) Position Sensor Performance	Engine not in afterrun mode (defined as engine speed greater than 0 rpm)	Engine speed greater than 600 to 850 rpm	engine is not in standby state (standby state occurs after ECM initialization or following after-run)	battery voltage is above 11 V for at least 3s	Engine is running which means the engine speed is greater than 600 to 850 rpm	engine is not in ready state (which is active when the ignition is on or following a stall of the engine)				

	DTC			Additional Basic Enable Conditions					
P0480	- Cooling Fan Speed Output Circuit	Engine not in afterrun mode (defined as engine speed greater than 0 rpm)	engine is not in standby state (standby state occurs after ECM initialization or following after-run)	battery voltage is above 11 V for at least 3s	Engine is running which means the engine speed is greater than 600 to 850 rpm				
P04	483 - Cooling Fan System Performance	Engine not in afterrun mode (defined as engine speed greater than 0 rpm)	Engine speed greater than 600 to 850 rpm	engine is not in standby state (standby state occurs after ECM initialization or following after-run)	Manufacturer Enable Counter is zero (value of 0 means ECM is locked and out of assembly plant mode)	ambient pressure is above 74.8kPa	Engine Run Time greater than 10 seconds (engine speed greater than 600 to 850 rpm to indicate the engine is running)	Engine is running which means the engine speed is greater than 600 to 850 rpm	engine is not in ready state (which is active when the ignition is on or following a stall of the engine)
P0489 (EGR)	Exhaust Gas Recirculation     Motor Control Circuit 1 Low     Voltage	engine is not in standby state (standby state occurs after ECM initialization or following after-nin)	battery voltage is above 11 V for at least 3s						
P0490 (EGR)	Exhaust Gas Recirculation     Motor Control Circuit 1 High     Voltage	engine is not in standby state (standby state occurs after ECM initialization or following after-run)	battery voltage is above 11 V for at least 3s						1
P049	5 - Cooling Fan Speed High	Engine not in afterrun mode (defined as engine speed greater than 0 rpm)	Engine speed greater than 600 to 850 rpm	engine is not in standby state (standby state occurs after ECM initialization or following after-run)	Manufacturer Enable Counter is zero (value of 0 means ECM is locked and out of assembly plant mode)	Engine Run Time greater than 10 seconds (engine speed greater than 600 to 850 rpm to indicate the engine is running)	Engine is running which means the engine speed is greater than 600 to 850 rpm	engine is not in ready state (which is active when the ignition is on or following a stall of the engine)	
P0495	0 - EGR Control Position Not Learned	engine is not in standby state (standby state occurs after ECM initialization or following after-run)	battery voltage is above 11 V for at least 3s						
F	20506 - Idle Speed Low	Engine Run Time greater than 10 seconds (engine speed greater than 600 to 850 rpm to indicate the engine is running)	engine is not in ready state (which is active when the ignition is on or following a stall of the engine)						
P	20507 - Idle Speed High	Engine Run Time greater than 10 seconds (engine speed greater than 600 to 850 rpm to indicate the engine is running)	engine is not in ready state (which is active when the ignition is on or following a stall of the engine)						
P0526	- Cooling Fan Speed Sensor Circuit	Engine not in afterrun mode (defined as engine speed greater than 0 rpm)	Engine speed greater than 600 to 850 rpm	engine is not in standby state (standby state occurs after ECM initialization or following after-run)	battery voltage is above 11 V for at least 3s	Engine Run Time greater than 10 seconds (engine speed greater than 600 to 850 rpm to indicate the engine is running)	Engine is running which means the engine speed is greater than 600 to 850 rpm	engine is not in ready state (which is active when the ignition is on or following a stall of the engine)	
P0545 (EGT) :	5 - Exhaust Gas Temperature Sensor 1 Circuit Low Voltage	Engine not in afterrun mode (defined as engine speed greater than 0 rpm)	Engine speed greater than 600 to 850 rpm	engine is not in standby state (standby state occurs after ECM initialization or following after-run)	battery voltage is above 11 V for at least 3s	Engine is running which means the engine speed is greater than 600 to 850 rpm			-
P0546 (E0	- Exhaust Gas Temperature GT) Sensor 1 Circuit High	Engine not in afterrun mode (defined as engine speed greater than 0 rpm)	Engine speed greater than 600 to 850 rpm	engine is not in standby state (standby state occurs after ECM initialization or following ofter sup)	battery voltage is above 11 V for at least 3s	Engine is running which means the engine speed is greater than 600 to 850 rpm			
P056	67 - Cruise Control Resume Switch Circuit	Engine not in afterrun mode (defined as engine speed greater than 0 rpm)	Engine speed greater than 600 to 850 rpm	engine is not in standby state (standby state occurs after ECM initialization or following after-run)	Manufacturer Enable Counter is zero (value of 0 means ECM is locked and out of assembly plant mode)	battery voltage is above 11 V for at least 3s	Engine Run Time greater than 10 seconds (engine speed greater than 600 to 850 rpm to indicate the engine is running)	Engine is running which means the engine speed is greater than 600 to 850 rpm	engine is not in ready state (which is active when the ignition is on or following a stall of the engine)
P0568	3 - Cruise Control Set Switch Circuit	Engine not in afterrun mode (defined as engine speed greater than 0 rpm)	Engine speed greater than 600 to 850 rpm	engine is not in standby state (standby state occurs after ECM initialization or following after-run)	Manufacturer Enable Counter is zero (value of 0 means ECM is locked and out of assembly plant mode)	battery voltage is above 11 V for at least 3s	Engine Run Time greater than 10 seconds (engine speed greater than 600 to 850 rpm to indicate the engine is running)	Engine is running which means the engine speed is greater than 600 to 850 rpm	engine is not in ready state (which is active when the ignition is on or following a stall of the engine)
P0575	- Cruise Control Input Circuit	Engine not in afterrun mode (defined as engine speed greater than 0 rpm)	Engine speed greater than 600 to 850 rpm	engine is not in standby state (standby state occurs after ECM initialization or	Manufacturer Enable Counter is zero (value of 0 means ECM is locked and out	battery voltage is above 11 V for at least 3s	Engine is running which means the engine speed is greater than 600 to 850 rpm	engine is not in ready state (which is active when the ignition is on or following	
P05	7C - Brake Pedal Position	engine is not in standby state (standby state occurs after ECM initialization or		tollowing atter-run)	of assembly plant mode)			a stall of the engine)	1
P05 Se	7D - Brake Pedal Position ensor Circuit Low Voltage	following after-run) engine is not in standby state (standby state occurs after ECM initialization or following after-run)							
P060	06 - Control Module Internal Performance	Engine not in afterrun mode (defined as engine speed greater than 0 rpm)	Engine speed greater than 600 to 850 rpm	engine is not in standby state (standby state occurs after ECM initialization or following after-run)	Engine Run Time greater than 10 seconds (engine speed greater than 600 to 850 rpm to indicate the engine is running)	Engine is running which means the engine speed is greater than 600 to 850 rpm	engine is not in ready state (which is active when the ignition is on or following a stall of the engine)		
P0623	7 - Fuel Pump Relay Control Circuit	battery voltage is above 11 V for at least 3s			·		·		
P0628	9 - Fuel Pump Relay Control Circuit Low 9 - Fuel Pump Relay Control	battery voltage is above 11 V for at least 3s battery voltage is above 11 V for at least	-						
P062F	- Control Module Long Term Memory Reformance	3s engine is not in standby state (standby state occurs after ECM initialization or	Ī						
PO6	340 - Intake Air (IA) Heater	following after-run) engine is not in standby state (standby state occurs after ECM initialization or	battery voltage is above 11 V for at least						
P0641	I - 5 Volt Reference 1 Circuit	following after-run) engine is not in standby state (standby state occurs after ECM initialization or following after-run)	battery voltage is above 11 V for at least 3s						
P064C	- Glow Plug Control Module Performance	engine is not in standby state (standby state occurs after ECM initialization or following after non	battery voltage is above 11 V for at least 3s						
P0650	- Malfunction Indicator Lamp Control Circuit	Engine not in afterrun mode (defined as engine speed greater than 0 rpm)	engine is not in standby state (standby state occurs after ECM initialization or following after-run)	battery voltage is above 11 V for at least 3s	Engine is running which means the engine speed is greater than 600 to 850 rpm				
P0651	I - 5 Volt Reference 2 Circuit	engine is not in standby state (standby state occurs after ECM initialization or following after-nin)	battery voltage is above 11 V for at least 3s						
P0671	- Glow Plug 1 Control Circuit	engine is not in standby state (standby state occurs after ECM initialization or following ofter pup)	battery voltage is above 11 V for at least 3s						
P0672	- Glow Plug 2 Control Circuit	engine is not in standby state (standby state occurs after ECM initialization or following after-run)	battery voltage is above 11 V for at least 3s						
P0673	- Glow Plug 3 Control Circuit	engine is not in standby state (standby state occurs after ECM initialization or following after.nm)	battery voltage is above 11 V for at least 3s						
P0674	- Glow Plug 4 Control Circuit	engine is not in standby state (standby state occurs after ECM initialization or following after-run)	battery voltage is above 11 V for at least 3s						
P0675	- Glow Plug 5 Control Circuit	engine is not in standby state (standby state occurs after ECM initialization or following after-run)	battery voltage is above 11 V for at least 3s						
P0676	- Glow Plug 6 Control Circuit	engine is not in standby state (standby state occurs after ECM initialization or following after-run)	battery voltage is above 11 V for at least 3s						
P0677	- Glow Plug 7 Control Circuit	engine is not in standby state (standby state occurs after ECM initialization or following after-nin)	battery voltage is above 11 V for at least 3s						
P0678	- Glow Plug 8 Control Circuit	engine is not in standby state (standby state occurs after ECM initialization or following after.nm)	battery voltage is above 11 V for at least 3s						
P0697	7 - 5 Volt Reference 3 Circuit	engine is not in standby state (standby state occurs after ECM initialization or following after-run)	battery voltage is above 11 V for at least 3s						
P06A3	3 - 5 Volt Reference 4 Circuit	engine is not in standby state (standby state occurs after ECM initialization or following after-run)	battery voltage is above 11 V for at least 3s						
P06D2	2 - 5 Volt Reference 5 Circuit	engine is not in standby state (standby state occurs after ECM initialization or following after-run)	battery voltage is above 11 V for at least 3s						
P07 Mod	00 - Transmission Control ule Requested Malfunction ficator Lamp Illumination	engine is not in standby state (standby state occurs after ECM initialization or following after-run)		-					
P08 (PNP)	151 - Park/Neutral Position ) Switch Circuit Low Voltage	engine is not in standby state (standby state occurs after ECM initialization or following after-run)	I						

DTC			Additional Basic Enable Conditions								
P0852 - Park/Neutral Position (PNP) Switch Circuit High Voltage	engine is not in standby state (standby state occurs after ECM initialization or following after-run)				-						
P1043 - Reductant Pump High Control Circuit Low Voltage	Engine not in afterrun mode (defined as engine speed greater than 0 rpm)	Engine speed greater than 600 to 850 rpm	engine is not in standby state (standby state occurs after ECM initialization or following after-run)	Engine Run Time greater than 10 seconds (engine speed greater than 600 to 850 rpm to indicate the engine is running)	Engine is running which means the engine speed is greater than 600 to 850 rpm	engine is not in ready state (which is active when the ignition is on or following a stall of the engine)					
P1044 - Reductant Pump High Control Circuit High Voltage	Engine speed greater than 600 to 850 rpm	engine is not in standby state (standby state occurs after ECM initialization or following after-run)	Engine Run Time greater than 10 seconds (engine speed greater than 600 to 850 rpm to indicate the engine is running)	Engine is running which means the engine speed is greater than 600 to 850 rpm	engine is not in ready state (which is active when the ignition is on or following a stall of the engine)						
P1048 - Reductant Injector High Control Circuit Low Voltage	Engine not in afterrun mode (defined as engine speed greater than 0 rpm)	Engine speed greater than 600 to 850 rpm	engine is not in standby state (standby state occurs after ECM initialization or following after-run)	battery voltage is above 11 V for at least 3s	Engine Run Time greater than 10 seconds (engine speed greater than 600 to 850 rpm to indicate the engine is running)	Engine is running which means the engine speed is greater than 600 to 850 rpm	engine is not in ready state (which is active when the ignition is on or following a stall of the engine)				
P1049 - Reductant Injector High Control Circuit High Voltage	Engine not in afterrun mode (defined as engine speed greater than 0 rpm)	Engine speed greater than 600 to 850 rpm	engine is not in standby state (standby state occurs after ECM initialization or following after-run)	battery voltage is above 11 V for at least 3s	Engine Run Time greater than 10 seconds (engine speed greater than 600 to 850 rpm to indicate the engine is running)	Engine is running which means the engine speed is greater than 600 to 850 rpm	engine is not in ready state (which is active when the ignition is on or following a stall of the engine)				
P10CC - Exhaust Aftertreatment Fuel Injector Control Circuit Shorted	Engine not in afterrun mode (defined as engine speed greater than 0 rpm)	engine is not in standby state (standby state occurs after ECM initialization or following after-run)	battery voltage is above 11 V for at least 3s	Engine is running which means the engine speed is greater than 600 to 850 rpm							
Fuel Injector High Control Circuit Low Voltage	Engine not in afterrun mode (defined as engine speed greater than 0 rpm)	engine is not in standby state (standby state occurs after ECM initialization or following after-run)	battery voltage is above 11 V for at least 3s	Engine is running which means the engine speed is greater than 600 to 850 rpm							
P10CE - Exhaust Aftertreatment Fuel Injector High Control Circuit High Voltage	Engine not in afterrun mode (defined as engine speed greater than 0 rpm)	engine is not in standby state (standby state occurs after ECM initialization or following after-run)	battery voltage is above 11 V for at least 3s	Engine is running which means the engine speed is greater than 600 to 850 rpm		_					
P10D0 - Reductant Injector Temperature - Exhaust Gas	Engine not in afterrun mode (defined as engine speed greater than 0 rpm)	Engine speed greater than 600 to 850 rpm	engine is not in standby state (standby state occurs after ECM initialization or following after run)	Engine is running which means the engine speed is greater than 600 to 850 rpm	engine is not in ready state (which is active when the ignition is on or following a stall of the angine)						
P111F - Fuel Temperature Sensor 1 - Fuel Temperature Sensor 2 Not	Engine not in afterrun mode (defined as	Engine speed greater than 600 to 850 rpm	engine is not in standby state (standby state occurs after ECM initialization or	Engine is running which means the engine	engine is not in ready state (which is active when the ignition is on or following						
Plausible P113A - Exhaust Gas Temperature Sensors 3-4 Not Plausible	Engine not in afterrun mode (defined as engine speed greater than 0 mm)	Engine speed greater than 600 to 850 rpm	following after-run) engine is not in standby state (standby state occurs after ECM initialization or	Engine is running which means the engine speed is greater than 600 to 850 rpm	a stall of the engine) engine is not in ready state (which is active when the ignition is on or following	-					
P11A6 - HO2S Performance - Signal High During Moderate Load	Engine not in afterrun mode (defined as engine speed greater than 0 rpm)	Engine speed greater than 600 to 850 rpm	engine is not in standby state (standby state occurs after ECM initialization or fellowing ofter such	Manufacturer Enable Counter is zero (value of 0 means ECM is locked and out of censembly pleat mode)	a stall of the engine) battery voltage is above 11 V for at least 3s	Engine Run Time greater than 10 seconds (engine speed greater than 600 to 850 rpm to indicate the engine is unaine)	Engine is running which means the engine speed is greater than 600 to 850 rpm	engine is not in ready state (which is active when the ignition is on or following a stall of the section.			
P11A9 - HO2S Performance - Signal Low During Moderate Load Sensor 1	Engine not in afterrun mode (defined as engine speed greater than 0 rpm)	Engine speed greater than 600 to 850 rpm	engine is not in standby state (standby state occurs after ECM initialization or following after-run)	Manufacturer Enable Counter is zero (value of 0 means ECM is locked and out of assembly plant mode)	battery voltage is above 11 V for at least 3s	Engine Run Time greater than 10 seconds (engine speed greater than 600 to 850 rpm to indicate the engine is running)	Engine is running which means the engine speed is greater than 600 to 850 rpm	engine is not in ready state (which is active when the ignition is on or following a stall of the engine)			
P11AF - HO2S Performance - Signal High During Moderate Load Bank 1 Sensor 2	Engine not in afterrun mode (defined as engine speed greater than 0 rpm)	Engine speed greater than 600 to 850 rpm	engine is not in standby state (standby state occurs after ECM initialization or following after-run)	Manufacturer Enable Counter is zero (value of 0 means ECM is locked and out of assembly plant mode)	battery voltage is above 11 V for at least 3s	Engine Run Time greater than 10 seconds (engine speed greater than 600 to 850 rpm to indicate the engine is running)	Engine is running which means the engine speed is greater than 600 to 850 rpm	engine is not in ready state (which is active when the ignition is on or following a stall of the engine)			
P11B2 - HO2S Performance - Signal Low During Moderate Load Bank 1 Sensor 2	Engine not in afterrun mode (defined as engine speed greater than 0 rpm)	Engine speed greater than 600 to 850 rpm	engine is not in standby state (standby state occurs after ECM initialization or following after-run)	Manufacturer Enable Counter is zero (value of 0 means ECM is locked and out of assembly plant mode)	battery voltage is above 11 V for at least 3s	Engine Run Time greater than 10 seconds (engine speed greater than 600 to 850 rpm to indicate the engine is running)	Engine is running which means the engine speed is greater than 600 to 850 rpm	engine is not in ready state (which is active when the ignition is on or following a stall of the engine)			
P11B4 - H02S Current Performance Sensor 1	Engine not in afterrun mode (defined as engine speed greater than 0 rpm)	Engine speed greater than 600 to 850 rpm	engine is not in standby state (standby state occurs after ECM initialization or following after-run)	Manufacturer Enable Counter is zero (value of 0 means ECM is locked and out of assembly plant mode)	battery voltage is above 11 V for at least 3s	Engine Run Time greater than 10 seconds (engine speed greater than 600 to 850 rpm to indicate the engine is running)	Engine is running which means the engine speed is greater than 600 to 850 rpm	engine is not in ready state (which is active when the ignition is on or following a stall of the engine)			
P11B5 - HO2S Current Performance Bank 1 Sensor 2	Engine not in afterrun mode (defined as engine speed greater than 0 rpm)	Engine speed greater than 600 to 850 rpm	engine is not in standby state (standby state occurs after ECM initialization or following after-run)	Manufacturer Enable Counter is zero (value of 0 means ECM is locked and out of assembly plant mode)	battery voltage is above 11 V for at least 3s	Engine Run Time greater than 10 seconds (engine speed greater than 600 to 850 rpm to indicate the engine is running)	Engine is running which means the engine speed is greater than 600 to 850 rpm	engine is not in ready state (which is active when the ignition is on or following a stall of the engine)			
P11CB - NOx Sensor Performance - Signal High Bank 1 Sensor 1	Engine not in afterrun mode (defined as engine speed greater than 0 rpm)	Engine speed greater than 600 to 850 rpm	engine is not in standby state (standby state occurs after ECM initialization or following after-run)	Manufacturer Enable Counter is zero (value of 0 means ECM is locked and out of assembly plant mode)	ambient air temperature is above -7 deg C	ambient pressure is above 74.8kPa	battery voltage is above 11 V for at least 3s	Engine Run Time greater than 10 seconds (engine speed greater than 600 to 850 rpm to indicate the engine is running)	System is not in active regeneration mode	Engine is running which means the engine speed is greater than 600 to 850 rpm	engine is not in ready state (which is active when the ignition is on or following a stall of the engine)
P11CC - NOx Sensor Performance - Signal Low Bank 1 Sensor 1	Engine not in afterrun mode (defined as engine speed greater than 0 rpm)	Engine speed greater than 600 to 850 rpm	engine is not in standby state (standby state occurs after ECM initialization or following after-run)	Manufacturer Enable Counter is zero (value of 0 means ECM is locked and out of assembly plant mode)	ambient air temperature is above -7 deg C	ambient pressure is above 74.8kPa	battery voltage is above 11 V for at least 3s	Engine Run Time greater than 10 seconds (engine speed greater than 600 to 850 rpm to indicate the engine is running)	System is not in active regeneration mode	Engine is running which means the engine speed is greater than 600 to 850 rpm	engine is not in ready state (which is active when the ignition is on or following a stall of the engine)
P11DB - NOx Sensor Current Performance Bank 1 Sensor 1	Engine not in afterrun mode (defined as engine speed greater than 0 rpm)	Engine speed greater than 600 to 850 rpm	engine is not in standby state (standby state occurs after ECM initialization or following after-run)	Manufacturer Enable Counter is zero (value of 0 means ECM is locked and out of assembly plant mode)	battery voltage is above 11 V for at least 3s	Engine Run Time greater than 10 seconds (engine speed greater than 600 to 850 rpm to indicate the engine is running)	System is not in active regeneration mode	Engine is running which means the engine speed is greater than 600 to 850 rpm	engine is not in ready state (which is active when the ignition is on or following a stall of the engine)		
P11DC - NOx Sensor Current Performance Bank 1 Sensor 2	Engine not in afterrun mode (defined as engine speed greater than 0 rpm)	Engine speed greater than 600 to 850 rpm	engine is not in standby state (standby state occurs after ECM initialization or following after-run)	Manufacturer Enable Counter is zero (value of 0 means ECM is locked and out of assembly plant mode)	battery voltage is above 11 V for at least 3s	Engine Run Time greater than 10 seconds (engine speed greater than 600 to 850 rpm to indicate the engine is running)	System is not in active regeneration mode	Engine is running which means the engine speed is greater than 600 to 850 rpm	engine is not in ready state (which is active when the ignition is on or following a stall of the engine)		
P122C - Intake Air Flow Valve Control Circuit Shorted	state occurs after ECM initialization or following after-run)	battery voltage is above 11 V for at least 3s									
P122D - Diesel Intake Air Flow Position Sensor Exceeded Learning Limit	engine is not in standby state (standby state occurs after ECM initialization or following after-run)	battery voltage is above 11 V for at least 3s									
P122E - Intake Air Flow Valve Control Circuit 2 Low Voltage	engine is not in standby state (standby state occurs after ECM initialization or following after nm)	battery voltage is above 11 V for at least 3s									
P122F - Intake Air Flow Valve Control Circuit 2 High Voltage	engine is not in standby state (standby state occurs after ECM initialization or following after-run)	battery voltage is above 11 V for at least 3s			_						
P125A - Fuel Pressure Regulator 2 High Control Circuit Low Voltage	Engine not in afterrun mode (defined as engine speed greater than 0 rpm)	engine is not in standby state (standby state occurs after ECM initialization or following after-run)	battery voltage is above 11 V for at least 3s	Engine is running which means the engine speed is greater than 600 to 850 rpm							
P125B - Fuel Pressure Regulator 2 High Control Circuit High Voltage	engine is not in standby state (standby state occurs after ECM initialization or following offer and				-						
P128E - Fuel Rail Pressure Performance	engine is not in ready state (which is active when the ignition is on or following	1									
P1407 - Exhaust Gas Recirculation (EGR) Motor Control Circuit Shorted	a stall of the engine) engine is not in standby state (standby state occurs after ECM initialization or following after-run)	battery voltage is above 11 V for at least 3s									
P140B - Exhaust Gas Recirculation Slow Response-Increasing Flow	Engine not in afterrun mode (defined as engine speed greater than 0 rpm)	Engine speed greater than 600 to 850 rpm	engine is not in standby state (standby state occurs after ECM initialization or following after-run)	ambient air temperature is above -7 deg C	ambient pressure is above 74.8kPa	battery voltage is above 11 V for at least 3s	Engine Run Time greater than 10 seconds (engine speed greater than 600 to 850 rpm to indicate the engine is running)	System is not in active regeneration mode	Engine is running which means the engine speed is greater than 600 to 850 rpm	engine is not in ready state (which is active when the ignition is on or following a stall of the engine)	
P140C - Exhaust Gas Recirculation Slow Response-Decreasing Flow	Engine not in afterrun mode (defined as engine speed greater than 0 rpm)	Engine speed greater than 600 to 850 rpm	engine is not in standby state (standby state occurs after ECM initialization or following after-run)	ambient air temperature is above -7 deg C	ambient pressure is above 74.8kPa	battery voltage is above 11 V for at least 3s	Engine Run Time greater than 10 seconds (engine speed greater than 600 to 850 rpm to indicate the engine is running)	System is not in active regeneration mode	Engine is running which means the engine speed is greater than 600 to 850 rpm	engine is not in ready state (which is active when the ignition is on or following a stall of the engine)	
P140D - Exhaust Gas Recirculation (EGR) Motor Control Circuit 2 Low Voltage	engine is not in standby state (standby state occurs after ECM initialization or following after-run)	battery voltage is above 11 V for at least 3s									
P140E - Exhaust Gas Recirculation (EGR) Motor Control Circuit 2 High Voltage	engine is not in standby state (standby state occurs after ECM initialization or following after-run)	battery voltage is above 11 V for at least 3s									
P140F - Exhaust Gas Recirculation (EGR) Motor Current Performance	engine is not in standby state (standby state occurs after ECM initialization or following after-run)	battery voltage is above 11 V for at least 3s									
P144B - Closed Loop Diesel Particulate Filter (DPF) Regeneration Control At Limit - Stage 1 Temperature Too Low	Engine not in afterrun mode (defined as engine speed greater than 0 rpm)	Engine speed greater than 600 to 850 rpm	engine is not in standby state (standby state occurs after ECM initialization or following after-run)	Engine Run Time greater than 10 seconds (engine speed greater than 600 to 850 rpm to indicate the engine is running)	Engine is running which means the engine speed is greater than 600 to 850 rpm	engine is not in ready state (which is active when the ignition is on or following a stall of the engine)					

DTC			Additional Basic Enable Conditions				-	
P144C - Closed Loop Diesel Particulate Filter (DPF) Regeneration Control At Limit - Stage 1 Temperature Too High	Engine not in afterrun mode (defined as engine speed greater than 0 rpm)	Engine speed greater than 600 to 850 rpm	engine is not in standby state (standby state occurs after ECM initialization or following after-run)	Engine Run Time greater than 10 seconds (engine speed greater than 600 to 850 rpm to indicate the engine is running)	Engine is running which means the engine speed is greater than 600 to 850 rpm	engine is not in ready state (which is active when the ignition is on or following a stall of the engine)		
P154A - Intake Air (IA) Heater Feedback Circuit	engine is not in standby state (standby state occurs after ECM initialization or following after-run)	battery voltage is above 11 V for at least 3s						
P154B - Intake Air (IA) Heater Voltage Signal Circuit	engine is not in standby state (standby state occurs after ECM initialization or following offer nm)	battery voltage is above 11 V for at least 3s						
P154C - Intake Air (IA) Heater Current Signal Circuit	engine is not in standby state (standby state occurs after ECM initialization or following after-run)	battery voltage is above 11 V for at least 3s						
P154D - Intake Air (IA) Heater Temperature Signal Circuit	engine is not in standby state (standby state occurs after ECM initialization or following after-sup)	battery voltage is above 11 V for at least 3s						
P160C - Engine Calibration Information Not Programed In The Control Module	Manufacturer Enable Counter is zero (value of 0 means ECM is locked and out of assembly plant mode)	battery voltage is above 11 V for at least 3s						
P161A - Glow Plug Control Module Not Programed	engine is not in standby state (standby state occurs after ECM initialization or following after-run)	battery voltage is above 11 V for at least 3s		_				
P1631 - Theft Deterrent Fuel Enable Signal Not Correct	Engine not in afterrun mode (defined as engine speed greater than 0 rpm)	engine is not in standby state (standby state occurs after ECM initialization or following after-run)	Manufacturer Enable Counter is zero (value of 0 means ECM is locked and out of assembly plant mode)					
P163C - Glow Plug Control Module Primary Circuit	engine is not in standby state (standby state occurs after ECM initialization or following after-run)	battery voltage is above 11 V for at least 3s		-				
P163D - Glow Plug Control Module Secondary Circuit	Engine not in afterrun mode (defined as engine speed greater than 0 rpm)	engine is not in standby state (standby state occurs after ECM initialization or following after-run)	battery voltage is above 11 V for at least 3s					
P163E - Glow Plug Control ModuleOvertemperature	engine is not in standby state (standby state occurs after ECM initialization or following after-run)	battery voltage is above 11 V for at least 3s		_				
P166B - Intake Air (IA) Heater Over Temperature	engine is not in standby state (standby state occurs after ECM initialization or following after-run)	battery voltage is above 11 V for at least 3s			1			
P2002 - Diesel Particulate Filter (DPF) Low Efficiency	Engine not in afterrun mode (defined as engine speed greater than 0 rpm)	Engine speed greater than 600 to 850 rpm	engine is not in standby state (standby state occurs after ECM initialization or following after-run)	ambient air temperature is above -7 deg C	ambient pressure is above 74.8kPa	Engine Run Time greater than 10 seconds (engine speed greater than 600 to 850 rpm to indicate the engine is running)	Engine is running which means the engine speed is greater than 600 to 850 rpm	engine is not in ready state (which is active when the ignition is on or following a stall of the engine)
P202E - Reductant Injector Performance	SCR Reductant Level not in restriction or empty level state (see reductant level warning definition)	Engine not in afterrun mode (defined as engine speed greater than 0 rpm)	Engine speed greater than 600 to 850 rpm	engine is not in standby state (standby state occurs after ECM initialization or following after-run)	battery voltage is above 11 V for at least 3s	Engine Run Time greater than 10 seconds (engine speed greater than 600 to 850 rpm to indicate the engine is running)	Engine is running which means the engine speed is greater than 600 to 850 rpm	engine is not in ready state (which is active when the ignition is on or following a stall of the engine)
P2032 - Exhaust Gas Temperature (EGT) Sensor 2 Circuit Low Voltage	Engine not in afterrun mode (defined as engine speed greater than 0 rpm)	Engine speed greater than 600 to 850 rpm	engine is not in standby state (standby state occurs after ECM initialization or following after-run)	battery voltage is above 11 V for at least 3s	Engine is running which means the engine speed is greater than 600 to 850 rpm			
P2033 - Exhaust Gas Temperature (EGT) Sensor 2 Circuit High Voltage	Engine not in afterrun mode (defined as engine speed greater than 0 rpm)	Engine speed greater than 600 to 850 rpm	engine is not in standby state (standby state occurs after ECM initialization or following after-run)	battery voltage is above 11 V for at least 3s	Engine is running which means the engine speed is greater than 600 to 850 rpm			
P203B - Reductant Level Sensor 1 Performance	Engine not in afterrun mode (defined as engine speed greater than 0 rpm)	Engine speed greater than 600 to 850 rpm	engine is not in standby state (standby state occurs after ECM initialization or following after-run)	battery voltage is above 11 V for at least 3s	Status of the Reductant Tank is not Frozen which means ambient air temperature is >= -7°C and the reductant tank temperature is >= -7°C	Engine Run Time greater than 10 seconds (engine speed greater than 600 to 850 rpm to indicate the engine is running)	Engine is running which means the engine speed is greater than 600 to 850 rpm	engine is not in ready state (which is active when the ignition is on or following a stall of the engine)
P203C - Reductant Level Sensor 1 Circuit Low	Engine not in afterrun mode (defined as engine speed greater than 0 rpm)	Engine speed greater than 600 to 850 rpm	engine is not in standby state (standby state occurs after ECM initialization or following after-run)	battery voltage is above 11 V for at least 3s	Engine Run Time greater than 10 seconds (engine speed greater than 600 to 850 rpm to indicate the engine is running)	Engine is running which means the engine speed is greater than 600 to 850 rpm	engine is not in ready state (which is active when the ignition is on or following a stall of the engine)	
P203D - Reductant Level Sensor 1 Circuit High	Engine not in afterrun mode (defined as engine speed greater than 0 rpm)	Engine speed greater than 600 to 850 rpm	engine is not in standby state (standby state occurs after ECM initialization or following after-run)	battery voltage is above 11 V for at least 3s	Engine Run Time greater than 10 seconds (engine speed greater than 600 to 850 rpm to indicate the engine is running)	Engine is running which means the engine speed is greater than 600 to 850 rpm	engine is not in ready state (which is active when the ignition is on or following a stall of the engine)	
P2047 - Reductant Injector Control Circuit	Engine not in afterrun mode (defined as engine speed greater than 0 rpm)	Engine speed greater than 600 to 850 rpm	engine is not in standby state (standby state occurs after ECM initialization or following after-run)	battery voltage is above 11 V for at least 3s	Engine Run Time greater than 10 seconds (engine speed greater than 600 to 850 rpm to indicate the engine is running)	Engine is running which means the engine speed is greater than 600 to 850 rpm	engine is not in ready state (which is active when the ignition is on or following a stall of the engine)	_
P2048 - Reductant Injector Control Circuit Low Voltage	Engine not in afterrun mode (defined as engine speed greater than 0 rpm)	Engine speed greater than 600 to 850 rpm	engine is not in standby state (standby state occurs after ECM initialization or following after-run)	battery voltage is above 11 V for at least 3s	Engine Run Time greater than 10 seconds (engine speed greater than 600 to 850 rpm to indicate the engine is running)	Engine is running which means the engine speed is greater than 600 to 850 rpm	engine is not in ready state (which is active when the ignition is on or following a stall of the engine)	_
P2049 - Reductant Injector Control Circuit High Voltage	Engine not in afterrun mode (defined as engine speed greater than 0 rpm)	Engine speed greater than 600 to 850 rpm	engine is not in standby state (standby state occurs after ECM initialization or following after-run)	battery voltage is above 11 V for at least 3s	Engine Run Time greater than 10 seconds (engine speed greater than 600 to 850 rpm to indicate the engine is running)	Engine is running which means the engine speed is greater than 600 to 850 rpm	engine is not in ready state (which is active when the ignition is on or following a stall of the engine)	
P204B - Reductant Pump Pressure Sensor Performance	engine is not in standby state (standby state occurs after ECM initialization or following after-run)							-
P204C - Reductant Pump Pressure Sensor Circuit Low	Engine not in afterrun mode (defined as engine speed greater than 0 rpm)	Engine speed greater than 600 to 850 rpm	engine is not in standby state (standby state occurs after ECM initialization or following after-run)	battery voltage is above 11 V for at least 3s	Engine Run Time greater than 10 seconds (engine speed greater than 600 to 850 rpm to indicate the engine is running)	Engine is running which means the engine speed is greater than 600 to 850 rpm	engine is not in ready state (which is active when the ignition is on or following a stall of the engine)	
P204D - Reductant Pump Pressure Sensor Circuit High	engine is not in standby state (standby state occurs after ECM initialization or following after-run)		•			·	·	•
P204F - Reductant System Performance Bank 1 (cannot build pump pressure)	SCR Reductant Level not in restriction or empty level state (see reductant level warning definition)	Engine not in afterrun mode (defined as engine speed greater than 0 rpm)	Engine speed greater than 600 to 850 rpm	engine is not in standby state (standby state occurs after ECM initialization or following after-run)	battery voltage is above 11 V for at least 3s	Engine Run Time greater than 10 seconds (engine speed greater than 600 to 850 rpm to indicate the engine is running)	Engine is running which means the engine speed is greater than 600 to 850 rpm	engine is not in ready state (which is active when the ignition is on or following a stall of the engine)
P205B - Reductant Tank Temperature Sensor Performance	Engine not in afterrun mode (defined as engine speed greater than 0 rpm)	Engine speed greater than 600 to 850 rpm	engine is not in standby state (standby state occurs after ECM initialization or following after-run)	Manufacturer Enable Counter is zero (value of 0 means ECM is locked and out of assembly plant mode)	battery voltage is above 11 V for at least 3s	Engine is running which means the engine speed is greater than 600 to 850 rpm	engine is not in ready state (which is active when the ignition is on or following a stall of the engine)	
P205C - Reductant Tank Temperature Sensor Circuit Low	Engine not in afterrun mode (defined as engine speed greater than 0 rpm)	Engine speed greater than 600 to 850 rpm	engine is not in standby state (standby state occurs after ECM initialization or following after-run)	battery voltage is above 11 V for at least 3s	Engine Run Time greater than 10 seconds (engine speed greater than 600 to 850 rpm to indicate the engine is running)	Engine is running which means the engine speed is greater than 600 to 850 rpm	engine is not in ready state (which is active when the ignition is on or following a stall of the engine)	
P205D - Reductant Tank Temperature Sensor Circuit High	Engine not in afterrun mode (defined as engine speed greater than 0 rpm)	Engine speed greater than 600 to 850 rpm	engine is not in standby state (standby state occurs after ECM initialization or following after-run)	battery voltage is above 11 V for at least 3s	Engine Run Time greater than 10 seconds (engine speed greater than 600 to 850 rpm to indicate the engine is running)	Engine is running which means the engine speed is greater than 600 to 850 rpm	engine is not in ready state (which is active when the ignition is on or following a stall of the engine)	
P2080 - Exhaust Temperature Sensor 1 Performance	Engine speed greater than 600 to 850 rpm	Manufacturer Enable Counter is zero (value of 0 means ECM is locked and out of assembly plant mode)	Engine Run Time greater than 10 seconds (engine speed greater than 600 to 850 rpm to indicate the engine is running)	Engine is running which means the engine speed is greater than 600 to 850 rpm	engine is not in ready state (which is active when the ignition is on or following a stall of the engine)			
P2084 - Exhaust Temperature Sensor 2 Performance	Engine speed greater than 600 to 850 rpm	Manufacturer Enable Counter is zero (value of 0 means ECM is locked and out of assembly plant mode)	Engine Run Time greater than 10 seconds (engine speed greater than 600 to 850 rpm to indicate the engine is running)	Engine is running which means the engine speed is greater than 600 to 850 rpm	engine is not in ready state (which is active when the ignition is on or following a stall of the engine)			_
P208A - Reductant Pump Control Circuit	Engine not in afterrun mode (defined as engine speed greater than 0 rpm)	Engine speed greater than 600 to 850 rpm	engine is not in standby state (standby state occurs after ECM initialization or following after-run)	battery voltage is above 11 V for at least 3s	Engine Run Time greater than 10 seconds (engine speed greater than 600 to 850 rpm to indicate the engine is running)	Engine is running which means the engine speed is greater than 600 to 850 rpm	engine is not in ready state (which is active when the ignition is on or following a stall of the engine)	
P208B - Reductant Pump Performance	engine is not in standby state (standby state occurs after ECM initialization or following after-run)	Manufacturer Enable Counter is zero (value of 0 means ECM is locked and out of assembly plant mode)	battery voltage is above 11 V for at least 3s	Status of the Reductant Tank is not Frozer which means ambient air temperature is >= -7°C and the reductant tank temperature is >= -7°C				
P208D - Reductant Pump Control Circuit High Voltage	Engine not in afterrun mode (defined as engine speed greater than 0 rpm)	Engine speed greater than 600 to 850 rpm	engine is not in standby state (standby state occurs after ECM initialization or following after-run)	Engine Run Time greater than 10 seconds (engine speed greater than 600 to 850 rpm to indicate the engine is running)	Engine is running which means the engine speed is greater than 600 to 850 rpm	engine is not in ready state (which is active when the ignition is on or following a stall of the engine)		

DTC			Additional Basic Enable Conditions							
P20A0 - Reductant Purge Valve Control Circuit	Engine not in afterrun mode (defined as engine speed greater than 0 rpm)	Engine speed greater than 600 to 850 rpm	engine is not in standby state (standby state occurs after ECM initialization or following after-run)	Engine Run Time greater than 10 seconds (engine speed greater than 600 to 850 rpm to indicate the engine is running)	Engine is running which means the engine speed is greater than 600 to 850 rpm	engine is not in ready state (which is active when the ignition is on or following a stall of the engine)				
P20A1 - Reductant Purge Valve Performance	engine is not in standby state (standby state occurs after ECM initialization or following after-run)	battery voltage is above 11 V for at least 3s			•	•	-			
P20A2 - Reductant Purge Valve Control Circuit Low Voltage	Engine not in afterrun mode (defined as engine speed greater than 0 rpm)	Engine speed greater than 600 to 850 rpm	engine is not in standby state (standby state occurs after ECM initialization or following after-run)	Engine Run Time greater than 10 seconds (engine speed greater than 600 to 850 rpm to indicate the engine is running)	Engine is running which means the engine speed is greater than 600 to 850 rpm	engine is not in ready state (which is active when the ignition is on or following a stall of the engine)				
P20A3 - Reductant Purge Valve Control Circuit High Voltage	Engine not in afterrun mode (defined as engine speed greater than 0 rpm)	Engine speed greater than 600 to 850 rpm	engine is not in standby state (standby state occurs after ECM initialization or following after-run)	Engine is running which means the engine speed is greater than 600 to 850 rpm	engine is not in ready state (which is active when the ignition is on or following a stall of the engine)					
P20B9 - Reductant Heater 1 Control Circuit	engine is not in standby state (standby state occurs after ECM initialization or following after-run)	battery voltage is above 11 V for at least 3s				-	-			
P20BA - Reductant Heater 1 Performance	SCR Reductant Level not in restriction or empty level state (see reductant level	Engine not in afterrun mode (defined as engine speed greater than 0 rpm)	engine is not in standby state (standby state occurs after ECM initialization or	Manufacturer Enable Counter is zero (value of 0 means ECM is locked and out	battery voltage is above 11 V for at least 3s	Engine is running which means the engine speed is greater than 600 to 850 rpm				
P20BB - Reductant Heater 1 Control Circuit Low	engine is not in standby state (standby state occurs after ECM initialization or following after run)	battery voltage is above 11 V for at least 3s	tollowing atter-run)	of assembly plant mode)	I		1			
P20BC - Reductant Heater 1 Control Circuit High	engine is not in standby state (standby state occurs after ECM initialization or following after-run)	battery voltage is above 11 V for at least 3s								
P20BD - Reductant Heater 2 Control Circuit	engine is not in standby state (standby state occurs after ECM initialization or following after-run)	battery voltage is above 11 V for at least 3s								
P20BF - Reductant Heater 2	engine is not in standby state (standby state occurs after ECM initialization or	battery voltage is above 11 V for at least								
P20C0 - Reductant Heater 2 Control Circuit High	following after-run) engine is not in standby state (standby state occurs after ECM initialization or	battery voltage is above 11 V for at least 3s								
P20C1 - Reductant Heater 3 Control Circuit	engine is not in standby state (standby state occurs after ECM initialization or following after-run)	battery voltage is above 11 V for at least 3s								
P20C3 - Reductant Heater 3 Control Circuit Low	engine is not in standby state (standby state occurs after ECM initialization or following after-run)	battery voltage is above 11 V for at least 3s								
P20C4 - Reductant Heater 3 Control Circuit High	engine is not in standby state (standby state occurs after ECM initialization or following after-run)	battery voltage is above 11 V for at least 3s			_					
P20CB - Exhaust Aftertreatment Fuel Injector Control Circuit	Engine not in afterrun mode (defined as engine speed greater than 0 rpm)	engine is not in standby state (standby state occurs after ECM initialization or following after-run)	battery voltage is above 11 V for at least 3s	Engine is running which means the engine speed is greater than 600 to 850 rpm		_				
P20CC - Exhaust Aftertreatment Fuel Injector Performance	Engine not in afterrun mode (defined as engine speed greater than 0 rpm)	Engine speed greater than 600 to 850 rpm	engine is not in standby state (standby state occurs after ECM initialization or following after-run)	Engine is running which means the engine speed is greater than 600 to 850 rpm	engine is not in ready state (which is active when the ignition is on or following a stall of the engine)					
P20CD - Exhaust Aftertreatment Fuel Injector Control Circuit Low Voltage	Engine not in afterrun mode (defined as engine speed greater than 0 rpm)	engine is not in standby state (standby state occurs after ECM initialization or following after-run)	battery voltage is above 11 V for at least 3s	Engine is running which means the engine speed is greater than 600 to 850 rpm	-					
P20CE - Exhaust Aftertreatment Fuel Injector Control Circuit High Voltage	Engine not in afterrun mode (defined as engine speed greater than 0 rpm)	engine is not in standby state (standby state occurs after ECM initialization or following after-run)	battery voltage is above 11 V for at least 3s	Engine is running which means the engine speed is greater than 600 to 850 rpm	ennine is set is reach, state (which is	1				
P20E2 - Exhaust Gas Temperature (EGT) Sensors 1-2 not plausible	Engine not in afterrun mode (defined as engine speed greater than 0 rpm) SCP. Reductant Level not in restriction or	Engine speed greater than 600 to 850 rpm	state occurs after ECM initialization or following after-run)	Engine is running which means the engine speed is greater than 600 to 850 rpm	active when the ignition is on or following a stall of the engine)	Enrine Pun Time is greater than 10	1			1
P20E8 - Reductant Pressure Too Low	empty level state (see parameter definitions for reductant level warning definition)	Engine not in afterrun mode (defined as engine speed greater than 0 rpm)	Engine speed greater than 600 to 850 rpm	engine is not in standby state (standby state occurs after ECM initialization or following after-run)	battery voltage is above 11 V for at least 3s	seconds (engine speed greater than 600 to 850 rpm to indicate the engine is running)	Engine is running which means the engine speed is greater than 600 to 850 rpm	engine is not in ready state (which is active when the ignition is on or following a stall of the engine)		
P20E9 - Reductant Pressure Too High	SCR Reductant Level not in restriction or empty level state (see parameter definitions for reductant level warning definition)	Engine not in afterrun mode (defined as engine speed greater than 0 rpm)	Engine speed greater than 600 to 850 rpm	engine is not in standby state (standby state occurs after ECM initialization or following after-run)	battery voltage is above 11 V for at least 3s	Engine Run Time is greater than 10 seconds (engine speed greater than 600 to 850 rpm to indicate the engine is running)	Engine is running which means the engine speed is greater than 600 to 850 rpm	engine is not in ready state (which is active when the ignition is on or following a stall of the engine)		
P20EE - SCR Nox Catalyst Efficiency Below Threshold Bank 1	SCR Reductant Level not in restriction or empty level state (see reductant level warning definition)	Engine not in afterrun mode (defined as engine speed greater than 0 rpm)	Engine speed greater than 600 to 850 rpm	engine is not in standby state (standby state occurs after ECM initialization or following after-run)	Manufacturer Enable Counter is zero (value of 0 means ECM is locked and out of assembly plant mode)	battery voltage is above 11 V for at least 3s	Status of the Reductant Tank is not Frozen which means ambient air temperature is >= -7°C and the reductatn tank temperature is >= -7°C	Engine Run Time greater than 10 seconds (engine speed greater than 600 to 850 rpm to indicate the engine is running)	Engine is running which means the engine speed is greater than 600 to 850 rpm	engine is not in ready state (which is active when the ignition is on or following a stall of the engine)
P214F - Reductant Heater 1 Current Too High	SCR Reductant Level not in restriction or empty level state (see parameter definitions for reductant level warning definition)	Engine not in afterrun mode (defined as engine speed greater than 0 rpm)	Engine speed greater than 600 to 850 rpm	engine is not in standby state (standby state occurs after ECM initialization or following after-run)	battery voltage is above 11 V for at least 3s	Engine Run Time is greater than 10 seconds (engine speed greater than 600 to 850 rpm to indicate the engine is running)	Engine is running which means the engine speed is greater than 600 to 850 rpm	engine is not in ready state (which is active when the ignition is on or following a stall of the engine)		
P21AA - Reductant Level Sensor 2 Circuit Low	Engine not in afterrun mode (defined as engine speed greater than 0 rpm)	Engine speed greater than 600 to 850 rpm	engine is not in standby state (standby state occurs after ECM initialization or following after-run)	battery voltage is above 11 V for at least 3s	Engine Run Time greater than 10 seconds (engine speed greater than 600 to 850 rpm to indicate the engine is running)	Engine is running which means the engine speed is greater than 600 to 850 rpm	engine is not in ready state (which is active when the ignition is on or following a stall of the engine)		-	
P21AB - Reductant Level Sensor 2 Circuit High	Engine not in afterrun mode (defined as engine speed greater than 0 rpm)	Engine speed greater than 600 to 850 rpm	engine is not in standby state (standby state occurs after ECM initialization or following after-run)	battery voltage is above 11 V for at least 3s	Engine Run Time greater than 10 seconds (engine speed greater than 600 to 850 rpm to indicate the engine is running)	Engine is running which means the engine speed is greater than 600 to 850 rpm	engine is not in ready state (which is active when the ignition is on or following a stall of the engine)			
P21AF - Reductant Level Sensor 3 Circuit Low	Engine not in afterrun mode (defined as engine speed greater than 0 rpm)	Engine speed greater than 600 to 850 rpm	engine is not in standby state (standby state occurs after ECM initialization or following after-run)	battery voltage is above 11 V for at least 3s	Engine Run Time greater than 10 seconds (engine speed greater than 600 to 850 rpm to indicate the engine is running)	Engine is running which means the engine speed is greater than 600 to 850 rpm	engine is not in ready state (which is active when the ignition is on or following a stall of the engine)			
P21B0 - Reductant Level Sensor 3 Circuit High	Engine not in afterrun mode (defined as engine speed greater than 0 rpm)	Engine speed greater than 600 to 850 rpm	engine is not in standby state (standby state occurs after ECM initialization or following after-run)	battery voltage is above 11 V for at least 3s	Engine Run Time greater than 10 seconds (engine speed greater than 600 to 850 rpm to indicate the engine is running)	Engine is running which means the engine speed is greater than 600 to 850 rpm	engine is not in ready state (which is active when the ignition is on or following a stall of the engine)			
P21DD - Reductant Heater 1 Current Too Low	SCR Reductant Level not in restriction or empty level state (see parameter definitions for reductant level warning definition)	Engine not in afterrun mode (defined as engine speed greater than 0 rpm)	Engine speed greater than 600 to 850 rpm	engine is not in standby state (standby state occurs after ECM initialization or following after-run)	battery voltage is above 11 V for at least 3s	Engine Run Time is greater than 10 seconds (engine speed greater than 600 to 850 rpm to indicate the engine is running)	Engine is running which means the engine speed is greater than 600 to 850 rpm	engine is not in ready state (which is active when the ignition is on or following a stall of the engine)		
P2200 - N0x Sensor Circuit Bank 1 Sensor 1	Engine not in afterrun mode (defined as engine speed greater than 0 rpm)	Engine speed greater than 600 to 850 rpm	engine is not in standby state (standby state occurs after ECM initialization or following after-run)	Manufacturer Enable Counter is zero (value of 0 means ECM is locked and out of assembly plant mode)	battery voltage is above 11 V for at least 3s	Engine Run Time greater than 10 seconds (engine speed greater than 600 to 850 rpm to indicate the engine is running)	Engine is running which means the engine speed is greater than 600 to 850 rpm	engine is not in ready state (which is active when the ignition is on or following a stall of the engine)		
P2202 - N0x Sensor Circuit Low Bank 1 Sensor 1	Engine not in afterrun mode (defined as engine speed greater than 0 rpm)	Engine speed greater than 600 to 850 rpm	engine is not in standby state (standby state occurs after ECM initialization or following after-run)	Manufacturer Enable Counter is zero (value of 0 means ECM is locked and out of assembly plant mode)	battery voltage is above 11 V for at least $3s$	Engine Run Time greater than 10 seconds (engine speed greater than 600 to 850 rpm to indicate the engine is running)	Engine is running which means the engine speed is greater than 600 to 850 rpm	engine is not in ready state (which is active when the ignition is on or following a stall of the engine)		
P2203 - N0x Sensor Circuit High Bank 1 Sensor 1	Engine not in afterrun mode (defined as engine speed greater than 0 rpm)	Engine speed greater than 600 to 850 rpm	engine is not in standby state (standby state occurs after ECM initialization or following after-run)	Manufacturer Enable Counter is zero (value of 0 means ECM is locked and out of assembly plant mode)	battery voltage is above 11 V for at least 3s	Engine Run Time greater than 10 seconds (engine speed greater than 600 to 850 rpm to indicate the engine is running)	Engine is running which means the engine speed is greater than 600 to 850 rpm	engine is not in ready state (which is active when the ignition is on or following a stall of the engine)		
P2205 - N0x Heater Control Circuit Bank 1 Sensor 1	Engine not in afterrun mode (defined as engine speed greater than 0 rpm)	Engine speed greater than 600 to 850 rpm	engine is not in standby state (standby state occurs after ECM initialization or following after-run)	Manufacturer Enable Counter is zero (value of 0 means ECM is locked and out of assembly plant mode)	battery voltage is above 11 V for at least 3s	Engine Run Time greater than 10 seconds (engine speed greater than 600 to 850 rpm to indicate the engine is running)	Engine is running which means the engine speed is greater than 600 to 850 rpm	engine is not in ready state (which is active when the ignition is on or following a stall of the engine)		
P2209 - N0x Heater Performance Bank 1 Sensor 1	Engine not in afterrun mode (defined as engine speed greater than 0 rpm)	Engine speed greater than 600 to 850 rpm	engine is not in standby state (standby state occurs after ECM initialization or following after-run)	Manufacturer Enable Counter is zero (value of 0 means ECM is locked and out of assembly plant mode)	battery voltage is above 11 V for at least 3s	Engine Run Time greater than 10 seconds (engine speed greater than 600 to 850 rpm to indicate the engine is running)	Engine is running which means the engine speed is greater than 600 to 850 rpm	engine is not in ready state (which is active when the ignition is on or following a stall of the engine)		
P220A - N0x Sensor Supply Voltage Out Of Range Bank 1 Sensor 1	engine is not in standby state (standby state occurs after ECM initialization or following after-run)	battery voltage is above 11 V for at least 3s								
P220B - N0x Sensor Supply Voltage Out Of Range Bank 1 Sensor 2	engine is not in standby state (standby state occurs after ECM initialization or following after-run)	battery voltage is above 11 V for at least 3s								

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Image: state	P221C - Reductant Heater 2 Current Too Low	SCR Reductant Level not in restriction or empty level state (see parameter definitions for reductant level warning definition)	Engine not in afterrun mode (defined as engine speed greater than 0 rpm)	Engine speed greater than 600 to 850 rpm	engine is not in standby state (standby state occurs after ECM initialization or following after-run)	battery voltage is above 11 V for at least 3s	Engine Run Time is greater than 10 seconds (engine speed greater than 600 to 850 rpm to indicate the engine is running)	Engine is running which means the engin speed is greater than 600 to 850 rpm	engine is not in ready state (which is active when the ignition is on or following a stall of the engine)		
Image: state	P221D - Reductant Heater 2 Current Too High	SCR Reductant Level not in restriction or empty level state (see parameter definitions for reductant level warning definition)	Engine not in afterrun mode (defined as engine speed greater than 0 rpm)	Engine speed greater than 600 to 850 rpm	engine is not in standby state (standby state occurs after ECM initialization or following after-run)	battery voltage is above 11 V for at least 3s	Engine Run Time is greater than 10 seconds (engine speed greater than 600 to 850 rpm to indicate the engine is running)	Engine is running which means the engin speed is greater than 600 to 850 rpm	engine is not in ready state (which is active when the ignition is on or following a stall of the engine)		
InductionNormality Normality Normality Normality Normality Normality Normality Normality Normality Normality Normality Normality Normality Normality Normality Normality Normality Normality Normality Normality Normality Normality Normality Normality Normality Normality Normality Normality Normality Normality Normality Normality Normality Normality Normality Normality Normality Normality Normality Normality Normality Normality Normality Normality Normality Normality Normality Normality Normality Normality Normality Normality Normality Normality Normality Normality Normality Normality Normality Normality Normality Normality Normality Normality Normality Normality Normality Normality Normality Normality Normality Normality Normality Normality Normality Normality Normality Normality Normality 	P221E - Reductant Heater 3 Current Too Low	SCR Reductant Level not in restriction or empty level state (see parameter definitions for reductant level warning definition)	Engine not in afterrun mode (defined as engine speed greater than 0 rpm)	Engine speed greater than 600 to 850 rpm	engine is not in standby state (standby state occurs after ECM initialization or following after-run)	battery voltage is above 11 V for at least 3s	Engine Run Time is greater than 10 seconds (engine speed greater than 600 to 850 rpm to indicate the engine is running)	Engine is running which means the engin speed is greater than 600 to 850 rpm	engine is not in ready state (which is active when the ignition is on or following a stall of the engine)		
Image: space	P221F - Reductant Heater 3 Current Too High	SCR Reductant Level not in restriction or empty level state (see parameter definitions for reductant level warning definition)	Engine not in afterrun mode (defined as engine speed greater than 0 rpm)	Engine speed greater than 600 to 850 rpm	engine is not in standby state (standby state occurs after ECM initialization or following after-run)	battery voltage is above 11 V for at least 3s	Engine Run Time is greater than 10 seconds (engine speed greater than 600 to 850 rpm to indicate the engine is runnice)	Engine is running which means the engin speed is greater than 600 to 850 rpm	engine is not in ready state (which is active when the ignition is on or following a stall of the engine)		
Image: state sta	P2228 - Barometric Pressure Sensor Circuit Low	Engine not in afterrun mode (defined as engine speed greater than 0 rpm)	Engine speed greater than 600 to 850 rpm	engine is not in standby state (standby state occurs after ECM initialization or following after-run)	battery voltage is above 11 V for at least 3s	Engine Run Time greater than 10 seconds (engine speed greater than 600 to 850 rpm to indicate the engine is running)	Engine is running which means the engine speed is greater than 600 to 850 rpm	e engine is not in ready state (which is active when the ignition is on or following a stall of the engine)		I.	
Normal Normal Normal Normal Normal Normal Normal Normal Normal Normal Normal Normal Normal Normal Normal Normal Normal Normal Normal Normal Normal Normal Normal Normal Normal Normal Normal Normal Normal Normal Normal Normal Normal Normal Normal Normal Normal Normal Normal Normal Normal Normal Normal Normal Normal Normal Normal Normal Normal Normal Normal Normal Normal Normal Normal Normal Normal Normal Normal Normal Normal Normal Normal Normal Normal Normal Normal Normal Normal Normal Normal Normal Normal Normal Normal Normal Normal Normal Normal Normal Normal Normal Normal Normal Normal Normal Normal Normal Normal Normal Normal Normal Normal Normal Normal Normal Normal Normal Normal Normal Normal Normal Normal Normal Normal Normal 	P2229 - Barometric Pressure Sensor Circuit High	Engine not in afterrun mode (defined as engine speed greater than 0 rpm)	Engine speed greater than 600 to 850 rpm	engine is not in standby state (standby state occurs after ECM initialization or following after-run)	battery voltage is above 11 V for at least 3s	Engine Run Time greater than 10 seconds (engine speed greater than 600 to 850 rpm to indicate the engine is running)	Engine is running which means the engine speed is greater than 600 to 850 rpm	e engine is not in ready state (which is active when the ignition is on or following a stall of the engine)	-		
No. 1       No. 2       No. 2 <th< td=""><td>P2263 - Turbo Boost System Performance</td><td>Engine not in afterrun mode (defined as engine speed greater than 0 rpm)</td><td>Engine speed greater than 600 to 850 rpm</td><td>engine is not in standby state (standby state occurs after ECM initialization or following after-run)</td><td>battery voltage is above 11 V for at least 3s</td><td>Engine Run Time greater than 10 seconds (engine speed greater than 600 to 850 rpm to indicate the engine is running)</td><td>Engine is running which means the engine speed is greater than 600 to 850 rpm</td><td>engine is not in ready state (which is active when the ignition is on or following a stall of the engine)</td><td>-</td><td></td><td></td></th<>	P2263 - Turbo Boost System Performance	Engine not in afterrun mode (defined as engine speed greater than 0 rpm)	Engine speed greater than 600 to 850 rpm	engine is not in standby state (standby state occurs after ECM initialization or following after-run)	battery voltage is above 11 V for at least 3s	Engine Run Time greater than 10 seconds (engine speed greater than 600 to 850 rpm to indicate the engine is running)	Engine is running which means the engine speed is greater than 600 to 850 rpm	engine is not in ready state (which is active when the ignition is on or following a stall of the engine)	-		
Normality         <	P2295 - Fuel Pressure Regulator 2	Engine not in afterrun mode (defined as	engine is not in standby state (standby state occurs after ECM initialization or	battery voltage is above 11 V for at least	Engine is running which means the engine			1	-		
No. Subscription       Participation       Pariterpation       Participation       Participat	P2296 - Fuel Pressure Regulator 2 Control Circuit High Voltage	Engine not in afterrun mode (defined as engine speed greater than 0 rpm)	following after-run) engine is not in standby state (standby state occurs after ECM initialization or following after-run)	battery voltage is above 11 V for at least 3s	Engine is running which means the engine speed is greater than 600 to 850 rpm	-					
Normality       Productional       P	P229E - NOx Sensor Circuit Bank 1 Sensor 2	Engine not in afterrun mode (defined as engine speed greater than 0 rpm)	Engine speed greater than 600 to 850 rpm	engine is not in standby state (standby state occurs after ECM initialization or following after-run)	Manufacturer Enable Counter is zero (value of 0 means ECM is locked and out of assembly plant mode)	battery voltage is above 11 V for at least 3s	Engine Run Time greater than 10 seconds (engine speed greater than 600 to 850 rpm to indicate the engine is running)	Engine is running which means the engin speed is greater than 600 to 850 rpm	engine is not in ready state (which is active when the ignition is on or following a stall of the engine)		
No. Social Socie Social Social Social Social Social Social Social So	P229F - NOx Sensor Performance Bank 1 Sensor 2	Engine not in afterrun mode (defined as engine speed greater than 0 rpm)	Engine speed greater than 600 to 850 rpm	engine is not in standby state (standby state occurs after ECM initialization or following after-run)	Manufacturer Enable Counter is zero (value of 0 means ECM is locked and out of assembly plant mode)	ambient air temperature is above -7 deg C	ambient pressure is above 74.8kPa	battery voltage is above 11 V for at lease 3s	Engine Run Time greater than 10 seconds (engine speed greater than 600 to 850 rpm to indicate the engine is running)	Engine is running which means the engine speed is greater than 600 to 850 rpm	engine is not in ready state (which is active when the ignition is on or following a stall of the engine)
Number       Num       Number       Number	P22A0 - NOx Sensor Circuit Low Bank 1 Sensor 2	Engine not in afterrun mode (defined as engine speed greater than 0 rpm)	Engine speed greater than 600 to 850 rpm	engine is not in standby state (standby state occurs after ECM initialization or following after-run)	Manufacturer Enable Counter is zero (value of 0 means ECM is locked and out of assembly plant mode)	battery voltage is above 11 V for at least 3s	Engine Run Time greater than 10 seconds (engine speed greater than 600 to 850 rpm to indicate the engine is running)	Engine is running which means the engin speed is greater than 600 to 850 rpm	engine is not in ready state (which is active when the ignition is on or following a stall of the engine)		
Number       Number       Number       Number       Number       Number       Number       Number       Number         101       Number	P22A1 - NOx Sensor Circuit High Bank 1 Sensor 2	Engine not in afterrun mode (defined as engine speed greater than 0 rpm)	Engine speed greater than 600 to 850 rpm	engine is not in standby state (standby state occurs after ECM initialization or following after-run)	Manufacturer Enable Counter is zero (value of 0 means ECM is locked and out of assembly plant mode)	battery voltage is above 11 V for at least 3s	Engine Run Time greater than 10 seconds (engine speed greater than 600 to 850 rpm to indicate the engine is running)	s n Engine is running which means the engin speed is greater than 600 to 850 rpm	e engine is not in ready state (which is active when the ignition is on or following a stall of the engine)		
Part Normalization       Part Andream Antinantian       Part Andream Antin Antinantian       Part Andream A	P22A3 - NOx Heater Control Circuit Bank 1 Sensor 2	Engine not in afterrun mode (defined as engine speed greater than 0 rpm)	Engine speed greater than 600 to 850 rpm	engine is not in standby state (standby state occurs after ECM initialization or following after-run)	Manufacturer Enable Counter is zero (value of 0 means ECM is locked and out of assembly plant mode)	battery voltage is above 11 V for at least 3s	Engine Run Time greater than 10 seconds (engine speed greater than 600 to 850 rpm to indicate the engine is running)	s n Engine is running which means the engin speed is greater than 600 to 850 rpm	e engine is not in ready state (which is active when the ignition is on or following a stall of the engine)		
No. State of the state of	P22A7 - NOx Heater Performance Bank 1 Sensor 2	Engine not in afterrun mode (defined as engine speed greater than 0 rpm)	Engine speed greater than 600 to 850 rpm	engine is not in standby state (standby state occurs after ECM initialization or following after-run)	Manufacturer Enable Counter is zero (value of 0 means ECM is locked and out of assembly plant mode)	battery voltage is above 11 V for at least 3s	Engine Run Time greater than 10 seconds (engine speed greater than 600 to 850 rpm to indicate the engine is running)	s n Engine is running which means the engin speed is greater than 600 to 850 rpm	e engine is not in ready state (which is active when the ignition is on or following a stall of the engine)		
Build and any and any	P22FA - NOx Sensor 1 Performance - Slow Response High to Low	Engine not in afterrun mode (defined as engine speed greater than 0 rpm)	Engine speed greater than 600 to 850 rpm	engine is not in standby state (standby state occurs after ECM initialization or following after-run)	Manufacturer Enable Counter is zero (value of 0 means ECM is locked and out of assembly plant mode)	battery voltage is above 11 V for at least 3s	Engine Run Time is greater than 10 seconds (engine speed greater than 600 to 850 rpm to indicate the engine is running)	System is not in active regeneration mod	Engine is running which means the engine speed is greater than 600 to 850 rpm	engine is not in ready state (which is active when the ignition is on or following a stall of the engine)	
Non-Strategy       Non-Strategy       Non-Strategy       Non-Strategy       Non-Strategy       Non-Strategy         Non-Strategy       Non-Strategy       Non-Strategy       Non-Strategy       Non-Strategy       Non-Strategy       Non-Strategy       Non-Strategy       Non-Strategy       Non-Strategy       Non-Strategy       Non-Strategy       Non-Strategy       Non-Strategy       Non-Strategy       Non-Strategy       Non-Strategy       Non-Strategy       Non-Strategy       Non-Strategy       Non-Strategy       Non-Strategy       Non-Strategy       Non-Strategy       Non-Strategy       Non-Strategy       Non-Strategy       Non-Strategy       Non-Strategy       Non-Strategy       Non-Strategy       Non-Strategy       Non-Strategy       Non-Strategy       Non-Strategy       Non-Strategy       Non-Strategy       Non-Strategy       Non-Strategy       Non-Strategy       Non-Strategy       Non-Strategy       Non-Strategy       Non-Strategy       Non-Strategy       Non-Strategy       Non-Strategy       Non-Strategy       Non-Strategy       Non-Strategy       Non-Strategy       Non-Strategy       Non-Strategy       Non-Strategy       Non-Strategy       Non-Strategy       Non-Strategy       Non-Strategy       Non-Strategy       Non-Strategy       Non-Strategy       Non-Strategy       Non-Strategy       Non-Strategy       Non-Strategy       Non-Str	P2428 - Exhaust Gas High Temperature	Engine not in afterrun mode (defined as engine speed greater than 0 rpm)	Engine speed greater than 600 to 850 rpm	engine is not in standby state (standby state occurs after ECM initialization or following after run)	Engine is running which means the engine speed is greater than 600 to 850 rpm	engine is not in ready state (which is active when the ignition is on or following a stall of the engine)					
Notice Signature Signatur	P242B - Exhaust Temperature Sensor 3 Performance	Engine speed greater than 600 to 850 rpm	Manufacturer Enable Counter is zero (value of 0 means ECM is locked and out of assembly plant mode)	Engine Run Time greater than 10 second (engine speed greater than 600 to 850 rpm to indicate the engine is running)	<sup>8</sup> Engine is running which means the engine speed is greater than 600 to 850 rpm	engine is not in ready state (which is active when the ignition is on or following a stall of the engine)					
Note that the tensor         Out of a start and the tensor         Out of a start and tensor         Out of a start and tensor           1000 ND	P242C - Exhaust Gas Temperature (EGD Sensor 3 Circuit Low Voltage	Engine not in afterrun mode (defined as engine speed greater than 0 mm)	Engine speed greater than 600 to 850 rpm	engine is not in standby state (standby state occurs after ECM initialization or	battery voltage is above 11 V for at least	Engine is running which means the engine speed is greater than 600 to 850 rpm	5				
Example and	P242D - Exhaust Gas Temperature (EGT) Sensor 3 Circuit High Voltage	Engine not in afterrun mode (defined as engine speed greater than 0 rpm)	Engine speed greater than 600 to 850 rpm	following after-run) engine is not in standby state (standby state occurs after ECM initialization or following after-run)	battery voltage is above 11 V for at least 3s	Engine is running which means the engine speed is greater than 600 to 850 rpm	•				
Description	P2453 - Diesel Particulate Filter Differential Pressure Sensor Performance	Engine not in afterrun mode (defined as engine speed greater than 0 rpm)	Engine speed greater than 600 to 850 rpm	engine is not in standby state (standby state occurs after ECM initialization or following after-run)	Manufacturer Enable Counter is zero (value of 0 means ECM is locked and out of assembly plant mode)	battery voltage is above 11 V for at least 3s	Engine Run Time greater than 10 seconds (engine speed greater than 600 to 850 rpm to indicate the engine is running)	s Engine is running which means the engin speed is greater than 600 to 850 rpm	e engine is not in ready state (which is active when the ignition is on or following a stall of the engine)		
Description       Descripion       Description       Description	P2454 - Diesel Particulate Filter Differential Pressure Sensor Circuit Low Voltage	Engine not in afterrun mode (defined as engine speed greater than 0 rpm)	Engine speed greater than 600 to 850 rpm	engine is not in standby state (standby state occurs after ECM initialization or following after-run)	battery voltage is above 11 V for at least 3s	Engine Run Time greater than 10 seconds (engine speed greater than 600 to 850 rpm to indicate the engine is running)	Engine is running which means the engine speed is greater than 600 to 850 rpm	engine is not in ready state (which is active when the ignition is on or following a stall of the engine)			
Part Data Card (CDP) Data Card (CDP) (CDP)       Data Card (CDP) (CDP)       Data Card (CDP) (CDP)       Data (CDP)       Data (CDP)<	P2455 - Diesel Particulate Filter Differential Pressure Sensor Circuit High Voltage	Engine not in afterrun mode (defined as engine speed greater than 0 rpm)	Engine speed greater than 600 to 850 rpm	engine is not in standby state (standby state occurs after ECM initialization or following after-run)	battery voltage is above 11 V for at least 3s	Engine Run Time greater than 10 seconds (engine speed greater than 600 to 850 rpm to indicate the engine is running)	Engine is running which means the engine speed is greater than 600 to 850 rpm	engine is not in ready state (which is active when the ignition is on or following a stall of the engine)			_
P2480-Desch Palitacidae Filler Reservations Reservations Reservations Reservations Reservations Reservations Reservations Reservations Reservations Reservations Reservations Reservations Reservations Reservations Reservations Reservations Reservations Reservations Reservations Reservations Reservations Reservations Reservations Reservations Reservations Reservations Reservations Reservations Reservations Reservations Reservations Reservations Reservations Reservations Reservations Reservations Reservations Reservations Reservations Reservations Reservations Reservations Reservations Reservations Reservations Reservations Reservations Reservations Reservations Reservations Reservations Reservations Reservations Reservations Reservations Reservations Reservations Reservations Reservations Reservations Reservations Reservations Reservations Reservations Reservations Reservations Reservations Reservations Reservations ReservationsReservations Reservations Reservations Reservations Reservations Reservations ReservationsReservations Reservations Reservations Reservations Reservations ReservationsReservations Reservations Reservations Reservations Reservations Reservations Reservations ReservationsReservations Reservations Reservations Reservations Reservations Reservations Reservations Reservations Reservations Reservations Reservations Reservations Reservations Reservations Reservations Reservations Reservations Reservations Reservations Reservations Reservations Reservations Reservations Reservations Reservations Reserva	P2457 - Exhaust Gas (EGR) Cooler Performance	Engine not in afterrun mode (defined as engine speed greater than 0 rpm)	Engine speed greater than 600 to 850 rpm	engine is not in standby state (standby state occurs after ECM initialization or following after-run)	ambient air temperature is above -7 deg C	ambient pressure is above 74.8kPa	battery voltage is above 11 V for at least 3s	Engine Run Time greater than 10 second (engine speed greater than 600 to 850 rpi to indicate the engine is running)	s n Engine is running which means the engine speed is greater than 600 to 850 rpm	engine is not in ready state (which is active when the ignition is on or following a stall of the engine)	
22407. Endeum Cancer Concort Report Line on transmy trade (Line) Concort Report Line on transmy trade (Line) for an ender to concort Report Line on transmy trade (Line) for an ender to concort Report Line on transmy trade (Line) for an ender to concort Report Line on transmy trade (Line) for an ender to concort Report Line on transmy trade (Line) for an ender to concort Report Line on transmy trade (Line) for an ender to concort Report Line on transmy trade (Line) for an ender to concort Report Line on transmy trade (Line) for an ender transmissionInterly voltage is above 111 V for at leas a how the set on transmy trade (Line) for an ender transmissionInterly voltage is above 111 V for at leas a how the set on transmy trade concort Report Line)Interly voltage is above 111 V for at leas a how the set on transmy trade (Line) for an ender an ender an ender mater set on transmissionInterly voltage is above 111 V for at leas a how the set on transmissionF2400 - Ender Report Line on transmission F2400 - Ender Report Line on transmission for an ender an en	P2459 - Diesel Particulate Filter Regeneration Frequency	ambient air temperature is above -7 deg C	ambient pressure is above 74.8kPa								
P284F       Ensure tase termination following after and the state course after CM initiatization following after and the following after and following after and the following after and following	P245A - Exhaust Gas Recirculation (EGR) Cooler Bypass Valve Control	engine is not in standby state (standby state occurs after ECM initialization or following after nm)	battery voltage is above 11 V for at least 3s								
P2400 Detained	P245C - Exhaust Gas Recirculation (EGR) Cooler Bypass Valve Control Circuit 1 Low Voltage	engine is not in standby state (standby state occurs after ECM initialization or following after-run)	battery voltage is above 11 V for at least 3s								
P280:0       Description       modert at temperature is above 7.4 mpC       mainteen pressure is above 7.4 mpC         P280:0       Description       modert at temperature is above 7.4 mpC       mainteen pressure is above 7.4 mpC       modert at temperature is above 7.4 mpC       modert at temper	P245D - Exhaust Gas Recirculation (EGR) Cooler Bypass Valve Control Circuit 1 High Voltage	engine is not in standby state (standby state occurs after ECM initialization or following after-run)	battery voltage is above 11 V for at least 3s								
P2483 - Desire Particulate Filer-       Engine rot in afternum mode (definded as genet man 00 to 80 or main Coll solution gater nam 00 to 80 or main Coll solution gater nam 00 to 80 or main Coll solution gater nam 00 to 80 or main Coll solution gater nam 00 to 80 or main Coll solution gater nam 00 to 80 or main Coll solution gater nam 00 to 80 or main Coll solution gater nam 00 to 80 or main Coll solution gater nam 00 to 80 or main Coll solution gater nam 00 to 80 or main Coll solution gater nam 00 to 80 or main Coll solution gater nam 00 to 80 or main Coll solution gater nam 00 to 80 or main Coll solution gater nam 00 to 80 or main Coll solution gater nam 00 to 80 or main Coll solution gater nam 00 to 80 or main Coll solution gater nam 00 to 80 or main Coll solution gater nam 00 to 80 or main Coll solution gater nam 00 to 80 or main Coll solution gater nam 00 to 80 or main Coll solution gater nam 00 to 80 or main Coll solution gater nam 00 to 80 or main Coll solution gater nam 00 to 80 or main Coll solution gater nam 00 to 80 or main Coll solution gater nam 00 to 80 or main Coll solution gater nam 00 to 80 or main Coll solution gater nam 00 to 80 or main Coll solution gater nam 00 to 80 or main Coll solution gater nam 00 to 80 or main Coll solution gater nam 00 to 80 or main Coll solution gater nam 00 to 80 or main Coll solution gater nam 00 to 80 or main Coll solution gater nam 00 to 80 or main Coll solution gater nam 00 to 80 or main Coll solution gater nam 00 to 80 or main Coll solution gater nam 00 to 80 or main Coll solution gater nam 00 to 80 or main Coll solution gater nam 00 to 80 or main Coll solution gater nam 00 to 80 or main Coll solution gater nam 00 to 80 or main Coll solution gater nam 00 to 80 or main Coll solution gater nam 00 to 80 or main Coll solution gater nam 00 to 80 or main Coll solution gater nam 00 to 80 or main Coll solution gater nam 00 to 80 or main Coll solution gater nam 00 to 80 or main Coll soluting nam 00 to 80 or main Coll solution gate	P2459 - Diesel Particulate Filter Regeneration Frequency	ambient air temperature is above -7 deg C	ambient pressure is above 74.8kPa	1				_			
PABLEF - Exhaust Temperature Struct of Performance         Engine speed greater than 000 to 500 pm         Multivicities (Engine Table Quarker than 000 to 500 pm)         Engine Table Quarker than 000 to 500 pm         E	P2463 - Diesel Particulate Filter - Soot Accumulation	Engine not in afterrun mode (defined as engine speed greater than 0 rpm)	Engine speed greater than 600 to 850 rpm	engine is not in standby state (standby state occurs after ECM initialization or following after-run)	Engine Run Time greater than 10 seconds (engine speed greater than 600 to 850 rpm to indicate the engine is running)	Engine is running which means the engine speed is greater than 600 to 850 rpm	engine is not in ready state (which is active when the ignition is on or following a stall of the engine)				
P2470 - Exhaust Gas Temperature (EGT) Sensor 4 Circuit Low Volge (EGT) Sensor 4 Ci	P246F - Exhaust Temperature Sensor 4 Performance	Engine speed greater than 600 to 850 rpm	Manufacturer Enable Counter is zero (value of 0 means ECM is locked and out of assembly plant mode)	Engine Run Time greater than 10 seconds (engine speed greater than 600 to 850 rpm to indicate the engine is running)	s Engine is running which means the engine speed is greater than 600 to 850 rpm	engine is not in ready state (which is active when the ignition is on or following a stall of the engine)		_			
(EGT) Servor 4 Oricuit High Voltage         Engine not in afterrum mode (defined as engine speed greater than 0 pm)         Engine speed greater than 600 to 850 pm	P2470 - Exhaust Gas Temperature (EGT) Sensor 4 Circuit Low Voltage P2471 - Exhaust Gas Temperature	Engine not in afterrun mode (defined as engine speed greater than 0 rpm)	Engine speed greater than 600 to 850 rpm	engine is not in standby state (standby state occurs after ECM initialization or following after-run) engine is not in standby state (etandby	battery voltage is above 11 V for at least 3s	Engine is running which means the engine speed is greater than 600 to 850 rpm					
	(EGT) Sensor 4 Circuit High Voltage	Engine not in afterrun mode (defined as engine speed greater than 0 rpm)	Engine speed greater than 600 to 850 rpm	state occurs after ECM initialization or following after-run)	battery voltage is above 11 V for at least 3s	Engine is running which means the engine speed is greater than 600 to 850 rpm					

DTC			Additional Basic Enable Conditions							
P249D - Closed Loop Reductant Injection Control At Limit - Flow Too Low	SCR Reductant Level not in restriction or empty level state (see reductant level warning definition)	Engine not in afterrun mode (defined as engine speed greater than 0 rpm)	Engine speed greater than 600 to 850 rpm	engine is not in standby state (standby state occurs after ECM initialization or following after-run)	Manufacturer Enable Counter is zero (value of 0 means ECM is locked and out of assembly plant mode)	battery voltage is above 11 V for at least 3s	Status of the Reductant Tank is not Frozer which means ambient air temperature is >=7°C and the reductatn tank. temperature is >=7°C-	Engine Run Time greater than 10 seconds (engine speed greater than 600 to 850 rpm to indicate the engine is running)	Engine is running which means the engine speed is greater than 600 to 850 rpm	engine is not in ready state (which is active when the ignition is on or following a stall of the engine)
P249E - Closed Loop Reductant Injection Control At Limit - Flow Too High	SCR Reductant Level not in restriction or empty level state (see reductant level warning definition)	Engine not in afterrun mode (defined as engine speed greater than 0 rpm)	Engine speed greater than 600 to 850 rpm	engine is not in standby state (standby state occurs after ECM initialization or following after-run)	Manufacturer Enable Counter is zero (value of 0 means ECM is locked and out of assembly plant mode)	battery voltage is above 11 V for at least 3s	Statue of the Reductant Tank is not Frozer which means ambient air temperature is >=7°C and the reductatn tank- temperature is >=7°C-	Engine Run Time greater than 10 seconds (engine speed greater than 600 to 850 rpm to indicate the engine is running)	Engine is running which means the engine speed is greater than 600 to 850 rpm	engine is not in ready state (which is active when the ignition is on or following a stall of the engine)
P24A0 - Closed Loop Particulate Filter Regeneration Control At Limit - Temperature Too Low	Engine not in afterrun mode (defined as engine speed greater than 0 rpm)	Engine speed greater than 600 to 850 rpm	engine is not in standby state (standby state occurs after ECM initialization or following after-run)	Engine Run Time greater than 10 seconds (engine speed greater than 600 to 850 rpm to indicate the engine is running)	Engine is running which means the engine speed is greater than 600 to 850 rpm	engine is not in ready state (which is active when the ignition is on or following a stall of the engine)				
P24A1 - Closed Loop Particulate Filter Regeneration Control At Limit - Temperature Too High	Engine not in afterrun mode (defined as engine speed greater than 0 rpm)	Engine speed greater than 600 to 850 rpm	engine is not in standby state (standby state occurs after ECM initialization or following after-run)	Engine Run Time greater than 10 seconds (engine speed greater than 600 to 850 rpm to indicate the engine is running)	Engine is running which means the engine speed is greater than 600 to 850 rpm	engine is not in ready state (which is active when the ignition is on or following a stall of the engine)				
P2510 - ECM Power Relay Circuit Performance	battery voltage is above 11 V for at least 3s							_		
P2564 - Turbocharger Boost Control Position Sensor Circuit Low	Engine not in afterrun mode (defined as engine speed greater than 0 rpm)	Engine speed greater than 600 to 850 rpm	engine is not in standby state (standby state occurs after ECM initialization or following after-run)	battery voltage is above 11 V for at least 3s	Engine Run Time greater than 10 seconds (engine speed greater than 600 to 850 rpm to indicate the engine is running)	Engine is running which means the engine speed is greater than 600 to 850 rpm	engine is not in ready state (which is active when the ignition is on or following a stall of the engine)			
P2565 - Turbocharger Boost Control Position Sensor Circuit High	Engine not in afterrun mode (defined as engine speed greater than 0 rpm)	Engine speed greater than 600 to 850 rpm	engine is not in standby state (standby state occurs after ECM initialization or following after-run)	battery voltage is above 11 V for at least 3s	Engine Run Time greater than 10 seconds (engine speed greater than 600 to 850 rpm to indicate the engine is running)	Engine is running which means the engine speed is greater than 600 to 850 rpm	engine is not in ready state (which is active when the ignition is on or following a stall of the engine)			
P2598 - Turbocharger Boost Control Position Sensor "A" Circuit Range/Performance - Stuck Low	Engine not in afterrun mode (defined as engine speed greater than 0 rpm)	Engine speed greater than 600 to 850 rpm	engine is not in standby state (standby state occurs after ECM initialization or following after-run)	battery voltage is above 11 V for at least 3s	Engine is running which means the engine speed is greater than 600 to 850 rpm	engine is not in ready state (which is active when the ignition is on or following a stall of the engine)	1	_		
P2599 - Turbocharger Boost Control Position Sensor "A" Circuit Range/Performance - Stuck High	Engine not in afterrun mode (defined as engine speed greater than 0 rpm)	Engine speed greater than 600 to 850 rpm	engine is not in standby state (standby state occurs after ECM initialization or following after-run)	battery voltage is above 11 V for at least 3s	Engine is running which means the engine speed is greater than 600 to 850 rpm	engine is not in ready state (which is active when the ignition is on or following a stall of the engine)				
P2610 - Control Module Ignition Off Timer Performance	engine is not in standby state (standby state occurs after ECM initialization or following after-run)	battery voltage is above 11 V for at least 3s					-			
P268A - Fuel Injector Calibration Not Programmed ECM	Manufacturer Enable Counter is zero (value of 0 means ECM is locked and out of assembly plant mode) Manufacturer Enable Counter in zero									
P268C - Cylinder 1 Injector Data Incorrect	(value of 0 means ECM is locked and out of assembly plant mode) Manufacturer Enable Counter is zero									
P268D - Cylinder 2 Injector Data Incorrect	(value of 0 means ECM is locked and out of assembly plant mode)									
P268E - Cylinder 3 Injector Data Incorrect	Manufacturer Enable Counter is zero (value of 0 means ECM is locked and out of assembly plant mode)									
P268F - Cylinder 4 Injector Data Incorrect	Manufacturer Enable Counter is zero (value of 0 means ECM is locked and out of assembly plant mode)									
P2690 - Cylinder 5 Injector Data Incorrect	(value of 0 means ECM is locked and out of assembly plant mode)	-								
P2691 - Cylinder 6 Injector Data Incorrect	(value of 0 means ECM is locked and out of assembly plant mode)									
P2692 - Cylinder 7 Injector Data Incorrect	Manufacturer Enable Counter is zero (value of 0 means ECM is locked and out of assembly plant mode)									
P2693 - Cylinder 8 Injector Data Incorrect	Manufacturer Enable Counter is zero (value of 0 means ECM is locked and out of assembly plant mode)		1	I	I	I	Status of the Deductors Tank is not Emma	Engine Due Tennis exector then 10	1	<b>]</b>
P2BAD - Exhaust NOx Concentration High - Unknown Reason	empty level state (see parameter definitions for reductant level warning definition)	Engine not in afterrun mode (defined as engine speed greater than 0 rpm)	Engine speed greater than 600 to 850 rpm	engine is not in standby state (standby state occurs after ECM initialization or following after-run)	Manufacturer Enable Counter is zero (value of 0 means ECM is locked and out of assembly plant mode)	battery voltage is above 11 V for at least 3s	which means the ambient air temperature is >= -7°C and the reductant tank temperature is >= -7°C	seconds (engine speed greater than 600 to 850 rpm to indicate the engine is running)	Engine is running which means the engine speed is greater than 600 to 850 rpm	engine is not in ready state (which is active when the ignition is on or following a stall of the engine)
U0073 - CAN A BUS OFF	Engine not in afterrun mode (defined as engine speed greater than 0 rpm)	engine is not in standby state (standby state occurs after ECM initialization or following after-run)	battery voltage is above 11 V for at least 3s							
U0074 - CAN B BUS OFF	Engine not in afterrun mode (defined as engine speed greater than 0 rpm)	engine is not in standby state (standby state occurs after ECM initialization or following after-run)	battery voltage is above 11 V for at least 3s							
U0101 - Lost Communications With Transmission Control System	Engine not in afterrun mode (defined as engine speed greater than 0 rpm)	state occurs after ECM initialization or following after-run)	battery voltage is above 11 V for at least 3s							
U0106 - Lost Communication With Glow Plug Control Module	Engine not in afterrun mode (defined as engine speed greater than 0 rpm)	engine is not in standby state (standby state occurs after ECM initialization or following after-run)	battery voltage is above 11 V for at least 3s	1				_		
U010E - Lost Communications With Reductant Control Module	Engine not in afterrun mode (defined as engine speed greater than 0 rpm)	Engine speed greater than 600 to 850 rpm	engine is not in standby state (standby state occurs after ECM initialization or following after-run)	battery voltage is above 11 V for at least 3s	Engine Run Time greater than 10 seconds (engine speed greater than 600 to 850 rpm to indicate the engine is running)	Engine is running which means the engine speed is greater than 600 to 850 rpm	e engine is not in ready state (which is active when the ignition is on or following a stall of the engine)			
U029D - N0x 1 loss of comm	Engine not in afterrun mode (defined as engine speed greater than 0 rpm)	Engine speed greater than 600 to 850 rpm	battery voltage is above 11 V for at least 3s	Engine is running which means the engine speed is greater than 600 to 850 rpm						
U029E - N0x 2 loss of comm	Engine not in afterrun mode (defined as engine speed greater than 0 rpm)	Engine speed greater than 600 to 850 rpm	battery voltage is above 11 V for at least 3s	Engine is running which means the engine speed is greater than 600 to 850 rpm	]					