Component / System	Fault Code	Monitor Strategy Description	Primary Malfunction Criteria		Threshold Logic and Valu	ıe	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 OR	<	-20.00	degrees	Engine backward rotation detected	=	FALSE	•	fail conditions exists for more than 2	В
			average value of camshaft offset	>	20.00	degrees	NO pending or confirmed DTCs	=	see sheet inhibit tables	-	events test performed	
							and Ignition ON and	=	TRUE	-	0.01 s rate	
							basic enable conditions met:	=	see sheet enable tables	-		
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:				injection quantity	>=	0.00	mm^3/rev	fail conditions exists for 0.01 s monitor runs	В
			mean offset learned value at fully closed valve position	<	68.01	%	and				once per trip with 0.01 s rate	
			or mean offset learned value at fully closed valve position	>	95.61	%	injection quantity and	<=	100.00	mm^3/rev	whenever enable conditions	
			valve position				accelerator pedal position and	<=	0.10	%	are met	
							Engine Speed and	>=	500.00	rpm		
							Engine Speed and Vehicle speed	<= >=	760.00 0.00	rpm mph		
							and Vehicle speed	<=	3.11	mph		
							and Battery voltage	>=	10.00	V		
							and engine coolant temperature and	>=	71.96	°C		
							engine coolant temperature and	<=	130.06	°C		
							Barometric pressure and	>=	65.00	kPa		
							Barometric pressure and	<=	110.00	kPa		
							time since start and	>	10.08	sec		
							Engine is Idling and Rich idle regeneration	=	TRUE inactive	-		
							and Rich idle and	=	inactive	-		

Component /	Fault	Monitor Strategy	Primary Malfunction	Threshold	Secondary		Enable		Time	MIL
System	Code	Description	Criteria	Logic and Value	Parameters		Conditions		Required	Illum.
					Adaption is finished for this driving cycle and	=	FALSE	-		
					turbocharger offset adaption timer and	>=	0.60	sec		
					mean offset learned value at fully open valve position	>=	5.54	%		
					and mean offset learned value at fully open valve position	<=	36.94	%		
					and valve closed and	=	TRUE			
					turbocharger offset adaption timer and	>=	0.15	sec		
					No Pending or confirmed DTCs	=	see sheet inhibit tables	-		
					and basic enable conditions met:	=	see sheet enable tables	-		
			Path 2: time taken to learn the mean offset learned value at fully closed valve	> 30.00 se	injection quantity c and	>=	0.00	mm^3/rev	fail conditions exists for	
			position		injection quantity	<=	100.00	mm^3/rev	0.01 s monitor runs	
					accelerator pedal position and	<=	0.10	%	once per trip with 0.01 s rate	
					Engine Speed and	>=	500.00	rpm	whenever enable	
					Engine Speed and	<=	760.00	rpm	conditions are met	
					Vehicle speed and Vehicle speed	>=	0.00 3.11	mph mph		
					and Battery voltage	>=	10.00	V		
					and engine coolant temperature	>=	71.96	°C		
					and engine coolant temperature	<=	130.06	°C		
					and Barometric pressure and	>=	65.00	kPa		
					Barometric pressure and	<=	110.00	kPa		
					time since start and	>	10.08	sec		
					Engine is Idling and Rich idle regeneration	=	TRUE inactive	-		
					and Rich idle Rich idle	=	inactive	-		
					and Adaption is finished for this driving cycle	=	FALSE	-		
					and					

Component /	Fault	Monitor Strategy	Primary Malfunction	Threshold		Secondary		Enable		Time	MIL
System	Code	Description	Criteria	Logic and Value		Parameters turbocharger offset adaption timer	>=	Conditions 0.60	sec	Required	Illun
						and	>=	0.60	Sec		
						mean offset learned value at fully open	>=	5.54	%		
						valve position and					
						mean offset learned value at fully open	<=	36.94	%		
						valve position		00.01	,,		
						and		TD. 15			
						valve closed and	=	TRUE			
						turbocharger offset adaption timer	>=	0.15	sec		
						and					
						No Pending or confirmed DTCs	=	see sheet inhibit tables	-		
						and		tables			
						basic enable conditions met:	=	see sheet enable	-		
								tables			
ļ											
			Path 3:			injection quantity	>=	0.00	mm^3/rev	fail	
			mean offset learned value at fully open valve position	< 5.54	%	and				conditions exists for	
			or			injection quantity	<=	100.00	mm^3/rev	0.01 s	
			mean offset learned value at fully open	> 36.94	%	and				monitor runs	
			valve position					0.40	0/	once per trip	
						accelerator pedal position and	<=	0.10	%	with 0.01 s rate	
						Engine Speed	>=	500.00	rpm	whenever	
						and				enable	
						Engine Speed and	<=	760.00	rpm	conditions	
						Vehicle speed	>=	0.00	mph	are met	
						and .					
						Vehicle speed	<=	3.11	mph		
						and Battery voltage	>=	10.00	V		
						and					
						engine coolant temperature	>=	71.96	°C		
						and engine coolant temperature	<=	130.06	°C		
						and	_	130.00	C		
						Barometric pressure	>=	65.00	kPa		
						and Barometric pressure		110.00	kPa		
						and	<=	110.00	KFa		
						time since start	>	10.08	sec		
						and		TDUE			
						Engine is Idling and	=	TRUE	-		
						Rich idle regeneration	=	inactive	-		
						and					
ļ						Rich idle	=	inactive	-		
ļ						and Adaption is finished for this driving cycle	=	FALSE	_		
ļ						The state of the driving cycle	_				
ļ						and					
						valve closed and	=	TRUE	-		

Component / System	Fault Code	Monitor Strategy Description	Primary Malfunction Criteria	Threshold Logic and Value	Secondary Parameters		Enable Conditions		Time Required	MI Illu
Cycle	- 5545	2000р	- Cittoria	209.0 4.14 74.40	and				rioquirou	
					turbocharger offset adaption timer and	>=	0.15	sec		
					No Pending or Confirmed DTCs	=	see sheet inhibit tables	-		
					and basic enable conditions met:	=	see sheet enable	_		
					basic chable conditions met.	_	tables			
			Path 4:		injection quantity	>=	0.00	mm^3/rev	fail	
			time taken to learn the mean offset	> 30.00 sec	and				conditions exists for	
			learned value at fully open valve position						0.01 s	
					injection quantity and	<=	100.00	mm^3/rev	monitor runs once per trip	
					accelerator pedal position and	<=	0.10	%	with 0.01 s	
					Engine Speed	>=	500.00	rpm	rate whenever	
					and Engine Speed	<=	760.00	rpm	enable conditions	
					and Vehicle speed	>=	0.00	mph	are met	
					and					
					Vehicle speed and	<=	3.11	mph		
					Battery voltage and	>=	10.00	V		
					engine coolant temperature and	>=	71.96	°C		
					engine coolant temperature	<=	130.06	°C		
					and Barometric pressure	>=	65.00	kPa		
					and Barometric pressure	<=	110.00	kPa		
					and time since start	>	10.08	sec		
					and					
					Engine is Idling and	=	TRUE	-		
					Rich idle regeneration and	=	inactive	-		
					Rich idle	=	inactive	-		
					and Adaption is finished for this driving cycle	=	FALSE	-		
					and					
					valve closed and	=	TRUE	-		
					turbocharger offset adaption timer	>=	0.60	sec		
					and turbocharger offset adaption timer	>=	0.15	sec		
					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.
Turbocharger Boost Control Circuit	P0045	Diagnoses the Turbocharger Boost Control 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 No Pending or confirmed DTCs and basic enable conditions met:	> 11.00 > 3.00 = FALSE = see sheet inhibit tables = see sheet enable tables	fail conditions exists for 3 s monitor runs with 0.01 s rate whenever enable conditions are met	В
		Boost Control low side	The ECM detects that the commanded state of the driver and the actual state of the control circuit do not match and the IC maximum temperature has been exceeded		for time and starter is active cranking No Pending or confirmed DTCs and basic enable conditions met:	> 11.00 > 3.00 = FALSE = see sheet inhibit tables = see sheet enable tables	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 Turbocharger Boost Control low side driver circuit for circuit faults.	Voltage low during driver off state (indicates short-to-ground)	= Short to ground: -	for time and starter is active cranking No Pending or confirmed DTCs and basic enable conditions met:	> 11.00 > 3.00 = FALSE = see sheet inhibitables = see sheet enablitables	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.
Turbocharger Boost Control Circuit High Voltage	P0048		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	>	11.00	V	fail conditions exists for 1 s monitor runs with 0.01 s rate whenever enable	В
					starter is active cranking No Pending or confirmed DTCs and basic enable conditions met:	=	FALSE see sheet inhibit tables see sheet enable tables	-	conditions are met	
Turbocharger Boost High Control Circuit Low VoltageTurbochar ger Boost Control Circuit High Voltage	P006E	Diagnoses the Turbo Charger Boost Circuit high 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 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	for time and starter is active cranking No Pending or confirmed DTCs and basic enable conditions met:	> = = =	3.00 FALSE see sheet inhibit tables see sheet enable tables	v sec	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.
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	V °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
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 -53	V °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 setpoint calculated out of difference between desired and actual value (see Look-Up-Table #68)	>	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:		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	В
			rail pressure deviation from setpoint 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 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:	= =	TRUE TRUE see sheet enable tables		fail conditions exists for 8 s monitor runs with 0.02 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.
							and metering unit actuator test active and NO Pending or Confirmed DTCs:	=	FALSE see sheet inhibit tables	-		
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 setpoint calculated out of difference between desired and actual value (see Look-Up-Table #69)	<	-80000 to -18000	kPa	current injection quantity and 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:	= = =	8.00 TRUE see sheet enable tables FALSE see sheet inhibit tables	mm^3/rev - - -	fail conditions exists for 8 s monitor runs with 0.02 s rate whenever enable conditions are met	В
			rail pressure deviation from setpoint calculated out of difference between desired and actual value	<	-18000.00	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: and NO Pending or Confirmed DTCs:	= = =	TRUE TRUE see sheet enable tables see sheet inhibit tables		fail conditions exists for 8 s monitor runs with 0.02 s rate whenever enable conditions are met	
Engine Coolant Temperature (ECT)-Fuel Temperature Not Plausible	P008F	Detects a biased ECT or fuel temperature by comparing start-up temperatures between the two sensors.	Path 1: (a) - (b) (see Look-Up-Table #15) where ((a) captured engine coolant temperature at start and (b) captured fuel temperature at start	> = =	100 to 999 measured parameter measured parameter	°C -	minimum engine-off time and ambient temperature and Engine Running for time	>= >=	-60.04 TRUE 0.00	°C - sec	fail conditions exists for 0.2 s monitor runs once per trip 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.
			or Path 2: (a) - (b) (see Look-Up-Table #15) with (a) captured engine coolant temperature at start and (b) captured fuel temperature at start and (a) - (b) (see Look-Up-Table #16) where (a) captured engine coolant temperature at start and (b) captured engine coolant temperature at start and (b) captured fuel temperature at start and (c) captured fuel temperature at start and (d) block heater detected (see parameter definition)	<pre></pre>	basic enable conditions met: and NO Pending or Confirmed DTCs:	= FALSE = FALSE = see sheet enable tables = see sheet inhibit tables		
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	for time and starter is active cranking for time and NO Pending or Confirmed DTCs: and Basic enable conditions met	> 11.00 V > 3.00 sec = FALSE - > 3.00 sec = see sheet inhibit tables = see sheet enable tables	fail conditions exists for 1 monitor runs with 0.01 s rate whenever enable conditions are met	A
		Diagnoses the Fuel Pressure Regulator 1 low side driver circuit for circuit faults.	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 V > 3.00 sec = FALSE -	fail conditions exists for 1 monitor runs with 0.01 s rate whenever enable conditions	А

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 NO Pending or Confirmed DTCs: and Basic enable conditions met	> = =	3.00 see sheet inhibit tables see sheet enable tables	sec -	are met	
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	for time and starter is active cranking for time and NO Pending or Confirmed DTCs: and Basic enable conditions met	> = > = =	3.00 FALSE 3.00 see sheet inhibit tables see sheet enable tables	v sec - sec -	fail conditions exists for 0.75s monitor runs with 0.01 s rate whenever enable conditions are met	А
Fuel Pressure Regulator 1 Control Circuit High	P0092	Diagnoses the Fuel Pressure Regulator 1 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	for time and starter is active cranking for time and NO Pending or Confirmed DTCs: and Basic enable conditions met	> = > = =	3.00 FALSE 3.00 see sheet inhibit tables 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	А

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 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	>	150	°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
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		ignition on and Basic enable conditions met	=	TRUE 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	P00CA	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	>	3.00	V	fail conditions exists for 0.1 s monitor runs with 0.1 s rate whenever enable	A

Component /	Fault	Monitor Strategy	Primary Malfunction		Threshold		Secondary		Enable		Time	MIL
System	Code	Description	Criteria	Lo	gic and Value		Parameters starter is active cranking for time and NO Pending or Confirmed DTCs: and Basic enable conditions met	= > =	FALSE 3.00 see sheet inhibit tables see sheet enable tables	sec -	conditions are met	Illum.
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 same as temperature of intake air temperature sensor 3	>	0.03	°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
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	V °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	Path1: Humidity Sensor Duty Cycle same as relative humidity	< >	5.00 100.00	%	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

Component / System	Fault Code	Monitor Strategy Description	Primary Malfunction Criteria	Threshold Logic and Value	Secondary Parameters	Enable Conditions	Time M Required IIIu
Oyotom	0000	Возоприон	O.N.C.N.C	Logio una varac	, drameters	Gondanono	Required
		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.	Path 2:		Engine Running (please see the definition)	= TRUE -	fail conditions exists for 0.1 s test performed continuously with 0.1 s
		sonson oncom.	Internal ECM PWM circuit low voltage and ECM PWM circuit maximum period detected	= TRUE - = TRUE -	and following conditions for time: battery voltage	> 1.00 sec > 11.00 V	rate
			or Internal ECM PWM period not received	= TRUE -	battery voltage and	< 655.34 V	
					basic enable conditions met:	= see sheet enable - tables	
					and no pending or confirmed DTCs	= see sheet inhibit - tables	
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	Path 1:		Engine Running (please see the definition)	= TRUE -	fail E conditions exists for 0.1 s test
			Humidity Sensor Duty Cycle same as relative humidity	> 95.00 % < 0.00 %	and following conditions for time: battery voltage battery voltage and	> 1.00 sec > 11.00 V < 655.34 V	performed continuously with 0.1 s rate
					basic enable conditions met: and no pending or confirmed DTCs	= see sheet enable - tables = see sheet inhibit - tables	
		The internal ECM PWM	Path 2:		Engine Running (please see the	= TRUE -	fail
		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.			definition)		conditions exists for 0.1 s test performed continuously with 0.1 s
			Internal ECM PWM circuit high voltage and ECM PWM circuit maximum period detected	= TRUE - = TRUE -	and following conditions for time: battery voltage	> 1.00 sec > 11.00 V	rate
			or		battery voltage	< 655.34 V	

Component / System	Fault Code	Monitor Strategy Description	Primary Malfunction Criteria		Threshold Logic and Value	<u> </u>	Secondary Parameters		Enable Conditions		Time Required	MIL Illum.
5,500		200.191011	Internal ECM PWM period not received	=	TRUE	-	and basic enable conditions met: and no pending or confirmed DTCs	=	see sheet enable tables see sheet inhibit tables		,	
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	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
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 (see Look-Up-Table #1) and with (b) air temperature dependent correction factor curve 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	< = = > = =	(a) - (b) 0.75 to 0.8 0 (c) + (b) 1.2	ratio factor ratio factor	ambient pressure and engine coolant temperature and engine coolant temperature and gradient of the charge-air temperature and gradient of the charge-air temperature and (Engine Runnung for time since start) and control value of the throttle valve	>= <= >= >= >= >= >= >= >= >= >= >= >= >= >=	74.80 -20.04 129.96 -2.00 2.00 TRUE 90.00 -400.00	kPa °C °C/sec °C/sec sec %	fail conditions exists for 10 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	Criteria	L	ogic and Valu	е	Parameters and		Conditions		Required	Illum.
							control value of the throttle valve	<=	5.00	%		
							(setpoint valve position of exhaust-gas recirculation	>=	-400.00	%		
							and setpoint valve position of exhaust-gas recirculation	<=	2.00	%		
							for time	>	3.00	sec		
							and injection quantity and	<=	300.00	mm^3/rev		
							air pressure in the induction volume	<=	280.00	kPa		
							and engine speed and	>=	625.00	rpm		
							engine speed and	<=	1500.00	rpm		
							intake air temperature and	>=	-7.04	°C		
							intake air temperature basic enable conditions met:	<= =	51.96 see sheet enable tables	°C -		
							and 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	usec	ignition on	=	TRUE	-	fail conditions exists for 3 s	A
			same as air mass flow	<	14.04	g/sec	and basic enable conditions met:	=	see sheet enable tables	-	monitor runs 0.01 s rate whenever	
							and NO Pending or Confirmed DTCs:	=	see sheet inhibit	_	enable conditions	
							INO Perioding of Committee DTCs.	=	tables	-	are met	
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	=	TRUE	-	ignition on	=	TRUE	-	fail conditions exists for 3 s monitor runs 0.01 s rate	A
			or signal period of air mass flow sensor (MAF)	<	50.00	usec	and basic enable conditions met:	=	see sheet enable tables	-	whenever enable conditions	
			same as air mass flow	>	7354.80	g/sec	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	e	Secondary Parameters		Enable Conditions		Time Required	MIL Illum.
Manifold Absolute Pressure (MAP) Sensor	P0106	Detects a skewed MAP or BARO sensor by comparing MAP readings to the BARO	Path 1:				engine coolant temperature	>	-3549.94	°C	fail conditions exists for 5 s	В
Performance		sensor	(a) - (b) or Path 2: (a) - (b) where (a) MAP sensor measured pressure	< > =	-15.00 15.00 measured parameter	kPa kPa -	and current injection quantity and actuator position of throttle valve and turbo charger (VNT) wiping is active (see parameter definition) and	< <= =	1308.00 327.67 FALSE	mm^3/rev % -	monitor runs with 0.01 s rate whenever enable conditions are met	
		and (b) BARO sensor measured pressure	=	measured parameter	-	(engine speed and	>=	0.00	rpm			
						engine speed) and	<=	100.00	rpm			
						vehicle speed and basic enable conditions met:	=	3.11 see sheet enable tables	mph -			
						and NO Pending or Confirmed DTCs:	=	see sheet inhibit tables	-			
Manifold Absolute Pressure (MAP) Sensor Circuit Low Voltage	essure (MAP) reac ensor Circuit Low indic	Detects low voltage readings on the MAP circuit, indicating an OOR low condition on the MAP circuit	Path 1:				engine synchronization completed	=	TRUE	·	fail conditions exists for 5 s test performed	A
			(sensor voltage of manifold absolute pressure	<	0.91	V	which means number of crankshaft revolutions	>=	4.00	revs	continuously 0.01 s rate	
			same as manifold absolute pressure	<	44.9	kPa	and crankshaft reference mark detected (reference mark is the 2 missing teeth in the 50-2 tooth-wheel configuration)	=	TRUE	-		
			and actuator position of throttle valve	<=	20.00	%	and basic enable conditions met:	=	see sheet enable tables	-		
			or Path 2: (
			sensor voltage of manifold absolute pressure same as	<	0.38	V						
			manifold absolute pressure and	<	-0.3	kPa						

Indicating an OOR high condition on the MAP circul same as manifold absolute pressure Indicating an OOR high condition on the MAP circul same as manifold absolute pressure Indicating an OOR high condition on the MAP circul same as manifold absolute pressure Indicating an OOR high condition on the MAP circul same as manifold absolute pressure Indicating an OOR high condition on the MAP circul same as manifold absolute pressure Indicating an OOR high condition on the MAP circul same as manifold absolute pressure Indicating an OOR high condition on the MAP circul same as manifold absolute pressure Indicating an OOR high condition on the MAP circul same as manifold absolute pressure Indicating an OOR high condition on the MAP circul same as manifold absolute pressure Indicating an OOR high condition on the MAP circul same as manifold absolute pressure Indicating an OOR high conditions met as see sheet enable and basic enable conditions met: Indicating an OOR high condition on the MAP circul same as manifold absolute pressure Indicating an OOR high condition on the Mark defends and an one present as the conditions met. Indicating an OOR high condition on the Mark defends and an one present as the condition on the manifold absolute pressure Indicating an OOR high conditions and the manifold absolute pressure Indicating an OOR high conditions and the manifold absolute pressure Indicating an OOR high conditions and the manifold and an one present as the conditions met. Indicating an OOR high conditions and the manifold absolute pressure Indicating an OOR high conditions and the pressure and an one present as the conditions and an an one present as the conditions and the manifold and an one present as the conditions and the manifold and an one present and the manifold and an one present as the conditions met. Internal ECM PVM circuit low voltage Inter	Component / System	Fault Code	Monitor Strategy Description	Primary Malfunction Criteria		Threshold Logic and Valu		Secondary Parameters		Enable Conditions		Time Required	MIL Illum.
Personage (ARP) Personage (ARP				actuator position of throttle valve)	>	20.00	%						
same as manifold absolute pressure P0112 Detects a low PVM period from the humidity temperature sensor period same as humidity temperature sensor circuit P0112 The internal ECM PVM Path 1: Path 2: Path 3: Path 4: Path 4: Path 5: Path 5: Path 6:	Pressure (MAP) Sensor Circuit	P0108	readings on the MAP circuit, indicating an OOR high		>	4.75	V	engine synchronization completed	=	TRUE	-	conditions exists for 5 s test	A
tritake Air emperature emoir 1 Circuit of the formative agents or circuit emperature sensor period same as humidity temperature adulty temperature = \$1.00 sec onditions not temperature and tribules = \$1.00 sec onditions on the humidity temperature = \$1.00 sec onditions on the humidity temperatur					>	371.3	kPa	number of crankshaft revolutions	>=	4.00	revs	continuously 0.01 s rate	
Intake Air Temperature Sensor 1 Circuit									=	TRUE	-		
Intake Air Temperature Sensor 1 Crout 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 Sensor 1 Crout temperature sensor circuit Humidity Temperature sensor period same as humidity temperature Sensor 1 Crout temperature sensor circuit Humidity Temperature sensor period same as humidity temperature Sensor 1 Crout temperature Sensor 1													
Temperature Sensor of Circuit Low 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. The internal ECM PWM circuit flow voltage The inte								57 5	=		-		
Temperature Sensor 1 Circuit Low Pumperature Sensor period Low Condition on the humidity temperature sensor circuit definition same as humidity temperature sensor circuit definition same as humidity temperature sensor circuit same as humidity temperature sensor circuit definition same and same as humidity temperature sensor circuit definition same and same as humidity temperature sensor circuit definition same and same as humidity temperature sensor circuit definition same and same as humidity temperature sensor circuit definition same and same as humidity temperature sensor circuit definition same and same as humidity temperature sensor circuit definition same and same as humidity temperature sensor circuit definition same and same as humidity temperature sensor circuit definition same and same as humidity temperature sensor circuit definition on the same and same as sensor circuit definition same and same as humidity temperature sensor circuit definition on the same and same as humidity temperature sensor circuit same and same as and conditions met: ***Engine Running (please see the definition)** **Engine Running (please see the definition)** **Engine Running (please see the definition)** **Engine Running (please see the definition)** **Internal ECM PWM circuit low voltage see and conditions met: **Engine Running (please see the definition)** **Internal ECM PWM													
same as humidity temperature > 145.96 °C battery voltage	Temperature Sensor 1 Circuit	P0112	from the humidity temperature sensor, indicating an OOR low condition on the humidity		<	0.26	centised	definition)	=	TRUE	-	conditions exists for 0.1 s	В
battery voltage and basic enable conditions met: = see sheet enable - tables The internal ECM PWM circuit low voltage and no pending or confirmed DTCs = see sheet inhibit - tables Engine Running (please see the definition) Internal ECM PWM circuit low voltage = TRUE - and				same as					>			with 0.1 s	
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. Path 2: Engine Running (please see the definition)	ļ			humidity temperature	>	145.96	°C	battery voltage					
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 Path 2:									=		-		
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 = TRUE - and condition condition condition condition condition definition) condition definition) definition) condition exists for s test perform condition internal ECM PWM circuit low voltage = TRUE - and									=		-		
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 = TRUE - and condition or definition) condition (definition) definition) condition exists for sex test exceeded, indicating short condition on the humidity sensor circuit.			The internal ECM PWM	Path 2:				Engine Running (please see the	=	TRUE		fail	
Internal ECM PWM circuit low voltage = TRUE - and rate			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									conditions exists for 0.1 s test performed continuously	
			Sensor Circuit.	Internal ECM PWM circuit low voltage and	=	TRUE	-	and following conditions for time:	>	1.00	sec	rate	
ECM PWM circuit maximum period = TRUE - battery voltage > 11.00 V detected or battery voltage < 655.34 V				detected	=	TRUE	-						

Component / System	Fault Code	Monitor Strategy Description	Primary Malfunction Criteria		Threshold Logic and Valu	Ie.	Secondary Parameters		Enable Conditions		Time Required	MIL Illum.
Jysteni	Code	Description	Internal ECM PWM period not received	=	TRUE	- -	and basic enable conditions met: and no pending or confirmed DTCs	=	see sheet enable tables see sheet inhibit tables		required	muni.
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	Path 1: Humidity Temperature sensor period same as humidity temperature	> <	10.00 -60.00	centisec ond °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	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 high condition on the humidity sensor circuit.	Path 2: 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	> > < = =	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	
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	<	0.51	V	ignition on	=	TRUE	·	fail conditions exists for 15 s test performed	А

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	>	149	°C	basic enable conditions met:	=	see sheet enable tables	-	continuously 0.2 s rate	
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) Low Region 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 49.96	°C	engine pre drive and time since start and measured engine coolant temperature and	= < < >=	FALSE 1440.00 -53.04	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
		temperature <= 10 dego.					captured value of coolant temperature during start and (ambient temperature and ambient temperature) and ambient temperature (used for low region determination) and engine idle time ratio which is defined by (idle time divided by	<= > < <= <	30.96 -7.04 59.96 9.96 0.50	°C °C °C %		

Component /	Fault	Monitor Strategy	Primary Malfunction		Threshold		Secondary		Enable		Time	MIL
System	Code	Description	Criteria	L	ogic and Value		Parameters		Conditions		Required	Illum.
							time since start) where idle time is incremented when: (
							accelerator pedal value and	<=	10.01	%		
							vehicle speed and	<=	9.94	mph		
							engine speed)	<=	750.00	rpm		
							and 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 thermostat by comparing	modeled coolant temperature (model derived from injection quantity,	>=	81.96	°C	engine pre drive	=	FALSE			
		actual engine coolant heat up profile to an expected modeled heat up profile. The targets are dependant on start up conditions (high and low regions)	coolant temperature at start, and ambient temperature)									
			and measured engine coolant temperature	<	70.96	°C	and time since start and	<	1440.00	sec		
		High region Engine Temperature at start < 52 degC AND ambient air temperature > 10 degC					measured engine coolant temperature and	>=	-53.04	°C		
							captured value of coolant temperature during start and	<=	51.96	°C		
							ambient temperature and	>	-7.04	°C		
							ambient temperature)	<	59.96	°C		
							and ambient temperature (used for high region determination) and	>	9.96	°C		
							engine idle time ratio which is defined by (idle time divided by time since start)	<	0.50	%		

Component / System	Fault Code	Monitor Strategy Description	Primary Malfunction Criteria	Threshold Logic and Value	Secondary Parameters	Enable Conditions		Time Required	MIL Illum.
					where idle time is incremented when: (<= 10.01 <= 9.94 <= 750.00 = FALSE = see sheet enable tables = see sheet inhibit tables	% mph rpm		
HO2S Bank 1 Sensor 1 Circuit Low	P0131	Detects an out of range low fault of the upstream Nox sensor lambda signal	Upstream Nox sensor lambda signal received via CAN	< -150.00 (-150 counts = 1100 Lambda = ~27 %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	sec	fault exists for more than 3 sec; monitor runs at 0.1 s when enable conditions are met	В
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)	counts 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	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)	= TRUE = TRUE	-	fault exists for more than 3 sec; monitor runs at 0.1 s when enable	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 (required for the NOx sensor to give valid response) and basic enable conditions met:	> =	20.00 see sheet enable tables	sec -	conditions are met	
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)	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
NOx Sensor - O2 Sensor Slow Response - Rich to Lean Bank 1 Sensor 1	P014C	measure 02 response time of upstream NOx sensor until 02 concentration reaches the calibrated upper limit of the modeled 02 concentration in overrun state	with O2 concentration of the sensor where (a) modeled O2 in waiting-injection falling state (b) factor for the determination of the upper limit of modeled O2 concentration	<= = =	2.00 ((0.2095 - (a)) *	sec factor factor	Engine speed Engine speed Engine speed Battery voltage Ambient Air Pressure Ambient Air Pressure Ambient Air Temperature Ambient Air Temperature Engine operation mode Post injection Oxygen Concentration Signal NO Pending or Confirmed DTCs: Communication with NOx Sensor Exhaust Gas Temperature Exhaust Gas Temperature Additional enable conditions for transitioning state machine from inactive state to stable operation state: following conditions for time: modeled O2 signal (based on injection quantity, air mass and fuel density)	> < > >= <= =	600.00 4000.00 11.00 74.80 106.00 -7.04 124.96 normal inactive active see sheet inhibit tables active -0.04 1299.96	rpm rpm V kPa kPa °C °C - - - °C °C	fault exists for more than 2 sec; monitor runs at 0.1 s when 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.
					Fuel Injection Quantity Engine speed	> >	120.00 600.00	mm^3/rev rpm		
					Additional enable conditions for transitioning state machine from stable operation state to wait-Injection falling state:					
					Fuel Injection Quantity with	<	a+b	-		
					a) Measured and stored Fuel Injection Quantity at start of diagnosis	=	measured parameter	-		
					b) Decline of Injection Quantity from stored fuel quantity at start of diagnosis	>=	18.00	mm^3/rev		
					and Fuel Injection Quantity with	>	a-b	-		
					a) Measured and stored Fuel Injection Quantity at start of diagnosis	=	measured parameter	-		
					b) Decline of Injection Quantity from stored fuel quantity at start of diagnosis	>=	18.00	mm^3/rev		
					and Engine speed	>	600.00	rpm		
					Additional enable conditions for transitioning state machine from wait- Injection falling state to wait-overrun state:					
					Fuel Injection Quantity Fuel Injection Quantity with	< <	120.00 a+b	mm^3/rev		
					a) Measured and stored Fuel Injection Quantity at start of diagnosis	=	measured parameter	-		
					b) Decline of Injection Quantity from stored fuel quantity at start of diagnosis	>=	18.00	mm^3/rev		
					Additional enable conditions for transitioning state machine from wait-overrun state to overrun state:					
					following for exhaust gas transfer time:	>	0.50	sec		
					actual valve position of exhaust-gas recirculation and	>=	0.00	%		
					actual valve position of exhaust-gas recirculation and	<=	80.00	%		
					within the time fuel injection falling below	<	1.05	sec		
					Fuel Injection Quantity and	<	4.00	mm^3/rev		
					Fuel Injection Quantity with	<	a+b			
					a) Measured Minimum Fuel Injection Quantity	=	measured parameter	-		

Component / System	Fault Code	Monitor Strategy Description	Primary Malfunction Criteria	Threshold Logic and Value	Secondary Parameters		Enable Conditions		Time Required	MIL Illum.
System	Code	Description	Cinteria	Logic and value	b) Maximum fluctuation of Injection Quantity	=<	16.00	mm^3/rev	Required	mum.
					Additional enable conditions for transitioning state machine from overrun state to delay state: actual valve position of exhaust-gas recirculation	>=	0.00	%		
					and actual valve position of exhaust-gas recirculation	<=	80.00	%		
					Deviation from maximum O2 concentration during overrun	<	0.06	-		
					Additional enable conditions for transitioning from delay state to diagnostic completion state: actual valve position of exhaust-gas recirculation	>=	0.00	%		
					and actual valve position of exhaust-gas recirculation	<=	80.00	%		
					Deviation from maximum O2 concentration during overrun	<	0.06	-		
uel Trim System ean	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 #41)	<= -164.4 to -46.12 mm^3/r ev	(Status of the Observer function's lambda-signal	=	TRUE	-	fail conditions exists for 12 s monitor runs	В
					means (TDUE		with 0.02 s rate whenever	
					lambda signal from NOx sensor ready (see parameter definition) fuel system is in fuel cut off (see	=	TRUE FALSE	-	enable conditions are met	
					parameter definition) Particulate Filter Regeneration Mode	=	FALSE	-		
					((fraction of total fuel injected that is involved in combustion (Fuel Mass for Combustion / Total fuel injected)	=	1	-		
					or calculated EGR rate	>=	0	-		
					for time))	>	1.00	sec		
					AND Controller status of the observer means	=	TRUE	-		
					Load dependent release state (see look up table #48)	=	0 to 1	-		

Component / System	Fault Code	Monitor Strategy Description	Primary Malfunction Criteria	Threshold Logic and Value	Secondary Parameters		Enable Conditions		Time Required	MIL Illum.
System	Code	Description	Griteria	Logic and value	AND Component Protection release state (see look up table #43)	>	0 to 1		Required	mum.
					engine coolant temperature engine coolant temperature Normal Injection Mode Barometric pressure Ambient temperature NO Pending or Confirmed DTCs: basic enable conditions met:	<= >= = >= >= =	199.96 64.96 TRUE 74.80 -7.04 see sheet inhibit tables see sheet enable tables	°C °C - kPa °C -		
_							_	-		-
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)	>= 46.12 to 164.64 mm^3/i	(Status of the Observer function's lambda-signal means	=	TRUE	-	fail conditions exists for 12 s monitor runs with 0.02 s	В
					(lambda signal from NOx sensor ready	=	TRUE	_	rate whenever	
					(see parameter definition) fuel system is in fuel cut off (see		FALSE	-	enable conditions	
					parameter definition) Particulate Filter Regeneration Mode	=	FALSE	-	are met	
					((fraction of total fuel injected that is involved in combustion (Fuel Mass for Combustion / Total fuel injected)	=	1	-		
					or calculated EGR rate	>=	0			
) for time))	>	1.00	sec		
					AND Controller status of the observer means	=	TRUE	-		
					(Load dependent release state (see look up table #48)	=	0 to 1	-		
					AND Component Protection release state (see look up table #43)	>	0 to 1	-		
					engine coolant temperature engine coolant temperature	<= >=	199.96 64.96	°C		
					Normal Injection Mode	=	TRUE	-		
					Barometric pressure Ambient temperature	>= >=	74.80 -7.04	kPa °C		

Component /	Fault	Monitor Strategy	Primary Malfunction		Threshold		Secondary		Enable		Time	MIL
System	Code	Description	Criteria	L	ogic and Valu	е	Parameters		Conditions		Required	Illum.
							NO Pending or Confirmed DTCs: basic enable conditions met:	=	see sheet inhibit tables see sheet enable tables	-		
Fuel pump Temperature Sensor 1 Circuit	P0182	Detects low voltage readings in the fuel pump temperature sensor 1	voltage of fuel temperature sensor 1	<	0.60	V	ignition on	=	TRUE		fail conditions exists for 5 s	В
Low		circuit, indicating an OOR low condition on the fuel pump temperature sensor 1 circuit	same as fuel temperature	>	59	°C	and basic enable conditions met:	=	see sheet enable tables	-	test performed continuously 0.2 s rate	
						_		_		_		_
Fuel pump Temperature Sensor 1 Circuit High	emperature r lensor 1 Circuit t ligh r	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	>	4.71	V	ignition on	=	TRUE	-	fail conditions exists for 5 s test performed continuously 0.2 s rate	В
			fuel temperature	<	-50.04	°C	basic enable conditions met:	=	see sheet enable tables	-		
Fuel Rail Pressure [FRP] Sensor Performance	P0191	Detects a drifted fuel rail pressure sensor by determining the adaptation factor of the fuel rail	fuel pressure regulator 2 adaptation factor	>=	1.25	factor	fuel pressure regulator 2 in closed loop control	=	TRUE		fail conditions exists for 0.01 s	A
		pressure regulator 2.	or fuel pressure regulator 2 adaptation factor	<=	0.75	factor	and adaptation for fuel pressure regulator 2 active means	=	TRUE	-	monitor runs with 0.01 s rate whenever enable	
							(counter for successful adaption	>	0	counts	conditions are met	
							or counter for the successful calculation of the adaptation and	>	9.00	counts		
							(engine speed	>	400.00	rpm		
							and engine speed	<	1000.00	rpm		

Component /	Fault	Monitor Strategy	Primary Malfunction		Threshold		Secondary		Enable		Time	MIL
System	Code	Description	Criteria	Lo	gic and Value		Parameters		Conditions		Required	Illum.
) and vehicle speed and	<=	1.86	mph		
							(state machine rail pressure control equal to pressure control valve	=	TRUE	-		
							or state machine rail pressure control equal coupled pressure control (rail pressure is controlled by metering unit and pressure control valve)	=	TRUE	-		l
							and basic enable conditions met:	=	see sheet enable tables	-		
		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.	(engine post drive/ afterun	=	TRUE		all conditions exists for more than 30 monitor runs once per driving cycle	
			rail pressure sensor voltage or rail pressure sensor voltage	< >	0.35 0.65	V V	and fuel temperature and	>	-0.04	°C	with 0.01 s rate whenever enable	ı
)		0.00	·	engine has already run in this driving cycle and	=	TRUE	-	conditions are met	ı
							rail pressure is reduced means	=	TRUE	-		İ
							rail pressure and fuel pressure regulator 2 current	<=	0.00 1.70	Kpa Amps		İ
							and time since engine off	>	30.08	sec		İ
							and number of fault measurements during engine postdrive/ afterun	>	10.00	counts		I
							and basic enable conditions met:	=	see sheet enable tables	-		İ
							and NO Pending or Confirmed DTCs:		see sheet inhibit tables	-		l

Component /	Fault	Monitor Strategy	Primary Malfunction		Threshold		Secondary		Enable		Time	MIL
System	Code	Description	Criteria		Logic and Value		Parameters		Conditions		Required	Illum.
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	ignition on and basic enable conditions met:	=	TRUE		fail conditions exists for 0.14 s monitor runs with 0.01 s rate whenever enable conditions are met	A
			Tam processio		Ů	u	and NO Pending or Confirmed DTCs:	=	tables see sheet inhibit tables	-		
Fuel Rail 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 voltage	>	4.81	V	ignition on	=	TRUE	-	fail conditions exists for 0.2 s monitor runs	A
			same as rail pressure	>	220000.00	kPa	and basic enable conditions met: and NO Pending or Confirmed DTCs:	=	see sheet enable tables see sheet inhibit tables	-	with 0.01 s rate whenever enable conditions	
								tables		are met		
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	>	(a) - (b)	-	environmental temperature	>	-7.04	°C	fail conditions exists for more than 0.01 s monitor runs with 0.01 s rate whenever enable conditions	В
			(with (a) maximum injection energizing time	=	384.4	usec	(fuel temperature and	>=	0.06	°C	are met	
			and with (b) offset of the maximum filtered energizing time)	=	12	usec	fuel temperature) and	<=	79.96	°C		
) for rail pressure point	=	70000.00	kPa	engine temperature and	>	49.96	°C		
							battery voltage	>	10.00	V		

Component /	Fault	Monitor Strategy	Primary Malfunction	Threshold	Secondary		Enable		Time	MIL
System	Code	Description	Criteria	Logic and Value	Parameters and		Conditions		Required	Illum.
					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		
					and intake manifold pressure and	<	150.00	kPa		1
					accelerator pedal position and	<	0.05	%		1
					Fuel system status and	=	Fuel cut off	-		
					engine speed and	>	(b) - (a)	-		1
					engine speed with	<	(a) + (c)	-		1
					(a) value of engine speed and with	=	30.00	rpm		1
					(b) gear specific minimum engine speed	=	950.00	rpm		
					and with (c) gear specific maximum engine speed)	=	1850.00	rpm		
					and current gear (see Look-Up-Table #93) (diagnostic enabled when equal to 1)	=	0 to 1	-		
					and vehicle speed and	>	0.00	mph		1
					rail pressure deviation from setpoint calculated out of difference between desired and actual value for	<	5000.00	kPa		
					time and	>	0.10	sec		
					no gear change is occurred and	=	TRUE	-		1
					4 wheel mode and	=	FALSE	-		1
					basic enable conditions met:	=	see sheet enable tables	-		1
					and NO Pending or Confirmed DTCs:	=	see sheet inhibit tables	-		
Cylinder 2 Injection Timing Retarded		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 rate	В

Component /	Fault	Monitor Strategy	Primary Malfunction		Threshold		Secondary		Enable		Time	MIL
System	Code	Description	Criteria		Logic and Value		Parameters		Conditions		Required	Illum.
		Detects a fault when the corrected energizing time exceeds the allowed limit.	corrected energizing time for the rail pressure calibration points and cylinder 2	>	(a) - (b)	-	and				whenever enable conditions	
			(with (a) maximum injection energizing time	=	384.4	usec	(fuel temperature and	>=	0.06	°C	are met	
			and with (b) offset of the maximum filtered		12		fuel temperature	<=	79.96	°C		
			energizing time	=	12	usec	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- Up-Table #94) and	>=	5 to 30	sec		
							intake manifold pressure and	>	75.00	kPa		
							intake manifold pressure and accelerator pedal position	<	150.00 0.05	kPa %		
							and 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 and with	=	950.00	rpm		
							(c) gear specific maximum engine speed)	=	1850.00	rpm		
							and current gear (see Look-Up-Table #93) (diagnostic enabled when equal to 1)	=	0 to 1	-		
							and vehicle speed and	>	0.00	mph		
							rail pressure deviation from setpoint calculated out of difference between desired and actual value for	<	5000.00	kPa		
							time and	>	0.10	sec		
							no gear change is occurred and 4 wheel mode	=	TRUE FALSE	-		

Component / System	Fault Code	Monitor Strategy Description	Primary Malfunction Criteria		Threshold Logic and Value		Secondary Parameters		Enable Conditions		Time Required	MIL Illum.
- Cyolomi		Sociation					basic enable conditions met: and NO Pending or Confirmed DTCs:	=	see sheet enable tables see sheet inhibit tables		u	- maile
Cylinder 7 Injection Timing Retarded	P01D7	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 7 (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	usec usec kPa	environmental temperature and (fuel temperature and fuel 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 combustion chamber is not cold off means time since last combustion (see Look- Up-Table #94) and intake manifold pressure and coccelerator pedal position and Fuel system status and (engine speed and with (a) value of engine speed and with (b) gear specific minimum engine speed and with (c) gear specific maximum engine speed and with (c) gear specific maximum 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) (a) + (c) 30.00 950.00 1850.00	°C °C °C V sec kPa kPa rpm rpm	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	Criteria	L	ogic and Value		Parameters		Conditions		Required	Illum.
							current gear (see Look-Up-Table #93) (diagnostic enabled when equal to 1) and vehicle speed	=	0 to 1	- mph		
							and rail pressure deviation from setpoint	<	5000.00	kPa		
							calculated out of difference between desired and actual value for					
							time and	>	0.10	sec		
							no gear change is occurred and	=	TRUE	-		
							4 wheel mode and basic enable conditions met:	=	FALSE see sheet enable	-		
							and	_	tables	-		
							NO Pending or Confirmed DTCs:	=	see sheet inhibit tables	-		
Cylinder 8 Injection	P01D9	Monitors the correction					environmental temperature	>	-7.04	°C	fail	В
Timing Retarded	10109	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					enviorimental temperature		-7.04	C	conditions exists for more than 0.01 s monitor runs with 0.01 s	ם
		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 8 (>	(a) - (b)	-	and (fuel temperature		0.06	°C	rate whenever enable conditions are met	
			(a) maximum injection energizing time	=	384.4	usec	and	>=	0.00	C		
			and with (b) offset of the maximum filtered	=	12	usec	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- 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 and	<	0.05	%		
l l		I	ı l				Fuel system status	=	Fuel cut off	-		

Component /	Fault	Monitor Strategy	Primary Malfunction		Threshold		Secondary		Enable		Time	MIL
System	Code	Description	Criteria		Logic and Valu	е	Parameters		Conditions		Required	Illum.
							and (engine speed and engine speed with (a) value of engine speed and with (b) gear specific minimum engine speed and with	> < = =	(b) - (a) (a) + (c) 30.00 950.00	- rpm rpm		
							(c) gear specific maximum engine speed) and current gear (see Look-Up-Table #93) (diagnostic enabled when equal to 1) and vehicle speed and raill pressure deviation from setpoint calculated out of difference between	= > <	1850.00 0 to 1 0.00 5000.00	rpm - mph kPa		
							desired and actual value for time and no gear change is occurred and 4 wheel mode and basic enable conditions met:	> = = =	0.10 TRUE FALSE see sheet enable	sec - -		
							and NO Pending or Confirmed DTCs:	=	tables 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 4	>	(a) - (b)		environmental temperature	>	-7.04	°C	fail conditions exists for more than 0.01 s monitor runs with 0.01 s rate whenever enable conditions	В
			(with (a) maximum injection energizing time	=	384.4	usec	(fuel temperature and	>=	0.06	°C	are met	
			and with (b) offset of the maximum filtered energizing time)	=	12	usec	fuel temperature) and	<=	79.96	°C		
			for rail pressure point	=	70000.00	kPa	engine temperature and	>	49.96	°C		

Component /	Fault	Monitor Strategy	Primary Malfunction	Threshold	Secondary		Enable		Time	MIL
System	Code	Description	Criteria	Logic and Value	Parameters		Conditions		Required	Illum.
					battery voltage	>	10.00	V		
					and					
					combustion chamber is not cold off					
					means					
					time since last combustion (see Look-	>=	5 to 30	sec		
					Up-Table #94)					
					and					
					intake manifold pressure	>	75.00	kPa		
					and intake manifold pressure	<	150.00	kPa		
					and		130.00	NI a		
					accelerator pedal position	<	0.05	%		
					and					
					Fuel system status	=	Fuel cut off	-		
					and					
					(engine speed		(b) - (a)	_		
					and	>	(b) - (a)	-		
					engine speed	<	(a) + (c)	_		
					with		(-7 (-7			
					(a) value of engine speed	=	30.00	rpm		
					and with					
					(b) gear specific minimum engine	=	950.00	rpm		
					speed and with					
					(c) gear specific maximum engine	=	1850.00	rpm		
					speed		1000.00			
)					
					and					
					current gear (see Look-Up-Table #93)	=	0 to 1	-		
					(diagnostic enabled when equal to 1) and					
					vehicle speed	>	0.00	mph		
					and		0.00	тірп		
					rail pressure deviation from setpoint	<	5000.00	kPa		
					calculated out of difference between					
					desired and actual value					
					for		0.40			
					time and	>	0.10	sec		
					no gear change is occurred	=	TRUE	_		
					and					
					4 wheel mode	=	FALSE	-		
					and					
					basic enable conditions met:	=	see sheet enable	-		
					and		tables			
					and NO Pending or Confirmed DTCs:	=	see sheet inhibit	_		
					ang or committee b 100.	_	tables			

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 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 5	>	(a) - (b)	-	environmental temperature	>	-7.04	°C	fail conditions exists for more than 0.01 s monitor runs with 0.01 s rate whenever enable conditions	В
			(with (a) maximum injection energizing time	=	384.4	usec	(fuel temperature and	>=	0.06	°C	are met	
			and with (b) offset of the maximum filtered energizing time	=	12	usec	fuel temperature)	<=	79.96	°C		
)				and		40.00			
			for rail pressure point	=	70000.00	kPa	engine temperature and battery voltage	>	49.96 10.00	°C		
							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 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 (b) gear specific minimum engine speed	=	30.00 950.00	rpm		
							and with (c) gear specific maximum engine speed)	=	1850.00	rpm		
							and current gear (see Look-Up-Table #93) (diagnostic enabled when equal to 1) and	=	0 to 1	-		
							vehicle speed and	>	0.00	mph		
							rail pressure deviation from setpoint calculated out of difference between desired and actual value	<	5000.00	kPa		

Component / System	Fault Code	Monitor Strategy Description	Primary Malfunction Criteria		Threshold Logic and Value		Secondary Parameters		Enable Conditions		Time Required	MIL Illum.
							for time and no gear change is occurred and 4 wheel mode and basic enable conditions met: and NO Pending or Confirmed DTCs:	> = = =	0.10 TRUE FALSE see sheet enable tables see sheet inhibit tables	sec - - -		
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. Detects a fault when the corrected energizing time	corrected energizing time for the rail pressure calibration points and cylinder 6	>	(a) - (b)		environmental temperature	>	-7.04	°C	fail conditions exists for more than 0.01 s monitor runs with 0.01 s rate whenever enable	В
		exceeds the allowed limit.	(with (a) maximum injection energizing time and with	=	384.4	usec	(fuel temperature and fuel temperature	>=	0.06 79.96	°C	conditions are met	
			(b) offset of the maximum filtered energizing time)) for rail pressure point	=	12 70000.00	usec kPa	and engine temperature and battery voltage and	> >	49.96 10.00	°C V		
							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	>= >	5 to 30 75.00 150.00	sec kPa kPa		
							accelerator pedal position and Fuel system status and (engine speed and engine speed with (a) value of engine speed and with	< = > < =	0.05 Fuel cut off (b) - (a) (a) + (c) 30.00	% - - - rpm		

Component /	Fault	Monitor Strategy	Primary Malfunction		Threshold		Secondary		Enable		Time	MIL
System	Code	Description	Criteria		Logic and Value		Parameters		Conditions		Required	Illum.
							(b) gear specific minimum engine speed and with (c) gear specific maximum engine speed	=	950.00 1850.00	rpm		
) and current gear (see Look-Up-Table #93) (diagnostic enabled when equal to 1) and	=	0 to 1	-		
							vehicle speed	>	0.00	mph		
ı							and rail pressure deviation from setpoint calculated out of difference between desired and actual value	<	5000.00	kPa		
							for time and	>	0.10	sec		
							no gear change is occurred and	=	TRUE	-		
							4 wheel mode and	=	FALSE	-		
							basic enable conditions met: and	=	see sheet enable tables	-		
							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	(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.									0.01 s monitor runs with 0.01 s rate	
ı		Detects a fault when the corrected energizing time exceeds the allowed limit.	corrected energizing time for the rail pressure calibration points and cylinder 3	>	(a) - (b)	-	and				whenever enable conditions	
			with (a) maximum injection energizing time	=	384.4	usec	fuel temperature and	>=	0.06	°C	are met	
ı			and with (b) offset of the maximum filtered energizing time	=	12	usec	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- Up-Table #94) and	>=	5 to 30	sec		

Component /	Fault	Monitor Strategy	Primary Malfunction	Threshold	Secondary		Enable		Time	MIL
System	Code	Description	Criteria	Logic and Value	Parameters		Conditions		Required	Illum.
					intake manifold pressure and	>	75.00	kPa		
					intake manifold pressure and	<	150.00	kPa		
					accelerator pedal position	<	0.05	%		
					and Fuel system status and	=	Fuel cut off	-		
					engine speed	>	(b) - (a)	-		
					engine speed with	<	(a) + (c)	-		
					(a) value of engine speed and with	=	30.00	rpm		
					(b) gear specific minimum engine speed and with	=	950.00	rpm		
					(c) gear specific maximum engine speed	=	1850.00	rpm		
					and current gear (see Look-Up-Table #93) (diagnostic enabled when equal to 1)	=	0 to 1	-		
					and vehicle speed and	>	0.00	mph		
					rail pressure deviation from setpoint calculated out of difference between desired and actual value for	<	5000.00	kPa		
					time	>	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 1 Injection	P01CC	Monitors the correction	(environmental temperature	>	-7.04	°C	fail	В
Timing Advanced		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) -	and				conditions exists for more than 0.01 s monitor runs with 0.01 s rate whenever enable conditions	
			((are met	
I			with		fuel temperature	>=	0.06	°C		

Component /	Fault	Monitor Strategy	Primary Malfunction		Threshold		Secondary		Enable		Time	MIL
System	Code	Description	Criteria		Logic and Value		Parameters		Conditions		Required	Illum.
			(a) minimum injection energizing time and with	=	107.2	usec	and fuel temperature	<=	79.96	°C		
			(b) offset of the minimum filtered energizing time	=	47.2	usec)		7 0.00	Ü		
)) for				and 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 and accelerator pedal position	<	150.00 0.05	kPa %		
							and Fuel system status	=	Fuel cut off	-		
							and ((1-)			
							engine speed and engine speed	> <	(b) - (a) (a) + (c)	-		
							with (a) value of engine speed	=	30.00	rpm		
							and with (b) gear specific minimum engine speed	=	950.00	rpm		
							and with (c) gear specific maximum engine speed	=	1850.00	rpm		
							and current gear (see Look-Up-Table #93) (diagnostic enabled when equal to 1) and	=	0 to 1	-		
							vehicle speed and	>	0.00	mph		
							rail pressure deviation from setpoint calculated out of difference between desired and actual value for	<	5000.00	kPa		
							time and	>	0.10	sec		
							no gear change is occurred and	=	TRUE	-		
							4 wheel mode and basic enable conditions met:	=	FALSE see sheet enable	-		
							and		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 Parameters Parameters		Conditions		Required	Illum.
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 2	<	(a) + (b)	-	environmental temperature	>	-7.04	°C	fail conditions exists for more than 0.01 s monitor runs with 0.01 s rate whenever enable conditions	В
							(are met	
			with (a) minimum injection energizing time	=	107.2	usec	fuel temperature and	>=	0.06	°C		
			and with (b) offset of the minimum filtered	=	47.2	usec	fuel temperature	<=	79.96	°C		
			energizing time)				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 current gear (see Look-Up-Table #93) (diagnostic enabled when equal to 1)	>=	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 and	>	(b) - (a)	-		
							engine speed with	<	(a) + (c)	-		
							(a) value of engine speed and with	=	30.00	rpm		
							(b) gear specific minimum engine speed	=	950.00	rpm		
							and with (c) gear specific maximum engine speed)	=	1850.00	rpm		
							and current gear (see Look-Up-Table #93) (diagnostic enabled when equal to 1) and	=	0 to 1	-		
							vehicle speed and	>	0.00	mph		

Component /	Fault	Monitor Strategy	Primary Malfunction		Threshold		Secondary		Enable		Time	MIL
System	Code	Description	Criteria	L	ogic and Value	•	Parameters		Conditions		Required	Illum.
							rail pressure deviation from setpoint calculated out of difference between desired and actual value	<	5000.00	kPa		
							for time and	>	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. Detects a fault when the corrected energizing time falls below the allowed limit.	corrected energizing time for the rail pressure calibration points and cylinder 7	<	(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	usec	(fuel temperature and	>=	0.06	°C		
			and with (b) offset of the minimum filtered energizing time	=	47.2	usec	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- 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 and	>	(b) - (a)	-		

Component /	Fault	Monitor Strategy	Primary Malfunction		Threshold		Secondary		Enable		Time	MIL
System	Code	Description	Criteria		Logic and Value)	Parameters		Conditions		Required	Illum.
							engine speed with	<	(a) + (c)	-		
							(a) value of engine speed and with (b) gear specific minimum engine	=	30.00 950.00	rpm		
							speed and with (c) gear specific maximum engine	=	1850.00	rpm		
							speed)	_	1630.00	тріп		
							and current gear (see Look-Up-Table #93) (diagnostic enabled when equal to 1) and	=	0 to 1	-		
							vehicle speed and	>	0.00	mph		
							rail pressure deviation from setpoint calculated out of difference between desired and actual value	<	5000.00	kPa		
							for time and	>	0.10	sec		
							no gear change is occurred and	=	TRUE	-		
							4 wheel mode and	=	FALSE	-		
							basic enable conditions met: and	=	see sheet enable tables	-		
							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	(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.									0.01 s monitor runs with 0.01 s rate	
		Detects a fault when the corrected energizing time falls below the allowed limit.	corrected energizing time for the rail pressure calibration points and cylinder 8	<	(a) + (b)	-	and				whenever enable conditions are met	
			(with (a) minimum injection energizing time	=	107.2	usec	(fuel temperature and	>=	0.06	°C		
			and with (b) offset of the minimum filtered	=	47.2	usec	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		
ı l			l l				and				1 I	

Component /	Fault	Monitor Strategy	Primary Malfunction	Threshold	Secondary		Enable		Time	MIL
System	Code	Description	Criteria	Logic and Value	Parameters		Conditions		Required	Illum.
		, , , , , , , , , , , , , , , , , , , ,			combustion chamber is not cold off					
					means time since last combustion (see Look-	>=	5 to 30	sec		
					Up-Table #94)	/-	3 10 30	300		
					and		75.00	LD		
					intake manifold pressure and	>	75.00	kPa		
					intake manifold pressure	<	150.00	kPa		
					and accelerator pedal position	<	0.05	%		
					and			70		
					Fuel system status and	=	Fuel cut off	-		
					(
					engine speed	>	(b) - (a)	-		
					and engine speed	<	(a) + (c)	_		
					with					
					(a) value of engine speed and with	=	30.00	rpm		
					(b) gear specific minimum engine	=	950.00	rpm		
					speed					
					and with (c) gear specific maximum engine	=	1850.00	rpm		
					speed			·		
) and					
					current gear (see Look-Up-Table #93)	=	0 to 1	-		
					(diagnostic enabled when equal to 1) and					
					vehicle speed	>	0.00	mph		
					and		5000.00	1.5		
					rail pressure deviation from setpoint calculated out of difference between	<	5000.00	kPa		
					desired and actual value					
					for time	>	0.10	sec		
					and			500		
					no gear change is occurred and	=	TRUE	-		
					and 4 wheel mode	=	FALSE	-		
					and		and about a self			
					basic enable conditions met:	=	see sheet enable tables	-		
					and					
					NO Pending or Confirmed DTCs:	=	see sheet inhibit tables	-		
							tables			
Cylinder 4 Injection		Monitors the correction	(environmental temperature	>	-7.04	°C	fail	В
Timing Advanced		values for the energizing							conditions	
		time of each cylinder. A correction value for the							exists for more than	
		energizing time is learned							0.01 s	
		for each cylinder at a calibrated rail pressure							monitor runs with 0.01 s	
		operating point.							rate	

Component /	Fault	Monitor Strategy	Primary Malfunction		Threshold		Secondary		Enable		Time	MIL
System	Code	Description	Criteria		Logic and Value		Parameters		Conditions		Required	Illum.
		Detects a fault when the corrected energizing time falls below the allowed limit.	corrected energizing time for the rail pressure calibration points and cylinder 4	<	(a) + (b)	-	and				whenever enable conditions are met	
			(with (a) minimum injection energizing time	=	107.2	usec	(fuel temperature and	>=	0.06	°C		
			and with (b) offset of the minimum filtered energizing time)	=	47.2	usec	fuel temperature) and	<=	79.96	°C		
) 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- 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 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 (b) gear specific minimum engine	=	30.00 950.00	rpm rpm		
							speed and with	-	950.00	трш		
							(c) gear specific maximum engine speed)	=	1850.00	rpm		
							and current gear (see Look-Up-Table #93) (diagnostic enabled when equal to 1) and	=	0 to 1	-		
							vehicle speed and	>	0.00	mph		
							rail pressure deviation from setpoint calculated out of difference between desired and actual value for	<	5000.00	kPa		
							time and	>	0.10	sec		
							no gear change is occurred and	=	TRUE	-		
							4 wheel mode and	=	FALSE	-		

Component / System	Fault Code	Monitor Strategy Description	Primary Malfunction Criteria		Threshold Logic and Value		Secondary Parameters		Enable Conditions		Time Required	MIL Illum.
System	Code	Description	Unteria		Logic and value		basic enable conditions met: and NO Pending or Confirmed DTCs:	=	see sheet enable tables see sheet inhibit tables	-	Required	mum.
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 5	<	(a) + (b)		environmental temperature	>	-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	usec	(fuel temperature and	>=	0.06	°C		
			and with (b) offset of the minimum filtered energizing time)	=	47.2	usec	fuel temperature) and	<=	79.96	°C		
) for rail pressure point	=	70000.00	kPa	engine temperature and	>	49.96	°C		
							battery voltage and combustion chamber is not cold off means time since last combustion (see Look- Up-Table #94) and intake manifold pressure	>= >	10.00 5 to 30 75.00	V sec kPa		
							and intake manifold pressure and	<	150.00	kPa		
							accelerator pedal position and Fuel system status and	=	0.05 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 and with (c) gear specific maximum engine speed)	=	950.00 1850.00	rpm		

Component /	Fault	Monitor Strategy	Primary Malfunction		Threshold		Secondary		Enable		Time	MIL
System	Code	Description	Criteria		Logic and Value	9	Parameters		Conditions		Required	Illum.
							and current gear (see Look-Up-Table #93) (diagnostic enabled when equal to 1) and	=	0 to 1	-		
							vehicle speed and	>	0.00	mph		
							rail pressure deviation from setpoint calculated out of difference between desired and actual value	<	5000.00	kPa		
							for time	>	0.10	sec		
							and 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 6 Injection Timing Advanced	P01D6	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 6	<	(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	usec	fuel temperature and	>=	0.06	°C		
			and with (b) offset of the minimum filtered energizing time)	=	47.2	usec	fuel temperature) and	<=	79.96	°C		
) for rail pressure point	=	70000.00	kPa	engine temperature and	>	49.96	°C		
			iaii pressure poirit	=	70000.00	кга	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 and	<	150.00	kPa		
							accelerator pedal position	<	0.05	%		

Component / System	Fault Code	Monitor Strategy Description	Primary Malfunction Criteria	- 1	Threshold Logic and Value		Secondary Parameters		Enable Conditions		Time Required	MIL Illum.
Oystem	Oode	Description	Gittella		Logic and Value		and Fuel system status and	=	Fuel cut off	-	Required	mum.
							(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 and with	=	950.00	rpm		
							(c) gear specific maximum engine speed	=	1850.00	rpm		
							and current gear (see Look-Up-Table #93) (diagnostic enabled when equal to 1) and	=	0 to 1	-		
							vehicle speed and	>	0.00	mph		
							rail pressure deviation from setpoint calculated out of difference between desired and actual value for	<	5000.00	kPa		
							time	>	0.10	sec		
							and 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 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 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 3	<	(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	usec	fuel temperature and	>=	0.06	°C		
			and with (b) offset of the minimum filtered energizing time	=	47.2	usec	fuel temperature) and	<=	79.96	°C		

Component /	Fault	Monitor Strategy	Primary Malfunction		Threshold		Secondary		Enable		Time	MIL
System	Code	Description	Criteria	Lo	gic and Value		Parameters		Conditions		Required	Illum.
) for rail pressure point		70000 00	l/Do	engine temperature	>	49.96	°C		
			raii 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-	>=	5 to 30	sec		
							Up-Table #94) and					
							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 and with	=	950.00	rpm		
							(c) gear specific maximum engine speed	=	1850.00	rpm		
							and current gear (see Look-Up-Table #93) (diagnostic enabled when equal to 1)	=	0 to 1	-		
							and vehicle speed and	>	0.00	mph		
							rail pressure deviation from setpoint calculated out of difference between desired and actual value for	<	5000.00	kPa		
							time 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.
Coolant Temperature Dropped Below Diagnostic Monitoring Temperature	P01F0	Detects a stuck open thermostat by monitoring for a decrease of the engine coolant temperature below the OBD monitoring threshold during normal operating conditions	engine coolant temperature	<	70.96	°C	engine pre drive	=	FALSE	-	fail conditions exists for 0.2 s monitor runs with 0.2 s rate whenever	В
			for fault counter which is equivalent to fault time	>= >=	200.00 40.00	- sec	and ambient temperature and	>=	-7.04	°C	enable conditions are met	
							engine coolant temperature at least once in driving cycle and	>=	70.96	°C	are met	
							instantaneous fuel consumption (low- pass filtered)	>=	6.00	liters / hr		
							and basic enable conditions met:	=	see sheet enable tables	-		
							and NO Pending or Confirmed DTCs:	=	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)	=	Open Circuit:≥ 200 K Ω impedance between ECU pin and load	-	Engine Running (see parameter definition)	Ξ	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)	=	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

Component / System	Fault Code	Monitor Strategy Description	Primary Malfunction Criteria	Threshold Logic and Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
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)	= 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 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)	= 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	А
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	А

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	P0206	Diagnoses the Fuel Injector Cylinder #6 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 7 Control Circuit		Diagnoses the Fuel Injector Cylinder #7 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 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)	= 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

Component /	Fault	Monitor Strategy	Primary Malfunction		Threshold		Secondary		Enable		Time	MIL
System	Code	Description	Criteria		Logic and Value		Parameters		Conditions		Required	Illum.
Turbocharger/Sup	P0234	Detects an permanent negative control deviation of	control deviation of the boost pressure calculated out of difference between	<	(d*e*f)	-	(fail conditions	В
Overboost Condition		the boost pressure indicating and overboost condition	desired and actual value (see Look-Up- Table #4)								exists for 10 s monitor runs	
			with (d) The lower threshold pressure (see	=	-31.5 to -10	kPa	VNT turbocharger offset adaptation active - in order to compensate sensor drift	=	FALSE	-	with 0.02 s rate	
			Look-Up-Table #62)	=	-31.3 to -10	KFd	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				whenever enable conditions are met	
			(e) correction factor (see Look-Up- Table #60)	=	0.699951 to 1	factor	and					
			(f) ECB valve based lower limit correction factor	=	1.00	factor	VNT turbocharger wiping is active	=	FALSE	-		
							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	=	TRUE	-		
							means increase of injection quantity	<	40.00	(mm^3/rev) /s		
							and engine speed is stable	=	TRUE	-		
							means increase of engine speed and	<	35.00	rpm/s		
							injection Quantity injection Quantity	>= <=	140.00 480.00	mm^3/rev mm^3/rev		
							and engine Speed engine Speed	>= <=	1600.00 3200.00	rpm rpm		
							and working range of boost pressure is in closed-loop means	=	TRUE	-		
							(engine speed and	>	1200.00	rpm		
							injection quantity) NO Bonding or Confirmed DTCs	>	20.00	mm^3/rev		
							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.
							for time and Basic enable conditions met	> =	2.00 see sheet enable tables	sec -		
Turbocharger/Supercharger "A" Underboost Condition	P0299	Detects an permanent positive control deviation of the boost pressure indicating and underboost condition.	control deviation of the boost pressure calculated out of difference between desired and actual value (see Look-Up-Table #3) with (a) the upper limit (see Look-Up-Table #61) (b) Correction factor (see Look-Up-Table #97) (c) ECB valve based upper limit correction factor	> = = =	(a*b*c) 19 to 40 1 to 1.099976 1.00	- kPa	VNT turbocharger offset adaptation active - 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 VNT turbocharger 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 injection Quantity and engine Speed engine Speed engine Speed and working range of boost pressure is in closed-loop means (engine speed and injection quantity) NO Pending or Confirmed DTCs:	= < = < = > = > =	FALSE TRUE 40.00 TRUE 35.00 132.00 480.00 1450.00 2000.00 TRUE	- (mm^3/rev) /s - rpm/s mm^3/rev rpm rpm - rpm -	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 Valu	е	Parameters		Conditions		Required	Illum.
							for time and Basic enable conditions met:	> =	2.00 see sheet enable tables	sec -		
Clyinder 1 Balance System	P0263	The amount of fuel compensation (reduction) as determined by Fuel Balance Control (FBC) exceeds the threshold	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/r ev factor mm^3/r ev	fuel balance control in closed loop (see closed loop conditions document for details) and current commanded injection quantity current commanded injection quantity engine coolant temperature ambient pressure engine speed engine speed vehicle speed and basic enable conditions met: and NO Pending or Confirmed DTCs:	= > >= > < = =	52.00 380.00 39.96 0.00 590.00 3000.00 186.45 see sheet enable tables see sheet inhibit tables	mm^3/rev mm^3/rev °C kpa rpm rpm mph	fail conditions exists for 30 s monitor runs with 0.01 s rate whenever enable conditions are met	В
Clyinder 2 Balance System	P0266	The amount of fuel compensation (reduction) as determined by Fuel Balance Control (FBC) exceeds the threshold	or 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/r ev factor mm^3/r ev	fuel balance control in closed loop (see closed loop conditions document for details) and current commanded injection quantity current commanded injection quantity engine coolant temperature ambient pressure engine speed engine speed vehicle speed and basic enable conditions met: and NO Pending or Confirmed DTCs:	= > < >= > < = =	52.00 380.00 39.96 0.00 590.00 3000.00 186.45 see sheet enable tables see sheet inhibit tables	mm^3/rev mm^3/rev °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 /	Fault	Monitor Strategy	Primary Malfunction		Threshold		Secondary		Enable		Time	MIL
System	Code	Description	Criteria		Logic and Value		Parameters		Conditions		Required	Illum.
Clyinder 3 Balance System	P0269	The amount of fuel compensation (reduction) as determined by Fuel Balance Control (FBC) exceeds the threshold	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)	v	(a) * (b) (c) * (b) -68 to 0 0.95 0 to 68	ev	fuel balance control in closed loop (see closed loop conditions document for details) and current commanded injection quantity current commanded injection quantity engine coolant temperature ambient pressure engine speed engine speed vehicle speed and basic enable conditions met: and NO Pending or Confirmed DTCs:	= > >= > < = =	52.00 380.00 39.96 0.00 590.00 3000.00 186.45 see sheet enable tables see sheet inhibit tables	mm^3/rev mm^3/rev °C kpa rpm rpm mph	fail conditions exists for 30 s monitor runs with 0.01 s rate whenever enable conditions are met	В
Clyinder 4 Balance System	P0272	The amount of fuel compensation (reduction) as determined by Fuel Balance Control (FBC) exceeds the threshold	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/r ev factor mm^3/r ev	fuel balance control in closed loop (see closed loop conditions document for details) and current commanded injection quantity current commanded injection quantity engine coolant temperature ambient pressure engine speed engine speed vehicle speed and basic enable conditions met: and NO Pending or Confirmed DTCs:	= > < >= > < <= = =	52.00 380.00 39.96 0.00 590.00 3000.00 186.45 see sheet enable tables see sheet inhibit tables	mm^3/rev mm^3/rev °C kpa rpm rpm mph	fail conditions exists for 30 s monitor runs with 0.01 s rate whenever enable conditions are met	В
Clyinder 5 Balance System	P0275	The amount of fuel compensation (reduction) as determined by Fuel Balance Control (FBC) exceeds the threshold	fuel balance correction quantity or fuel balance correction quantity with	< >	(a) * (b)	-	fuel balance control in closed loop (see closed loop conditions document for details) and current commanded injection quantity current commanded injection quantity	= > <	TRUE 52.00 380.00	mm^3/rev mm^3/rev	fail conditions exists for 30 s monitor runs with 0.01 s rate whenever	В

Fault	Monitor Strategy	Primary Malfunction		Threshold		Secondary		Enable		Time	MIL
Code	Description	Criteria		Logic and Valu	e	Parameters		Conditions		Required	Illum.
		(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)	= =	-68 to 0 0.95 0 to 68	ev	vehicle speed	\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\	39.96 0.00 590.00 3000.00 186.45 see sheet enable tables see sheet inhibit tables	°C kpa rpm rpm mph	enable conditions are met	
P0278	The amount of fuel compensation (reduction) as determined by Fuel Balance Control (FBC) exceeds the threshold	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	В
		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	> =	(c) * (b) -68 to 0	ev	ambient pressure engine speed engine speed vehicle speed	>	52.00 380.00 39.96 0.00 590.00 3000.00 186.45	mm^3/rev mm^3/rev °C kpa rpm rpm mph	with 0.01 s rate whenever enable conditions are met	
		#39)		0.000	ev	basic enable conditions met:	=	see sheet enable tables see sheet inhibit tables	-		
P0281	The amount of fuel compensation (reduction) as determined by Fuel Balance Control (FBC) exceeds the threshold	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	В
		or truel balance correction quantity with (a) lower limitation (see Look-Up-Table #38) and with (b) factor for correction quantity and with	> =	(c) * (b) -68 to 0	ev	current commanded injection quantity current commanded injection quantity engine coolant temperature ambient pressure engine speed engine speed vehicle speed	>	52.00 380.00 39.96 0.00 590.00 3000.00 186.45	mm^3/rev mm^3/rev °C kpa rpm rpm mph	with 0.01 s rate whenever enable conditions are met	
	P0278	P0278 The amount of fuel compensation (reduction) as determined by Fuel Balance Control (FBC) exceeds the threshold P0281 The amount of fuel compensation (reduction) as determined by Fuel Balance Control (FBC) exceeds the	P0278 The amount of fuel compensation (reduction) as determined by Fuel Balance Control (FBC) exceeds the threshold P0281 The amount of fuel compensation (reduction) as determined by Fuel Balance Control (FBC) exceeds the threshold P0281 The amount of fuel compensation (reduction) as determined by Fuel Balance Control (FBC) exceeds the threshold P0281 The amount of fuel compensation (reduction) as determined by Fuel Balance Control (FBC) exceeds the threshold P0281 The amount of fuel compensation (reduction) as determined by Fuel Balance Control (FBC) exceeds the threshold P0281 The amount of fuel compensation (reduction) as determined by Fuel Balance Control (FBC) exceeds the threshold P0281 The amount of fuel compensation (reduction) as determined by Fuel Balance Control (FBC) exceeds the threshold P0281 The amount of fuel compensation (reduction) as determined by Fuel Balance Control (FBC) exceeds the threshold P0281 The amount of fuel compensation (reduction) as determined by Fuel Balance Control (FBC) exceeds the threshold P0281 The amount of fuel compensation (reduction) as determined by Fuel Balance Control (FBC) exceeds the threshold P0281 The amount of fuel compensation (reduction) as determined by Fuel Balance Control (FBC) exceeds the threshold P0281 The amount of fuel compensation (reduction) as determined by Fuel Balance Control (FBC) exceeds the threshold P0281 The amount of fuel compensation (reduction) as determined by Fuel Balance Control (FBC) exceeds the threshold P0281 The amount of fuel compensation (reduction) as determined by Fuel Balance Control (FBC) exceeds the threshold P0281 The amount of fuel compensation (reduction) as determined by Fuel Balance Control (FBC) exceeds the fuel balance correction quantity with (b) factor for correction quantity with (c) for fuel balance correction quantity with (d) fuel balance correction quantity with (d) fuel balance correction quantity with (d) fuel balance correction quantity (d) fuel balance correction quantity (d) fuel balance cor	P0278 The amount of fuel compensation (reduction) as determined by Fuel Balance Control (FBC) exceeds the threshold P0281 The amount of fuel compensation (reduction) as determined by Fuel Balance Control (FBC) exceeds the threshold P0281 The amount of fuel compensation (reduction) as determined by Fuel Balance Control (FBC) exceeds the threshold P0281 The amount of fuel compensation (reduction) as determined by Fuel Balance Control (FBC) exceeds the threshold P0281 The amount of fuel compensation (reduction) as determined by Fuel Balance Control (FBC) exceeds the threshold P0281 The amount of fuel compensation (reduction) as determined by Fuel Balance Control (FBC) exceeds the threshold P0281 The amount of fuel compensation (reduction) as determined by Fuel Balance Control (FBC) exceeds the threshold Fuel balance correction quantity	P0278 The amount of fuel compensation (reduction) as determined by Fuel Balance Correction quantity with (c) upper limitation (see Look-Up-Table #39) P0281 The amount of fuel compensation (reduction) as determined by Fuel Balance Control (FBC) exceeds the threshold P0281 The amount of fuel compensation (reduction) as determined by Fuel Balance correction quantity with (a) lower limitation (see Look-Up-Table #39) P0281 The amount of fuel compensation (reduction) as determined by Fuel Balance correction quantity and with (c) upper limitation (see Look-Up-Table #39) P0281 The amount of fuel compensation (reduction) as determined by Fuel Balance Correction quantity and with (c) upper limitation (see Look-Up-Table #39) P0281 The amount of fuel compensation (reduction) as determined by Fuel Balance Correction quantity and with (c) upper limitation (see Look-Up-Table #39) P0281 The amount of fuel government of fuel compensation (reduction) as determined by Fuel Balance Correction quantity and with (a) lower limitation (see Look-Up-Table #39) P0281 The amount of fuel government of fuel compensation (reduction) as determined by Fuel Balance correction quantity and with (b) factor for correction quantity and with (b) factor for correction quantity and with (b) factor for correction quantity and with (b) factor for correction quantity and with (b) factor for correction quantity and with (b) factor for correction quantity and with (b) factor for correction quantity and with (b) factor for correction quantity and with (b) factor for correction quantity and with (b) factor for correction quantity and with (b) factor for correction quantity and with (b) factor for correction quantity and with (b) factor for correction quantity and with (b) factor for correction quantity and with (c) quantity and with (c) quantity and with (c) quantity and with (c) quantity and with (c) quantity and with (c) quantity and quantity and quantity and quantity and quantity and quantity and quantity and quantity and quantity and quantity and	Post Code Description Criteria Logic and Value	Poze Poz Poze Poz	Code Description Criteria (a) lower limitation (see Look-Up-Table #38) = -68 to 0 mm^str engine codent temperature >= ambient pressure engine speed > comparison (reduction) as determined by Fuel Balance Correction quantity with (a) lower limitation (see Look-Up-Table = 0 to 68 mm^str engine condent temperature >= ambient pressure engine speed > comparison (reduction) as determined by Fuel Balance Correction quantity with (a) lower limitation (see Look-Up-Table = 0 to 68 mm^str engine condent temperature >= ambient pressure engine speed > comparison (reduction) as determined by Fuel Balance Correction quantity > (c) * (b) - comparison (reduction) as and with (c) pear limitation (see Look-Up-Table #38) = 0 to 68 mm^str engine control in closed loop (see closed loop conditions document for details)	Content Cont	Control Cont	Possible Possible

Component /	Fault	Monitor Strategy	Primary Malfunction		Threshold		Secondary		Enable		Time	MIL
System	Code	Description	Criteria		Logic and Valu	e	Parameters		Conditions		Required	Illum.
							basic enable conditions met: and NO Pending or Confirmed DTCs:	=	see sheet enable tables see sheet inhibit tables	-		
Clyinder 8 Balance System	P0284	The amount of fuel compensation (reduction) as determined by Fuel Balance Control (FBC) exceeds the threshold	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/i ev factor mm^3/i ev	ambient pressure engine speed engine speed vehicle speed	= > >= > <= = =	52.00 380.00 39.96 0.00 590.00 3000.00 186.45 see sheet enable tables see sheet inhibit tables	mm^3/rev mm^3/rev °C kpa rpm rpm mph	fail conditions exists for 30 s monitor runs with 0.01 s rate whenever enable conditions are met	В
CAC Efficiency Below Threshold	P026A	Detects insufficient charge- air cooler efficiency. The efficiency is calculated out of temperature upstream of the charge air cooler, temperature downstream of the charge air cooler and ambient temperature.	filtered charge-air cooler efficiency	<	0.25		air mass flow air mass flow (see Look-Up-Table #98) engine coolant temperature engine coolant temperature (maximum value of (a) and (b)) the maximum value is then divided by (b) with (a) boost pressure downstream compressor and with (b) ambient pressure	>=	13.89 55.5 to 277.78 69.96 129.96 1.22 measured parameter measured	mph g/sec g/sec °C °C -	fail conditions exists for 30 s monitor runs once per driving cycle with 100 ms 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.
					and					
					control value of the throttle valve	>=	-400.00	%		
					control value of the throttle valve and	<=	5.00	%		
					(a) - (b)	>=	50.00	°C		
					(a) - (b) with	>=	50.00	C		
					(a) charge air cooler upstream	=	measured	_		
					temperature		parameter			
					and with		F-0.1-0.1.			
					(b) modeled ambient air temperature	=	measured	-		
							parameter			
					and					
					injection quantity	>=	80.00	mm^3/rev		
					injection quantity	<=	480.00	mm^3/rev		
					ambient pressure	>	74.80	kPa °C		
					modeled ambient air temperature and	>	-7.04	-0		
					basic enable conditions met:	=	see sheet enable	_		
					basic enable conditions met.	=	tables	-		
					and		lables			
					NO Pending or Confirmed DTCs:	=	see sheet inhibit	-		
					3		tables			
njection Quantity	P026C		Unlimited fuel mass observer correction	<= -32.00 mm^	3/r ((Status of the Observer function's		TRUE		fail	В
Too Low	1 0200	Monitors the fuel mass	quantity - emission control correction	ev			THOL		conditions	
		observer correction quantity.	quantity						exists for 12	
		Detects if the correction	1						S	
		quantity exceeds the emissions limit.							monitor runs	
		emissions iimit.							with 0.02 s	
					means				rate	
					(whenever	
					lambda signal from NOx sensor ready	=	TRUE	-	enable	
					(see parameter definition)		EAL 0E		conditions	
					fuel system is in fuel cut off (see	=	FALSE	-	are met	
					parameter definition) Particulate Filter Regeneration Mode	=	FALSE	_		
					((_	TALOL	-		
					fraction of total fuel injected that is	=	1	_		
					involved in combustion (Fuel Mass for					
					Combustion / Total fuel injected)					
					or					
					calculated EGR rate	>=	0	-		
)		4.00			
					for time	>	1.00	sec		
)) AND					
					Controller status of the observer	=	TRUE	_		
					means	-	INOL	-		
					(
					Load dependent release state	=	0 to 1	-		
					(see look up table #48)					
					ÀND					
					Component Protection release state	>	0 to 1	-		
					(see look up table #43)					
					()					
) engine coolant temperature	<=	199.96	°C		
	Ì	I	I	1	ongine coolant temperature	<=	133.30	C		

Component / System	Fault Code	Monitor Strategy Description	Primary Malfunction Criteria	Threshold Logic and Value	Secondary Parameters		Enable Conditions		Time Required	MIL Illum.
					engine coolant temperature Normal Injection Mode (not in DPF	>=	64.96 TRUE	°C -		
					regeneration) Barometric pressure Ambient temperature Vehicle speed NO Pending or Confirmed DTCs:	>= >= < =	74.80 -7.04 1.86 see sheet inhibit tables	kPa °C mph		
) AND (
					Engine speed AND	<=	1040	rpm		
					Engine speed)	>=	448	rpm		
					AND NO Pending or Confirmed DTCs:	=	see sheet inhibit tables	-		
					basic enable conditions met:	=	see sheet enable tables	-		
njection 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)	>= 8 to 30 mm^3/ ev	r ((Status of the Observer function's lambda-signal	=	TRUE	-	fail conditions exists for 12 s monitor runs with 0.02 s rate	В
					(lambda signal from NOx sensor ready	=	TRUE	-	whenever enable	
					(see parameter definition) fuel system is in fuel cut off (see parameter definition)	=	FALSE	-	conditions are met	
					Particulate Filter Regeneration Mode ((=	FALSE	-		
					fraction of total fuel injected that is involved in combustion (Fuel Mass for Combustion / Total fuel injected)	=	1	-		
					or calculated EGR rate	>=	0	-		
					for time)) AND	>	1.00	sec		
					Controller status of the observer means	=	TRUE	-		
					(Load dependent release state (see look up table #48) AND	=	0 to 1	-		
					Component Protection release state (see look up table #43)	>	0 to 1	-		
)					

Component /	Fault	Monitor Strategy	Primary Malfunction		Threshold		Secondary		Enable		Time	MIL
System	Code	Description	Criteria		Logic and Value		Parameters		Conditions 199.96	°C	Required	Illum.
							engine coolant temperature	<= >=	199.96 64.96	°C		
							engine coolant temperature	>=	TRUE	-		
							Normal Injection Mode (not in DPF	=	IRUE	-		
							regeneration)		74.80	kPa		
							Barometric pressure	>=	-7.04	°С		
							Ambient temperature	>= <	-7.04 1.86			
							Vehicle speed		see sheet inhibit	mph		
							NO Pending or Confirmed DTCs:	=				
							,		tables			
							AND					
							/ /					
							Engine speed	<=	1040	rpm		
							AND	\ <u> </u>	1040	трии		
							Engine speed	>=	448	rpm		
							Lingine speed		440	тріп		
) AND					
1							NO Pending or Confirmed DTCs:	=	see sheet inhibit	_		
							NO Pending of Confirmed DTCs.	=	tables	-		
							,		tables			
)					
							basic enable conditions met:	=	see sheet enable			
							basic enable conditions met.	_	tables	-		
									tables			
Cylinder 1 Injection	P02CD	Monitors the correction	(environmental temperature	>	-7.04	°C	fail	В
Timing Reached		values for the energizing									conditions	
Feedback Limit		time of each cylinder.									exists for	
		A correction value for the									more than	
		energizing time is learned									0.5 s	
		for each cylinder at three									monitor runs	
l		different rail pressure										
		different rail pressure operating point.									with 0.01 s	
			corrected energizing time for the rail	>	(a) - (b)	_	and				with 0.01 s rate	
		operating point. Detects a fault when the		>	(a) - (b)	-	and				with 0.01 s rate whenever	
		operating point.	corrected energizing time for the rail pressure calibration points and cylinder 1	>	(a) - (b)	-	and				with 0.01 s rate	
		operating point. Detects a fault when the corrected energizing time		>	(a) - (b)	-	and				with 0.01 s rate whenever enable conditions	
		operating point. Detects a fault when the corrected energizing time exceeds the feedback		>	(a) - (b)	-	and (with 0.01 s rate whenever enable	
		operating point. Detects a fault when the corrected energizing time exceeds the feedback		>	(a) - (b)	-	and (fuel temperature	>=	0.06	°C	with 0.01 s rate whenever enable conditions	
		operating point. Detects a fault when the corrected energizing time exceeds the feedback	pressure calibration points and cylinder 1 (with		(a) - (b) 353.2 to 670.8	- usec	(>=	0.06	°C	with 0.01 s rate whenever enable conditions	
		operating point. Detects a fault when the corrected energizing time exceeds the feedback	pressure calibration points and cylinder 1 (with (a) maximum injection energizing time				(fuel temperature	>=	0.06	°C	with 0.01 s rate whenever enable conditions	
		operating point. Detects a fault when the corrected energizing time exceeds the feedback	pressure calibration points and cylinder 1 (with				(fuel temperature and	>= <=	0.06 79.96	°C	with 0.01 s rate whenever enable conditions	
		operating point. Detects a fault when the corrected energizing time exceeds the feedback	pressure calibration points and cylinder 1 (with (a) maximum injection energizing time (see Look-Up-Table #20) and with			usec	(fuel temperature				with 0.01 s rate whenever enable conditions	
		operating point. Detects a fault when the corrected energizing time exceeds the feedback	(with (a) maximum injection energizing time (see Look-Up-Table #20) and with (b) offset of the maximum filtered	=	353.2 to 670.8		(fuel temperature and				with 0.01 s rate whenever enable conditions	
		operating point. Detects a fault when the corrected energizing time exceeds the feedback	pressure calibration points and cylinder 1 (with (a) maximum injection energizing time (see Look-Up-Table #20) and with	=	353.2 to 670.8	usec	(fuel temperature and				with 0.01 s rate whenever enable conditions	
		operating point. Detects a fault when the corrected energizing time exceeds the feedback	(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	=	353.2 to 670.8	usec	(fuel temperature and				with 0.01 s rate whenever enable conditions	
		operating point. Detects a fault when the corrected energizing time exceeds the feedback	(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	=	353.2 to 670.8	usec	(fuel temperature and fuel temperature)				with 0.01 s rate whenever enable conditions	
		operating point. Detects a fault when the corrected energizing time exceeds the feedback	(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	=	353.2 to 670.8	usec	(fuel temperature and fuel temperature)				with 0.01 s rate whenever enable conditions	
		operating point. Detects a fault when the corrected energizing time exceeds the feedback	(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))	=	353.2 to 670.8	usec	(fuel temperature and fuel temperature) and	<=	79.96	°C	with 0.01 s rate whenever enable conditions	
		operating point. Detects a fault when the corrected energizing time exceeds the feedback	(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 (=	353.2 to 670.8 10 to 16	usec	(fuel temperature and fuel temperature) and engine temperature and	<=	79.96	°C	with 0.01 s rate whenever enable conditions	
		operating point. Detects a fault when the corrected energizing time exceeds the feedback	(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	= =	353.2 to 670.8	usec	(fuel temperature and fuel temperature) and engine temperature	<=	79.96 49.96	°C	with 0.01 s rate whenever enable conditions	
		operating point. Detects a fault when the corrected energizing time exceeds the feedback	(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 (= =	353.2 to 670.8 10 to 16	usec	(fuel temperature and fuel temperature) and engine temperature and	<=	79.96 49.96	°C	with 0.01 s rate whenever enable conditions	
		operating point. Detects a fault when the corrected energizing time exceeds the feedback	(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	= =	353.2 to 670.8 10 to 16	usec	(fuel temperature and fuel temperature) and engine temperature and	<=	79.96 49.96	°C	with 0.01 s rate whenever enable conditions	
		operating point. Detects a fault when the corrected energizing time exceeds the feedback	(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	= =	353.2 to 670.8 10 to 16	usec	(fuel temperature and fuel temperature) and engine temperature and	<=	79.96 49.96	°C	with 0.01 s rate whenever enable conditions	
		operating point. Detects a fault when the corrected energizing time exceeds the feedback	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 (with	= = <	353.2 to 670.8 10 to 16	usec	(fuel temperature and fuel temperature) and engine temperature and battery voltage and	<=	79.96 49.96	°C	with 0.01 s rate whenever enable conditions	
		operating point. Detects a fault when the corrected energizing time exceeds the feedback	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	= = <	353.2 to 670.8 10 to 16 (a) + (b)	usec usec	(fuel temperature and fuel temperature) and engine temperature and battery voltage	<=	79.96 49.96	°C	with 0.01 s rate whenever enable conditions	

Component /	Fault	Monitor Strategy	Primary Malfunction		Threshold		Secondary		Enable		Time	MIL
System	Code	Description	Criteria		Logic and Value		Parameters		Conditions		Required	Illum.
		·	(b) offset of the minimum filtered energizing time (see Look-Up-Table #22)	=	10 to 16	usec	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		
							and accelerator pedal position and	<	0.05	%		
							Fuel system status and /	=	Fuel cut off	-		
							engine speed and	>	(b) - (a)	-		
							engine speed with (a) value of engine speed	<	(a) + (c) 30.00	-		
							(a) value or engine speed and with (b) gear specific minimum engine	=	950.00	rpm		
							speed and with			·		
							(c) gear specific maximum engine speed)	=	1850.00	rpm		
							and current gear (see Look-Up-Table #93) (diagnostic enabled when equal to 1)	=	0 to 1	-		
							and vehicle speed and	>	0.00	mph		
							rail pressure deviation from setpoint calculated out of difference between desired and actual value	<	5000.00	kPa		
							for time and	>	0.10	sec		
							no gear change is occurred and	=	TRUE	-		
							4 wheel mode and basic enable conditions met:	=	FALSE see sheet enable	-		
							and		tables			
							NO Pending or Confirmed DTCs:	=	see sheet inhibit tables	-		
Cylinder 2 Injection Timing Reached Feedback Limit	P02CF	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 three different rail pressure operating point.									0.5 s monitor runs with 0.01 s rate	

Component /	Fault	Monitor Strategy	Primary Malfunction		Threshold		Secondary		Enable		Time	MIL
System	Code	Description	Criteria		Logic and Value		Parameters		Conditions		Required	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 2	>	(a) - (b)	-	and				whenever enable conditions are met	
			with (a) maximum injection energizing time (see Look-Up-Table #20)	=	353.2 to 670.8	usec	fuel temperature and	>=	0.06	°C		
			and with (b) offset of the maximum filtered energizing time (see Look-Up-Table #21)	=	10 to 16	usec	fuel temperature) and	<=	79.96	°C		
			OR				engine temperature	>	49.96	°C		
			(corrected energizing time for the rail pressure calibration points and cylinder 2	<	(a) + (b)	-	and battery voltage	>	10.00	V		
			(with (a) minimum injection energizing time	=	107.2	usec	and combustion chamber is not cold off					
			and with (b) offset of the minimum filtered energizing time (see Look-Up-Table #22)	=	10 to 16	usec	means 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		
							and 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 (b) gear specific minimum engine	=	30.00 950.00	rpm		
							speed and with (c) gear specific maximum engine speed	=	1850.00	rpm		
) and current gear (see Look-Up-Table #93) (diagnostic enabled when equal to 1) and	=	0 to 1	-		
							vehicle speed and	>	0.00	mph		
							rail pressure deviation from setpoint calculated out of difference between desired and actual value for	<	5000.00	kPa		

Component /	Fault	Monitor Strategy	Primary Malfunction		Threshold		Secondary		Enable		Time	MIL
System	Code	Description	Criteria		Logic and Value		Parameters		Conditions		Required	Illum.
							time and no gear change is occurred and	> =	0.10 TRUE	sec -		
							4 wheel mode and	=	FALSE	-		
							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 7	>	(a) - (b)		environmental temperature	>	-7.04	°C	fail conditions exists for more than 0.5 s monitor runs with 0.01 s rate whenever enable conditions	В
		CONTROL MAIN.	(with (a) maximum injection energizing time (see Look-Up-Table #20)	=	353.2 to 670.8	usec	(fuel temperature and	>=	0.06	°C	are met	
			and with (b) offset of the maximum filtered energizing time (see Look-Up-Table #21)	=	10 to 16	usec	fuel temperature) and	<=	79.96	°C		
) OR				engine temperature	>	49.96	°C		
			corrected energizing time for the rail pressure calibration points and cylinder 7	<	(a) + (b)	-	battery voltage	>	10.00	V		
			(with (a) minimum injection energizing time	=	107.2	usec	and combustion chamber is not cold off					
			and with (b) offset of the minimum filtered energizing time (see Look-Up-Table #22)	=	10 to 16	usec	means time since last combustion (see Look- Up-Table #94)	>=	5 to 30	sec		
)				and intake manifold pressure	>	75.00	kPa		
			rail pressure point (see Look-Up-Table #19)	=	30000 to 90000	kPa	and intake manifold pressure	<	150.00	kPa		
							and accelerator pedal position and	<	0.05	%		
							Fuel system status and	=	Fuel cut off	-		

Component /	Fault	Monitor Strategy	Primary Malfunction		Threshold		Secondary		Enable		Time	MIL
System	Code	Description	Criteria		Logic and Value	•	Parameters		Conditions		Required	Illum.
							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 and with	=	950.00	rpm		
							(c) gear specific maximum engine speed	=	1850.00	rpm		
							and current gear (see Look-Up-Table #93) (diagnostic enabled when equal to 1) and	=	0 to 1	-		
							vehicle speed and	>	0.00	mph		
							rail pressure deviation from setpoint calculated out of difference between desired and actual value	<	5000.00	kPa		
							for time 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 8 Injection	P02DB	Monitors the correction	(anvironmental temperature		-7.04	°C	fail	В
Cylinder 8 injection Timing Reached Feedback Limit	PUZUB	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	corrected energizing time for the rail pressure calibration points and cylinder 8	>	(a) - (b)	-	environmental temperature	>	-7.04		conditions exists for more than 0.5 s monitor runs with 0.01 s rate whenever enable conditions	В
		control limit.	((>=	0.06	°C	are met	
			with (a) maximum injection energizing time (see Look-Up-Table #20)	=	353.2 to 670.8	usec	fuel temperature and	>=	0.00	C		
			and with (b) offset of the maximum filtered energizing time (see Look-Up-Table #21)	=	10 to 16	usec	fuel temperature)	<=	79.96	°C		
))				and					
			OR (engine temperature and	>	49.96	°C		

Component /	Fault	Monitor Strategy	Primary Malfunction		Threshold		Secondary		Enable		Time	MIL
System	Code	Description	Criteria		Logic and Value		Parameters		Conditions		Required	Illum.
			corrected energizing time for the rail pressure calibration points and cylinder 8	<	(a) + (b)	-	battery voltage	>	10.00	V		
			(with (a) minimum injection energizing time	=	107.2	usec	and combustion chamber is not cold off					
			and with (b) offset of the minimum filtered energizing time (see Look-Up-Table #22)	=	10 to 16	usec	means time since last combustion (see Look- Up-Table #94)	>=	5 to 30	sec		
)				and intake manifold pressure and	>	75.00	kPa		
			tor rail pressure point (see Look-Up-Table #19)	=	30000 to 90000	kPa	intake manifold pressure	<	150.00	kPa		
							and 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 (b) gear specific minimum engine	=	30.00 950.00	rpm		
							speed and with (c) gear specific maximum engine speed	=	1850.00	rpm		
) and current gear (see Look-Up-Table #93) (diagnostic enabled when equal to 1)	=	0 to 1	-		
							and vehicle speed and	>	0.00	mph		
							rail pressure deviation from setpoint calculated out of difference between desired and actual value	<	5000.00	kPa		
							for time and	>	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	-		

Fault	Monitor Strategy	Primary Malfunction		Threshold		Secondary		Enable		Time	MIL
Code	Description	Criteria		Logic and Value		Parameters		Conditions		Required	Illum
P02D3	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 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 4	>	(a) - (b)	-	and				monitor runs with 0.01 s rate whenever enable conditions are met	
			=	353.2 to 670.8	usec	fuel temperature and	>=	0.06	°C		
	and with (b) offset of the maximum filtered energizing time (see Look-Up-Table #21)	=	10 to 16	usec	fuel temperature)	<=	79.96	°C			
		OR				engine temperature	>	49.96	°C		
		corrected energizing time for the rail pressure calibration points and cylinder 4	<	(a) + (b)	-		>	10.00	٧		
		(with (a) minimum injection energizing time	=	107.2	usec	and combustion chamber is not cold off					
		and with (b) offset of the minimum filtered energizing time (see Look-Up-Table #22)	=	10 to 16	usec	means time since last combustion (see Look- Up-Table #94)	>=	5 to 30	sec		
)				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	%		
						and (
						engine speed and engine speed	>	(b) - (a)	-		
						with (a) value of engine speed	=	30.00	rpm		
						(b) gear specific minimum engine speed	=	950.00	rpm		
						and with (c) gear specific maximum engine speed	=	1850.00	rpm		
		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	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. (with (a) maximum injection energizing time (see Look-Up-Table #21)) OR (corrected energizing time for the rail pressure calibration points and cylinder 4 (with (a) minimum injection energizing time for the rail pressure calibration points and cylinder 4 (with (a) minimum injection energizing time for the rail pressure calibration points and cylinder 4 (with (a) minimum injection energizing time and with (b) offset of the minimum filtered energizing time (see Look-Up-Table #22)) for rail pressure point (see Look-Up-Table	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. (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 (with (a) minimum injection energizing time (see Look-Up-Table #21)) OR (with (a) minimum injection energizing time = and with (b) offset of the minimum filtered energizing time (see Look-Up-Table #22)) or corrected energizing time (see Look-Up-Table #22)) or corrected energizing time for the rail pressure calibration points and cylinder 4 (with (a) minimum injection energizing time = and with (b) offset of the minimum filtered energizing time (see Look-Up-Table #22)) for rail pressure point (see Look-Up-Table =	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. (with (a) maximum injection energizing time exceeds the feedback control limit. (with (a) maximum filtered energizing time (see Look-Up-Table #21)) OR (corrected energizing time for the rail pressure calibration points and cylinder 4 (with (a) minimum injection energizing time (a) + (a) + (b) + (a) + (b) + (a) + (b) + (a) + (a) + (b) + (a) + (a) + (b) + (a) + (a) + (a) + (b) + (a) + (a) + (b) + (a) + (a) + (b) + (a) + (a) + (b) + (a) + (a) + (b) + (a) + (b) + (a) + (b) + (a) + (b)	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. (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 (with (a) minimum injection energizing time = 100 to 16 usec energizing time for the rail pressure calibration points and cylinder 4 (with (a) minimum filtered energizing time for the rail pressure calibration points and cylinder 4 (with (a) minimum injection energizing time = 100 to 16 usec energizing time for the rail pressure calibration points and cylinder 4 (with (a) minimum injection energizing time = 107.2 usec energizing time (see Look-Up-Table #22)) for rail pressure point (see Look-Up-Table = 30000 to 90000 kPa	Po2D3 Monitors the correction values for the energizing time of each cylinder. A correction value for the energizing time is learned for each cylinder. A correction value for the energizing time is learned for each cylinder. A corrected energizing time exceeds the fleedback control limit. Oetects a fault when the corrected energizing time exceeds the fleedback control limit. (with (a) maximum injection energizing time exercised energizing time (see Look-Up-Table #21)) OR (orrected energizing time for the rail pressure calibration points and cylinder 4 energizing time (see Look-Up-Table #21)) OR (with (a) minimum injection energizing time exercised energizing time for the rail pressure calibration points and cylinder 4 (exercised energizing time for the rail pressure calibration points and cylinder 4 (exercised energizing time for the rail pressure calibration points and cylinder 4 (exercised energizing time for the rail pressure calibration points and cylinder 4 (exercised energizing time for the rail pressure calibration points and cylinder 4 (exercised energizing time for the rail pressure calibration points and cylinder 4 (exercised energizing time for the rail pressure calibration points and cylinder 4 (exercised energizing time exercised Notitions the correctedion value for the energizing time is learned for each cylinder. A correction value for the energizing time is learned for each cylinder, at three different rail pressure construct control limit. Control limit. Contro	Monitors the correction value for the energizing time of each cylinder. A correction value for the energizing time is each cylinder. A correction value for the energizing time is earned for each cylinder. A correction value for the energizing time is earned for each cylinder. A correction value for the corrected energizing time corrected energizing time corrected energizing time corrected energizing time corrected energizing time exceeds the feedback control limit. Value	Monitors the correction volute for the energizing firm of each cylinder. A connection value for the energizing time of each cylinder. A connection value for the energizing time of each cylinder. A connection value for the energizing time of each cylinder. A connection value for the energizing time of each cylinder. A connection value for the energizing time of each cylinder. A connection value for the energizing time of each cylinder. A connection value for the energizing time of each cylinder of the maximum filtered energizing time (see Look-Up-Table graph of the rail) OR Connected energizing time (see Look-Up-Table graph) Connected energizing time for the rail connected energizing time (see Look-Up-Table graph) Connected energiz	Monitors the correction value for the energicing fine of each cylinder. A correction value for the energicing time deach cylinder at three different rule pressure possible possible conditions are with 0.01 state of each cylinder at three different rule pressure possible possible conditions are with 0.01 state of energizing time (see Lock-Up-Table (a) maximum injection energizing time (see Lock-Up-Table (a) maximum injection energizing time (see Lock-Up-Table (a) maximum injection energizing time (see Lock-Up-Table (a) maximum injection energizing time (see Lock-Up-Table (a) maximum injection energizing time (see Lock-Up-Table (a) minimum injection energizing time (see L	

Component /	Fault	Monitor Strategy	Primary Malfunction		Threshold		Secondary		Enable		Time	MIL
System	Code	Description	Criteria		Logic and Value		Parameters		Conditions		Required	Illum.
							current gear (see Look-Up-Table #93) (diagnostic enabled when equal to 1) and	=	0 to 1	-		
							vehicle speed and	>	0.00	mph		
							rail pressure deviation from setpoint calculated out of difference between desired and actual value for	<	5000.00	kPa		
							time 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 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. Detects a fault when the	corrected energizing time for the rail	>	(a) - (b)	_	environmental temperature	>	-7.04	°C	fail conditions exists for more than 0.5 s monitor runs with 0.01 s rate whenever	В
		corrected energizing time exceeds the feedback control limit.	pressure calibration points and cylinder 5		(,, (,,						enable conditions are met	
			with (a) maximum injection energizing time (see Look-Up-Table #20)	=	353.2 to 670.8	usec	fuel temperature and	>=	0.06	°C		
			and with (b) offset of the maximum filtered energizing time (see Look-Up-Table #21)	=	10 to 16	usec	fuel temperature) and	<=	79.96	°C		
) OR				engine temperature	>	49.96	°C		
			(corrected energizing time for the rail pressure calibration points and cylinder 5	<	(a) + (b)	-	and battery voltage	>	10.00	٧		
			(with (a) minimum injection energizing time	=	107.2	usec	and combustion chamber is not cold off					
			and with (b) offset of the minimum filtered energizing time (see Look-Up-Table #22)	=	10 to 16	usec	means time since last combustion (see Look- Up-Table #94)	>=	5 to 30	sec		
)				and intake manifold pressure	>	75.00	kPa		

Component /	Fault	Monitor Strategy	Primary Malfunction		Threshold		Secondary		Enable		Time	MIL
System	Code	Description	Criteria for		Logic and Value		Parameters and		Conditions		Required	Illum.
			rail pressure point (see Look-Up-Table #19)	=	30000 to 90000	kPa	intake manifold pressure	<	150.00	kPa		
							and accelerator pedal position and	<	0.05	%		
							Fuel system status and	=	Fuel cut off	-		
							engine speed and	>	(b) - (a)	-		
							engine speed	<	(a) + (c)	-		
							with (a) value of engine speed and with	=	30.00	rpm		
							(b) gear specific minimum engine speed and with	=	950.00	rpm		
							(c) gear specific maximum engine speed	=	1850.00	rpm		
							and current gear (see Look-Up-Table #93) (diagnostic enabled when equal to 1)	=	0 to 1	-		
							and vehicle speed and	>	0.00	mph		
							rail pressure deviation from setpoint calculated out of difference between desired and actual value for	<	5000.00	kPa		
							time and	>	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 6 Injection	P02D7	Monitors the correction	(environmental temperature	>	-7.04	°C	fail	В
Timing Reached 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 6	>	(a) - (b)	-	and				conditions exists for more than 0.5 s monitor runs with 0.01 s rate whenever enable conditions are met	
			with				(fuel temperature	>=	0.06	°C		

Component /	Fault	Monitor Strategy	Primary Malfunction		Threshold		Secondary		Enable		Time	MIL
System	Code	Description	Criteria		Logic and Value		Parameters		Conditions		Required	Illum.
			(a) maximum injection energizing time (see Look-Up-Table #20) and with	=	353.2 to 670.8	usec	and		79.96	°C		
			and with (b) offset of the maximum filtered energizing time (see Look-Up-Table #21)	=	10 to 16	usec	fuel temperature)	<=	79.90	C		
)				and					
			OR (engine temperature and	>	49.96	°C		
			corrected energizing time for the rail pressure calibration points and cylinder 6	<	(a) + (b)	-	battery voltage	>	10.00	V		
			with (a) minimum injection energizing time	=	107.2	usec	and combustion chamber is not cold off					
			and with (b) offset of the minimum filtered energizing time (see Look-Up-Table #22)	=	10 to 16	usec	means time since last combustion (see Look- Up-Table #94)	>=	5 to 30	sec		
)				and intake manifold pressure	>	75.00	kPa		
			for rail pressure point (see Look-Up-Table #19)	=	30000 to 90000	kPa	and intake manifold pressure	<	150.00	kPa		
			,				and 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 and with	=	950.00	rpm		
							(c) gear specific maximum engine speed	=	1850.00	rpm		
							and current gear (see Look-Up-Table #93) (diagnostic enabled when equal to 1) and	=	0 to 1	-		
							vehicle speed and	>	0.00	mph		
							rail pressure deviation from setpoint calculated out of difference between desired and actual value for	<	5000.00	kPa		
							time	>	0.10	sec		
							and no gear change is occurred and	=	TRUE	-		
							4 wheel mode and	=	FALSE	-		

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: and NO Pending or Confirmed DTCs:	=	see sheet enable tables 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. Detects a fault when the corrected energizing time exceeds the feedback control limit.	corrected energizing time for the rail pressure calibration points and cylinder 3	>	(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 (see Look-Up-Table #20) and with (b) offset of the maximum filtered energizing time (see Look-Up-Table	=	353.2 to 670.8 10 to 16	usec	fuel temperature and fuel temperature)	>= <=	0.06 79.96	°C		
			#21)) OR (corrected energizing time for the rail pressure calibration points and cylinder 3	<	(a) + (b)	-	and engine temperature and battery voltage	> >	49.96 10.00	°C V		
			(with (a) minimum injection energizing time and with (b) offset of the minimum filtered energizing time (see Look-Up-Table	=	107.2 10 to 16	usec	and combustion chamber is not cold off means time since last combustion (see Look-Up-Table #94)	>=	5 to 30	sec		
			#22))) for rail pressure point (see Look-Up-Table #19)	=	30000 to 90000	kPa	and intake manifold pressure and intake manifold pressure	> <	75.00 150.00	kPa kPa		
							and accelerator pedal position and Fuel system status and	< =	0.05 Fuel cut off	%		
							(engine speed and engine speed	> <	(b) - (a) (a) + (c)	-		
							with (a) value of engine speed and with	=	30.00	rpm		

Component /	Fault	Monitor Strategy	Primary Malfunction	Threshold	Secondary		Enable		Time	MIL
System	Code	Description	Criteria	Logic and Value	Parameters		Conditions		Required	Illum
					(b) gear specific minimum engine speed and with (c) gear specific maximum engine speed	=	950.00 1850.00	rpm		
) and current gear (see Look-Up-Table #93) (diagnostic enabled when equal to 1) and	=	0 to 1	-		
					vehicle speed	>	0.00	mph		
					and rail pressure deviation from setpoint calculated out of difference between desired and actual value for	<	5000.00	kPa		
					time and	>	0.10	sec		
					no gear change is 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	-		
take Air Flow alve Control ircuit	P02E0	Diagnoses the Throttle Valve 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	for time and starter is active cranking for time and starter is active cranking for time and Throttle Valve Actuator Solenoid Control Circuit and basic enable conditions met and NO Pending or Confirmed DTCs:	> = = = =	3.00 FALSE 3.00 ACTIVE see sheet enable tables see sheet inhibit tables	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	>	11.00	V	fail conditions	

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 Throttle Valve Actuator Solenoid Control Circuit and basic enable conditions met and NO Pending or Confirmed DTCs:	> = > = = =	3.00 FALSE 3.00 ACTIVE see sheet enable tables see sheet inhibit tables	sec	exists for 3 s monitor runs with 0.005 s rate whenever enable conditions are met	
			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 and Throttle Valve Actuator Solenoid Control Circuit and basic enable conditions met and NO Pending or Confirmed DTCs:	> = = = = =	3.00 FALSE 3.00 ACTIVE see sheet enable tables see sheet inhibit tables	v sec sec	fail conditions exists for 3 s monitor runs with 0.005 s rate whenever enable conditions are met	
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)	= Short to ground: -	for time and starter is active cranking for time and Throttle Valve Actuator Solenoid Control Circuit and	> = = =	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	В

Component / System	Fault Code	Monitor Strategy Description	Primary Malfunction Criteria		Threshold Logic and Value		Secondary Parameters		Enable Conditions		Time Required	MIL Illum.
Jystelli	Code	Description	Gineria		Logic and value		basic enable conditions met and NO Pending or Confirmed DTCs:	=	see sheet enable tables see sheet inhibit tables		кечинеи	muni.
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: ≤ 0.5 Ω impedance between signal and controller		battery voltage	>	11.00	V	fail conditions exists for 3 s monitor runs with 0.005 s	В
					power		for time and starter is active cranking for time and Throttle Valve Actuator Solenoid Control Circuit and basic enable conditions met and NO Pending or Confirmed DTCs:	> = > = = =	3.00 FALSE 3.00 ACTIVE see sheet enable tables see sheet inhibit tables	sec	rate whenever enable conditions are met	
Throttle Valve Actuator (TVA) Position Sensor Performance	P02E7	Detects in range TVA position errors by comparing the difference between desired and actual TVA position.	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 -10.00	%	and throttle valve controller bypass is active and throttle valve is driven to a mechanical stop and Throttle Governor Active and Throttle Valve Permanent Control Deviation and Engine Coolant Temperature	= = = = <	FALSE TRUE FALSE 198.96	- - - - - C	fail conditions exists for 10 s monitor runs with 0.005 s rate whenever enable conditions are met	В
							and Engine Running and basic enable conditions met and	=	TRUE see sheet enable tables	-		

Component / System	Fault Code	Monitor Strategy Description	Primary Malfunction Criteria		Threshold Logic and Va		Secondary Parameters		Enable Conditions		Time Required	MIL Illum.
- Oyutum	0000	Decomption	O. I.O. I.O.		Logio and ve		NO Pending or Confirmed DTCs:	=	see sheet inhibit tables	-	Required	mam
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 value via sensor	<	5.01	%	ignition on	=	TRUE		fail conditions exists for 5 s test performed continuously 0.005 s rate	А
							and basic enable conditions met	=	see sheet enable tables	-		
							and analog digital converter error present and	=	FALSE	-		
							NO Pending or Confirmed DTCs:	=	see sheet inhibit tables	-		
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 value via sensor	>	94.99	%	ignition on	=	TRUE	-	fail conditions exists for 5 s test performed continuously 0.005 s rate	А
							basic enable conditions met	=	see sheet enable tables	-		
							no sensor supply error	=	TRUE	-		
							and SENT frame correctly received and	=	FALSE	-		
							NO Pending or Confirmed DTCs:	=	see sheet inhibit tables	-		
	Doore								11.00			
Intake Air Flow Valve Control Motor Current Performance	P02EB	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	>	11.00	V	fail conditions exists for 2 s monitor runs	В
							for time	>	3.00	sec	with 0.005 s rate	
							and starter is active cranking	=	FALSE		whenever enable	
							for time	>	3.00	sec	conditions are met	
							and Throttle Valve Actuator Solenoid Control Circuit	=	ACTIVE	-		
							and basic enable conditions met	=	see sheet enable tables	-		

Component /	Fault	Monitor Strategy	Primary Malfunction	Threshold		Secondary		Enable		Time	MIL
System	Code	Description	Criteria	Logic and Valu	ie	Parameters NO Pending or Confirmed DTCs:	=	Conditions see sheet inhibit tables	-	Required	Illum.
Engine Misfire Detected	P0300	Indicates engine has experienced more than one cylinder misfiring	angular acceleration of the crankshaft	-1.40 (a) * (b) 20.00 20.00 TRUE	s^(2) - counts counts -	NO Pending or Confirmed DTCs: (Engine Running (see parameter definition) and engine speed	= > < < = = = = = = = = = = = = = = = =	see sheet inhibit	rpm rpm mm^3/rev mm^3/rev °C mph sec -	fail conditions exists for 0.02 ms monitor runs with 0.02 s rate whenever enable conditions are met	В
						and number of detected misfires and basic enable conditions met: and NO Pending or Confirmed DTCs:	> = =	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 Description	Criteria		Logic and Value		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 cly are rotating at after a	angular acceleration of the crankshaft	<	-1.40	s^(2)	(fail conditions exists for 0.02 s monitor runs with 0.02 s rate	В
		combustion event.									whenever	
			and				Engine Running (see parameter definition)	=	TRUE	-	enable conditions are met	
			evaluated crankshaft revolutions with	>=	(a) * (b)	-	and	_	448.00	****		
			(a) number of crankshaft revolutions per block (see general description document for details)	=	20.00	counts	engine speed and	>	440.00	rpm		
			and with				engine speed	<	1560.00	rpm		
			(b) number of test blocks	=	20.00	counts) and					
							(a) - (b) with	<	200.00	rpm		
							(a) actual desired idle speed	=	calculated parameter	-		
							and with (b) engine speed	=	measured parameter	-		
						and		paramotor				
							(current injection quantity and	>	12.00	mm^3/rev		
							current injection quantity)	<	400.00	mm^3/rev		
							and engine coolant temperature and	>=	39.96	°C		
		Calculates angle					vehicle speed and	<=	1.86	mph		
		acceleration after an injection event for the cylinder under test and compares it to the minimum										
		threshold.					time since start	>=	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	-		

Component / System	Fault Code	Monitor Strategy Description	Primary Malfunction Criteria		Threshold Logic and Valu	е	Secondary Parameters		Enable Conditions		Time Required	MIL Illum.
				>= =		e s^(2)	Engine Running (see parameter definition) and engine speed and engine speed 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	= > < = = > <	TRUE 448.00 1560.00 200.00 calculated parameter measured parameter 12.00 400.00	rpm rpm mm^3/rev mm^3/rev		
		Calculates angle acceleration after an injection event for the cylinder under test and compares it to the minimum threshold.					engine coolant temperature and vehicle speed and time since start and deletion of error memory (Mode\$4) not executed since last check of the	>= <= >= =	39.96 1.86 10.00 TRUE	°C mph sec		
							monitoring conditions and adaptation value for tooth wheel has been learned and	=	TRUE	-		
							number of detected misfires and basic enable conditions met:	> =	140.00 see sheet enable tables	counts -		
							and NO Pending or Confirmed DTCs:	=	see sheet inhibit tables	-		

Component / System	Fault Code	Monitor Strategy Description	Primary Malfunction Criteria		Threshold Logic and Valu	ue	Secondary Parameters		Enable Conditions		Time Required	MIL Illum.
- Cyclom		2007/pt/011	Ctoriu								quii ou	uiii
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 cly are rotating at after a combustion event.	angular acceleration of the crankshaft	<	-1.40	s^(2)	(fail conditions exists for 0.02 ms monitor runs with 0.02 s rate whenever enable	В
			and		(-) * (L)		Engine Running (see parameter definition)	=	TRUE	-	conditions are met	
			evaluated crankshaft revolutions with (a) number of crankshaft revolutions per block (see general description	=	(a) * (b) 20.00	counts	and engine speed and	>	448.00	rpm		
			document for details) and with (b) number of test blocks	=	20.00	counts	engine speed) and	<	1560.00	rpm		
							(a) - (b) with	<	200.00	rpm		
							(a) actual desired idle speed and with	=	calculated parameter	-		
							(b) engine speed	=	measured parameter	-		
							(current injection quantity and	>	12.00	mm^3/rev		
							current injection quantity	<	400.00	mm^3/rev		
							and engine coolant temperature	>=	39.96	°C		
		Calculates angle acceleration after an injection event for the cylinder under test and compares it to the minimum					and vehicle speed and	<=	1.86	mph		
		threshold.					time since start	>=	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 and	=	TRUE	-		
							number of detected misfires and	>	140.00	counts		
							basic enable conditions met: and	=	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	ue	Parameters		Conditions		Required	Illum
	_											
ylinder 4 Misfire letected	P0304	Detects cylinder misfire. The minimum average angle acceleration is calculated every 2 rotations and represents the average angle acceleration that all cly are rotating at after a combustion event.	angular acceleration of the crankshaft	<	-1.40	s^(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)	=	TRUE	-	conditions are met	
			evaluated crankshaft revolutions with (a) number of crankshaft revolutions per block (see general description document for details)	>=	(a) * (b) 20.00	counts	and engine speed and	>	448.00	rpm		
			and with (b) number of test blocks	=	20.00	counts	engine speed) and	<	1560.00	rpm		
							(a) - (b) with	<	200.00	rpm		
							(a) actual desired idle speed	=	calculated parameter	-		
							and with (b) engine speed and	=	measured parameter	-		
							(current injection quantity and	>	12.00	mm^3/rev		
							current injection quantity)	<	400.00	mm^3/rev		
							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	>=	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 and	=	TRUE	-		
							number of detected misfires and basic enable conditions met:	> =	140.00 see sheet enable tables	counts		

Component /	Fault	Monitor Strategy	Primary Malfunction		Threshold		Secondary		Enable		Time	MIL
System	Code	Description	Criteria		Logic and Valu	e	Parameters		Conditions		Required	Illum.
							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 cly are rotating at after a combustion event.	angular acceleration of the crankshaft	<	-1.40	s^(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	
			with (a) number of crankshaft revolutions per block (see general description document for details)	>=	(a) * (b) 20.00	counts	engine speed	>	448.00	rpm		
			and with (b) number of test blocks	=	20.00	counts	engine speed) and	<	1560.00	rpm		
							(a) - (b) with	<	200.00	rpm		
							(a) actual desired idle speed and with	=	calculated parameter	-		
							(b) engine speed	=	measured parameter	-		
							current injection quantity and	>	12.00	mm^3/rev		
							current injection quantity	<	400.00	mm^3/rev		
							and 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	>=	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 and	=	TRUE	-		
							number of detected misfires and	>	140.00	counts		
							basic enable conditions met:	=	see sheet enable tables	-		

Component /	Fault	Monitor Strategy	Primary Malfunction		Threshold		Secondary		Enable		Time	MIL
System	Code	Description	Criteria		Logic and Valu	<u>e</u>	Parameters and NO Pending or Confirmed DTCs:	=	see sheet inhibit tables	-	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 cly are rotating at after a combustion event.	angular acceleration of the crankshaft and evaluated crankshaft revolutions with (a) number of crankshaft revolutions per block (see general description document for details) and with (b) number of test blocks	>= =	-1.40 (a) * (b) 20.00 20.00	s^(2) - counts counts	engine speed	= > < < = = > < >= <= <= <= <= <= <= <= <= <= <= <= <= <=	TRUE 448.00 1560.00 200.00 calculated parameter measured parameter 12.00 400.00 39.96 1.86	rpm rpm mm^3/rev mm^3/rev °C mph	fail conditions exists for 0.02 ms monitor runs with 0.02 s rate whenever enable conditions are met	В
		Calculates angle acceleration after an injection event for the cylinder under test and compares it to the minimum threshold.					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	>= = = >	10.00 TRUE TRUE 140.00	sec - - counts		

Component /	Fault	Monitor Strategy	Primary Malfunction		Threshold		Secondary		Enable		Time	MIL
System	Code	Description	Criteria		Logic and Valu	ıe	Parameters		Conditions		Required	Illum.
							basic enable conditions met: and NO Pending or Confirmed DTCs:	=	see sheet enable tables 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 cly are rotating at after a combustion event. Calculates angle acceleration after an injection event for the cylinder under test and compares it to the minimum	angular acceleration of the crankshaft and evaluated crankshaft revolutions with (a) number of crankshaft revolutions per block (see general description document for details) and with (b) number of test blocks	< >= =	-1.40 (a) * (b) 20.00 20.00	s^(2) - counts counts	engine speed	=	TRUE 448.00 1560.00 200.00 calculated parameter measured parameter 12.00 400.00 39.96 1.86	rpm rpm mm^3/rev mm^3/rev c mph	fail conditions exists for 0.02 ms monitor runs with 0.02 s rate whenever enable conditions are met	В
		threshold.					time since start and deletion of error memory (Mode\$4) not executed since last check of the	>=	10.00 TRUE	sec		
							monitoring conditions and adaptation value for tooth wheel has been learned	=	TRUE	-		
							and number of detected misfires	>	140.00	counts		

Component / System	Fault Code	Monitor Strategy Description	Primary Malfunction Criteria		Threshold Logic and Valu	ie	Secondary Parameters		Enable Conditions		Time Required	MIL Illum.
					J.		and basic enable conditions met: and NO Pending or Confirmed DTCs:	=	see sheet enable tables see sheet inhibit tables	-		
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 cly are rotating at after a combustion event.	and evaluated crankshaft revolutions with (a) number of crankshaft revolutions per block (see general description document for details) and with (b) number of test blocks	>= = =	-1.40 (a) * (b) 20.00 20.00	s^(2) - counts counts	engine speed	= > < < = = >	TRUE 448.00 1560.00 200.00 calculated parameter measured parameter 12.00	rpm rpm mm^3/rev	fail conditions exists for 0.02 ms monitor runs with 0.02 s rate whenever enable conditions are met	В
		Calculates angle acceleration after an injection event for the cylinder under test and compares it to the minimum threshold.					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	< >= <= >= =	400.00 39.96 1.86 10.00 TRUE	mm^3/rev °C mph sec -		

Component /	Fault	Monitor Strategy	Primary Malfunction		Threshold		Secondary		Enable		Time	MIL
System	Code	Description	Criteria	Lo	gic and Value		Parameters		Conditions		Required	Illum.
							number of detected misfires and basic enable conditions met: and NO Pending or Confirmed DTCs:	> =	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 Wheel learn only occurs when the memory is cleared within the ECM. Once the wheel learn is completed once, the wheel learn values are stored within the EEPROM	fuel balance wheel learn complete	=	FALSE	-	fuel system is in fuel cut off engine speed engine speed fuel balance wheel learn values stored in EEPROM Inhibit Status (no inhibiting faults) (No pending or stored DTC)	> <	900 2700 FALSE see sheet inhibit tables	rpm rpm	fail conditions exists for 5000 s cumulative time monitor runs with 1 s rate whenever enable conditions are met	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 crankshaft rotations not detected	= >=	FALSE	counts	Ignition ON and Engine backward rotation detected and (engine speed and synchronization completed which means number of crankshaft revolutions and crankshaft reference mark detected (reference mark is the 2 missing teeth in the 50-2 tooth-wheel configuration)	= = = = = = = = = = = = = = = = = = = =	TRUE FALSE 400.00 TRUE 4.00 TRUE	rpm - revs -	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 Value	<u> </u>	Secondary Parameters		Enable Conditions		Time Required	MIL Illum.
					-) or starter is active cranking) and (vehicle speed or vehicle speed and engine speed) and basic enable conditions met:	=	TRUE 0 16 200.00 see sheet enable tables	mph mph 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) with increment	>= > > > > = = = = = = = = = = = = = =	10.00 200000.00 68.00 1.5 to 2 3.38 to 8	counts us counts ratio ratio counts	Engine Running (see parameter definition) and ECM has detected reference mark on the crankshaft and basic enable conditions met:	= =	TRUE FALSE see sheet enable tables		fail conditions exists for 0.1 s monitor runs with 0.1 s rate whenever enable conditions are met	A
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	Α

Component / System	Fault Code	Monitor Strategy Description	Primary Malfunction Criteria	Threshold Logic and Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
System Camshaft Position [CMP] Sensor Performance		Detects implausible camshaft sensor operation by detecting incorrect cam sensor patterns	number of camshaft edges	,	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	B
Indicator Control Circuit high side dr	Diagnoses the Glow Lamp Circuit high side driver circuit for circuit faults.	Voltage high during driver off state (open circuit)	= Open Circuit: ≥ - 200 K Ω impedance between ECU pin and load signal and controller ground	and battery voltage for time and Basic enable conditions met:	= TRUE > 11.00 V > 3.00 sec = see sheet enable - tables	fail conditions exists for 0.2 s monitor runs with 0.01 s rate whenever enable conditions are met	В	
		Diagnoses the Glow Lamp 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	lamp is commanded on and battery voltage for time and Basic enable conditions met:	= TRUE - > 11.00 V > 3.00 sec = see sheet enable - tables	fail conditions exists for 3 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.
		Diagnoses the Glow Lamp 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	-	lamp is commanded off and battery voltage for time and Basic enable conditions met:	= > > =	11.00 3.00 see sheet enable tables	V sec	fail conditions exists for 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:	= =	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 (b) Environmental Pressure correction factor (see Look-Up-Table #8)	> ===	(a)*(b) -0.63 0.48 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 and VGT offset learning is active maximum setpoint for air-mass flow (see Look-Up-Table #9) and Engine speed	= < = > <=	TRUE 80.00 0.25 35.00 0.99 FALSE 0.8 to 1.2	(mm^3/rev) /sec sec rpm/sec sec - g/rev rpm	fail conditions exists for 10 s 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.
							Engine speed and	>=	480.00	rpm		
							Torque generating commanded engine	<=	120.00	mm^3/rev		
							fuel injection quantity Torque generating commanded engine fuel injection quantity	>=	20.00	mm^3/rev		
							and setpoint valve position of exhaust-gas recirculation and	>	5.00	%		
							throttle position and	<	5.00	%		
							basic enable conditions met:	=	see sheet enable tables	-		
							and NO Pending or Confirmed DTCs:	=	see sheet inhibit tables	-		
) for time	>=	3.00	sec		
				-	_				_	-		-
Exhaust Gas Recirculation(EGR) Flow Excessive	flow. Actual MAF readings recirculation (EGR) - calculated out of	>	(a)*(b)	-	(fail conditions exists for 8 s monitor runs 0.02 s rate	В		
		riowing.	with (a) Maximum Controller Deviation	=	0.32 to 1.12	g/rev	EGR controller is active and	=	TRUE	-	whenever enable conditions	
			(see Look-Up-Table #10) (b) Environmental Pressure correction factor (see Look-Up-Table #12)	=	1 to 2	factor	change of injection quantity between actual and last received value	<	80.00	(mm^3/rev) /sec	are met	
							for time	=	0.25	sec		
							and change of engine speed between actual and last received value	<	35.00	rpm/sec		
							for time	=	1.00	sec		
							VGT offset learning is active	=	FALSE	-		
							maximum setpoint for EGR mass flow and	<	0.79	g/rev		
							Engine speed Engine speed	<= >=	1600.00 1100.00	rpm rpm		
							and Torque generating engine fuel injection quantity	<=	480.00	mm^3/rev		
							Torque generating engine fuel injection quantity and	>=	160.00	mm^3/rev		
							basic enable conditions met:	=	see sheet enable tables	-		
							and NO Pending or Confirmed DTCs:	=	see sheet inhibit tables	-		
) for time	>=	1.50	sec		

Component / System	Fault Code	Monitor Strategy Description	Primary Malfunction Criteria	Threshold Logic and Value	Secondary Parameters		Enable Conditions		Time Required	MIL Illum.
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	=	ACTIVE		fail conditions exists for 7 s monitor runs with 0.005 s rate whenever enable	В
					offset learning for EGR valve is completed and	=	TRUE	-	conditions are met	
					battery voltage for time	> >	11.00 3.00	V		
					and starter is active cranking	=	FALSE	-		
	state			for time and	>	3.00	sec			
				basic enable conditions met:	=	see sheet enable tables	-			
					and NO Pending or Confirmed DTCs:	=	see sheet inhibit tables	-		
			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	=	ACTIVE	·	fail conditions exists for 3 s	В
					and offset learning for EGR valve is completed	=	TRUE	-	monitor runs with 0.005 s rate	
					and battery voltage for	>	11.00	V	whenever enable conditions	
					time and	>	3.00	sec	are met	
					starter is active cranking for time	=	FALSE 3.00	-		
					and basic enable conditions met:	> =	see sheet enable tables	sec -		
					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.
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 -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	P0406	Detects high voltage readings on the EGR position circuit, indicating an	raw voltage of EGR actuator position sensor	>	4.80	V	ignition on	=	TRUE		fail conditions exists for 5 s	A
Prosition Sensor Circuit High Voltage		OOR high condition on the EGR position circuit	same as EGR actuator position	>	127	%	and basic enable conditions met: and NO Pending or Confirmed DTCs:	=	see sheet enable tables	-	test performed continuously 0.005 s rate	
Exhaust Gas	P040C	Detects low voltage readings on the EGR cooler	EGR temperature sensor 2 voltage	<	0.46	V	(tables	_	fail conditions	В
) Temperature Sensor A Circuit Low Voltage	ecirculation(EGR Temperature ensor A Circuit ow Voltage	readings on the EGR cooler temperature circuit, indicating an OOR low condition on the EGR cooler temperature 2 circuit	same as				time since engine start	>	0.00	sec	exists for 5 s monitor runs 0.05 s rate whenever enable	
			EGR sensor 2 temperature	>	220	°C	and engine coolant temperature	<	199.96	°C	conditions are met	
							and ambient temperature and	>	-60.04	°C		
							ambient pressure and (>	20.00	kPa		
							setpoint valve position of exhaust-gas recirculation and	>	-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 and	>	-100.00	%		

Component /	Fault	Monitor Strategy	Primary Malfunction			reshold		Secondary		Enable		Time	MIL
System	Code	Description	Criteria		Logic	and Value		Parameters		Conditions		Required	Illum.
								valve position of EGR cooler bypass and basic enable conditions met: and	=	200.00 see sheet enable tables	% -		
								NO Pending or Confirmed DTCs:	=	see sheet inhibit tables	-		
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					time since engine start	>	0.00	sec	conditions	
			EGR sensor 2 temperature	<		-50	°C	and engine coolant temperature	>	-60.04	°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	-		
								current injection quantity and	>	0.00	mm^3/rev		
								valve position of EGR cooler bypass	>	-100.00	%		
								and valve position of EGR cooler bypass)	<	200.00	%		
) for time and basic enable conditions met:	> =	0.00 see sheet enable	sec		
								and	_	tables			
								NO Pending or Confirmed DTCs:	=	see sheet inhibit tables	-		
Exhaust Gas Recirculation(EGR) Temperature	P040F	Detects biased EGR temperature sensors by comparing the two EGR	Path 1:					minimum engine-off time	>=	28800.00	sec	fail conditions exists for 0.1	В
Sensor Correlation (EGR 1/ EGR 2)		cooler temp sensor after an engine off soak time										s monitor runs with 0.1 s	
		l	(a) - (b) (see Look-Up-Table #4)	>	100	0 to 999	°C	and				rate	

Component /	Fault	Monitor Strategy	Primary Malfunction		Threshold		Secondary		Enable		Time	MIL
System	Code	Description	Criteria		Logic and Value		Parameters		Conditions		Required	Illum.
System	Code	Description	with (a) captured EGR sensor 2 temperature at start and with (b) captured EGR sensor 1 temperature at start or Path 2: ((a) - (b) (see Look-Up-Table #4) with (a) captured EGR sensor 2 temperature at start and with (b) captured EGR sensor 1 temperature at start and (a) - (b) (see Look-Up-Table #7) with (a) captured EGR sensor 1 temperature at start and (i(a) - (b) (see Look-Up-Table #7) with (b) captured EGR sensor 2 temperature at start and with (b) captured EGR sensor 1 temperature at start and with (c) captured EGR sensor 1 temperature at start and (c) status of block heater (see parameter definition) or status of sun-load detection (see parameter definition))	= = = = = = = = = = = = = = = = = = = =	measured parameter measured parameter 100 to 999 measured parameter measured parameter 20 to 999 measured parameter measured parameter FALSE FALSE	- °C - - -	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:	> = = = = = = = = = = = = = = = = = = =	Conditions -60.04 TRUE 0.00 FALSE FALSE see sheet enable tables see sheet inhibit tables	°C - sec	Required whenever enable conditions are met	Illum.
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	>	220	v °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)	>	0.00 199.96 -60.04 20.00 -100.00	sec °C °C kPa %	fail conditions exists for 5 s monitor runs 0.05 s rate whenever enable conditions are met	В

Component / System	Fault Code	Monitor Strategy Description	Primary Malfunction Criteria	ı	Threshold Logic and Value		Secondary Parameters		Enable Conditions		Time Required	MIL Illum.
, , , , , ,							and Engine Running (see parameter definition) and	=	TRUE	-		
							(valve position of EGR cooler bypass	>	-100.00	%		
							and valve position of EGR cooler bypass	<	200.00	%		
							and basic enable conditions met: and NO Pending or Confirmed DTCs:	=	see sheet enable tables see sheet inhibit tables	-		
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	>	4.84	V	(fail conditions exists for 5 s monitor runs 0.05 s rate whenever	В
			same as EGR sensor 1 temperature		-50	°C	time since engine start	>	0.00	sec	enable conditions	
			EGR sensor i temperature	<	-50	C	engine coolant temperature and	>	-60.04	°C	are met	
							ambient temperature and	>	-60.04	°C		
							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)	=	TRUE	-		
							and current injection quantity and	>	0.00	mm^3/rev		
							valve position of EGR cooler bypass and	>	-100.00	%		
							valve position of EGR cooler bypass)	<	200.00	%		
							for time and	>	0.00	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.
System	Code	Description	Criteria	Logic and value	rai ameters	Conditions		Required	mum.
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	< 0.55 -				fail conditions exists for more than 0.1 seconds monitor runs once per driving cycle with 0.1 s rate	В
					(Modeled HC mass converted in the oxidation catalyst since monitor start means Converted HC mass model uses commanded fuel quantity, DOC temperature, and exhaust gas mass flow as inputs	> 140.00	g	whenever enable conditions are met	
					and average HC mass flow calculated by Average HC mass flow is determined by dividing the integrated HC mass by the integrated time step	> 0.00	g/sec		
					and simulated heat quantity in oxidation catalyst	> 0.00	kJ		
					and particulate filter regeneration and no reset condition for evaluation is active	= TRUE	-		
					therefore (regeneration was not aborted to assure that HC conversion was not disturbed	= TRUE	-		
					and evaluation took place one time step before (to ensure P0420 has not already completed))	= FALSE	-		
					and there has been sufficient HC integrated in order to evaluate the monitor conversion efficiency. means	= TRUE	-		
					(particulate filter regeneration) and	= TRUE	-		
					measured temperature upstream of the oxidation catalyst and	> 249.96	°C		

Component /	Fault	Monitor Strategy	Primary Malfunction		Threshold		Secondary		Enable		Time	MIL
System	Code	Description	Criteria	Lo	ogic and Value		Parameters		Conditions		Required	Illum.
							engine speed and	>	700.00	rpm		
							engine speed)	<	3400.00	rpm		
							and diagnostic performed in current dc	=	FALSE	-		
							and reset condition which becomes False under following conditions	=	FALSE	-		
							converted HC mass in the oxidation catalyst during monitoring calculated by integrating the amount of fuel injected by the HCI (Hydro-Carbon Injector) or	<	140.00	g		
							particulate filter regeneration or	=	FALSE	-		
							regeneration was not aborted to assure that HC conversion was disturbed	=	TRUE	-		
							and NO Pending or Confirmed DTCs:)	=	see sheet inhibit tables	-		
							and basic enable conditions met:	=	see sheet enable tables	-		
Primary Fuel Sensor Performance	P0461	Detects an error in the primary fuel tank sensor performance by comparing	(a) - (b)	>=	100.00	miles	Engine Running	=	TRUE	·	fail conditions exists for	В
		the decrease of the fuel level for a certain driven mileage to a threshold.	with				for				0.02 s monitor runs 0.02 s rate whenever	
			(a) total vehicle distance	=	measured parameter	-	time	>=	60.00	sec	enable conditions	
			and with (b) change in mileage	=	calculated parameter	-	and fuel transfer pump active means	=	FALSE	-	are met	
			and (c) - (d) with	<	4.00	I	filtered fuel volume in primary tank (fuel volume is calculated by converting the measured fuel level (%) to volume based on the calibratable fuel tank maximum capacity)	>	1638.35	I		
			(c) maximum volume of fuel reached in primary tank during driving cycle	=	measured parameter	-	and					
			and with				filtered fuel volume in secondary tank	<	0.00	1		

Component /	Fault	Monitor Strategy	Primary Malfunction		Threshold	Secondary		Enable		Time	MIL
System	Code	Description	Criteria		gic and Value	Parameters		Conditions		Required	Illum.
			(d) minimum volume of fuel reached in primary tank during driving cycle		measured - parameter	for					
						time and	>=	0.00	sec		
						cumulative transfer pump on time in current ignition cycle) and	>	0.00	sec		
						fuel level zone 3 means	=	TRUE	-		
						filtered fuel volume in primary tank and	<	137.40	I		
						filtered fuel volume in secondary tank	>	0.00	I		
						or fuel level zone 4 means	=	TRUE	-		
						filtered fuel volume in primary tank and	<	137.40	I		
						filtered fuel volume in secondary tank	<=	0.00	I		
) and basic enable conditions met:	=	see sheet enable tables	-		
						and NO Pending or Confirmed DTCs:	-	see sheet inhibit tables	-		
SRC low for fuel level sensor of primary tank	P0462	Detects low voltage readings in the fuel level primary tank sensor circuit, indicating an OOR low condition on the fuel level sensor circuit	voltage of fuel level sensor 1	<	0.20 V	and basic enable conditions met:	=	TRUE see sheet enable tables	-	fail conditions exists for 24 s test performed continuously 0.1 s rate	В
SRC high for fuel level sensor of primary tank	P0463	Detects high voltage readings in the fuel level primary tank sensor circuit, indicating an OOR high condition on the fuel level sensor circuit	voltage of fuel level sensor 1	>	4.80 V	ignition on	=	TRUE	-	fail conditions exists for 24 s test performed	В

Component / System	Fault Code	Monitor Strategy Description	Primary Malfunction Criteria	L	Threshold ogic and Value		Secondary Parameters		Enable Conditions		Time Required	MIL Illum.
- Gyddin	9900	Societion	J. Kolika	_	ogio and value		basic enable conditions met:	=	see sheet enable tables	-	0.1 s rate	- mani
Exhaust Gas Recirculation (EGR) Position Sensor Performance	P046C		controller deviation of EGR valve calculated out of difference between desired and actual value or controller deviation of EGR valve calculated out of difference between desired and actual value	>= <=	5.00	%	and offset learning of EGR actuator active and offset learning in the previous driving cycle was complete and Engine Running and duty cycle of the Intake Air Heater output and battery voltage and EGR Valve EGR Valve EGR Valve Jammed and NO Pending or Confirmed DTCs: and basic enable conditions met:	=	TRUE TRUE 5.00 11.00 ACTIVE FALSE see sheet inhibit tables see sheet enable tables	- % V - -	fail conditions exists for 8 s monitor runs with 0.02 s rate whenever enable conditions are met	В
Cooling Fan Speed Output Circuit	P0480	This diagnostic checks the circuit for electrical integrity during operation.	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 and ignition on	> = > =	11.00 3.00 FALSE 3.00 TRUE	V sec	fail conditions exists for 3 s test performed continuously 0.02 s rate	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 basic enable conditions met:	=	see sheet enable tables	-		
		This diagnostic checks the circuit for electrical integrity during operation.	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 and ignition on and basic enable conditions met:	> = = = =	3.00 FALSE 3.00 TRUE see sheet enable tables	V sec sec - sec	fail conditions exists for 1 s test performed continuously 0.02 s rate	
Cooling Fan System Performance	P0483	Detects inability to control fan speed to desired RPM	fan speed difference between actual and commanded value or fan speed difference between actual and commanded value or fan speed difference between actual and commanded value, unfiltered or fan speed difference between actual and commanded value, unfiltered	<= >= <= >=	-500.00 500.00 -500.00 500.00	rpm rpm rpm	PWM of fan driver output and Commanded fan speed and (fan input speed means Fan input speed is calculated by the engine speed * the pulley ratio	>= >= <	28.00 999.00 5320.00	% rpm rpm	fail conditions exists for 120 s monitor runs with 0.1 s rate whenever enable conditions are met	В
							and fan input speed means Fan input speed is calculated by the engine speed * the pulley ratio) and engine coolant temperature	>	400.00 69.96	rpm		
							and fan drive speed rate of change	<	2000.00	rpm		
							and fan speed weight factor calculated out of ((a) * (b) * (c) * (d)	>	0.59	factor		
							with (a) factor based on input shaft stability (see Look-Up-Table #32) and with	=	0 to 1	factor		

Component /	Fault	Monitor Strategy	Primary Malfunction	Threshold	Secondary		Enable		Time	MIL
System	Code	Description	Criteria	Logic and Value	Parameters		Conditions		Required	Illum.
					(b) factor based on intake air temperature (see Look-Up-Table #35) and with (c) factor based on engine coolant temperature (see Look-Up-Table #34) and with (d) factor based on fan drive speed (see Look-Up-Table #33)) and basic enable conditions met:	= = =	0 to 1 0 to 1 0 to 1 see sheet enable	factor factor		
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)	= Short to ground: ≤ 0.5 Ω impedance between signal and controller ground	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 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)	= Short to power: - ≤ 0.5 Ω impedance between signal and controller power	and 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 3 s monitor runs with 0.005 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	9	Parameters		Conditions		Required	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	calculated by a model where fluid flow in and fluid flow out are calculated. The fluid flow in model is based on fan output speed. The fluid out model is based on fluid temperature and the difference between fan input and output speed. or				rate whenever enable conditions are met	
			equivalent to 80 sec				Maximum allowed clutch pump out time	>=	600 to 65534	sec		
							when { input fan speed means Fan input speed is calculated by the engine speed * the pulley ratio	>	1500.00	rpm		
							and (PWM of fan driver output	<=	45.00	%		
							and Commanded fan speed	<	600.00	rpm		
							and ambient pressure	>	55.00	kPa		
							and intake air temperature and	>	-40.04	°C		
							time since engine off and	>	0.00	sec		
							Engine Running for	=	TRUE	-		
							time) }	>	0.00	sec		
							and basic enable conditions met:	=	see sheet enable tables	-		
Exhaust Gas Recirculation (EGR) Control Position Not Learned	P049D	Detects adaptation values of EGR bypass that are not plausible. Compares the difference between the maximum and minimum adaptation values to a	Path 1:				offset learning is active	=	TRUE	-	fail conditions exists for 0.005 s monitor runs with 0.005 s	В
		maximum and minimum adaptation values to a threshold.	(a) - (b)	>	30.00	%	active under following conditions				monitor ru	ins 5 s

Component /	Fault	Monitor Strategy	Primary Malfunction		Threshold		Secondary		Enable		Time	MIL
System	Code	Description	Criteria		Logic and Value		Parameters		Conditions		Required	Illum.
			with (a) maximum learned offset value for EGR valve and with	=	measured parameter	-	(engine coolant temperature	>=	5.06	°C	enable conditions are met	
		Only the closed position is learned.	(b) minimum learned offset value for EGR valve	=	measured parameter	-	and engine coolant temperature	<=	130.06	°C		
		The learn procedure includes 3 actual learns. i.e. the valve is commanded open then closed, then the closed position is read for learn. Then position is commanded open, then closed position is read for learn. Then position is read for learn. Then position is commanded open and closed a 3rd time, and closed a 3rd time, and closed position is read for learn. The maximum and minimum learned offset referrs to the maximum and minimum learned values of the 3 learns performed within total learn procedure.					and					
		leam procedure.					battery voltage	>=	10.00	V		
			Path 2: (learned offset value for EGR valve in	>	23.33	%	and battery voltage) and	<=	30.00	V		
			the present driving cycle or learned offset value for EGR valve in the present driving cycle)	<	-23.33	%	EGR sweep has ended - no movement in EGR valve means the EGR valve cleaning procedure (cycle the valve fully open, fully close 10 times) is performed before the learn starts (in after-run). This signal (EGR sweep has ended) indicates that this cleaning procedure is complete.	=	TRUE	-		
							and engine post drive/ afterun and	=	TRUE	-		
							engine was running during last driving cycle means	=	TRUE	-		
							engine running during last driving cycle	=	TRUE	-		
							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 Valu	е	Parameters		Conditions		Required	Illum.
							basic enable conditions met:	=	see sheet enable tables	•		
		Detects a jammed EGR valve during opening or	Path 1:				Path 1:				fail conditions	
		closing the valve.	EGR valve stuck during opening means	=	TRUE	-	EGR valve is opening or	=	TRUE	-	exists for 0.005 s monitor runs	
			((a) + (b) with	>=	20.01	%	Path 2: EGR valve is closing and	=	TRUE	-	with 0.005 s rate whenever	
			(a) position of EGR valve	=	measured parameter	-	engine post drive/ afterun	=	TRUE	-	enable conditions	
			and with (b) learned offset value of EGR valve in the previous driving cycle	=	measured parameter	-	and offset learning active and	=	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 (refers to last measured valve position in the previous raster calculation)	=	measured parameter	-						
			for time	>	5.00	sec						
			Path 2: EGR valve stuck during closing means	=	TRUE	-						
			position of EGR valve with	<=	(a) * (b)	-						
			(a) reference position of the EGR valve in open position and with	=	measured parameter	-						
			(b) factor for EGR valve close position or	=	0.50	factor						
			(c) - (d) with	>	0.02	%						
			(c) position of EGR valve	=	measured parameter	-						
			(d) position of EGR valve of previous process cycle (refers to last measured valve position in the previous raster calculation)) for	=	measured parameter	-						
			time	>	5.00	sec						

Component /	Fault	Monitor Strategy	Primary Malfunction		Threshold		Secondary		Enable		Time	MIL
System	Code	Description	Criteria		Logic and Value		Parameters		Conditions		Required	Illum.
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	<	maximum value of (a) OR (b - (b * c))		Engine Running and	=	TRUE	-	fail conditions exists for 20 s monitor runs with 0.1 s	В
			(a) minimum engine speed and with (b) minimum idle speed setpoint (see table #91 for commanded) minimum idle speed	=	300.00 calculated parameter	rpm -	(engine coolant temperature and	>	-7.04	°C	rate whenever enable conditions are met	
			and with (c) factor for calculation of engine speed interval	=	24.00	%	engine coolant temperature)	<	129.96	°C	are met	
							and idle speed controller active active when TCC not in lock up and when the commanded pedal torque is less than idle governor torque and	=	TRUE	-		
							vehicle speed and	<	1.86	mph		
							no other torque demanding function active means no torque demand based on accelerator pedal input and	=	TRUE	-		
							setpoint torque of the speed controller and	>	0	NM		
							measured engine speed and	>	300.00	rpm		
							basic enable conditions met:	=	see sheet enable tables	-		
							and NO Pending or Confirmed DTCs:	=	see sheet inhibit tables	-		
											_	
Idle Speed Too High	P0507	Detects an idle speed governor that is unable to achieve the desired idle speed and the idle speed is too high.	engine speed	>	minimum value of (a) OR (b + (b * c))		Engine Running	=	TRUE	-	fail conditions exists for 20 s monitor runs	В
			with (a) maximum engine speed and with (b) minimum idle speed setpoint (see	=	2500.00 calculated	rpm -	and (engine coolant temperature and	>	-7.04	°C	with 0.1 s rate whenever enable	
			table #91 for commanded) minimum idle speed and with (c) factor for calculation of engine	=	parameter 24.00	%	engine coolant temperature	<	129.96	°C	conditions are met	
			speed interval				and idle speed controller active active when	=	TRUE	-		

Component / System	Fault Code	Monitor Strategy Description	Primary Malfunction Criteria	L	Threshold ogic and Value	9	Secondary Parameters		Enable Conditions		Time Required	MIL Illum.
							TCC not in lock up and when the commanded pedal torque is less than idle governor torque and					
							vehicle speed and	<	1.86	mph		
							no other torque demanding function active means no torque demand based on accelerator pedal input and	=	TRUE	-		
							setpoint torque of the speed controller and	>	0	NM		
							measured 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	P0526	This diagnostic checks the	Path 1:				engine speed	>	550.00	rpm	fail	В
ooling Fan peed Sensor ircuit		circuit for electrical integrity during operation.	period is too long to measure and	>	0.21	sec	and {				conditions exists for 3 s monitor runs with 0.020 s	
			current state of the signal received from fan is low	=	TRUE	-	(PWM of fan driver output	>=	45.00	%	rate whenever enable	
			or				and Commanded fan speed)	>=	0.00	rpm	conditions are met	
			Path 2: period is too long to measure	>	0.21	sec	for time or	>	30.00	sec		
			and		0.21	360	vehicle speed	<	203.65	mph		
			current state of the signal received from fan is high	=	TRUE	-	for time	>	327.67	sec		
							and basic enable conditions met:	=	see sheet enable tables	-		
							and NO Pending or Confirmed DTCs:	=	see sheet inhibit tables	-		
Exhaust Gas Temperature (EGT) Sensor 1 Circuit Low	P0545	Detects low voltage readings on the EGT 1 circuit, indicating an OOR low condition on the EGT	voltage of the temperature sensor upstream of oxidation catalyst	<	0.65	V	NO Pending or Confirmed DTCs:	=	see sheet inhibit tables	-	fail conditions exists for 3 s monitor runs	В
Voltage		circuit	same as				for				0.050 s rate whenever	
			temperature upstream of oxidation catalyst	<	-50	°C	time	>	0.00	sec	enable conditions	

Component / System	Fault Code	Monitor Strategy Description	Primary Malfunction Criteria	Threshold Logic and Va		Secondary Parameters		Enable Conditions		Time Required	MIL Illum.
						and ignition on and basic enable conditions met:	=	TRUE see sheet enable tables	-	are met	
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	v °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	P054E	Quantity Threshold - Fuel Quantity Lower Than Expected	with Current injection quantity with Current gear and minimum expected injection quantity (see Look-Up Table #96) and factor for calculating the minimum threshold out of the reference map)	minimum expected injection quan (map) * factor for calculating the minimum threshold out the reference map # Neutral = 46.0 to 161.	ev tity ee of e	AND Vehicle speed AND Particulate filter regeneration AND Engine speed AND Engine speed AND Engine coolant temperature AND Idle speed controller all for time AND AND	= <= >	1.86 not active 1040.00 448.00 -20.04 active 5.00	rpm rpm °C - sec	fail conditions exists for 15 s monitor runs 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		Logic and Value		Parameters		Conditions		Required	Illum.
							Fluctuation range of engine speed (calculates the delta RPM from the max idle speed seen from the min idle speed seen and if this delta is less then this calibration value it will release the monitor) AND Basic enable conditions met	=	16383.50 see sheet enable tables	rpm -		
[P054F	Quantity Throcked First	Current injection questitus		mavi	mm: 40 /	,				fail	В
	PU54F	Quantity Threshold - Fuel Quantity Higher Than Expected	Current injection quantity	<	maximum expected injection quantity (map) * factor for calculating the maximum threshold out of the reference	mm^3/r ev	(conditions exists for 15 s monitor runs 0.2 s rate whenever enable conditions are met	В
			with		map		Current gear	=	unchanged	-		
			Current gear and maximum expected injection quantity	≠ =	Neutral 122.8 to 244.4		AND Vehicle speed AND	<=	1.86	mph		
			(see Look-Up-Table #50) and factor for calculating the maximum	=	1.50	ev factor	Particulate filter regeneration AND	=	not active			
			threshold out of the reference map)				Engine speed AND	<=	1040.00	rpm		
							Engine speed AND	>=	448.00	rpm		
							Engine coolant temperature AND	>	-20.04	°C		
							Idle speed controller all for time	= >	active 5.00	- sec		
							AND Fluctuation range of engine speed (calculates the delta RPM from the max idle speed seen from the min idle speed seen and if this delta is less then this calibration value it will release the monitor)	<	16383.50	rpm		
							AND Basic enable conditions met	=	see sheet enable tables	-		
Cruise Control Multi-Function Input "A" Circuit	P0564	Cruise switch status indicated not in "between range" for calibrated period	Set Switch CAN message value "Between Ranges"	=	9	-	ignition on	=	TRUE	-	fail conditions exists for 5	Special C
		of time.					and input circuit active and	=	TRUE	-	sec monitor runs with 0.005 s rate	

Component /	Fault	Monitor Strategy	Primary Malfunction	Threshold	Secondary	Enable		Time	MIL
System	Code	Description	Criteria	Logic and Value	Parameters basic enable conditions met and NO Pending or Confirmed DTCs:	= see sheet enable tables = see sheet inhibit tables		whenever enable conditions are met	Illum.
Cruise Control "On" Signal	P0565	If the Cruise ON switch is continuously applied for greater than a calibratable time	Set Switch CAN message value "Cruise On"	= 5 -	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 20s monitor runs with 0.005 s rate whenever enable conditions are met	
Cruise Control "Resume" Signal	P0567	Resume switch state indicates problem with the circuit, by remaining in the high / active state for a calibrated period of time	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	
Cruise Control "Set" Signal	P0568	Set switch state indicates problem with the circuit, by remaining in the high / active state for a calibrated period of time	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	

Component /	Fault	Monitor Strategy	Primary Malfunction		Threshold		Secondary		Enable		Time	MIL
System	Code	Description	Criteria		Logic and Valu		Parameters		Conditions		Required	Illum.
"Cancel" Signal Cruise Control P05	P056C	Cruise Control CANCEL switch state indicates problem with the circuit, by remaining in the high / active state for a calibrated period of time	Set Switch CAN message value "CANCEL"	=	6		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 20s monitor runs with 0.005 s rate whenever enable conditions are met	Special C
Input Circuit	F0575	Cruise control CAN communication monitoring	amount of errors in consecutive frames with number of consecutive frames		3.00		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 s monitor runs with 0.005 s rate whenever enable conditions are met	Special C
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 (a) maximum analog brake sensor raw voltage during test (b) minimum analog brake sensor raw voltage during test where difference of the brake sensor voltage corresponds to a corrected value of (see Look-Up-Table #14)	= =	calculated parameter calculated parameter 0 to 1	factor V V factor	following conditions for time: (ignition on and starter is active cranking for	=	4 TRUE FALSE	sec -	monitor runs 0.02 s rate whenever enable conditions are met	A
							time and battery voltage for	>	3.00 11.00	sec V		
							time) and gear has been in Park during this driving cycle	> =	3.00 TRUE	sec -		

Component / System	Fault Code	Monitor Strategy Description	Primary Malfunction Criteria	Threshold Logic and Value	Secondary Parameters	Enable Conditions		Time Required	MIL Illum.
					full test has not been completed this driving cycle gear selector currently not in Park vehicle speed accelerator pedal position 1 and No Pending or Confirmed DTCs: and basic enable conditions met:	= TRUE = TRUE >= 4.35 < 5.00 = see sheet inhibit tables = see sheet enable tables	- - mph % -		
Brake Pedal Position Sensor "A" Circuit Low	P057C	Brake pedal position sensor voltage below a threshold for a calibrated period of time indicating an OOR low	Brake pedal position sensor voltage	< 0.25 V	ignition on and No Pending or Confirmed DTCs: and basic enable conditions met:	= TRUE = see sheet inhibit tables = see sheet enable tables	mo 0.4 - w	fail conditions ists for 0.5 s onitor runs cold s rate whenever enable conditions are met	A
Brake Pedal Position Sensor "A" Circuit High	P057D	Brake pedal position sensor voltage above a threshold for a calibrated period of time indicating an OOR high	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	mo 0.4 - w	fail conditions ists for 0.5 s only color runs color rate whenever enable conditions are met	A
Cruise Control Multi-Function Input "A" Circuit Low	P0580	Cruise switch status in Open/short circuit to ground for a calibrated period of time	Set Switch CAN message value "Open/Short to Ground"	= 7 -	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	e. mo with	fail conditions exists for 20s conitor runs th 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.
Cruise Control Multi-Function Input "A" Circuit High		Cruise switch status in"short circuit to Power" for a calibrated period of time	Set Switch CAN message value "Short to Power"	= 8 -	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 2.5s monitor runs with 0.005 s rate whenever enable conditions are met	Special C
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	Α
Control Module Not Programmed		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
System	Code	Description	Criteria	Log	gic and Value	Parameters		Conditions		Required	Illum
control Module nternal erformance	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. These redundant calculations are compared to the respective values of the primary function or to fixed limits to evaluate the monitoring path. A failure of these monitoring paths would for example be caused by a corrupt RAM cell leading to an implausible value for a parameter.	SPI communication, data transfer lost	=	TRUE	and basic enable conditions met:	=	TRUE see sheet enable tables		fail conditions exists for 0.5 s test performed continuously with 0.01 s rate	A
			faults detected in the SPI communication	>	523.00 coun	s 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 at least 0.64 s least 0.64 s once per trip during pre drive at least twice every 0.08s rate whenever enable conditions are met	
			internal supply voltage or internal supply voltage	>	4.2 V 5.25 V	ignition on and counter of reactivation attempt of power output stage and	= >=	TRUE 2.00	- counts	fail conditions exists for 0.08s	

Component /	Fault	Monitor Strategy	Primary Malfunction		Threshold		Secondary		Enable		Time	MIL
System	Code	Description	Criteria		Logic and Valu	е	Parameters		Conditions		Required	Illum
							NO Pending or Confirmed DTCs:	=	see sheet inhibit tables	-	once per trip during pre drive at least twice every 0.08s rate whenever enable conditions are met	
			(a) - (b)	>	50.00	usec	programmed energizing time for fuel injection has been read back	=	TRUE	-	fail conditions	
			with (a) parallel redundant calculation of energizing time for fuel injection	=	calculated parameter	-	means programmed energizing time for fuel injection	>=	0	-	exists for at least 0.05 s monitor runs	
			and with (b) parallel redundant calculation of programmed energizing time for fuel injection	=	calculated parameter	-	and measured energizing time for fuel injection has been read back	=	TRUE	-	with 0.01 s rate whenever enable	
							means measured energizing time for fuel injection	>=	0	-	conditions are met	
							and engine speed and	>	1200.00	rpm		
							rail pressure and	>	20000.00	kPa		
							engine test active via diagnosis tester and	=	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	-	conditions exists for at least 0.05 s	
			or parallel redundant calculation of angle for pilot injection 1 quantity)	>	102.99	degrees					monitor runs with 0.01 s rate whenever	
			or Path 2:								enable conditions	
			parallel redundant calculation of angle for main injection quantity or	<	-32.98	degrees					are met	
			parallel redundant calculation of angle for main injection quantity) or Path 3:	>	43.53	degrees						
			(parallel redundant calculation of angle for post injection quantity 1	<	-360.00	degrees						
			or parallel redundant calculation of angle for post injection quantity 1	>	-67.00	degrees						

Component /	Fault	Monitor Strategy	Primary Malfunction		Threshold		Secondary		Enable		Time	M
System	Code	Description	Criteria		Logic and Valu	ue	Parameters		Conditions		Required	IIIu
			or Path 4: (parallel redundant calculation of angle for post injection quantity 2 or parallel redundant calculation of angle for post injection quantity 2) or Path 5: (parallel redundant calculation of angle for	< >	-83.00 43.53 -83.00	degrees degrees degrees						
			post injection quantity 3 or parallel redundant calculation of angle for post injection quantity 3)	>	0.00	degrees						
			(parallel redundant calculation of energizing times of the correction value for pilot injection quantity (see Look-Up- Table #56)	<	-500 to -50	usec	redundant engine speed calculation and	>=	1200.00	rpm	fail conditions exists for at least 0.2 s monitor runs	
			or parallel redundant calculation of energizing times of the correction value for pilot injection quantity (see Look-Up-Table #55)	>	50 to 500	usec	engine test active via diagnosis tester	=	FALSE	-	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 TRUE		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	>	200 to 6000		fuel system is in fuel cut off (see parameter definition line #189)	=	TRUE	·	fail conditions exists for at least 0.8 s monitor runs	

Component /	Fault	Monitor Strategy	Primary Malfunction		Threshold		Secondary		Enable		Time	MII
System	Code	Description	Criteria		Logic and Value		Parameters		Conditions		Required	Illui
		·	activation counter (intervention) of the surge damper	>=	74.00	counts		>	0.65	sec	with 0.04 s	
							and redundant engine speed calculation and	>	1440.00	rpm	whenever enable	
							general engine speed demand (see parameter definition line #213)	=	FALSE	-	conditions are met	
							and external torque demand from stability ECU via CAN and	=	FALSE	-		
							external torque demand from transmission ECU via CAN and	=	FALSE	-		
							cruise control active	=	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 and	>	120.00	rpm		
							redundant engine speed calculation at start (see Look-Up-Table #57)	>	840 to 1120	rpm		
							and engine test active via diagnosis tester	=	FALSE	-		
			parallel redundant calculation of averaged wave correction quantity for pilot injection or	>=	7.50	mm^3	redundant engine speed calculation	>=	1200.00	rpm	fail conditions exists for at least 0.2 s	
			parallel redundant calculation of averaged wave correction quantity for main injection or	>=	7.50	mm^3		=	FALSE	-	monitor runs with 0.04 s rate whenever	
			parallel redundant calculation of averaged wave correction quantity for post injection 2 or	>=	7.50	mm^3					enable conditions are met	
			parallel redundant calculation of averaged wave correction quantity for post injection 3	>=	7.50	mm^3						

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

Component / System	Fault Code	Monitor Strategy Description	Primary Malfunction Criteria		Threshold Logic and Value	<u> </u>	Secondary Parameters		Enable Conditions	Time Required	N III
- Cystelli	Code	Description	Onteria		Logic and Value		ा वा वागच्यत् ५		Conditions	Nequired	
			redundant, independent algorithm for plausibility fault of accelerator pedal signal for safety reasons: Path 1: (maximum (a) (b)) - 2 * (maximum (c) (b)) with (a) voltage accelerator pedal 1 and with (b) lower limit for accelerator pedal voltage and with (c) voltage accelerator pedal 2	>	0.29	V	ignition on and engine test active via diagnosis tester and Input signal fault present and ADC fault present	= = =	TRUE FALSE FALSE FALSE	 fail conditions exists for 0.28 s monitor runs with 0.04 s rate whenever enable conditions are met	
			and (voltage accelerator pedal 1	>	1.45	V					
			or voltage accelerator pedal 2)	>	1.45	V					
			or Path 2: (maximum (a) (b)) - 2 * (maximum (c) (b)) with	>	0.41	V					
			(a) voltage accelerator pedal 1 and with (b) lower limit for accelerator pedal voltage and with (c) voltage accelerator pedal 2 and		0.95	V					
			(voltage accelerator pedal 1 or	<=	1.45	V					
			voltage accelerator pedal 2)	<=	1.45	V					
			no response to an injection request processor internal	=	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 are met	
			no response to shut-off path test processor internal	=	TRUE	-	ignition on and	=	TRUE	fail conditions	

Component /	Fault	Monitor Strategy	Primary Malfunction	Threshol		Secondary		Enable		Time	M
System	Code	Description	Criteria	Logic and V		Parameters NO Pending or Confirmed DTCs:	=	Conditions see sheet inhibit tables		exists for more than 0.523 monitor runs at the 0.01 s rate whenever enable	Illu
			no response to hardware activation request processor internal	= TRUE	ā	gnition on and NO Pending or Confirmed DTCs:	=	TRUE see sheet inhibit tables	-	fail conditions exists for more than 0.437 monitor runs at least twice every 0.08 s rate whenever enable	
			no response from processor operative system processor internal	= TRUE	á	gnition 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 are met	
			Path 1: repetitions of injection shut-off path test or Path 2: (number of a powerstage test too few and number of cylinders)	>= 523.00 < 2.00 >= 8.00	counts	gnition on and njection shut-off path test	=	TRUE		fail conditions exists for more than 0.64 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	= TRUE	- j	gnition on	=	TRUE		fail conditions exists for	

Component /	Fault	Monitor Strategy	Primary Malfunction	Threshold	Secondary	Enable	Time
System	Code	Description	Criteria bytes received by monitoring module from CPU as response	< 4 Bytes	Parameters	Conditions	Required II 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
			ECM detects plausibility error of the communication between controller and the monitoring module (2 processors in ECU) processor internal	= TRUE -	ignition on	= 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	< 3.10 V	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.
Oysten	- Ville	Description	or redundant filtered supply voltage to injector chip 1	>	3.50	V	and battery voltage and basic enable conditions met:	>	8.00 see sheet enable tables	V -	exists for 0.5 s monitor runs with 0.01 s rate whenever enable conditions are met	muni.
			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 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	
			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	

Component / System	Fault Code	Monitor Strategy Description	Primary Malfunction Criteria		Threshold Logic and Value)	Secondary Parameters		Enable Conditions	Time Require	
,											
			piezo injector actuator internal feedback voltage or piezo injector actuator internal feedback voltage	>	3.30	V	main injection	=	ACTIVE	- fail condition exists for more the 0.1 s monitor rr with 0.01 rate whenev	or an uns
			Path 1:				injection cut off demand from ECM	=	TRUE	enable condition are me	ns
			engine speed or Path 2: engine speed	>	1500.00 1600.00	rpm	internal monitoring		INOL	condition exists for 0.02 s test perform continuou with 0.02	ed esly
			security torque limitation request due to implausible air system control requests	=	TRUE	·	ignition on	=	TRUE	- fail condition exists for more the 533 ever test perform continuou with 0.01	or an nts ed isly
			security torque limitation request due to implausible rail pressure request	=	TRUE	-	ignition on	=	TRUE	- fail condition exists for more th: 533 ever test perform continuou with 0.01	or an nts ed asly

Component /	Fault	Monitor Strategy	Primary Malfunction		Threshold		Secondary		Enable		Time	MIL
System	Code	Description	Criteria		Logic and Value		Parameters		Conditions		Required	Illum.
		·	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	= =	(a) + (b) + (c) + (d) calculated parameter 11.72 to 99.61 calculated parameter calculated parameter	- % -	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	
			voltage of charging switch or voltage of charging switch if buffer of a bank is not charged completely, or not at all	>	210.00 100.00	V	ECM is in startup before injections are released	=	TRUE	-	fail conditions exists for more than 4 events 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.
- Oyalon	0000	Sestipion	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	
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	П	TRUE	-	engine post drive/ afterun	=	TRUE	·	fail conditions exists for 0.01 s test performed once per drive cycle during afterrun	A
Control Module Analog to Digital Performance	P060B	Redundant electronic ECM circuitry determines if ADC is correctly converting signals within the correct time periods.	voltage at ADC test voltage input or voltage at ADC test voltage input	>		V	ignition on	=	TRUE	-	fail conditions exists for at least 0.15 s test performed continuously 0.01 s	A
			(a) - (b) with (a) voltage accelerator pedal signal 2 at internal ADC and with	> =		V V	ignition on and (counter for steady state detection of the internal AD converter	= >=	TRUE	- events	fail conditions exists for at least 0.12 s monitor runs with 0.01 s	

Component / System	Fault Code	Monitor Strategy Description	Primary Malfunction Criteria		Threshold Logic and Value		Secondary Parameters		Enable Conditions		Time Required	MIL Illum.
			(b) voltage accelerator pedal signal 2 at external ADC	II	measured parameter	V	means (a) - (b) with (a) voltage accelerator pedal signal 2 at internal ADC and with (b) voltage of the accelerator pedal signal 2 at the external ADC or counter for steady state detection of the external AD converter means (c) - (d) with (c) voltage accelerator pedal signal 2 at external ADC and with (d) voltage of the accelerator pedal signal 2 signal 2 at the internal ADC)	<= = = >= <= =	0.06 measured parameter measured parameter 4.00 0.06 measured parameter measured parameter	V V v events V V	rate whenever enable conditions are met	
			(ratio metric correction factor or ratio metric correction factor)	< >	0.62 0.74	factor	ignition on	=	TRUE		fail conditions exists for at least 0.15 s test performed continuously 0.01 s	
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.	with (a) redundant calculated engine speed and with (b) engine speed	>= =	calculated parameter measured parameter	rpm - -	and engine synchronization engine synchronization completed which means number of crankshaft revolutions and crankshaft reference mark detected (reference mark is the 2 missing teeth in the 50-2 tooth-wheel configuration)	>= = = >= =	TRUE TRUE 4.00 TRUE	rpm revs -	fail conditions exists for more than 0.32 s monitor runs with 0.04 s rate whenever enable conditions are met	A

Component / System	Fault Code	Monitor Strategy Description	Primary Malfunction Criteria		Threshold Logic and Valu	II.	Secondary Parameters		Enable Conditions		Time Required	MIL Illum.
System	Code	Description	Gilleria		Logic and van	ue	basic enable conditions met:	=	see sheet enable tables		Required	mum.
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	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	А
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	А
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	А
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	=	TRUE		fail conditions exists for 0.1 s test	А

Component / System	Fault Code	Monitor Strategy Description	Primary Malfunction Criteria	Threshold Logic and Value	Secondary Parameters	Enable Conditions		Time Required	MIL Illum.
				-	and basic enable conditions met:	= see sheet enal tables	ble -	performed continuously 0.01s rate	
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 and basic enable conditions met:	= TRUE = see sheet enal tables	- ble -	fail conditions exists for 1.0 s test performed continuously 0.01s rate	В
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 enal tables	- ble -	fail conditions exists for 0.1 s test performed continuously 0.01s rate	В
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 open circuit)	= Open Circuit:≥ - 200 K Ω impedance between ECU pin and load	circuit active at low current and ignition on and ECU Initialization tasks in progress	= TRUE = TRUE	-	fail conditions exists for 2 s monitor runs with 0.01 s rate whenever enable conditions are met	B (No MIL)
					ECU Initialization tasks in progress for time and ECU Shutdown tasks in progress for time and Battery voltage	= FALSE > 1.00 = FALSE > 1.00 > 10.50	sec - sec V		

Component / System	Fault	Monitor Strategy Description	Primary Malfunction Criteria	Threshold	Secondary Parameters		Enable Conditions		Time	MIL
System	Code	Description	Criteria	Logic and Value	for time and basic enable conditions met:	> =	3.00 see sheet enable tables	sec -	Required	Illum.
		Diagnoses the Malfunction Indicator Lamp (MIL) 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	and ignition on and ECU Initialization tasks in progress for time and ECU Shutdown tasks in progress for time and ECU shutdown tasks in progress for time and battery voltage for time and basic enable conditions met:	= = > > = > > > = = > > = = = = = = = =	TRUE TRUE FALSE 1.00 FALSE 1.00 10.50 3.00 see sheet enable tables	- sec - sec V sec	fail conditions exists for 2 s monitor runs with 0.01 s rate whenever enable conditions are met	B (No MIL
		Diagnoses the Malfunction Indicator Lamp (MIL) 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	circuit active at low current and ignition on and ECU Initialization tasks in progress for time and ECU Shutdown tasks in progress for time and Battery voltage for time and basic enable conditions met:	= = = > > > > > > > > > > > > > > > > >	TRUE FALSE 1.00 FALSE 1.00 10.50 3.00 see sheet enable tables	sec V sec -	fail conditions exists for 3 s monitor runs with 0.01 s rate whenever enable conditions are met	B (No MII

Component / System	Fault Code	Monitor Strategy Description	Primary Malfunction Criteria	Threshold Logic and Value	Secondary Parameters		Enable Conditions		Time Required	MIL Illum.
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	=	TRUE	-	fail conditions exists for 1 s test performed	A (No MIL)
					for time and new message is received via CAN	> =	0.25 TRUE	sec -	continuously 0.5 s rate	
					and basic enable conditions met	=	see sheet enable	-		
					and NO Pending or Confirmed DTCs:	=	tables see sheet inhibit tables	-		
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	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 -					fail conditions exist for more than 3000 events monitor runs	В
		data			battery voltage	>=	11.00	٧	with 0.01 s rate	
					and battery voltage)	<=	655.34	٧	whenever enable conditions	
					and engine speed and	<=	7000.00	rpm	are met	
					selected gear position is park	=	TRUE	-		
					selected gear position is neutral	=	TRUE	-		
					and basic enable conditions met:	=	see sheet enable tables	-		
					and NO Pending or Confirmed DTCs:	=	see sheet inhibit tables	-		
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	Message Received	=	TRUE	-	fault exists for 1 message group; monitor runs whenever enable	Special C
					and no rolling count or protection errors on CAN Frame \$1C7 and	=	TRUE	-	conditions are met.	
					ignition on and	=	TRUE	-		

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:	=	see sheet enable tables see sheet inhibit tables	-		
Reductant Pump High Control Circuit Low Voltage	P1043	Diagnoses the Ruductant Pump Motor 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	for time and battery voltage for time and battery voltage for time and battery voltage for time and battery voltage for time and battery voltage correction factor (please see the parameter definition (please see the parameter definition and battery voltage correction factor (please see the parameter definition (please see the parameter definition (please see the parameter definition (please see the parameter definition) for time and basic enable conditions met:	=	1.00 11.00 3.00 655.34 3.00 0.00 4.00 3.00 see sheet enable tables see sheet inhibit tables	sec V sec V sec factor	fail conditions exists for 3 s monitor runs with 10 msec rate whenever enable conditions are met	A
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)	= Short to power: ≤ - 0.5 Ω impedance between signal and controller power	ECU initialization tasks in progress for time and battery voltage for time and battery voltage	> > > <	1.00 11.00 3.00 655.34	sec V sec V	fail conditions exists for 3 s monitor runs with 10 msec 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 (please see the parameter definition and	>	0.00	factor		
					battery voltage correction factor (please see the parameter definition) .	<	4.00	factor		
					for time and basic enable conditions met:	> =	3.00 see sheet enable	sec		
					and NO Pending or Confirmed DTCs:	=	tables see sheet inhibit			
							tables			
Reductant Purge Valve High Control Circuit High Voltage	P1046		Voltage high during driver off state (indicates short to power)	= Short to power: ≤ - 0.5 Ω impedance between signal and controller power	ECU initialization tasks in progress	=	FALSE		fail conditions exists for 3 s monitor runs with 10 msec rate	В
					for time and	>	1.00	sec	whenever enable conditions	
					battery voltage for	>	11.00	V	are met	
					time and battery voltage	> <	3.00 655.34	sec V		
					for time and	>	3.00	sec		
					(battery voltage correction factor (please see the parameter definition and	>	0.00	factor		
					battery voltage correction factor (please see the parameter definition)	<	4.00	factor		
					for time and	>	3.00	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.
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) OR Output current to dosing valve	= >	Short to ground: ≤ 0.5 Ω impedance between signal and controller ground	- Amps	ECU initialization tasks in progress for time	= ^	FALSE	- sec	fail conditions exists for 3 s monitor runs with 10 msec rate whenever enable	A
							and battery voltage	>	11.00	V	conditions are met	
							for time and	>	3.00	sec		
							battery voltage for	<	655.34	V		
							time and	>	3.00	sec		
							(battery voltage correction factor (please see the parameter definition and	>	0.00	factor		
							battery voltage correction factor (please see the parameter definition)	<	4.00	factor		
							for time and	>	3.00	sec		
							basic enable conditions met:	=	see sheet enable tables	-		
							NO Pending or Confirmed DTCs:	=	see sheet inhibit tables	-		
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		ECU initialization tasks in progress	=	FALSE		fail conditions exists for 3 s monitor runs with 10 msec rate	A
			OR Output current to dosing valve	<	0.10	Amps	for time	>	1.00	sec	whenever enable	
							and battery voltage for	>	11.00	V	conditions are met	
							time and	>	3.00	sec		
							battery voltage for	<	655.34	V		
							time and	>	3.00	sec		
							battery voltage correction factor (please see the parameter definition and	>	0.00	factor		
							battery voltage correction factor (please see the parameter definition	<	4.00	factor		
ı İ							for					

Component / System	Fault Code	Monitor Strategy Description	Primary Malfunction Criteria	Threshold Logic and Value	Secondary Parameters		Enable Conditions		Time Required	MIL Illum.
					time and basic enable conditions met: and NO Pending or Confirmed DTCs:	> = =	3.00 see sheet enable tables see sheet inhibit tables	sec -		
Fuel Rail Pressure Performance	P1089	Measured rail pressure is checked against desired rail pressure to detect high rail pressure deviations in fuel cut-off	rail pressure deviation from setpoint calculated as the absolute value of difference between desired and actual value as an enable condition for injection timing correction learning	> 5000.00 kPa	rail pressure control commanded during injection timing correction learning phase and NO Pending or Confirmed DTCs limiting rail pressure set point for time and basic enable conditions met:	= > =	TRUE see sheet inhibit tables 2.00 see sheet enable tables	- sec -	fail conditions exists for 720 crank revolutions monitor runs with 0.02 s rate whenever enable conditions are met	В
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: ≤ 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:		1.00 11.00 3.00 FALSE 3.00 ACTIVE see sheet enable tables	sec V sec - sec -	fail conditions exists for more than 5 events monitor runs with 0.1 s rate whenever enable conditions are met	В
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	=	FALSE	-	fail conditions exists for more than 30 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.
					time and battery voltage for time and starter is active cranking for time and basic enable conditions met:	> > = > = >	1.00 11.00 3.00 FALSE 3.00 see sheet enable tables	sec V sec - sec -	with 0.1 s rate whenever enable conditions are met	
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	for time and battery voltage for time and starter is active cranking for time and battery voltage for time and starter is continuous to time and basic enable conditions met:	> > > = > = > = > = > = = > = = = = = =	1.00 11.00 3.00 FALSE 3.00 see sheet enable	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
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: (a) - (b) (see Look-Up-Table #3) with (a) captured charge air cooler downstream temperature at start and with (b) captured charge air cooler	= measured parameter	minimum engine-off time C and ambient temperature - and engine speed (see Look-Up-Table #3)	>=	28800.00 -60.04 530 to 870	sec °C rpm	fail conditions exists for 0.1 s monitor runs once per trip with 0.1 s rate whenever enable conditions are met	В
			or Path 2: ((a) - (b) (see Look-Up-Table #3)	parameter	time and engine post drive/ afterun and diagnostic performed in current dc	> = =	0.00 FALSE FALSE	sec - -		

Component /	Fault	Monitor Strategy	Primary Malfunction		Threshold		Secondary		Enable		Time	MIL
System	Code	Description	Criteria		Logic and Value		Parameters		Conditions		Required	Illum.
			with (a) captured charge air cooler downstream temperature at start and with	=	measured parameter	-	basic enable conditions met: and NO Pending or Confirmed DTCs:	=	see sheet enable tables see sheet inhibit tables	-		
			(b) captured charge air cooler upstream temperature at start and	=	measured parameter	-						
			(a) - (b) (see Look-Up-Table #6) with	>	27 to 999	°C						
			(a) captured charge air cooler downstream temperature at start and with	=	measured parameter	-						
			(b) captured charge air cooler upstream temperature at start and	=	measured parameter	-						
			status of block heater (see parameter definition)	=	FALSE	-						
			status of sun-load detection (see parameter definition)	=	FALSE	-						
Deductont Injector	P10D0	Detecte on implemental CCD	/o\ /b\	>	30 to 3276.7	°C	ignition on	=	TRUE		fail	В
Reductant Injector Temperature - Exhaust Gas Temperature 2	PTODO	Detects an implausible SCR dosing valve coil temperature by comparing the temperature with a	(a) - (b) (see Look-Up-Table #90)	>	30 10 3276.7	C	ignition on	=	TRUE	-	conditions exists for 0.1	ь
Correlation		reference temperature	with				and				monitor with	
			(a) dosing valve coil temperature	=	calculated parameter	°C	state of selective catalytic reduction system	=	STANDBY or NO PRESSURE CONTROL	-	0.1 s rate whenever enable conditions	
			and with (b) oxidation catalyst downstream temperature	=	measured parameter	°C	and active heating phase for dosing valve	=	FALSE	-	are met	
							and valve already activated within this driving cycle	=	FALSE	-		
							and battery voltage and	>	11.00	٧		
							ambient temperature and	>=	-60.04	°C		
							engine run time and engine off time	>	10.00 28800.00	sec		
							and urea pump motor output duty cycle and	=	0.00	%		
							Max [(a), (b)] - Min [(a), (b)] where	<=	7.00	°C		
							(a) ambient temperature (b) oxidation catalyst downstream	=	measured parameter measured	-		
							temperature and urea dosing valve output duty cycle	>	parameter 3.00	%		

Component / System	Fault Code	Monitor Strategy Description	Primary Malfunction Criteria	Threshold Logic and Value		Secondary Parameters		Enable Conditions		Time Required	MIL Illum.
						and coil current measurement is valid and basic enable conditions met: and NO Pending or Confirmed DTCs:	= =	TRUE see sheet enable tables see sheet inhibit tables	-		
Exhaust Gas Temperature Sensors 3-4 Not Plausible	P113A	Detects biased urea catalyst temperature sensor by comparing the urea catalyst temperature sensor to the particulate filter temperature sensor after an engine off soak time	with ((a) captured temperature downstream of the urea catalyst at start and with (b) captured temperature downstream of the particulate filter at start)	 30 to 999 measured parameter measured parameter 	°C°°C°°C°°C°°C°°C°°C°°C°°C°°C°°C°°C°°C°	and Engine Running for time and engine post drive/ afterun and diagnostic performed in current dc and basic enable conditions met: and NO Pending or Confirmed DTCs:	>= = = = =	TRUE 0.00 FALSE FALSE see sheet enable tables see sheet inhibit tables	sec sec -	fail conditions exists for 0.01 s monitor runs with 0.01 s rate whenever enable conditions are met	В
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 where (a) Filtered calculated O2 concentration based on injection quantity, air mass and fuel density (b) Positive O2 concentration margin	> (a) + (b) = Please see the general description for details of this calcaulted O2 concentration = 0.04	factor	engine speed engine speed engine speed commanded fuel injection quantity commanded fuel injection quantity Air mass per cylinder Air mass per cylinder Status of binary lambda signal valid (see parameter definition at line #273) for time	> <	550 240.00 88.00 3.96 1.98 TRUE	rpm rpm mm^3/rev g/rev g/rev g/rev - sec	fail conditions exists for more than 2 event monitor runs with 0.1 s rate whenever enable conditions are met	В

Component /	Fault Code	Monitor Strategy Description	Primary Malfunction Criteria		Threshold Logic and Value		Secondary Parameters		Enable Conditions		Time	MIL Illum.
System	Code	Description	Criteria		Logic and value		oxidation catalyst upstream temperature		999.96	°C	Required	mum.
							oxidation catalyst upstream temperature	<	999.90	C		
							oxidation catalyst upstream temperature	>	99.96	°C		
							integrated air mass since all other	>	2.5	g		
							release conditions are fulfilled for O2					
							plausibility					
							battery voltage	>	11.00	V		
							Fuel volume in fuel tank	>	-1638.40	I		
							Deceleration fuel cut-off	=	FALSE	-		
							Injection active	=	TRUE	-		
							calculated oxygen concentration	<=	(a) + (b)	factor		
							calculated oxygen concentration where	>=	(a) - (b)	factor		
							(a) Oxygen concentration is captured	=	measure variable	factor		
							at the moment when the above	=	measure variable	Tactor		
							steady state conditions are met					
							Steady State Conditions are met					
		1					(b) tolerance range of calculated	=	0.02	factor		
							Oxygen concentration		0.02	idotoi		
		1					for time	>	0.10	sec		
							Engine operation mode (Please see the	=	normal operation	-		
							definition)					
							engine speed	<	4500.00	rpm		
							engine speed	>	600.00	rpm		
							ambient temperature	<	122.96	°C		
							ambient temperature	>	-45.04	°C		
							ambient pressure	<	110.00	kPa		
							ambient pressure	>	74.80	kPa		
							NO Pending or Confirmed DTCs:	=	see sheet inhibit	-		
									table			
							basic enable conditions met:	=	see sheet enable	-		
									tables			
	P11A9	Compare the pressure	Pressure compensated O2 concentration	<	(a) - (b)	factor	engine speed	<	1800	rpm	fail	В
HO2S		compensated O2									conditions	
Performance -		concentration sensor signal									exists for	
Signal Low During											more than 2	
		with a threshold										
Moderate Load		with a threshold									event	
		with a threshold									event monitor runs	
Moderate Load		with a threshold	where		51		engine speed	>	550	rpm	event monitor runs with 0.1 s	
Moderate Load		with a threshold	(a) Filtered calculated O2 concentration	=	Please see the	factor	engine speed commanded fuel injection quantity	> <	550 240.00	rpm mm^3/rev	event monitor runs with 0.1 s rate	
Moderate Load		with a threshold	(a) Filtered calculated O2 concentration based on injection quantity, air mass	=	general	factor					event monitor runs with 0.1 s rate whenever	
Moderate Load		with a threshold	(a) Filtered calculated O2 concentration	=	general description for	factor					event monitor runs with 0.1 s rate whenever enable	
Moderate Load		with a threshold	(a) Filtered calculated O2 concentration based on injection quantity, air mass	=	general description for details of this	factor					event monitor runs with 0.1 s rate whenever enable conditions	
Moderate Load		with a threshold	(a) Filtered calculated O2 concentration based on injection quantity, air mass	=	general description for details of this calcaulted O2	factor					event monitor runs with 0.1 s rate whenever enable	
Moderate Load		with a threshold	(a) Filtered calculated O2 concentration based on injection quantity, air mass and fuel density		general description for details of this calcaulted O2 concentration		commanded fuel injection quantity	<	240.00	mm^3/rev	event monitor runs with 0.1 s rate whenever enable conditions	
Moderate Load		with a threshold	(a) Filtered calculated O2 concentration based on injection quantity, air mass	=	general description for details of this calcaulted O2		commanded fuel injection quantity	>	240.00 88.00	mm^3/rev	event monitor runs with 0.1 s rate whenever enable conditions	
Moderate Load		with a threshold	(a) Filtered calculated O2 concentration based on injection quantity, air mass and fuel density		general description for details of this calcaulted O2 concentration		commanded fuel injection quantity commanded fuel injection quantity Air mass per cylinder	> <	240.00 88.00 3.96	mm^3/rev mm^3/rev g/rev	event monitor runs with 0.1 s rate whenever enable conditions	
Moderate Load		with a threshold	(a) Filtered calculated O2 concentration based on injection quantity, air mass and fuel density		general description for details of this calcaulted O2 concentration		commanded fuel injection quantity commanded fuel injection quantity Air mass per cylinder Air mass per cylinder	>	240.00 88.00 3.96 1.98	mm^3/rev	event monitor runs with 0.1 s rate whenever enable conditions	
Moderate Load		with a threshold	(a) Filtered calculated O2 concentration based on injection quantity, air mass and fuel density		general description for details of this calcaulted O2 concentration		commanded fuel injection quantity commanded fuel injection quantity Air mass per cylinder Air mass per cylinder Status of binary lambda signal valid (see	> <	240.00 88.00 3.96	mm^3/rev g/rev g/rev	event monitor runs with 0.1 s rate whenever enable conditions	
Moderate Load		with a threshold	(a) Filtered calculated O2 concentration based on injection quantity, air mass and fuel density		general description for details of this calcaulted O2 concentration		commanded fuel injection quantity commanded fuel injection quantity Air mass per cylinder Air mass per cylinder	> < >	240.00 88.00 3.96 1.98	mm^3/rev g/rev g/rev	event monitor runs with 0.1 s rate whenever enable conditions	
Moderate Load		with a threshold	(a) Filtered calculated O2 concentration based on injection quantity, air mass and fuel density		general description for details of this calcaulted O2 concentration		commanded fuel injection quantity commanded fuel injection quantity Air mass per cylinder Status of binary lambda signal valid (see parameter definition at line #273)	> < > =	240.00 88.00 3.96 1.98 TRUE	mm^3/rev mm^3/rev g/rev g/rev -	event monitor runs with 0.1 s rate whenever enable conditions	
Moderate Load		with a threshold	(a) Filtered calculated O2 concentration based on injection quantity, air mass and fuel density		general description for details of this calcaulted O2 concentration		commanded fuel injection quantity commanded fuel injection quantity Air mass per cylinder Air mass per cylinder Status of binary lambda signal valid (see parameter definition at line #273) for time	> > = >	240.00 88.00 3.96 1.98 TRUE 0.50	mm^3/rev mm^3/rev g/rev g/rev - sec	event monitor runs with 0.1 s rate whenever enable conditions	
Moderate Load		with a threshold	(a) Filtered calculated O2 concentration based on injection quantity, air mass and fuel density		general description for details of this calcaulted O2 concentration		commanded fuel injection quantity commanded fuel injection quantity Air mass per cylinder Air mass per cylinder Status of binary lambda signal valid (see parameter definition at line #273) for time	> > = >	240.00 88.00 3.96 1.98 TRUE 0.50	mm^3/rev mm^3/rev g/rev g/rev - sec	event monitor runs with 0.1 s rate whenever enable conditions	

Component /	Fault	Monitor Strategy	Primary Malfunction		Threshold		Secondary		Enable		Time	MIL
System	Code	Description	Criteria		Logic and Value		Parameters		Conditions		Required	Illum.
							integrated air mass since all other release conditions are fulfilled for O2 plausibility	>	2.5	g		
							battery voltage	>	11.00	V		
							Fuel volume in fuel tank	>	-1638.40	1		
							Deceleration fuel cut-off	=	FALSE	-		
							Injection active	=	TRUE	-		
							calculated oxygen concentration	<=	(a) + (b)	factor		
							calculated oxygen concentration where	>=	(a) - (b)	factor		
							(a) Oxygen concentration is captured at the moment when the above	=	measure variable	factor		
							steady state conditions are met					
							(b) tolerance range of calculated Oxygen concentration	=	0.02	factor		
							for time	>	0.10	sec		
							Engine operation mode (Please see the definition)	=	normal operation	-		
							engine speed	<	4500.00	rpm		
							engine speed	>	600.00	rpm		
							ambient temperature	<	122.96	°C		
							ambient temperature	>	-45.04	°C		
							ambient pressure	<	110.00 74.80	kPa kPa		
							ambient pressure NO Pending or Confirmed DTCs:	> =	see sheet inhibit	KPa -		
							NO Pending of Confirmed DTCs.	=	table	-		
							basic enable conditions met:	=	see sheet enable	_		
							basic shabic sorialishis met.	_	tables			
									tables			
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	<	1800	rpm	fail conditions exists for more than 2 event monitor runs	В
			l .									
			where				engine speed	>	550	rpm	with 0.1 c	
			where (a) Filtered calculated O2 concentration	=	Please see the	factor	engine speed commanded fuel injection quantity	> <	550 240.00	rpm mm^3/rev	with 0.1 s	
			(a) Filtered calculated O2 concentration	=	Please see the general	factor	engine speed commanded fuel injection quantity			rpm mm^3/rev	rate	
				=		factor					rate whenever	
			(a) Filtered calculated O2 concentration based on injection quantity, air mass	=	general	factor					rate whenever enable	
			(a) Filtered calculated O2 concentration based on injection quantity, air mass	=	general description for	factor			240.00	mm^3/rev	rate whenever	
			(a) Filtered calculated O2 concentration based on injection quantity, air mass	=	general description for details of this calcaulted O2		commanded fuel injection quantity commanded fuel injection quantity		240.00 88.00	mm^3/rev mm^3/rev	rate whenever enable conditions	
			(a) Filtered calculated O2 concentration based on injection quantity, air mass and fuel density		general description for details of this calcaulted O2 concentration		commanded fuel injection quantity commanded fuel injection quantity Air mass per cylinder	> <	240.00 88.00 3.96	mm^3/rev mm^3/rev g/rev	rate whenever enable conditions	
			(a) Filtered calculated O2 concentration based on injection quantity, air mass and fuel density		general description for details of this calcaulted O2 concentration		commanded fuel injection quantity commanded fuel injection quantity Air mass per cylinder Air mass per cylinder	>	240.00 88.00 3.96 1.98	mm^3/rev mm^3/rev	rate whenever enable conditions	
			(a) Filtered calculated O2 concentration based on injection quantity, air mass and fuel density		general description for details of this calcaulted O2 concentration		commanded fuel injection quantity commanded fuel injection quantity Air mass per cylinder Air mass per cylinder Status of binary lambda signal valid (see	> < >	240.00 88.00 3.96	mm^3/rev mm^3/rev g/rev	rate whenever enable conditions	
			(a) Filtered calculated O2 concentration based on injection quantity, air mass and fuel density		general description for details of this calcaulted O2 concentration		commanded fuel injection quantity commanded fuel injection quantity Air mass per cylinder Status of binary lambda signal valid (see parameter definition at line #273)	>	240.00 88.00 3.96 1.98 TRUE	mm^3/rev mm^3/rev g/rev g/rev -	rate whenever enable conditions	
			(a) Filtered calculated O2 concentration based on injection quantity, air mass and fuel density		general description for details of this calcaulted O2 concentration		commanded fuel injection quantity commanded fuel injection quantity Air mass per cylinder Air mass per cylinder Status of binary lambda signal valid (see parameter definition at line #273) for time		240.00 88.00 3.96 1.98 TRUE 0.50	mm^3/rev mm^3/rev g/rev g/rev - sec	rate whenever enable conditions	
			(a) Filtered calculated O2 concentration based on injection quantity, air mass and fuel density		general description for details of this calcaulted O2 concentration		commanded fuel injection quantity commanded fuel injection quantity Air mass per cylinder Air mass per cylinder Status of binary lambda signal valid (see parameter definition at line #273) for time SCR downstream temperature		240.00 88.00 3.96 1.98 TRUE 0.50 999.96	mm^3/rev mm^3/rev g/rev g/rev - sec °C	rate whenever enable conditions	
			(a) Filtered calculated O2 concentration based on injection quantity, air mass and fuel density		general description for details of this calcaulted O2 concentration		commanded fuel injection quantity commanded fuel injection quantity Air mass per cylinder Air mass per cylinder Status of binary lambda signal valid (see parameter definition at line #273) for time SCR downstream temperature SCR downstream temperature	>	240.00 88.00 3.96 1.98 TRUE 0.50 999.96 99.96	mm^3/rev g/rev g/rev - sec °C °C	rate whenever enable conditions	
			(a) Filtered calculated O2 concentration based on injection quantity, air mass and fuel density		general description for details of this calcaulted O2 concentration		commanded fuel injection quantity commanded fuel injection quantity Air mass per cylinder Air mass per cylinder Status of binary lambda signal valid (see parameter definition at line #273) for time SCR downstream temperature SCR downstream temperature integrated air mass since all other release conditions are fulfilled for O2		240.00 88.00 3.96 1.98 TRUE 0.50 999.96	mm^3/rev mm^3/rev g/rev g/rev - sec °C	rate whenever enable conditions	
			(a) Filtered calculated O2 concentration based on injection quantity, air mass and fuel density		general description for details of this calcaulted O2 concentration		commanded fuel injection quantity commanded fuel injection quantity Air mass per cylinder Air mass per cylinder Status of binary lambda signal valid (see parameter definition at line #273) for time SCR downstream temperature SCR downstream temperature integrated air mass since all other release conditions are fulfilled for O2 plausibility	<pre></pre>	240.00 88.00 3.96 1.98 TRUE 0.50 999.96 99.96 2.5	mm^3/rev g/rev g/rev g/rev - sec °C °C g	rate whenever enable conditions	
			(a) Filtered calculated O2 concentration based on injection quantity, air mass and fuel density		general description for details of this calcaulted O2 concentration		commanded fuel injection quantity commanded fuel injection quantity Air mass per cylinder Air mass per cylinder Status of binary lambda signal valid (see parameter definition at line #273) for time SCR downstream temperature SCR downstream temperature integrated air mass since all other release conditions are fulfilled for O2	>	240.00 88.00 3.96 1.98 TRUE 0.50 999.96 99.96	mm^3/rev g/rev g/rev - sec °C °C	rate whenever enable conditions	
			(a) Filtered calculated O2 concentration based on injection quantity, air mass and fuel density		general description for details of this calcaulted O2 concentration		commanded fuel injection quantity commanded fuel injection quantity Air mass per cylinder Air mass per cylinder Status of binary lambda signal valid (see parameter definition at line #273) for time SCR downstream temperature SCR downstream temperature integrated air mass since all other release conditions are fulfilled for O2 plausibility battery voltage	<pre></pre>	240.00 88.00 3.96 1.98 TRUE 0.50 999.96 99.96 2.5	mm^3/rev g/rev g/rev - sec °C °C g	rate whenever enable conditions	

Component /	Fault	Monitor Strategy	Primary Malfunction		Threshold		Secondary		Enable		Time	MIL
System	Code	Description	Criteria		Logic and Value	1	Parameters		Conditions		Required	Illum.
							calculated oxygen concentration calculated oxygen concentration where	<= >=	(a) + (b) (a) - (b)	factor factor		
							(a) Oxygen concentration is captured at the moment when the above steady state conditions are met	=	measure variable	factor		
							(b) tolerance range of calculated Oxygen concentration	=	0.02	factor		
							for time	>	0.10	sec		
							Engine operation mode (Please see the definition)	=	normal operation	-		
							engine speed	<	4500.00 600.00	rpm		
							engine speed ambient temperature	> <	122.96	rpm °C		
							ambient temperature	>	-45.04	°C		
							ambient pressure	<	110.00	kPa		
							ambient pressure	>	74.80	kPa		
							NO Pending or Confirmed DTCs:	=	see sheet inhibit table	-		
							basic enable conditions met:	=	see sheet enable tables	-		
	P11B2	Compare the pressure	Pressure compensated O2 concentration	<	(a) - (b)	factor	engine speed	<	1800	rpm	fail	В
HO2S Performance - Signal Low During Moderate Load Bank 1 Sensor 2		compensated O2 concentration sensor signal with a threshold									conditions exists for more than 2 event monitor runs	
			where				engine speed	>	550	rpm	with 0.1 s	
			(a) Filtered calculated O2 concentration based on injection quantity, air mass and fuel density	=	Please see the general description for details of this calcaulted O2 concentration	factor	commanded fuel injection quantity	<	240.00	mm^3/rev	rate whenever enable conditions are met	
			(b) Positive O2 concentration margin	=	0.05	factor	commanded fuel injection quantity	>	88.00	mm^3/rev		
							Air mass per cylinder	<	3.96	g/rev		
							Air mass per cylinder Status of binary lambda signal valid (see	>	1.98 TRUE	g/rev -		
							parameter definition at line #273) for time	= >	0.50	sec		
							SCR downstream temperature	<	999.96	°C		
							SCR downstream temperature	>	99.96	°C		
							integrated air mass since all other release conditions are fulfilled for O2	>	2.5	g		
							plausibility battery voltage	>	11.00	V		
							Fuel volume in fuel tank	>	-1638.40	V		
							Deceleration fuel cut-off	=	FALSE	-		
							Injection active	=	TRUE	-		
							calculated oxygen concentration calculated oxygen concentration	<= >=	(a) + (b) (a) - (b)	factor factor		
							where (a) Oxygen concentration is captured at the moment when the above steady state conditions are met	=	measure variable	factor		

Component /	Fault	Monitor Strategy	Primary Malfunction	Threshold	Secondary	Enable		Time	MIL
System	Code	Description	Criteria	Logic and Value	Parameters	Conditions		Required	Illum.
					(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 NO Pending or Confirmed DTCs:	= 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	sec - rpm rpm °C °C kPa kPa -		
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 (b) total time for which diagnosis is enabled	< 0.50 r. = measured parameter = calculated parameter	Atio NOx sensor's heater temperature has reached the set point for time Enabling Upstream 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: basic enable conditions met:	= TRUE > 2.00 = TRUE <= 0.1 to 10 = measured parameter = calculated parameter > 5.00 = see sheet inhibit tables = see sheet enable tables	sec - sec	fail conditions exists for more than 36 sec monitor runs with 0.02 s rate whenever enable conditions are met	В
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	< 0.50 r. = measured parameter calculated parameter	notio NOx sensor's heater temperature has reached the set point for time Enabling Upstream 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: basic enable conditions met:	= TRUE > 2.00 = TRUE <= 0.1 to 10 = measured parameter calculated parameter > 5.00 = see sheet inhibit tables = see sheet enable tables	sec factor sec	fail conditions exists for more than 36 sec 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
IOx Sensor	P11CB	Compares the averaged	Averaged relative NOx concentration	> 0.699951 -	for averaging time with the following	>=	5.00	sec	fault exists	В
erformance -		relative deviation of the	deviation		secondary parameters fulfilled				for more	
gnal High Bank 1		measured NOx sensor							than 1 event;	
ensor 1		concentration from the							monitor runs	
1001		modeled Nox concentration							at 0.1 s once	
		against the averaged							per trip	
		threshold								
					(
					Status of NOx signal of upstream NOx	=	TRUE	-		
					sensor (please see the definition)					
					Normal Mode (Particulate Filter	=	TRUE	-		
					Regeneration not active)					
					for time	>=	15.00	sec		
					ambient pressure	>=	75.00	kPa		
					ambient pressure	<=	106.00	kPa		
						>=	-7.04	°C		
					ambient temperature			°C		
					ambient temperature	<=	37.96	-0		
					((
					filtered modeled Nox concentration	<=	0.05	-		
					percent positive deviation					
					filtered modeled Nox concentration	>=	0.05	-		
					percent negative deviation					
					for time	>	2.00	sec		
)					
)))					
					for time	>	2.00	000		
					time since start		30.00	sec		
						>		sec		
					Engine Coolant Temperature	>=	68.96	°C		
					Engine Coolant Temperature	<=	129.96	°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)		0 10 00	pattorri		
					Table #02)		24 = pilot 1 main			
							56 = pilot 7 main			
							1, main			
							58 = pilot 2, pilot			
							1, main, post 2			
							26 = pilot 1 main,			
				1			post 2			
				1			0 = all off			
							(overrun)			
					Vehicle speed	>=	37.29	mph		
				1	for time	>	1.00	sec		
				1	.57 41110	_	1.00	550		
				1	Enable range for the plausibility shock of	≠0	0 to 1	factor		
				1	Enable range for the plausibility check of	<i>∓</i> ∪	0 10 1	factor		
				1	Upstream Nox sensor (see Look-Up-					
				1	Table #74)					
				1	for time	>	0.00	sec		
				1	Air mass per cylinder	>=	0.00	g/rev		
				1	Air mass per cylinder	<=	5.40	g/rev		
				1	for time	>	5.00	sec		
				1	actual valve position of exhaust-gas	>=	0.00	%		
				1	recirculation		0.00	,,		
				1	actual valve position of exhaust-gas	<=	100.00	%		
				1	recirculation	<=	100.00	70		
				1						
					for time	>	0.50	sec		
						> >=	0.50 0.00	sec ppm		

Component /	Fault	Monitor Strategy	Primary Malfunction		Threshold		Secondary		Enable		Time	MIL
System	Code	Description	Criteria		Logic and Value		Parameters		Conditions		Required	Illum.
							filtered modeled NOx-concentration upstream of the SCR	<=	1650.00	ppm		
							for time	>	0.50	sec		
							Diagnostic has not completed this driving cycle	=	FALSE	-		
							NO Pending or Confirmed DTCs	=	see sheet inhibit	-		
1							basic enable conditions met:	=	tables see sheet enable tables	-		
)					
NOx Sensor Performance - Signal Low Bank 1 Sensor 1	P11CC	Compares the averaged relative deviation of the measured NOx sensor concentration from the modeled Nox concentration against the averaged	Averaged relative NOx concentration deviation	<	(a) * (b)		for averaging time with the following secondary parameters fulfilled	>=	5.00	sec	fault exists for more than 1 event; monitor runs at 0.1 s once per trip	В
		threshold	(a) Table for the base value of the lower plausibility limit (see Look-Up-Table #80)	=	-1 to -0.486328	-	(
			(b) Factor correction based on Environmental Pressure	=	1	-	Status of NOx signal of upstream NOx sensor (please see the definition)	=	TRUE	-		
							Normal Mode (Particulate Filter Regeneration not active)	=	TRUE	-		
							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 percent positive deviation	<=	0.05	-		
							filtered modeled Nox concentration percent negative deviation	>=	0.05	-		
							for time)))	>	2.00	sec		
							for time	>	2.00	sec		
							time since start	>	30.00	sec		
							Engine Coolant Temperature	>=	68.96	°C		
							Engine Coolant Temperature	<=	129.96	°C		
							Exhaust gas temperature range at Upstream Nox sensor (see Look-Up- Table #81)	>0	0 to 1	factor		
							Fuel Injection pattern (see Look-Up- Table #82)	=	0 to 58	pattern		
									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)			
							Vehicle speed	>=	37.29	mph		
		I	l	1			for time	>	1.00	sec		

Component /	Fault	Monitor Strategy	Primary Malfunction	Threshold	Secondary		Enable		Time	MIL
System	Code	Description	Criteria	Logic and Value	Parameters		Conditions		Required	Illum.
					Enable range for the plausibility check of Upstream Nox sensor (see Look-Up-	≠0	0 to 1	factor		
					Table #75) for time	>	0.00	sec		
					Air mass per cylinder	>=	0.00	g/rev		
					Air mass per cylinder	<=	5.40	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		
					filtered modeled NOx-concentration upstream of the SCR	<=	1650.00	ppm		
					for time	>	0.50	sec		
					Diagnostic has not completed this driving	=	FALSE	-		
					cycle					
					NO Pending or Confirmed DTCs	=	see sheet inhibit tables	-		
					basic enable conditions met:	=	see sheet enable tables	-		
)					
Downstream NOx sensor Self diagnostic Bank 1 Sensor 2		During the NOx sensor self- diagnostic test, the number of aborted self-diagnostics is monitor. If the self- diagnostic is aborted, by NOx sensor indication, a	number of self-diagnostic abortions of downstream NOx sensor	> 0.00 counts	Global Release conditions:				fault exists for more than 3 events; monitor runs at 0.1 s once	В
		calibrated number of times the fault is set							per trip during the	
					time interval between the runs of the diagnostic tests	>	10.00	sec	afterrun	
					status of downstream NOx sensor validity	=	TRUE	-		
					SCR downstream temperature	>=	-7.04	°C		
					SCR downstream temperature	<=	399.96	°C		
					status of current engine operation system ≠ Post Drive	=	TRUE	-		
					Engine operation mode = normal mode	=	1.00	-		
					engine speed	<=	1500.00	rpm		
					engine speed	>=	0.00	rpm		
					for time		5.00	sec		
					Modeled downstream NOx concentration	<	160.00	ppm		
					Battery voltage	<=	6553.40	V		
i					Battery voltage	>=	10.00	V		
					NO Pending or Confirmed DTCs:	=	see sheet	-		
			l	I			inhibit tables		1	

Component /	Fault	Monitor Strategy	Primary Malfunction	Threshold	Secondary		Enable		Time	MIL
System	Code	Description	Criteria	Logic and Value	Parameters		Conditions		Required	Illum.
Í					status of heater temperature validity for	=	True	-		
					downstream Nox sensor					
					(
					engine speed	<	1200.00	rpm		
					virtual pedal angle	<	10.00	%		
					for time With	<=	14400.00	sec		
					(((
					SCR downstream temperature	<=	129.96	°C		
					for time	>=	40.00	sec		
)					
					for time	>=	600.00	sec		
)					
					((
					vehicle speed	<=	31.08	mph		
					for time	>=	40.00	sec		
J) for time	>=	600.00	sec		
))	/=	000.00	300		
					<i>''</i>					
					(
					Status: DFP Regeneration active	=	FALSE	-		
					Or					
					Status: DPF Regeneration not completed	=	FALSE	-		
)					
					Rising edge of the following conditions:	=	TRUE	_		
					itising eage of the following conditions.	-	TROL	_		
					(
					Ignition key on	=	TRUE	-		
					Engine operation status	=	Running	-		
)					
					with					
					(TD.1.E			
					Status: DPF Regeneration not completed	=	TRUE	-		
ļ					Status: DFP Regeneration active	=	TRUE	_		
					Engine coolant temperature	= <=	59.96	°C		
J))	\ <u>-</u>	33.30	J		
					<u>"</u>					
					(
ļ					Ignition key on	=	TRUE	-		
					Or					
					status of over run condition	=	TRUE	-		
ļ					for time	<=	12.00 False	sec		
					status of over run condition for time	= >	20.00	sec		
) ioi uille	_	20.00	300		
ļ					<u> </u> '					
					(
ļ					Estimated HC Load in SCR catalyst	<=	2.00	g		
ļ					Or			-		
ļ					[(
					change of estimated HC Load in SCR	>=	(a) * (b)	g		
					catalyst					
					within time	<	0.20	sec		
ļ					(a) Estimated HC Load limit in SCR	=	-0.01	g/sec		
			l	I	catalyst				ı I	

Component /	Fault	Monitor Strategy	Primary Malfunction	Threshold	Secondary		Enable		Time	MIL
System	Code	Description	Criteria	Logic and Value	Parameters		Conditions		Required	Illum.
					(b) time factor		0.20	sec		
))					
					And					
					(
					Estimated HC Load in SCR catalyst	>=	32.00	g		
					engine speed	<=	4000.00	rpm		
					engine speed	>=	500.00	rpm		
					SCR downstream temperature	<=	199.96	°C		
					SCR downstream temperature	>=	-40.04	°C		
					((<=	199.96	°C		
					SCR downstream temperature for time	>=	1.00	sec		
)	/-	1.00	360		
					for time (see Look-Up-Table #99)	>=	100 to 900	sec		
)	-	100 10 000	000		
					((
					vehicle speed	<=	44.75	mph		
					for time	>=	1.00	sec		
)					
					for time (see Look-Up-Table #99)	>=	100 to 900	sec		
))					
					Additional release conditions:					
							_			
					vehicle speed	=	0	mph		
					number of possible test runs in after-	<	20.00	-		
					run		TDUE	-		
					Engine operation status = Post Drive for time	=	TRUE 100.00			
					for time in ECM afterrun	>= >=	30.00	sec sec		
					for time in ECM afterrun	<i>>=</i> <=	300.00	sec		
					status of heater temperature validity for	=	TRUE	-		
					downstream Nox sensor	_	INOL			
					Status of downstream NOx sensor self-	=	2	_		
					diagnostic abortion (Bit1)	_	2			
					diagnostic abortion (Bit1)					
					Afterrun Conditions:					
					NO Pending or Confirmed DTCs:	=	see sheet inhibit	-		
					Ĭ		tables			
					Engine operation status = Post Drive	=	TRUE	-		
					vehicle speed	=	0			
					measured downstream NOx	<=	160.00	ppm		
					concentration					
					DPF regeneration active	=	FALSE	-		
					engine speed	>=	0.00	rpm		
					engine speed	<=	1500.00	rpm		
					NOx sensor signal is valid (e.g. No	=	TRUE	-		
					CAN error of NOx CAN messages) maximum duration in afterrun		300.00			
						<=		sec		
					minimum duration to start self-	<=	100.00	sec		
					diagnostic					
					number of self-diagnostic attempts	<	20.00	count		
					basic enable conditions met:	=	see sheet enable	-		
							tables			

Note Sensor Current Cu	Component /	Fault	Monitor Strategy	Primary Malfunction		Threshold		Secondary		Enable		Time	MIL
Current Performance Burs 1 detacts	System	Code	Description	Criteria		Logic and Value		Parameters		Conditions		Required	Illum.
P11C Detects a failure of the Performance Dank Sensor Current Performance Dank I Sensor 2 P11C Current Performance of Current Performance Dank I Sensor 2 P11C Current Performance of Current Performance Dank I Sensor 2 P11C Current Performance of Current Performance Dank I Sensor 2 P11C Current Performance of Current Performance Dank I Sensor 2 P11C Curr	Current Performance Bank	P11DB	feedback performance of	status time count (invalid time / total	>	0.50	ratio	NOx status time (sum of valid and invalid Nox status for diagnostic determination)	>=	18.00	sec	conditions exists for more than	В
P11DC Detects a failure of the Park Service Park Institute Countries and Nox Service Park Institute Countries and Nox Service Park Institute Countries and Nox Service Park Institute Countries Institute								Engine Running (see parameter	=	TRUE	-	monitor runs	
PIDC Detects a failure of the recedance performance downstream NoX sensor detects a lean PFFCCurrent Performance Bankt Sensor 2 PFFCC PFFCCurrent Performance Bankt Sensor 2 PFFCCurrent Performance Bankt Sensor 2 PFFCCUrrent Perf								for time (required for the NOx sensor to give valid response)	>	20.00	sec	rate whenever	
Nox Sensor P11DC Detects a failure of the leadback performance of downstream NoX sensor 2 P11DC Detects a failure of the leadback performance of Senk I Sensor 2 Senk I Sensor 2 Senk I Sensor 2 Senk I Sensor 2 Senk I Sensor 2 Senk I Sensor 2 Senk I Sensor 2 Senk I Sensor 2 Senk I Sensor 2 Senk I Sensor 2 Senk I Sensor 2 Senk I Sensor 2 Senk I Sensor 2 Senk I Sensor 2 Senk I Sensor 2 Senk I Sensor 2 Senk I Sensor 3 S								Upstream NoX sensor detects a lean A/F mixture	=	TRUE	-	conditions	
Nox Sensor Courset P11DC Detects a failure of the feedback penformance Barrix Sensor 2 P11DC Detects a failure of the feedback penformance Barrix Sensor 2 P11DC Detects a failure of the feedback penformance Barrix Sensor 2 P11DC Detects a failure of the feedback penformance Barrix Sensor 2 P11DC Detects a failure of the feedback penformance P11DC Detects a failure of the feedback pen								Valid NOx signal from CAN is received	=	TRUE	-		
Current Performance Bank1 Sensor 2 feedback performance of downstream NoX sensor feedback performance of downstream NoX sensor feedback performance of downstream NoX sensor feedback performance of downstream NoX sensor for time (required for the NoX sensor to give valid response) and Downstream 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: and Valid NoX signal from CAN is received (no Nox sensor communication failures) or following conditions for time: battery voltage > 120.00 sec battery voltage > 11.00 V								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)	>= <= >= = > <= = =	11.00 655.34 94.96 3003.56 TRUE 20.00 0.1 to 10 5.00 see sheet inhibit tables see sheet enable	V V°C°C °C- sec-		
battery voltage	Current Performance	P11DC	feedback performance of		>	0.50	ratio	downstream NOx sensor 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 Downstream 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 downstream temperature	= > > = = > > = <=	TRUE 20.00 TRUE TRUE 120.00 11.00 655.34 94.96	sec - sec V V C °C	conditions exists for more than 36 sec monitor runs with 0.02 s rate whenever enable conditions	В

Component /	Fault	Monitor Strategy	Primary Malfunction	Threshold	Secondary		Enable		Time	MIL
System	Code	Description	Criteria	Logic and Value	Parameters		Conditions		Required	Illum.
					Engine Running (see parameter definition) for time (required for the NOx sensor to give valid response) and Downstream Lambda signal is in steady	= > <=	TRUE 20.00 0.2 to 3.2	sec		
					state condition (measured lambda signal - filtered lambda signal) (see Look-Up-Table #27) for time Inhibit Status (no inhibiting faults) (No pending or stored DTC) basic enable conditions met:	>= = =	5.00 see sheet inhibit tables see sheet enable tables	sec - -		
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)	= 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	A
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	А
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

Component / System	Fault Code	Monitor Strategy Description	Primary Malfunction Criteria	Threshold Logic and Value	Secondary Parameters		Enable Conditions		Time Required	MIL Illum.
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	>	11.00 3.00	V	fail conditions exists for 3 s monitor runs with 0.005 s rate	В
					and and Throttle Valve Actuator Solenoid Control Circuit	=	ACTIVE	-	whenever enable conditions are met	1
					and Open Load Diagnosis active and basic enable conditions met	=	FALSE see sheet enable	-	are mer	1
					scale challenging	_	tables			ı
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 adaption values to a threshold.	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 10.05 s monitor runs once per drivingcycle	В
	threshold. or throttle valve control deviation	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	-	with 0.005 s rate whenever enable	1	
		The learn procedure includes 3 actual learns. i.e. the valve is commanded open then closed, then the closed position is read for learn. Then position is commanded open, then closed a 2nd time, and the closed position is read for learn. Then position is commanded open and closed a 3rd time, and closed position is read for learn.			and Engine Coolant Temperature	>	199.96	°C	conditions are met	
		The maximum and minimum learned offset referrs to the maximum and minimum learned values of the 3 learns performed within total learn procedure.			and					
					offset learning for the throttle valve was successful in the previous driving cycle and engine post drive/ afterun	=	TRUE TRUE	-		

Component /	Fault	Monitor Strategy	Primary Malfunction		Threshold		Secondary		Enable		Time	MIL
System	Code	Description	Criteria		Logic and Value		Parameters and		Conditions		Required	Illum.
							and basic enable conditions met and		see sheet enable tables	-		
							NO Pending or Confirmed DTCs:	=	see sheet inhibit tables	-		
		Detects implausible learned offset values.	Path 1:				(fail conditions	
		onset values.	learned throttle valve offset position at open or closed position	<	-20.00	%	engine temperature	>=	4.96	°C	exists for 0.005 s	
			or learned throttle valve offset position at open or closed position	>	20.00	%	and engine temperature	<=	130.06	°C	monitor runs once per drivingcycle	
			or Path 2:)				with 0.005 s	
			difference between the maximum and minimum positions learned at closed	>	30.00	%	and (rate whenever enable	
			position or				battery voltage	>=	8.00	V	conditions are met	
			Path 3: difference between the maximum and minimum positions learned at open position	>	30.00	%	and				are met	
							battery voltage	<=	30.00	V		
							Throttle Valve is not frozen consisting of:					
							Engine Coolant Temperature or if	>=	5.06	°C		
							Engine Coolant Temperature	<	5.06	°C		
							then Engine Coolant Temperature for	>	6.06	°C		
							time) and		10.00	sec		
							engine speed and	=	0	rpm		
							engine post drive/ afterun and	=	TRUE	-		
							basic enable conditions met		see sheet enable tables	-		
ntake Air Flow /alve Control Circuit 2 Low /oltage	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	В
					ground		for		2.00		whenever	
		l	l	l			time	>	3.00	sec	enable	

Component / System	Fault Code	Monitor Strategy Description	Primary Malfunction Criteria	Threshold Logic and Value	Secondary Parameters	Enable Conditions		Time Required	MIL Illum.
					and and Throttle Valve Actuator Solenoid Control Circuit and Open Load Diagnosis active and basic enable conditions met	= ACTIVE = FALSE = see sheet enable tables	-	conditions are met	
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	for time and and Throttle Valve Actuator Solenoid Control Circuit and Open Load Diagnosis active and basic enable conditions met	> 11.00 > 3.00 = ACTIVE = FALSE = see sheet enable tables	V sec	fail conditions exists for 3 s monitor runs with 0.005 s rate whenever enable conditions are met	В
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)	= 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 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)	= 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	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 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	Α
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	А
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	А

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	for time and NO Pending or Confirmed DTCs: and ignition on and basic enable conditions met:	> 3.00 sec = see sheet inhibit tables = TRUE - = see sheet enable tables	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: ≤ - 0.5 Ω impedance between signal and controller power	engine speed or engine post drive/ afterun) and NO Pending or Confirmed DTCs: for time and basic enable conditions met:	= 0 rpm = TRUE - = see sheet inhibit - tables > 2.00 sec = see sheet enable - tables	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	state machine rail pressure control equal coupled pressure control (rail pressure is controlled by metering unit and pressure control valve) and	= TRUE -	fail conditions exists for 2 s monitor runs with 0.02 s rate	A

Component /	Fault	Monitor Strategy	Primary Malfunction		Threshold		Secondary		Enable		Time	MIL
System	Code	Description	Criteria		Logic and Value		Parameters basic enable conditions met: and NO Pending or Confirmed DTCs:	=	conditions see sheet enable tables see sheet inhibit tables	-	whenever enable conditions are met	Illum
			rail pressure (see Look-Up-Table #72)	<	0 to 15000	kPa	state machine rail pressure control equal to pressure control valve and basic enable conditions met: and NO Pending or Confirmed DTCs:	= =	TRUE see sheet enable tables see sheet inhibit tables	-		
			rail pressure (see Look-Up-Table #70)	<	0 to 15000	kPa	state machine rail pressure control equal to metering unit control mode and basic enable conditions met: and NO Pending or Confirmed DTCs:	= =	TRUE see sheet enable tables see sheet inhibit tables	-		
			rail pressure	>	215000.00	kPa	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 NO Pending or Confirmed DTCs:	= =	TRUE see sheet enable tables see sheet inhibit tables	- - -	fail conditions exists for 1.01 s. monitor runs with 0.02 s rate whenever enable conditions are met	
			rail pressure	>	215000.00	kPa	state machine rail pressure control equal to pressure control valve and basic enable conditions met: and NO Pending or Confirmed DTCs:	= = =	TRUE see sheet enable tables see sheet inhibit tables	-		
			rail pressure	>	215000.00	kPa	state machine rail pressure control equal to metering unit control mode and	=	TRUE			

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: and NO Pending or Confirmed DTCs:	=	see sheet enable tables see sheet inhibit tables	-		
Cold Start Emission Reduction Control System	P1400	Detects problems resulting in improper delivery of fuel for catalyst light off and aftertreatment system preparation	Path 1: Pilot Injection 1 is prohibited due to exceeding the allowed number of injections (see general description for details) or Path 2: Pilot Injection 1 is prohibited due to collision (overlap) with Main Injection and Pilot Injection 2 (see general description	=	TRUE		engine operating mode which means: Cold Start Injection Monitoring and engine operating mode state transition and engine coolant temperature and engine coolant temperature	= = > <	exhaust warm-up ENABLED FALSE 16.00 71.00	state bit mask - - °C °C	fail conditions exists for 20 revs test performed continuously 0.01 s rate	В
			Path 3: Injector circuit or activation errors (setpoint deviation) occurred when the injector was being energized for Pilot or	=	TRUE	-						
			Path 4: Pilot Injection 2 is prohibited due to exceeding the allowed number of injections (see general description for details) or	=	TRUE	-						
			Path 5: Pilot Injection 2 is prohibited due to collision (overlap) with Pilot Injection 1 (see general description for details) or	=	TRUE							
			Path 6: Injector circuit or activation errors (setpoint deviation) occurred when the injector was being energized for Pilot	=	TRUE	-						

Component /	Fault	Monitor Strategy	Primary Malfunction	Threshold	Secondary	Enable	Time	MIL
System	Code	Description	Criteria	Logic and Value	Parameters	Conditions	Required	Illum.
			Path 7: Injector circuit or activation errors (setpoint deviation) occurred when the injector was being energized for Main	= 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 or	= TRUE -				
			Path 10: Injector circuit or activation errors (setpoint deviation) occurred when the injector was being energized for Post or	= TRUE -				
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 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

Component /	Fault	Monitor Strategy	Primary Malfunction		Thi	reshold		Secondary		Enable		Time	MIL
System	Code	Description	Criteria			and Value		Parameters		Conditions		Required	Illum.
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	>		0.25	g/rev	(fail conditions exists for 15 s monitor runs with 0.1s	В
								ambient pressure and	>	74.80	kPa	rate whenever	
								engine coolant temperature and	>	69.96	°C	enable conditions	
								EGR control is in closed loop for time	= >	TRUE 2.00	- sec	are met	
								and EGR control is active	=	TRUE	-		
								for time and	>	0.00	sec		
							exhaust gas system regeneration mode	=	FALSE	-			
							for time and	>	5.00	sec			
							Engine speed	>=	1300.00	rpm			
							Engine speed and	<=	2000.00	rpm			
							injection quantity injection quantity	>= <=	100.00 260.00	mm^3/rev mm^3/rev			
							and desired delta air mass flow desired delta air mass flow	> <	-0.10 -0.01	g/sec g/sec			
								and difference of the air mass	<	0	g/rev		
								and NO Pending or Confirmed DTCs:	=	see sheet inhibit tables	-		
								for time	>	0.20	sec		
								and basic enable conditions met:	=	see sheet enable tables	-		
Exhaust Gas	P140C	Detects a positive slow	average positive gradient of the air mass	>=		0.25	g/rev	(fail	В
Recirculation Slow Response- Decreasing Flow		response by comparing expected system dynamics with actual value	 calculated by accumulating control deviation (deviation between desired and actual value) over a sampling time and dividing result by sampling time 									conditions exists for 15 s monitor runs	
		dividing result by sampling time					ambient pressure	>	74.80	kPa	with 0.1s rate		
								and engine coolant temperature and	>	69.96	°C	whenever enable	
							EGR control is in closed loop for time	= >	TRUE 2.00	- sec	conditions are met		
								and EGR control is active	> =	TRUE	sec		
								for time	>	0.00	sec		
								and exhaust gas system regeneration mode	=	FALSE	-		
								for time	>	5.00	sec		

Component /	Fault	Monitor Strategy	Primary Malfunction	Threshold	Secondary		Enable		Time	MIL
System Exhaust Gas Recirculation	Code P140D	Diagnoses the EGR Valve high side driver circuit for	Criteria Voltage low during driver on state (indicates short to ground)	Logic and Value = Short to ground: - ≤ 0.5 Ω	Parameters and Engine speed Engine speed and injection quantity injection quantity and desired delta air mass flow desired delta air mass flow and difference of the air mass and NO Pending or Confirmed DTCs:) for time and basic enable conditions met:	>= <= >= <= >	1300.00 2000.00 100.00	rpm rpm rpm rpm rpm sylvariation rpm rpm rpm rpm sylvariation rpm sylvariation rpm sylvariation rpm rpm rpm rpm rpm rpm rpm rpm rpm rpm	Required fail conditions	Illum.
Recirculation (EGR) Motor Control Circuit 2 Low Voltage		nigh side driver circuit for circuit faults.	(indicates short to ground)	impedance between signal and controller ground	and 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 -	conditions exists for 3 s monitor runs with 0.005 s rate whenever enable conditions are met	
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)	= Short to power: ≤ - 0.5 Ω impedance between signal and controller power	and battery voltage for time and starter is active cranking for time and starter active cranking for time and	> > >	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.
- Cycloni		Beestiphen	Sinona	Logic una varia	basic enable conditions met:	= see sheet enable tables		rioquirou	mum.
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	= ACTIVE > 11.00 > 3.00	- V sec	fail conditions exists for 2 s monitor runs with 0.005 s rate whenever enable conditions are met	В
					and starter is active cranking for time and basic enable conditions met:	= FALSE > 3.00 = see sheet enable tables	sec -		
Exhaust Gas Recirculation (EGR) Motor 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	EGR Cooling Bypass 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	P1412	Diagnoses the EGR Cooler Bypass 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	EGR Cooling Bypass Solenoid Control Circuit and battery voltage	= ACTIVE	- V	fail conditions exists for 3 s monitor runs with 0.005 s rate whenever enable	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 time and starter is active cranking for time and basic enable conditions met:	> = > =	3.00 FALSE 3.00 see sheet enable tables	sec - sec -	conditions are met	
Exhaust Gas Recirculation (EGR) Motor Control Circuit Shorted	P1413	Electronic output driver circuitry determines circuit integrity on the EGR cooler bypass solenoid. 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.		EGR Cooling Bypass Solenoid Control Circuit and battery voltage for time and starter is active cranking for time and starter shade and basic enable conditions met:	> > =	ACTIVE 11.00 3.00 FALSE 3.00 see sheet enable tables	v sec	fail conditions exists for 3 s monitor runs with 0.005 s rate whenever enable conditions are met	В
Exhaust Gas Recirculation (EGR) Cooler Bypass Valve Current Performance	P1414	Electronic output driver circuitry determines circuit integrity on the EGR cooler bypass solenoid.	The ECM detects that the commanded state of the driver and the actual state of the control circuit do not match.	=	EGR Cooling Bypass Solenoid Control Circuit and 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 2 s monitor runs with 0.005 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.
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	>=	0.99	-	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)	=	0 to 1	-	fail conditions exists for 200 s monitor runs with 0.1 s rate whenever enable	В
		exhaust das temberature.	and				and				conditions	
			deviation from the temperature setpoint for inner control loop	>	maximum of (a) and (b)	-	release of the exhaust gas temperature outer loop control monitoring	=	TRUE	-	are met	
			(means					
			with (a) limitation of the temperature threshold and with (b) temperature threshold value for maximum deviation	=	100.00	°C	active operation mode of the inner control loop means	=	TRUE	-		
			maximum deviation				particulate filter regeneration and	=	TRUE	-		
							temperature before oxidation catalyst and temperature after particulate filter and	>	99.96	°C		
							temperature before oxidation catalyst and temperature after particulate filter or	<	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	<=	124.30	mph		
							Relative accelerator pedal position for	>	3.00	%		
							time and	>	1.00	sec		
							basic enable conditions met:	=	see sheet enable tables	-		
							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 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 das temperature.	commanded control value of the inner control loop of the 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 #24)		0 to 1		fail conditions exists for 200 s monitor runs with 0.1 s rate whenever enable conditions	B
			deviation from the temperature setpoint for inner control loop	<	minimum of (a) and (b)	-	release of the exhaust gas temperature outer loop control monitoring means	=	TRUE	-	are met	
			with (a) limitation of the temperature threshold and with (b) temperature threshold value for minimum deviation	=	-100.00 100	°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 and	>	99.96	°C		
							temperature before oxidation catalyst and temperature after particulate filter or	<	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	<=	124.30	mph		
							Relative accelerator pedal position for	>	3.00	%		
							time and	>	1.00	sec		
							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 test	А

Component / System	Fault Code	Monitor Strategy Description	Primary Malfunction Criteria		Threshold Logic and Value		Secondary Parameters		Enable Conditions		Time Required	MIL Illum.
			number of messages with rolling count / protection value errors detected with number of consecutive frames) or Path 2: (internal calculated checksum value for transmission is not equal the received value and number of fault results) or Path 3: time since last frame with valid protection value was received from transmission	>= = >	7.00 12.00 TRUE 15.00	- - sec	basic enable conditions met: and NO Pending or Confirmed DTCs:	=	see sheet enable tables see sheet inhibit tables	-	performed continuously 0.01 s	
Cruise Control Switch Data Integrity	P155A	Cruise switch status indicates "indeterminate" switch state for calibrated period of time.	Set Switch CAN message value "Indeterminate"	=	0		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 15.5s monitor runs with 0.005 s rate whenever enable conditions are met	Special C
Validation Error in messages received in Power Take Off frame	P1591	Rolling counter and protection value evaluation of the power take off frame	number of messages with validation errors in the last number of messages (sliding window) received PTO frames	>=	4.00	counts	ignition on for time and Bus off or error passive on CAN and basic enable conditions met: and NO Pending or Confirmed DTCs:	= = = = = =	3.00 FALSE see sheet enable tables see sheet inhibit tables	sec	Once the fault is reported there will be no debouncing of the DFC until ignition key state changes from 0 to 1. monitor runs with 0.005 s rate whenever enable	Special C

Component / System	Fault Code	Monitor Strategy Description	Primary Malfunction Criteria	Threshold Logic and Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
Throttle Sensor Communication Circuit Low Voltage	P16A0	Detects low voltage readings on the throttle valve sensor communication circuit, indicating an OOR low condition on the throttle valve sensor communication circuit	sensor communication circuit voltage	<= SENT_INFO_LIN V E_LOW	ignition on	= TRUE -	fail conditions exists for 5 s test performed continuously 0.005 s rate	В
					and basic enable conditions met and	= see sheet enable - tables		
					no sensor supply error	= TRUE -		
					NO Pending or Confirmed DTCs:	= see sheet inhibit - tables		
Throttle Sensor Communication Circuit High Voltage	P16A1	Detects high voltage readings on the throttle valve sensor communication circuit, indicating an OOR high condition on the throttle sensor communication circuit	sensor communication circuit voltage	>= SENT_INFO_LIN V E_HIGH	ignition on	= TRUE -	fail conditions exists for 5 s test performed continuously 0.005 s rate	В
		Circuit			and basic enable conditions met	= see sheet enable - tables		
					and no sensor supply error	= TRUE -		
					and NO Pending or Confirmed DTCs:	= see sheet inhibit - tables		
Throttle Sensor Communication Circuit Performance	P16A2	Detects an error in the throttle sensor communication.	throttle valve position sensor communication circuit disturbed due to noise or wrong CRC (cyclic redundancy check)	= TRUE -	ignition on	= TRUE -	fail conditions exists for 8 s test	В
					and basic enable conditions met and	= see sheet enable - tables	performed continuously 0.005 s rate	
					no sensor supply error	= TRUE -		
					NO Pending or Confirmed DTCs:	= see sheet enable - tables		
Cruise Control Switch Status	P1797	Driver Selected Mode Switch 1 State stuck switch	Driver Selected Mode switch status 1	= TRUE -	ignition on	= TRUE -	fail conditions	Special C
					and Frame timeout and	= FALSE -	exists for 20 s monitor runs with 0.005 s	

Component / System	Fault Code	Monitor Strategy Description	Primary Malfunction Criteria	Threshold Logic and Value	Secondary Parameters		Enable Conditions		Time Required	MIL Illum.
					Bus off or error passive on CAN and) and basic enable conditions met and NO Pending or Confirmed DTCs:	= =	FALSE see sheet enable tables see sheet inhibit tables	-	rate whenever	
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	> 0.38 factor	the particulate filter	<	3000.00	m^3/h	fail conditions exists for 0.1s monitor runs with 0.1s rate whenever enable	В
					Calculated exhaust-gas volume flow in the particulate filter and Temperature upstream of the particulate	>	600.00 799.96	m^3/h °C	conditions are met	
					filter and Temperature upstream of the particulate filter	>	499.96	°C		
					and Temperature downstream particulate filter	<	799.96	°C		
					and Temperature downstream particulate filter and	>	499.96	°C		
					Upstream and downstream particulate filter temperature difference and	<	300.00	°C		
					Upstream and downstream particulate filter temperature difference and	>	-300.00 799.96	°C		
					Simulated surface temperature, particulate filter and Simulated surface temperature,	>	799.96 499.96	°C		
					particulate filter and Basic enable conditions met	=	see sheet enable	-		
					NO Pending or Confirmed DTCs	=	tables see sheet inhibit tables	-		
Dadustast lais it is	DOOOE	This disposation should be	Number of times the FOM date to the	40.00			TDUE		fault aviati	Δ.
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 substated of Pressure control state (acutant Reductant Injector coil temperature Calculated Reductant Injector coil temperature Calculated Reductant Injector coil temperature Calculated Reductant Injector coil temperature Calculated Reductant Injector coil temperature (acutant Posing System pump relative pressure Reductant Dosing System pump relative pressure Reductant Dosing System pump relative pressure (ambient pressure ambient pressure =) Reductant Dosing System pump relative pressure Reductant Dosing System pump relative pressure (ambient pressure =) Reductant Dosing System pump relative pressure (ambient pressure =) Reductant Dosing System pump relative pressure (ambient pressure =) Reductant Dosing System pump relative (ambient pressure =) Reduct	Malfuno		1,	Thresho		Secondary Parameters		Enable Conditions		Time Required	MIL Illum.
Exhaust Gas Temperature Another Gacustal Reductant Injector coil temperature Another Cosing System pump relative Another Cosing System pump rela	niteria			zgio and	value	Reductant Dosing System Metering control substate of Pressure control state	=	TRUE	-	monitor runs with 100 ms rate	mulli.
Exhaust Gas Temperature (EGT) Sensor 2 Circuit, Indicating an OOR Circuit Low Voltage Exhaust Gas Temperature (EGT) Sensor 2 Circuit, Indicating an OOR Circuit Low Voltage Calculated Reductant Injector coil temperature Activity of tage Activity of tage							>=	-6.64	°C	whenever enable conditions	
Exhaust Gas Temperature (EGT) Sensor 2 Circuit Low Voltage Carried and Company of Confirmed DTCs Condition on the EGT 2 circuit, indicating an OOR low condition on the EGT 2 circuit and condition on the EGT 2 circuit indicating an OOR low						Calculated Reductant Injector coil	<=	99.96	°C	are met	
Exhaust Gas Temperature (EGT) Sensor 2 Circuit Low Voltage Vol								11.00 655.34	V V		
Exhaust Gas Temperature (EGT) Sensor 2 Circuit Low Voltage Voltage Voltage Exhaust Gas Temperature (EGT) Sensor 2 Circuit, indicating an OOR low condition on the EGT 2 circuit, indicating an OOR low condition on the EGT 2 circuit same as temperature downstream of oxidation same as tempera							>=	350.00	kPa		
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 same as temperature downstream of oxidation ambient pressure ambient pressure ambient pressure ambient pressure ambient pressure ambient pressure (NO Pending or Confirmed DTCs = see temperature > >						Reductant Dosing System pump relative	<=	650.00	kPa		
Exhaust Gas Temperature (EGT) Sensor 2 Circuit Low Voltage Exhaust Gas Temperature (EGT) Sensor 2 Circuit Low Voltage Exhaust Gas Temperature (EGT) Sensor 2 Circuit Low Voltage Exhaust Gas Temperature (EGT) Sensor 2 Circuit Sensor 2 Circuit Sensor 2 Circuit Sensor 3 Circuit Sensor 3 Circuit Sensor 4 Circuit Sensor 5 Circuit Sensor 5 Circuit Sensor 6 Circuit Sensor 8 Exhaust Gas Temperature sensor voltage downstream of oxidation on the EGT 2 Sensor 8 Exhaust Gas Temperature Sensor voltage downstream of oxidation on the EGT 2 Sensor 9 Circuit Sensor 9 Circui								0.00 130.00	kPa kPa		
Exhaust Gas Temperature (EGT) Sensor 2 Circuit Low Voltage Voltage Voltage Exhaust Gas Temperature (EGT) Sensor 2 Circuit, indicating an OOR low condition on the EGT 2 circuit tow Voltage Voltage Exhaust Gas Temperature (EGT) Sensor 2 Circuit, indicating an OOR low condition on the EGT 2 circuit tow Voltage Same as temperature downstream of oxidation Temperature (EGT) Sensor 2 Circuit Low Voltage Temperature (EGT) Sensor 2 Circuit, indicating an OOR low condition on the EGT 2 circuit tow Voltage Temperature (EGT) Sensor 2 Circuit, indicating an OOR low condition on the EGT 2 circuit Same as temperature downstream of oxidation Temperature) (\=	130.00	кга		
Exhaust Gas Temperature (EGT) Sensor 2 Circuit Low Voltage Voltage Voltage Exhaust Gas Temperature (EGT) Sensor 2 Circuit Low Voltage Voltage Exhaust Gas Temperature (EGT) Sensor 2 Circuit Low Voltage Voltage Exhaust Gas Temperature (EGT) Sensor 2 Circuit Low Voltage Temperature (EGT) Sensor 2 Circuit Low Voltage Temperature (EGT) Sensor 2 Circuit Same as temperature downstream of oxidation Temperature (EGT) Sensor 2 Circuit Same as temperature downstream of oxidation Temperature (EGT) Sensor 2 Circuit Same as temperature downstream of oxidation Temperature (EGT) Sensor 2 Circuit Same as temperature downstream of oxidation Temperature (EGT) Sensor 2 Circuit Same as temperature downstream of oxidation Temperature (EGT) Sensor 2 Circuit Same as Temperature Temperature (EGT) Sensor 2 Circuit (EGT) Sensor 2 Circuit (EGT) Sensor 2 Circuit (EGT) Sensor 2 Circuit (EGT) Sensor 2 Circuit (EGT) Sensor 2 Circuit (EGT) Sensor 2 Circuit (EGT) Sensor 2 Circuit (EGT) Sensor 2 Circuit (EGT) Sensor 2 Circuit (EGT) Sensor 3 Circuit (EGT) Sensor 4 Circuit (EGT) Sensor 5 Circuit (EGT) Sensor 6 Circuit (EGT) Sensor 7 Circuit (EGT) Sensor 7 Circuit (EGT) Sensor 8 Circuit (EGT) Sensor 9 Circuit (EGT) Sens						NO Pending or Confirmed DTCs	=	see sheet inhibit tables	-		
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 same as temperature downstream of oxidation < -50 °C basic enable conditions met: = see								0.00 -30.04	kPa °C		
Temperature (EGT) Sensor 2 Circuit, indicating an OOR low condition on the EGT 2 circuit Voltage readings on the EGT 2 circuit, indicating an OOR low condition on the EGT 2 circuit same as temperature downstream of oxidation - 50 C basic enable conditions met: = see						basic enable conditions met:	=	see sheet enable tables	-		
same as and temperature downstream of oxidation < -50 °C basic enable conditions met: = see		ream	<	0.65	V	ignition on	=	TRUE	-	fail conditions exists for 3 s monitor runs	А
	vnstream	tion	<	- 50	°C		=	see sheet enable tables	-	0.050 s rate whenever enable conditions are met	
Exhaust Gas P2033 Detects high voltage temperature sensor voltage downstream of oxidation catalyst		ream:	>	2.21	V	ignition on	=	TRUE	·	fail conditions exists for 3 s monitor runs 0.050 s rate	А

Component /	Fault	Monitor Strategy	Primary Malfunction		Threshold		Secondary		Enable		Time	MIL
System	Code	Description	Criteria		Logic and Value		Parameters		Conditions		Required	Illum.
			temperature downstream of oxidation catalyst	^	1000	°C	basic enable conditions met:	=	see sheet enable tables	-	enable conditions are met	
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	=	TRUE	-	ignition on	=	TRUE	-	fail conditions exists for 5 s test performed	В
			which means				and				continuously	
			(basic enable conditions met:	=	see sheet enable tables	-	1 s rate whenever	
			(measured tank level sensor 2 voltage after 1.5 ms since a test impulse was applied)	=	(0.0 to 1.7)	V	and				enable conditions	
			(measured tank level sensor 1 voltage after 1.5 ms since a test impulse was applied)) or	=	(1.71 to 3.56)	V	NO Pending or Confirmed DTCs:	=	see sheet inhibit tables	-	are met	
			((measured tank level sensor 3 voltage after 1.5 ms since a test	=	(0.0 to 1.7)	V						
			impulse was applied) (measured tank level sensor 1 voltage after 1.5 ms since a test impulse was applied)) or	=	(1.71 to 3.56)	V						
			((measured tank level sensor 3 voltage after 1.5 ms since a test	=	(0.0 to 1.7)	V						
			impulse was applied) (measured tank level sensor 2 voltage after 1.5 ms since a test impulse was applied))	=	1.71 to 3.56)	V						
Reductant Level Sensor 1 Circuit	P203C	CAN message: Discrete level sensor level 1 short to	Reductant Tank Level 1 Error Status	=	1	-	ignition on	=	TRUE		fail conditions	А
Low		ground error	(tank level sensor 1 voltage directly	<	(0.17)	V	battery voltage	>	8	V	exists for more than 3	
			measured after a test impulse was applied)				basic enable conditions met:	=	see sheet enable tables	-	sec. monitor runs with 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.
											conditions are met	
Reductant Level Sensor 1 Circuit High	P203D	Path 1: CAN message: Discrete level sensor 1 open load error Path 2: CAN message: Discrete level sensor 1 short to	Reductant Tank Level 1 Error Status (measured tank level sensor 1 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) Reductant Tank Level 1 Error Status	= > <	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
		battery error	(measured tank level sensor 1 voltage after 1.5 ms since a test impulse was applied)	>	(4.74)	٧	battery voltage basic enable conditions met:	> =	8 see sheet enable tables	V -		
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		for time and battery voltage for time and battery voltage for time and battery voltage for time and battery voltage for time and battery voltage for time and (battery voltage correction factor (please see the parameter definition and battery voltage correction factor (please see the parameter definition) for	> > < > > < > > < > > < > > < > > < > > < > > < > > < > > < > < > > < > > < > > < > > < > > < > > < > > < > > < > > < > > < > < > > < > > < > > < > > < > > < > > < > > < > > < > > < > > < > < > > > < > > < > > < > > < > > < > > < > > < > > < > > < > > < > > < > > > < > > < > > > < > > > < > > < > > > < > > > < > > > < > > > < > > > > < > > > < > > > > > < > > > > > < > > > > > > < >	1.00 11.00 3.00 655.34 3.00 0.00	sec V sec V sec factor	fail conditions exists for 3 s monitor runs with 10 msec 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.
					time and No Pending or confirmed DTCs and basic enable conditions met:	> =	3.00 See sheet inhibit tables see sheet enable tables	sec - -		
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	ECU initialization task in progress	=	FALSE		fail conditions exists for 2 s monitor runs with 10 msec rate whenever enable	A
					time and battery voltage for time and	> >	1.00 11.00 3.00	sec V sec	conditions are met	
					battery voltage for time and	>	655.34 3.00	V		
					(battery voltage correction factor (please see the parameter definition and battery voltage correction factor (please see the parameter definition	>	0.00 4.00	factor		
) for time and No Pending or confirmed DTCs and	> =	3.00 See sheet inhibit tables	sec -		
					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)	= Short to power: - ≤ 0.5 Ω impedance between signal and controller power	ECU initialization task in progress for time	=	FALSE	- sec	fail conditions exists for 3 s monitor runs with 10 msec rate whenever enable conditions	A

Component / System	Fault Code	Monitor Strategy Description	Primary Malfunction Criteria		hreshold c and Value	Secondary Parameters		Enable Conditions		Time Required	MIL Illum.
						and battery voltage	>	11.00	V	are met	
						for time	>	3.00	sec		
						and battery voltage for	<	655.34	V		
						time and	>	3.00	sec		
						battery voltage correction factor (please see the parameter definition and	>	0.00	factor		
						battery voltage correction factor (please see the parameter definition	<	4.00	factor		
						for time and	>	3.00	sec		
						No Pending or confirmed DTCs	=	See sheet inhibit tables	-		
						basic enable conditions met:	=	see sheet enable tables	-		
Reductant Pressure Sensor Circuit Range/Performanc e		Pressure difference between baro pressure and unfiltered Reductant pressure is compared to a threshold while the SCR system is in No Pressure Control state	Pressure sensor signal change during No Pressure Control state	>	50.00 kPa	Reductant filling state in the pressure line	<=	0.00	%	fail conditions exists for more than 0.6 sec monitor runs	A
						and status of SCR control state (please see the definition)	=	No Pressure Control	-	with 0.01 s rate whenever	
						and State of the defrosting check of pressure line (please see the definition)	=	TRUE	-	enable conditions are met	
						and		0.00	1.5		
						ambient pressure and ambient temperature	>	0.00 -30.04	kPa °C		
						and NO Pending or Confirmed DTCs:	=	see shet inhibit tables	-		
						and basic enable conditions met:	=	see sheet enable tables	-		
Reductant Pump Pressure Sensor Circuit Low		Measured reductant pump pressure sensor signal low voltage	Reductant pump pressure sensor signal	<	0.41 V	ignition on	=	TRUE	-	fail conditions exists for	А

Component / System	Fault Code	Monitor Strategy Description	Primary Malfunction Criteria		Threshold Logic and Value		Secondary Parameters		Enable Conditions		Time Required	MIL Illum.
Jystein	Code	Description	same as: reductant pump pressure	<	0	kPa	NO Pending or Confirmed DTCs: basic enable conditions met:	=	see sheet inhibit tables see sheet enable tables		more than 0.4 sec. monitor runs with 0.01 s rate whenever enable	mun.
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 status byte in substate PRESSUREBUILDUP Reductant Defrost check (please see the definition) ambient pressure ambient temperature number of pressure build-up attempts in pressure buildup and ventilation states Dwell time in Pressure Build up substate Urea heater release reason NO Pending or Confirmed DTCs: basic enable conditions met:	= = > > = > = = = = = = = = = = = = = =	PRESSURE BUILDUP RUNNING TRUE 0.00 -30.04 20 10.00 0.23 COMPONENT PROTECTION see sheet inhibit tables see sheet enable tables	- kPa °C counts sec	fail conditions exists for 1 event monitor runs with 0.1 s rate whenever enable conditions are met	A
Reductant Tank Temperature Sensor Performance	P205B	Path 1:									fail conditions exists for more than	В

Component /	Fault	Monitor Strategy	Primary Malfunction		Threshold		Secondary		Enable		Time	MIL
System	Code	Description			Logic and Value		Parameters		Conditions		Required	Illum.
			(a) - (b)	>	34.96	°C	ignition on	=	True	-	0.5 sec monitor runs with 0.01 s rate whenever enable conditions	
			where (a) Reductant tank temperature (b) fuel temperature	=	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:	= > <= = = =	No Pressure control 28800.00 6.00 6.96 measured parameter measured parameter see sheet inhibit	sec sec °C -	are met	
		Path 2: OR The temperature difference between reductant tank temperature and diesel fuel temperature are compared to a lower threshold after sufficient engine-off duration	(a) - (b)	<	-35.04	°C	basic enable conditions met: ignition on status of SCR control state (please see the definition)	= =	tables see sheet enable tables True No Pressure control	- \	fail conditions exists for more than 0.5 sec monitor runs with 0.01 s rate whenever enable	
			where (a) Reductant tank temperature (b) fuel temperature	=	measured parameter measured parameter	-	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:	> <= = = = = =	28800.00 6.00 6.96 measured parameter measured parameter measured parameter see sheet inhibit tables see sheet enable tables	sec sec °C	conditions are met	

Component / System	Fault Code	Monitor Strategy Description	Primary Malfunction Criteria		Threshold Logic and Value	2	Secondary Parameters		Enable Conditions		Time Required	MIL Illum.
System 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	<= >=	0x001 -55.0 1200	hex °C	basic enable conditions met: and No rolling count or protection value errors. (sliding window errors) in the	=	see sheet enable tables	-	fault exists for more than 3 sec; monitor runs at 1 s whenever enable conditions	A
	emperature reading of the Reductant	Corresponds to a voltage of	>=	5.0	V	CAN frame				are met		
Reductant Tank Temperature Sensor Circuit High	reading of the Reductant Tank Temperature Sensor		>	0x3FE 1022	hex dec	basic enable conditions met:	=	see sheet enable tables		fault exists for more than 6 sec; monitor runs at 1 s whenever enable conditions	В	
	Corresponds to a temperature of Corresponds to a resistance of Corresponds to a voltage of	>= <= <=	160.0 0.153	°C kOhm V	and No rolling count or protection value errors. (sliding window errors) in the CAN frame	=	TRUE	-	are met			
	Raw value of the CAN message for the Reductant Tank Temperature	=	0x3FF 1023	hex dec								
Secondary Fuel Sensor Performance	econdary Fuel ensor erformance 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)	<	100.00	miles	Engine Running	=	TRUE	•	fail conditions exists for 0.02 s monitor runs 0.02 s rate	В	
		with (a) total vehicle distance and with	=	measured parameter	-	for time	>=	60.00	sec	whenever enable conditions are met		
		(b) change in mileage	=	measured parameter	-	diagnosis tester and	=	FALSE	-			
		(c) - (d) with (c) maximum volume of fuel reached in secondary tank during driving cycle	=	4.00 measured parameter	-	fuel transfer pump active means (=	FALSE	-			
			and with (d) minimum volume of fuel reached in secondary tank during driving cycle	=	measured parameter	-	(filtered fuel volume in primary tank	>	1638.35	I		

Component / System	Fault Code	Monitor Strategy Description	Primary Malfunction Criteria	L	Threshold ogic and Value		Secondary Parameters		Enable Conditions		Time Required	MIL Illum.
			and filtered fuel volume in secondary tank	>	0.00	I	or filtered fuel volume in secondary tank for time and cumulative transfer pump on time in current ignition cycle) and fuel level zone 1 means (filtered fuel volume in primary tank and filtered fuel volume in secondary tank) and basic enable conditions met:	> >	0.00 0.00 137.40 0.00 see sheet enable tables see sheet inhibit tables	l sec sec		
SRC low for fuel level sensor of secondary tank	P2067	Detects low voltage readings in the fuel level secondary tank sensor circuit, indicating an OOR low condition on the fuel level sensor circuit	voltage of fuel level sensor 2	<	0.20	V	ignition on and basic enable conditions met:	=	TRUE see sheet enable tables		fail conditions exists for 24 s test performed continuously 0.2 s rate	В
SRC high for fuel level sensor of secondary tank	P2068	Detects high voltage readings in the fuel level secondary tank sensor circuit, indicating an OOR high condition on the fuel level sensor circuit	voltage of fuel level sensor 2	>	4.80	V	ignition on and basic enable conditions met:	=	TRUE see sheet enable tables		fail conditions exists for 24 s test performed continuously 0.2 ms rate	В

Component /	Fault	Monitor Strategy	Primary Malfunction		Threshold		Secondary		Enable		Time	MIL
System	Code	Description	Criteria		Logic and Value		Parameters		Conditions		Required	Illum
Exhaust Femperature 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 5 times monitor runs with 0.1 s	В
			or integrated heat quantity of exhaust gas temperature sensor 1	>	(a) / (b) * (c) / (d) * (e) * (g)	-	for time	>	1500.00	sec	rate whenever enable	
			with (a) exhaust gas mass flow and with	=	calculated parameter	-	and time since start	>	327.00	sec	conditions are met	
			(b) factor and with		3.60	g/sec	(exhaust-gas temperature sensor 1	>	-60.04	°C		
	and with (d) factor and with (e) correction factor for heat flk quantity depending on exhaust mass flow for temperature sen and with (f) minimum permissible tempe deviation for exhaust gas temp		=	1050.00	J/Kg/°C	exhaust-gas temperature sensor 1	<	1999.96	°C			
		and with (e) correction factor for heat flow	=	1000	kW/°C factor	and change in exhaust-gas temperature	<	7.00	°C			
		quantity depending on exhaust gas mass flow for temperature sensor 1				sensor 1 for						
		and with (f) minimum permissible temperature deviation for exhaust gas temperature sensor 1	=	-100.00	°C	time and	=	5.00	sec			
			and with (g) maximum permissible temperature deviation for exhaust gas	=	100.00	°C	engine operation point suitable for diagnostic (see Look-Up-Table #29) for	=255	0 to 255	-		
			temperature sensor 1				time and	>=	50.00	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		
							temperature sensor 1 further defined that heat quantity is integrated and monitor makes a decision at between the above calibration heat quantity range and integrator is reset (diagnostic multiple times per cycle)	<	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		

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: and NO Pending or Confirmed DTCs:	=	see sheet enable tables see sheet inhibit tables	-		
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 5 times monitor runs with 0.1 s	В
			or integrated heat quantity of exhaust gas temperature sensor 2	>	(a) / (b) * (c) / (d) * (e) * (g)	-	for time	>	1500.00	sec	rate whenever enable	
			(a) exhaust gas mass flow	=	calculated parameter	-	and time since start	>	327.00	sec	conditions are met	
			(b) factor and with (c) heat capacity	=	3.60 1050.00	g/sec J/Kg/°C	(exhaust-gas temperature sensor 2	>	-60.04	°C		
			and with (d) factor and with	=	1000	kW/°C	exhaust-gas temperature sensor 2) and	<	1999.96	°C		
			(e) correction factor for heat flow quantity depending on exhaust gas mass flow for temperature sensor 2	=	1.00	factor	change in exhaust-gas temperature sensor 2	<	7.00	°C		
	mass flow for temperature sensor 2 and with (f) minimum permissible temperature deviation for exhaust gas temperature sensor 2 and with (g) maximum permissible	(f) minimum permissible temperature deviation for exhaust gas temperature	=	-100.00	°C	for time and	=	5.00	sec			
		and with	=	100.00	°C	engine operation point suitable for diagnostic (see Look-Up-Table #29) for	=	0 to 255	-			
			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		
							heat quantity for exhaust gas temperature sensor 2 further defined that heat quantity is integrated and monitor makes a decision at between the above calibration heat quantity range and integrator is reset (diagnostic multiple times per cycle)	<	12.00	kJ		

Component /	Fault	Monitor Strategy	Primary Malfunction		Threshold		Secondary		Enable		Time	MIL
System	Code	Description	Criteria		Logic and Value		Parameters		Conditions		Required	Illum.
							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	-		
							and NO Pending or Confirmed DTCs:	=	see sheet inhibit tables	-		
					_			_	_	_		_
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	<	(a) / (b) * (c) / (d) * (e) * (f)	-	exhaust gas system regeneration mode	=	FALSE	-	fail conditions exists for 5 times monitor runs with 0.1 s	В
			or integrated heat quantity of exhaust gas temperature sensor 3 with	>	(a) / (b) * (c) / (d) * (e) * (g)	-	for time and	>	1500.00	sec	rate whenever enable	
			(a) exhaust gas mass flow	=	calculated parameter	-	time since start	>	327.00	sec	conditions are met	
			and with (b) factor and with	=	3.60	g/sec	and (exhaust-gas temperature sensor 3	>	-60.04	°C		
			(c) heat capacity and with	=	1050.00	J/Kg/°C	exhaust-gas temperature sensor 3	<	1999.96	°C		
			(d) factor and with (e) correction factor for heat flow quantity depending on exhaust gas mass flow for temperature sensor 3	=	1.00	kW/°C factor	and change in exhaust-gas temperature sensor 3	<	7.00	°C		
			and with (f) minimum permissible temperature deviation for exhaust gas temperature sensor 3	=	-100.00	°C	for time and	=	5.00	sec		
			and with (g) maximum permissible temperature deviation for exhaust gas temperature sensor 3	=	100.00	°C	engine operation point suitable for diagnostic (see Look-Up-Table #29) for	=	0 to 255	-		
			temperature sensor 3				time and	>=	0.05	sec		
							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 further defined that	<	12.00	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 is integrated and monitor makes a decision at between the above calibration heat quantity range and integrator is reset (diagnostic evaluates multiple times per cvcle)					
							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	-		
							and NO Pending or Confirmed DTCs:	=	see sheet inhibit tables	-		
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 threshold.	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 5 times monitor runs with 0.1 s	В
			or integrated heat quantity of exhaust gas temperature sensor 3	>	(a) / (b) * (c) / (d) * (e) * (g)	-	for time	>	1500.00	sec	rate whenever enable	
			with (a) exhaust gas mass flow	=	calculated parameter	-	and time since start	>	327.00	sec	conditions are met	
			and with (b) factor and with (c) heat capacity	=	3.60 1050.00	g/sec J/Kg/°C	and (exhaust-gas temperature sensor 4 and	>	-60.04	°C		
			and with (d) factor and with	=	1000	kW/°C	/	<	1999.96	°C		
			(e) correction factor for heat flow quantity depending on exhaust gas mass flow for temperature sensor 3	=	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 3 and with (g) maximum permissible temperature deviation for exhaust gas	=	100.00	°C	engine operation point suitable for diagnostic (see Look-Up-Table #29) for	=	0 to 255	-		
			temperature sensor 3				time and	>=	0.05	sec		
							change in modeled exhaust-gas temperature sensor 4 and	>	4.00	°C		

Component / System	Fault Code	Monitor Strategy Description	Primary Malfunction Criteria	Threshold Logic and Value	Secondary Parameters		Enable Conditions		Time Required	MIL Illum.
		2000.,p.1011	5	209.0 aa valao	(heat quantity for exhaust gas temperature sensor 4	>	10.00	kJ	rioquirou	
					and heat quantity for exhaust gas temperature sensor 4 further defined that heat quantity is integrated and monitor makes a decision at between the above calibration heat quantity range and integrator is reset (diagnostic multiple times per cycle)	<	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	-		
Reductant Pump Control Circuit	P208A	Diagnoses the Reductant Pump Motor low side driver circuit for circuit faults.	Voltage low during driver off state (indicates Open circuit)	= Open Circuit:≥ - 200 K Ω impedance between signal and controller ground	ECU Initialization task in progress	=	FALSE	-	fail conditions exists for 6.2 s monitor runs with 10 msec rate whenever	А
					for time and	>	1.00	sec	enable conditions are met	
					battery voltage for	>	11.00	V	a.o mot	
					time and battery voltage	> <	3.00 655.34	sec V		
					for time	>	3.00	sec		
					(battery voltage correction factor (please see the parameter definition	>	0.00	factor		
					and battery voltage correction factor (please see the parameter definition	<	4.00	factor		
					for time and	>	3.00	sec		

Component / System	Fault Code	Monitor Strategy Description	Primary Malfunction Criteria		Threshold gic and Value		Secondary Parameters		Enable Conditions		Time Required	MIL Illum.
System	Code	Description	Gineria	Lo	gio anu value		basic enable conditions met: and NO Pending or Confirmed DTCs:	=	see sheet enable tables see sheet inhibit tables	-	Required	mum.
			The ECM detects that the commanded state of the driver and the actual state of the control circuit do not match.				ECU Initialization task in progress	=	FALSE	-	fail conditions exists for	
							for time and	>	1.00	sec	0.01 s monitor runs with 0.01 sec	
							battery voltage for time	>	11.00 3.00	V sec	rate whenever	
							and battery voltage	<	655.34	V	enable conditions are met	
							for time and	>	3.00	sec	are met	
							(battery voltage correction factor (please see the parameter definition	>	0.00	factor		
							and battery voltage correction factor (please see the parameter definition	<	4.00	factor		
) for time	>	3.00	sec		
							and basic enable conditions met:	=	see sheet enable tables	-		
							and NO Pending or Confirmed DTCs:	=	see sheet inhibit tables	-		
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 0.3 s; monitor runs at 0.1 s whenever	A
			timer for functional acknowledgement of the reductant pump motor	<=	6.00	sec	Reductant Pump Warm-up status where the Warm-up state is defined as:	=	FALSE	-	enable conditions are met	
							(No Pressure control state (please see the definition)	=	TRUE	-		
							SCR Engine State (please see the definition)	=	ON	-		
							((Remaining defrosting time of the tank	>	0	sec		
							Remaining defrosting time of the tank	<=	120.00	sec		

Component / System	Fault Code	Monitor Strategy Description	Primary Malfunction Criteria	Threshold Logic and Value	Secondary Parameters		Enable Conditions		Time Required	MIL Illum.
					OR Reductant Defrost check (please see the definition)	=	TRUE	-		
					(ambient temperature	>	-30.04	°C		
) 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	ECU Initialization task in progress	=	FALSE		fail conditions exists for 3 s monitor runs with 10 msec rate whenever	A
					for time	>	1.00	sec	enable conditions	
					and battery voltage for	>	11.00	V	are met	
					time and	>	3.00	sec		
					battery voltage for	<	655.34	V		
					time and	>	3.00	sec		
					battery voltage correction factor (please see the parameter definition and	>	0.00	factor		
					battery voltage correction factor (please see the parameter definition	<	4.00	factor		
					for time and	>	3.00	sec		
					basic enable conditions met:	=	see sheet enable tables	-		
					and NO Pending or Confirmed DTCs:	=	see sheet inhibit tables	-		
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	ECU Initialization task in progress for time	= >	FALSE	- sec	fail conditions exists for 3 s monitor runs with 10 msec rate whenever	A
					and battery voltage	>	11.00	V	enable conditions	

Component / System	Fault Code	Monitor Strategy Description	Primary Malfunction Criteria	Threshold Logic and Value	Secondary Parameters		Enable Conditions		Time Required	MIL Illum.
,		·			for				are met	
					time and	>	3.00	sec		
					battery voltage for	<	655.34	V		
					time	>	3.00	sec		
					and (
					battery voltage correction factor (please see the parameter definition	>	0.00	factor		
					and					
					battery voltage correction factor (please see the parameter definition	<	4.00	factor		
) for					
					time	>	3.00	sec		
					and basic enable conditions met:	=	see sheet enable	_		
					and		tables			
					NO Pending or Confirmed DTCs:	=	see sheet inhibit	-		
							tables			
	_							_		
Reductant Purge	P20A1	This diagnostic checks the	Difference between reductant pump	< 50.00 kPa	(fault exists	А
Valve Performance		Reductant Purge valve performance during	pressure at beginning and end of pressure reduction state						for more than 1 event	
		operation by detecting a lack	,						monitor runs	
		of reduction of the reductant pressure							with 100 ms rate	
					Reductant Dosing System state pressure reduction	=	TRUE	-	whenever enable	
					Reductant Dosing System pump relative	>=	350.00	kPa	conditions	
					pressure to initiate test)				are met	
					AND					
					Time attempting to reduce dosing	>=	5.00	sec		
					pressure AND					
					Deductant Design System nump relative		50.00	kPa		
					Reductant Dosing System pump relative pressure after attempting to reduce	>	50.00	кга		
					pressure)					
					OR		50.00	L-D-		
					Reductant Dosing System pump relative pressure after attempting to reduce	<=	50.00	kPa		
					pressure					
					(
					ambient pressure ambient temperature	> >	0.00 -100.04	kPa °C		
) NO Pending or Confirmed DTCs	=	see sheet inhibit	_		
							tables			
		l l		I	basic enable conditions met:	=	see sheet enable	-	1	

Component /	Fault	Monitor Strategy	Primary Malfunction	Threshold	Secondary		Enable		Time	MIL
System	Code	Description	Criteria	Logic and Value	Parameters		Conditions		Required	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 ground: - ≤ 0.5 Ω impedance between signal and controller ground	ECU Initialization task in progress	П	FALSE	-	fail conditions exists for 2 s monitor runs with 10 msec rate whenever	A
					for time and	>	1.00	sec V	enable conditions are met	
					battery voltage for time	>	11.00 3.00	sec		
					and battery voltage	<	655.34	V		
					for time and	>	3.00	sec		
				(battery voltage correction factor (please see the parameter definition	>	0.00	factor			
				battery voltage correction factor (please see the parameter definition	<	4.00	factor			
					for time and	>	3.00	sec		
				basic enable conditions met:	=	see sheet enable tables	-			
					and NO Pending or Confirmed DTCs:	=	see sheet inhibit tables	-		
							_	_		-
Reductant Purge Valve Control Circuit High Voltage	P20A3	0A3 Diagnoses the Reductant Purge Valve low side driver circuit for circuit faults.	Purge Valve low side driver (indicates short to power)	= Short to power: - ≤ 0.5 Ω impedance between signal and controller power	ECU Initialization task in progress	=	FALSE	-	fail conditions exists for 3 s monitor runs with 10 msec rate whenever enable	А
					time and	>	1.00	sec	conditions	
					battery voltage for	>	11.00	V	are met	
					time and	>	3.00	sec		
					battery voltage for	<	655.34	V		
					time and (>	3.00	sec		
					battery voltage correction factor (please see the parameter definition	>	0.00	factor		

Component / System	Fault Code	Monitor Strategy Description	Primary Malfunction Criteria		Threshold gic and Value		Secondary Parameters		Enable Conditions		Time Required	MIL Illum.
- Cyclonii		2000.p.io.ii	0.10.10	00	gio una value		and battery voltage correction factor (please see the parameter definition	<	4.00	factor	rioquiiou	
							for time and	>	3.00	sec		
							basic enable conditions met:	=	see sheet enable tables	-		
							NO Pending or Confirmed DTCs:	=	see sheet inhibit tables	-		
Exhaust	P20CB	Electronic output driver	The ECM detects that the commanded				engine pre drive	=	FALSE		fail	В
Aftertreatment Fuel Injector Control Circuit		circuitry determines circuit integrity on the exhaust aftertreatment fuel injector control circuit.	state of the driver and the actual state of the control circuit do not match.				for				conditions exists for more than 30 events	
							time battery voltage	> >	1.00 11.00	sec V	monitor runs with 0.1 s rate	
							for time and	>	3.00	sec	whenever enable	
							starter is active cranking for	=	FALSE	-	conditions are met	
							time and	>	3.00	sec		
							basic enable conditions met:	=	see sheet enable tables	-		
							basic enable conditions met:	=	see sheet enable tables	-		
					_	_			_			
Exhaust Aftertreatment Fuel Injector	P20CC	Detects high exhaust temperatures in order to protect the engine	oxidation catalyst downstream temperature - oxidation catalyst upstream temperature	>	300	°C	(fail conditions exists for	А
Performance			OR				oxidation catalyst upstream temperature change	<	50.00	°C	180 s test	
			particulate filter downstream temperature - SCR downstream temperature	>	300	°C	for time	>	10.00	sec	performed continuously 0.1 s rate	
) AND (
							time since last successful regeneration) AND	>	900.00	sec		
							((Normal Mode (Particulate Filter Regeneration not active) OR	=	TRUE	-		
							Exhaust Gas Temperature (Active) Management Mode	=	TRUE	-		

Component / System	Fault Code	Monitor Strategy Description	Primary Malfunction Criteria	Threshold Logic and Value	Secondary Parameters		Enable Conditions		Time Required	MIL Illum.
System	Code	Description	Gilleria	Logic and value) for time) AND	>	300.00	sec	Required	mum.
					(time since the end of the last tip cleaning request of the Exhaust Aftertreatment Fuel Injector HCI tip cleaning is performed to prevent the nozzle of the HCI from sticking shut or building deposits that may effect its flow. During tip cleaning, the injector is operating at a higher injection frequency (100 Hz) with 30% duty cycle for a duration less than two seconds. HCI tip cleaning is requested at 30%, 50% and 75% of soot loading level on the DPF when the following conditions are also met. HCI injector is not currently activated	>	300.00 TRUE	sec		
					SCR Catalyst downstream temperature SCR Catalyst downstream temperature	= <	499.96 179.96	- ℃ ℃		
					DOC Upstream Temperature Engine Speed Vehicle Speed Exhaust Mass Flow	> > > >	219.96 500 3.10 72.00	°C rpm mph g/sec		
					AND basic enable conditions met:	=	see sheet enable tables	-		
					NO Pending or Confirmed DTCs:		see sheet inhibit tables	-		
						_		_		
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	=	FALSE	-	fail conditions exists for more than 30 events monitor runs	В
					time	>	1.00	sec	with 0.1 s	
					battery voltage for	>	11.00	V	rate whenever	
[time	>	3.00	sec	enable	
					and starter is active cranking for	=	FALSE	-	conditions are met	
					time	>	3.00	sec		
					and basic enable conditions met:	=	see sheet enable tables	-		
1 !					Diesel dosing valve: fuel injection	=	INACTIVE	-		

Component / System	Fault Code	Monitor Strategy Description	Primary Malfunction Criteria		Threshold Logic and Value		Secondary Parameters		Enable Conditions		Time Required	MIL Illum.
							and basic enable conditions met:	=	see sheet enable tables	-		
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	=	FALSE	-	fail conditions exists for more than 30 events monitor runs with 0.1 s	В
							time battery voltage for time and starter is active cranking for time	> > = >	1.00 11.00 3.00 FALSE 3.00	sec V sec - sec	whenever enable conditions are met	
							and basic enable conditions met: and basic enable conditions met:	=	see sheet enable tables see sheet enable tables	-		
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:				minimum engine-off time	>=	28800.00	sec	fail conditions exists for 0.050 s monitor runs with 0.050 s rate	В
		orgine on courtino	(a) - (b) (see Look-Up-Table #30) with (a) captured oxidation catalyst downstream temperature at start	> =	100 to 999 measured parameter	°C -	and ambient temperature and	>	-60.04	°C	whenever enable conditions are met	
			and with (b) captured oxidation catalyst upstream temperature at start as reference temperature	=	measured parameter	-	Engine Running (see parameter definition) for	=	TRUE	-		
			or Path 2:				time and engine post drive/ afterun	> =	0.00 FALSE	sec -		
			(a) - (b) (see Look-Up-Table #30) with (a) captured oxidation catalyst downstream temperature at start and with	<= =	100 to 999 measured parameter	°C	and diagnostic performed in current do and basic enable conditions met:	=	FALSE 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.
			(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 upstream temperature at start as reference temperature at start as reference temperature and status of block heater	= = =	measured parameter 30 to 999 measured parameter measured parameter FALSE	°C -	and NO Pending or Confirmed DTCs:	=	see sheet inhibit tables			
Reductant Pressure Too Low	P20E8	Compare Reductant tank pressure with lower thresholds under metering control	Reductant Pump Module Pressure	V	400.00	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 more than 60.0 s monitor runs with 0.1 s rate whenever enable conditions are met	A
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	= = > >= >= >=	Metering control Running 1.00 0.00 -30.04	- sec kPa °C	fail conditions exists for more than 10 s 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 Value		Secondary Parameters		Enable Conditions		Time Required	MIL Illum.
System	Code	Description	Criteria		Logic and value)	NO Pending or Confirmed DTCs:	=	see inhibit tables	-	Kequired	mum.
							basic enable conditions met:	=	see sheet enable tables	-		
		Path 2: Or Reductant tank pressure high	Unfiltered Reductant Pump Module Pressure	>=	795.00	kPa	ambient pressure ambient temperature basic enable conditions met:	> =	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	
SCR Nox Catalyst Efficiency Below	P20EE	Compare EWMA filtered NOx conversion efficiency of	EWMA filtered delta SCR catalyst efficiency of (a) - (b)	<	0.00	factor	NO Pending or Confirmed DTCs:	=	see sheet inhibit tables	-	fail conditions	A
Threshold Bank 1		SCR catalyst with a threshold value	where (a) measured SCR catalyst efficiency	=	calculated	factor	for time	>	300.00	sec	exists for more than 1 event monitor runs	
			(b) offset-corrected modeled SCR catalyst efficiency:	=	parameter calculated parameter	factor	Status of NOx signal of upstream NOx sensor (please see the definition)	=	TRUE	-	with 0.01 s rate whenever	
			(b) = ((c) * (d) * (e)) + (f) where (c) SCR modeled NOx conversion efficiency		calculated parameter	factor	for time Status of NOx signal of downstream NOx sensor (please see the definition)	> =	60.00 TRUE	sec -	enable conditions are met	
			(d) correction map dependent on SCR catalyst temperature and upstream NOx mass flow (e) correction map dependent on SCR		1.00	factor	for time	>	60.00	sec		
			catalyst temperature and exhaust mass flow (f) Offset threshold (see Look-Up-Table		-0.3 to -0.1	factor						
			#100)				Release of dosing strategy (please see the definition) for time	= >=	TRUE (a) + (b)	- sec		
							(a) Turn on delay time 1 of status metering strategy (b) Turn on delay time 2 of status	/-	330.00	sec		
							metering strategy)					
							Status for disabling SCR Efficiency monitoring following an SCR Adaptation completion (please see the definition)	=	FALSE	-		
							for time (a) Debounce time after pre controlled dosing over	> >	(a) + (b) 0.50	sec sec		

Component /	Fault	Monitor Strategy	Primary Malfunction	Threshold	Secondary		Enable		Time	MIL
System	Code	Description	Criteria	Logic and Value	Parameters		Conditions		Required	Illum.
,					(b) delay time the status of disabling	>	80.00	sec		
					SCR Efficiency monitoring		00.00	000		
					or					
					integrated upstream NOx	>=	3276.70	g		
)			<u>.</u>		
					(
					Status of pre controlled dosing (please	=	FALSE	-		
					see the definition)					
					for time	>	(a) + (b)			
					(a) Debounce time after pre controlled	=	0.50	sec		
					dosing off					
					(b) Delay time after pre controlled dosing	=	300.00	sec		
					off					
					or					
					integrated upstream NOx	>=	3276.70	g		
)					
					(
					Decrease of Reductant load level	=	FALSE	-		
					(please see the definition)					
					for time	>	300.00	sec		
)					
					(
					Average slow filtered NOx mass flow	<=	0.20	g/sec		
					upstream SCR					
					for time	>	0.50	sec		
					Monitor disable time based on average	>	0 to 120	sec		
					NOx mass flow and the time (see Look-					
					Up-Table #88)					
)					
					for the continue of the		F 00			
					for time with	>	5.00	sec		
					Delta SCR temperature (see Look-Up-	<	59.96 to 64.96	°C		
					Table #85)	_	39.90 10 04.90	C		
					Delta SCR temperature (see Look-Up-		-50.04 to -0.04	°C		
					Table #101)	>	-30.04 10 -0.04	C		
					Delta SCR temperature	<=	524.96	°C		
					Delta SCR temperature	>=	199.96	°C		
					Initialization time of temperature gradient	>=	2.50	sec		
					calculation	-	2.00	300		
)					
					or or					
					Delta SCR temperature	<	229.96	°C		
					or	•		-		
					Delta SCR temperature	>	499.96	°C		
					for time	>	10.00	sec		
)					
					1					
					normalized HC load in SCR catalyst	>	21.00	-		
)					
					1					
					ambient pressure	>=	74.80	kPa		
					ambient temperature	>=	-7.04	°C		
)					
					(1	

Component /	Fault	Monitor Strategy	Primary Malfunction	Threshold	Secondary		Enable		Time	MIL
System	Code	Description	Criteria	Logic and Value	Parameters		Conditions		Required	Illum.
					Stuck reductant dosing valve fault was	=	FALSE	-		
					healed					
					last particulate filter regeneration	=	TRUE	-		
					successful					
)					
					(
					State of the NH3 slip detection	=	FALSE	-		
					integrated upstream NOx during SCR	>=	20.00	g		
					adaptation plausibility check active		EAL OF			
					Status of the SCR adaptation plausibility	=	FALSE	-		
					check active (please see the definition)					
					for time	>	600.00	sec		
					ioi time	_	000.00	Sec		
					SCR NOx Catalyst Efficiency Below	=	FALSE	_		
					Threshold Bank 1 was performed this	_	TALOL			
					drive cycle					
					drive cycle					
					engine speed	>=	1000.00	rpm		
					engine speed	<=	3000.00	rpm		
					for time	>	0.00	sec		
					SCR estimated current Reductant load	>=	0.05 to 0.75	g		
					(see Look-Up-Table #77)			Ü		
					SCR estimated current Reductant load	<=	2 to 2.2	g		
					(see Look-Up-Table #76)					
					Difference between nominal and	>=	-0.5 to -0.1	g		
					estimated Reductant (see Look-Up-					
					Table #79)					
					Difference between nominal and	<=	0.15 to 0.25	g		
					estimated Reductant (see Look-Up-					
					Table #78)					
					SCR in Pre-Control State (please see	=	FALSE	-		
					the definition)					
					(
					Disable after SCR adaptation	=	FALSE	-		
					for time	>	600.00	sec		
)					
					(()		74.00	00		
					(a) - (b)	<=	74.96	°C		
					for time	>	0.00	sec		
)					
					or /					
					(a) - (b)	>=	14.96	°C		
					(a) - (b) for time	>= >	0.00	sec		
					(a) upstream SCR catalyst temperature		0.00	300		
					(a) apolicam con calalyst temperature					
					(b) downstream SCR catalyst					
					temperature					
					\)					
					Integrated NOx mass upstream SCR	>	1.00	g		
					for time	>	0.00	sec		
					ioi time	-	0.00	000		
					Average SCR Temperature	<=	399.96	°C		
					Average SCR Temperature	>=	-3549.94	°C		
			1	1						
					Downstream SCR catalyst temperature	>=	3003.56	°C		

System Code Description Criteria Logic and Value Parameters Conditions Required Blum	Component /	Fault	Monitor Strategy	Primary Malfunction	Threshold	Secondary		Enable		Time	MIL
Downsteam SCR catalyst emporation — — S591.94 °C Filtered and delayed updates NO. trans — — — — — — — — — — — — — — — — — — —					Logic and Value			Conditions		Required	Illum.
Filtered and delayed upstream No. no. combined in the combined of the combined	.,						<=		°C		
Filtered and delayed uptilerant NOx race * 175.00 ppm Filtered and delayed NOx race emission * 1.75 ppm Filtered and delayed NOx race emission * 1.75 ppm Filtered and delayed NOx race emission * 1.75 ppm Filtered and delayed NOx race emission * 1.75 ppm Filtered and gain mass flow * 1.75 ppm Filtered emission gain mass flow * 1.75 ppm Filtered emission gain mass flow * 1.75 ppm Filtered emission gain mass flow * 1.75 ppm Filtered emission gain mass flow * 1.75 ppm Filtered emission gain mass flow * 1.75 ppm Filtered emission gain mass flow * 1.75 ppm Filtered emission gain mass flow * 1.75 ppm Filtered emission gain mass flow * 1.75 ppm Filtered emission gain mass flow * 1.75 ppm Filtered emission gain mass flow * 1.75 ppm Filtered emission gain gain gain gain gain gain gain gai						zomonoum con catalyot tomporatare		00 10.0 1	Ü		
Filtered and delayed uptilerant NOx race * 175.00 ppm Filtered and delayed NOx race emission * 1.75 ppm Filtered and delayed NOx race emission * 1.75 ppm Filtered and delayed NOx race emission * 1.75 ppm Filtered and delayed NOx race emission * 1.75 ppm Filtered and gain mass flow * 1.75 ppm Filtered emission gain mass flow * 1.75 ppm Filtered emission gain mass flow * 1.75 ppm Filtered emission gain mass flow * 1.75 ppm Filtered emission gain mass flow * 1.75 ppm Filtered emission gain mass flow * 1.75 ppm Filtered emission gain mass flow * 1.75 ppm Filtered emission gain mass flow * 1.75 ppm Filtered emission gain mass flow * 1.75 ppm Filtered emission gain mass flow * 1.75 ppm Filtered emission gain mass flow * 1.75 ppm Filtered emission gain gain gain gain gain gain gain gai						Filtered and delayed upstream NOx raw	>=	750.00	ppm		
Filtred and odaleyed to displayed to mission Filtred and odaleyed to mission Filtred and odaleyed to mission Filtred and odaleyed to mission mass flow upstream of SCR Filtred and odaleyed NOz raw emission mass flow upstream of SCR Filtred and odaleyed to mission mass flow upstream of SCR Filtred and odaleyed to mission mass flow upstream of SCR Filtred and odaleyed to mission MAP for valid origine operation prioris for SCR efficiency monitoring flow blood Table wild, Ta							-	700.00	PP		
Filtered and delayed NOx raw emission Filtered and delayed NOx raw emission Filtered and delayed NOx raw emission Filtered and delayed NOx raw emission Filtered emission are store Filtered emission								175.00	nnm		
Filtered and designed Not recommended. Filtered and support of the commended of the commen							~-	175.00	ppiii		
mass flow upstream of SCR Filtered and total Not are we mission Filtered and total parts are store Filtered exhaust parts are flow Filtered exhaust parts are flow May Por vaula engine operation points for SCR ethorison prints for the parts are formed to the parts are fo								0.47	-/		
Filtred and delayed NDC raw emission man fallow upsterem in SCR Filtred derivating as mass low. Filtred derivating as mass low. Filtred derivating as mass low. Filtred derivating as mass low. Filtred derivating as mass low. Filtred derivating as mass low. Filtred derivating as mass low. Filtred derivating as mass low. Filtred derivating as mass low. Filtred derivating as mass low. Filtred derivating as mass low. Filtred derivating as mass low. Filtred derivating as mass low. Filtred derivating as mass low. Filtred derivating as mass low. Filtred derivating as mass low. Filtred delivers l							<=	0.17	g/sec		
mass flow upstream of SCR Filtered evaluating assess to view of Filtered evaluating assess to view of Filtered evaluating assess to view of Filtered evaluating assess to view of view									,		
Filtured durbauts gas mass flow >= 28.6 1.3 g/sec Filtured durbauts gas mass flow >= 910.0 30 g/sec Filtured durbauts gas mass flow >= 910.0 30 g/sec Filture fi							>=	0.01	g/sec		
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Component / System	Fault Code	Monitor Strategy Description	Primary Malfunction Criteria	Lo	Threshold ogic and Value	е	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	>=	4.75 125.6	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 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	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

Component / System	Fault Code	Monitor Strategy Description	Primary Malfunction Criteria		Threshold Logic and Value		Secondary Parameters		Enable Conditions		Time Required	MIL Illum.
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 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	А
Accelerator Pedal Position (APP) Sensor 1-2 Correlation	P2138	Detects in range pedal positions errors by comparing the voltages on each of the pedal position sensors.	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)	> = = = =	measured parameter 2.00 450.00 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

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 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: ≤ 0.5 Ω impedance between signal and controller power Open Circuit: ≥ 200 K Ω impedance between ECU pin and load signal and controller 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
					and fuel system status	= no fuel cut off -		
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)	= Short to power: ≤ - 0.5 Ω impedance between signal and controller power Open Circuit: ≥ 200 K Ω impedance between ECU pin and load signal and controller ground Short to ground: ≤ 0.5 Ω 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 Logic and Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
Injector Positive Voltage Control Circuit Group 3	P2152		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 pin and load signal and controller 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
					and fuel system status	= no fuel cut off -		

Component /	Fault	Monitor Strategy	Primary Malfunction	Threshold		Secondary		Enable		Time	MIL
System Injector Positive Voltage Control Circuit Group 4	Code P2155	Description ECM Electronic out-put driver circuitry determines if faults (open/short/no load) exist on injector charging bank #4.	Criteria Voltage high during driver off state (indicates short to power, short to ground, or open circuit)	Logic and Value Short to power: ≤ 0.5 Ω impedance between signal and controller power Open Circuit: ≥ 200 K Ω impedance between ECU pin and load signal and controller ground Short to ground: ≤ 0.5 Ω impedance between signal and controller ground	-	Parameters Engine Running (see parameter definition) and fuel system status	=	Conditions TRUE no fuel cut off		Required fail conditions exists for more than 0.04 s monitor runs with 0.01 s rate whenever enable conditions are met	A A
Reductant tank heater short circuit		Compare the maximum measured conductance of a tank heater against the threshold	maximum conductance of tank heater (a) upper threshold (b) factor for tolerances	>= (a) * (b) with = 0.98 = 1.00		ignition switch on urea tank heater powerstage on battery voltage battery voltage engine off time urea tank temperature (conductance of the urea tank heater is steady or falling maximum counter or heater activation time) basic enable conditions met: NO Pending or Confirmed DTCs:	=	TRUE 11.00 100.00 5400.00 41.96 TRUE 1000.00 600.00 see sheet enable tables see sheet inhibit tables	V V sec °C - count sec	fail conditions exists for 0.001 s monitor runs once per trip with 0.001 s rate whenever enable conditions	В

Component /	Fault	Monitor Strategy	Primary Malfunction		Threshold		Secondary		Enable		Time	MIL
Component / System Intake Air Temp Sensor 1 / 2 Correlation	Fault Code P2199	Monitor Strategy Description Detects biased Humidity Temperature Sensor (IAT #1) or MAF Intake Air Temperature Sensor (IAT #2) by comparing the measured temperatures at start.	Criteria Path 1: (a) - (b) (see Look-Up-Table #2) where (a) captured intake air temperature at start and (b) captured humidity temperature at start or Path 2: ((a) - (b) (see Look-Up-Table #2) where (a) captured intake air temperature at start and (b) captured intake air temperature at start and (b) captured humidity temperature at start and	> = = = = = = = = = = = = = = = = = = =	100 to 999 measured parameter 100 to 999 measured parameter 100 to 999 measured parameter measured parameter	°C	and ambient air 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:	>= > = = = =	Enable Conditions 28800.00 -60.04 TRUE 0.00 FALSE FALSE see sheet enable tables see sheet inhibit tables	sec °C - sec	Time Required fail conditions exists for 0.1 s monitor runs once per trip with 0.1 s rate whenever enable conditions are met	MIL Illum. B
			(a) - (b) (see Look-Up-Table #5) where (a) captured intake air temperature at start and (b) captured humidity temperature at start and	> = =	20 to 999 measured parameter measured parameter	°C - -						
			status of block heater (see parameter definition) or status of sun-load detection (see parameter definition))	=	FALSE FALSE	-						
Reductant Level Sensor 2 Circuit Low	P21AA	CAN message: Discrete level sensor level 2 short to ground error	Reductant Tank Level 2 Error Status (tank level sensor 2 voltage directly measured after a test impulse was applied)	= <	1 (0.17)	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	A
Reductant Level Sensor 2 Circuit High	P21AB	Path 1:									are met	

Component /	Fault	Monitor Strategy	Primary Malfunction		Threshold		Secondary		Enable		Time	MIL
System	Code	Description	Criteria		Logic and Value	•	Parameters		Conditions		Required	Illum.
		CAN message: Discrete level sensor 2 open load error	Reductant Tank Level 2 Error Status	=	3	-	ignition on	=	TRUE	-		
		error	(measured tank level sensor 2 voltage after 1.5 ms since a test impulse was	>	(3.56)	V	battery voltage	>	8	V		
			applied) (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 applied)	>	(4.74)	V	battery voltage	>	8	V		
							basic enable conditions met:	=	see sheet enable tables	-		
ensor 3 Circuit	P21AF	CAN message: Discrete level sensor level 3 short to	Reductant Tank Level 3 Error Status	=	1		ignition on	=	TRUE		fail conditions	А
Low		ground error	(tank level sensor 3 voltage directly measured after a test impulse was	<	(0.17)	٧	battery voltage	>	8	V	exists for more than 3 sec	
			applied)				basic enable conditions met:	=	see sheet enable tables	-	monitor runs with 1 s rate whenever enable conditions	
Reductant Level Sensor 3 Circuit	P21B0	Path 1:									are met	
High		CAN message: Discrete level sensor 3 open load	Reductant Tank Level 3 Error Status	=	3	-	ignition on	=	TRUE	-		
		error	(measured tank level sensor 3 voltage after 1.5 ms since a test impulse was applied)	>	(3.56)	V	battery voltage	>	8	V		
			(measured tank level sensor 3 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 3 short to	Reductant Tank Level 3 Error Status	=	2	-	ignition on	=	TRUE	-		
		battery error	(measured tank level sensor 3 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	-		

Component /	Fault	Monitor Strategy	Primary Malfunction			hreshold		Secondary		Enable		Time	MIL
System	Code	Description	Criteria		Logi	c and Valu	е	Parameters Parameters Parameters		Conditions		Required	Illum.
												\Box	
Reductant tank leater open circuit	P21DD	Compare the maximum measured conductance of a tank heater against the	maximum conductance of tank heater	<=	•	(a) * (b)	1/Ohm	ignition switch on	=	TRUE	-	fail conditions exists for	В
		threshold	(a) lower threshold (b) factor for tolerances	= =	with	0.28 1.00		urea tank heater powerstage on battery voltage battery voltage engine off time urea tank temperature (conductance of the urea tank heater is steady or falling maximum counter or heater activation time) basic enable conditions met:	= >= <= >= <= > >	TRUE 11.00 100.00 5400.00 41.96 TRUE 1000.00 600.00 see sheet enable tables see sheet inhibit tables	V V sec °C - count sec -	0.001 s monitor runs once per trip with 0.001 s rate whenever enable conditions are met	
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		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 Upstream 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 inhibit tables	sec V V °C °C - sec - sec V V -	fail conditions exists for more than 13 sec. monitor runs with 0.01 s rate whenever enable conditions	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 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	

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

Component /	Fault	Monitor Strategy	Primary Malfunction	Threshold	Secondary		Enable		Time	MIL
System	Code	Description	Criteria	Logic and Value	Parameters Can Bus Initialized (CAN Bus is Active) consisting of: ignition on for time battery voltage battery voltage Upstream 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	Required	Illum
		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 -	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 Upstream 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 inhibit tables see sheet enable	V V °C °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	
		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 -	battery voltage battery voltage battery voltage SCR upstream temperature SCR upstream temperature Engine Running for time	>	0.50 11.00 655.34 94.96 3003.56 TRUE 20.00	Sec V V °C °C - sec	fail conditions exists for more than 13 sec. monitor runs with 0.01 s rate whenever enable conditions are met	

Component / System	Fault Code	Monitor Strategy Description	Primary Malfunction Criteria		Threshold ogic and Value		Secondary Parameters		Enable Conditions		Time Required	MIL Illum.
Gyatan	3346	Sostiption	Ontoria		and value		Can Bus Initialized (CAN Bus is Active) consisting of: ignition on for time battery voltage battery voltage Upstream 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 V	required	HIGHT.
N0x Sensor Circuit High Bank 1 Sensor 1	P2203	Detects an out of range high fault of the upstream NoX Sensor	Nox sensor signal (raw information received via CAN from Nox sensor)	>	2500.00	ppm	Nox sensor 1 ready status (see parameter definition) Valid NOx signal from CAN is received (no Nox sensor communication failures) Engine Running (see parameter definition)	= =	TRUE TRUE TRUE 20.00		fault exists for more than 10 sec; monitor runs at 0.1 s when enable conditions are met	В
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 Injection Quantity or Upstream NOx sensor dewpoint achieved (please see the definition) for time	> = >	8.00 TRUE 600.00	mm^3/rev - 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 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 Upstream NOx sensor dewpoint achieved (please see the definition)	>	11.00 655.34 94.96 3003.56 TRUE 20.00 TRUE TRUE 3 9.8 655.34 TRUE	v v v °C °C - sec - sec v v v -	fail conditions exists for more than 13 sec. 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
					no pending or confirmed faults basic enable conditions met:	=	see sheet inhibit tables 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 battery voltage SCR upstream temperature SCR upstream temperature Engine Running for time Can Bus Initialized (CAN Bus is Active)	>= <= >= <= = >=	11.00 655.34 94.96 3003.56 TRUE 20.00 TRUE	V V °C °C - sec	with 0.01 s rate whenever enable conditions are met	
					consisting of: ignition on for time battery voltage battery voltage Upstream NOx sensor dewpoint achieved (please see the definition)	= >= > < =	TRUE 3 9.8 655.34 TRUE	sec V V		
					no pending or confirmed faults basic enable conditions met:	=	see sheet inhibit tables see sheet enable tables	-		
0x Heater rformance Bank Gensor 1	P2209	Monitoring of the upstream NOx sensor signal readiness	Upstream NOx sensor heater temperature has reached setpoint	= FALSE -	(hatter verters		11.00	V	fault exists for more than 1 event	В
					battery voltage and battery voltage	>=	655.34	V	when dewpoint end is	
					and Oxidation Catalyst upstream temperature	>=	94.96	°C	reached; monitor runs	
					and Oxidation Catalyst upstream temperature and	<=	3003.56	°C	at 0.02 s when enable conditions are met	
					Engine running	=	TRUE	_	1	
					for time	>	20.00	sec		
			and Upstream NOx sensor dewpoint end is reached (please see parameter definition)	=	TRUE	-				

Component / System	Fault Code	Monitor Strategy Description	Primary Malfunction Criteria		Threshold gic and Value		Secondary Parameters		Enable Conditions		Time Required	MIL Illum.
					,		basic enable conditions met: No Pending or Confirmed DTC	=	see sheet enable tables see sheet inhibit tables	-		
Reductant pressure line heater open circuit	P221C	Compare the measured conductance of a pressure line heater against the threshold	conductance of pressure line heater	>=	(a) * (b)	1/Ohm	ignition switch on	=	TRUE	·	fail conditions exists for 5 s monitor runs	В
			(a) upper threshold (b) factor for tolerances	with = =	0.26 1.00	1/Ohm factor	and urea pressure line heater powerstage on battery voltage battery voltage engine off time heater activation time basic enable conditions met: NO Pending or Confirmed DTCs:	= <= >= >= =	TRUE 11.00 100.00 0.00 81.00 see sheet enable tables see sheet inhibit tables	V V sec sec	with 3 s rate whenever enable conditions are met	
Reductant pressure line heater short circuit	P221D	Compare the measured conductance of a pressure line heater against the threshold	conductance of pressure line heater (a) lower threshold (b) factor for tolerances	<= with = =	(a) * (b) 0.05 1.00	1/Ohm 1/Ohm factor	ignition switch on and urea pressure line heater powerstage on battery voltage battery voltage engine off time heater activation time basic enable conditions met: NO Pending or Confirmed DTCs:	= >= <= >= = =	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 5 s monitor runs with 3 s rate whenever enable conditions are met	В
Urea supply module heater open circuit	P221E	Detects a supply module heater open circuit by detecting low conductance in the heater	a <= b with (a) maximum conductance of the supply module heater and with (b) minimum tolerance threshold of the conductance for the supply module heater		TRUE calculated parameter 0.14		ignition switch on and supply module heater powerstage on and battery voltage and battery voltage and engine off time and (= >= >= <= >=	TRUE 11.00 100.00 7600.00	- V V sec	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	L	Threshold ogic and Value	e	Secondary Parameters		Enable Conditions		Time Required	MIL Illum.
							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:	> >= =	100.00 10.00 see sheet enable tables see sheet inhibit tables	sec sec		
Urea supply module heater short circuit	P221F	heater short circuit by detecting high conductance	a >= b with (a) maximum conductance of the supply module heater and with (b) maximum tolerance threshold of the conductance for the supply module heater	= =	TRUE calculated parameter 0.35		ignition switch on and supply module heater powerstage on and battery voltage and battery voltage and engine off time 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:	=	TRUE TRUE 11.00 100.00 7600.00 100.00 10.00 see sheet enable tables see sheet inhibit tables	- V V sec sec sec	fail conditions exists for 0.1 s monitor runs once per trip with 0.1 s rate whenever enable conditions are met	В
Barometric Pressure Sensor "A" 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	<= <=	50.00	V kPa	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 0.8 s monitor runs 0.1 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.
Barometric Pressure Sensor "A" 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	>	4.54	V	ignition on	=	TRUE	-	fail conditions exists for 0.8 s monitor runs 0.1 s rate	A
			same as ambient pressure	>=	115.00	kPa	and NO Pending or Confirmed DTCs: and basic enable conditions met:	=	see sheet inhibi tables see sheet enabl tables		whenever enable conditions are met	
Turbo Boost	P2263	Detects if the Turbocharger	Path 1				(fail	Α
System Performance		is severely over or under boosting based on control deviation									conditions exists for 15 s	
			control deviation of the boost pressure calculated out of difference between desired and actual value	>	(g*h)		VNT turbocharger offset adaptation active	=	FALSE	-	monitor runs with 0.01 s rate	
	desired and actual value with	(g) the upper limit (see Look-Up-	=	42.5 to 45.0	kPa	 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 				whenever enable conditions are met		
			Table #64) (h) correction factor (see Look-Up- Table #59)	=	0.900024 to 1	factor	VNT turbocharger wiping is active	=	FALSE	-		
							- 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	=	TRUE	-			
						increase of injection quantity	<	80.00	(mm^3/rev) /sec			
						and engine speed is stable means	=	TRUE	-			
						increase of engine speed and	<	100.00	rpm/sec			
							injection Quantity injection Quantity and	>= <=	80.00 480.00	mm^3/rev mm^3/rev		
							engine Speed engine Speed and	>= <=	1200.00 3400.00	rpm rpm		

Component /	Fault	Monitor Strategy	Primary Malfunction		Threshold		Secondary		Enable		Time	MIL
System	Code	Description	Criteria	L	ogic and Value		Parameters working range of boost pressure is in closed-loop means	=	Conditions TRUE	·	Required	Illum.
							(engine speed and	>	1200.00	rpm		
							injection quantity) NO Pending or Confirmed DTCs:	> =	20.00 see sheet inhibit tables	mm^3/rev		
							for time and	>	2.00	sec		
							basic enable conditions met:	=	see sheet enable tables			
			Path 2 control deviation of the boost pressure	<	(i*j)	_	(VNT turbocharger offset adaptation	=	FALSE		fail conditions	
			calculated out of difference between desired and actual value with	<	(1))	-	active - in order to compensate sensor drift	=	FALSE	-	exists for 15 s monitor runs	
							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				with 0.01 s rate whenever enable conditions are met	
			(i) the upper limit (see Look-Up-Table #63) (j) correction factor	=	-80 to -40	kPa factor	and VNT turbocharger wiping is active	=	FALSE	_		
			g, conceute. Ideas.				- 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	=	TRUE	-		
							increase of injection quantity	<	80.00	(mm^3/rev) /sec		
							engine speed is stable means increase of engine speed	= <	TRUE 100.00	rpm/sec		
							and injection Quantity injection Quantity	>= <=	80.00 480.00	mm^3/rev mm^3/rev		
							and engine Speed engine Speed	>= <=	1200.00 3400.00	rpm rpm		
							and working range of boost pressure is in closed-loop means	=	TRUE	-		
							(engine speed	>	1200.00	rpm		

Component / System	Fault Code	Monitor Strategy Description	Primary Malfunction Criteria	Threshold Logic and Value	Secondary Parameters		Enable Conditions		Time Required	MIL Illum.
- Cystain	0040	Societies	Sitolia	Logio ana value	and injection quantity) NO Pending or Confirmed DTCs: for time and Basic enable conditions met:	> = > =	20.00 see sheet inhibit tables 2.00 see sheet enable tables	mm^3/rev - sec -	roquirou	
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	for time and NO Pending or Confirmed DTCs: and ignition on and basic enable conditions met:	> = = =	3.00 see sheet inhibit tables 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
		Diagnoses the Fuel Pressure Regulator 2 low side driver circuit for driver over temperature faults.	The ECM detects that the commanded state of the driver and the actual state of the control circuit do not match and the IC maximum temperature has been exceeded		battery voltage for time and NO Pending or Confirmed DTCs: and ignition on and basic enable conditions met:	> = = =	3.00 see sheet inhibit tables 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	

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 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	for time and NO Pending or Confirmed DTCs: and ignition on and basic enable conditions met:	> = = =	3.00 see sheet inhibit tables TRUE see sheet enable tables	sec - -	fail conditions exists for 0.75 s monitor runs with 0.01 s rate whenever enable conditions are met	A
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	for time and NO Pending or Confirmed DTCs: and ignition on and basic enable conditions met:	> = = =	3.00 see sheet inhibit tables 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	А
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)	> <= <= >= <= = = =	0.50 11.00 655.34 94.96 3003.56 TRUE 20.00 TRUE	v v v °C °C · sec ·	fail conditions exists for more than 13 s monitor runs with 0.1 s rate whenever enable conditions are met	А

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

sho	ort circuit error via the	Criteria Short circuit NOx signal error of downstream NOx sensor via CAN	Logic and Value	Parameters no pending or confirmed faults basic enable conditions met:	=	conditions see sheet inhibit tables see sheet enable tables		Required	Illu
sho	ort circuit error via the		_ TDIE			tables see sheet enable	-		
sho	ort circuit error via the		_ TDIE	basic enable conditions met:	=	see sheet enable	-		
sho	ort circuit error via the		_ TDIE	basic enable conditions met:	=		-		
sho	ort circuit error via the		TDUE			tables			
sho	ort circuit error via the		TDIE						
sho	ort circuit error via the		_ TDIJE						
sho	ort circuit error via the		_ TDUE						
sho	ort circuit error via the			following conditions for time	>	0.50	sec	fail	
								conditions	
		message						exists for	
				battery voltage	>=	11.00	V	more than	
				battery voltage	<=	655.34	V	13 s	
				SCR downstream temperature	>=	94.96	°C	monitor runs	
				SCR downstream temperature	<=	3003.56	°C	with 0.1 s	
				Engine Running	=	TRUE	-	rate	
				for time	>=	20.00	sec	whenever	
				Can Bus Initialized (CAN Bus is Active	=	TRUE	-	enable	
1)					
1				consisting of:					
1					=	TRUE	-		
1					>=		sec		
					>				
					<		V		
					=	TRUE	-		
				no pending or confirmed faults	=		-		
				basic enable conditions met:	=		-		
						tables			
Sho	port circuit error of hipany	Short circuit lambda binary error of	- TRUE	following conditions for time		0.50	SAC	fail	
			- 1100	Tollowing conditions for time		0.50	360		
		message							
Via	a the OAIV message			battery voltage	>=	11 00	V		
					>=	94.96	°C		
					<=	3003.56	°C		
1				Engine Running	=	TRUE	-		
				for time	>=	20.00	sec		
				Can Bus Initialized (CAN Bus is Active	=	TRUE	-		
1				consisting of:				aro mor	
1				ignition on	=	TRUE	-		
l					>=	3	sec		
l				battery voltage	>	9.8	V		
1					<		V		
1					=	TRUE	-		
1									
				no pending or confirmed faults	=	see sheet inhibit tables	-		
1				basic enable conditions met:	=		-		
						tables			
1									
	laı Do	Short circuit error of binary lambda signal of Downstream NOx sensor via the CAN message	lambda signal of downstream NOx sensor via CAN message	lambda signal of downstream NOx sensor via CAN message	Short circuit error of binary lambda signal of Downstream NOx sensor via the CAN message Short circuit error of binary lambda signal of Downstream NOx sensor via CAN message Short circuit error of binary lambda signal of Downstream NOx sensor via CAN message Short circuit lambda binary error of downstream NOx sensor via CAN message Short circuit lambda binary error of downstream NOx sensor via CAN message Short circuit lambda binary error of downstream NOx sensor via CAN message TRUE following conditions for time battery voltage battery voltage battery voltage battery voltage battery voltage SCR downstream temperature SCR downstream temperature SCR downstream temperature Engine Running for time Can Bus Initialized (CAN Bus is Active) consisting of: ignition on for time	Short circuit error of binary lambda signal of Downstream NOx sensor via CAN message Short circuit error of binary lambda signal of Downstream NOx sensor via CAN message Short circuit lambda binary error of downstream NOx sensor via CAN message Short circuit lambda binary error of downstream NOx sensor via CAN message Short circuit lambda binary error of downstream NOx sensor via CAN message Short circuit lambda binary error of downstream NOx sensor via CAN message Short circuit lambda binary error of downstream NOx sensor via CAN message TRUE TRUE following conditions for time battery voltage battery voltage SCR downstream temperature Engine Running tor time Can Bus Initialized (CAN Bus is Active) consisting of: ignition on for time can Bus Initialized (CAN Bus is Active) consisting of: ignition on for time battery voltage battery voltage battery voltage battery voltage consisting of: ignition on for time consisting of: ignition on achieved (please see the definition) no pending or confirmed faults end consisting of: ignition on consistin	Short circuit error of binary lambda signal of Downstream NOx sensor via the CAN message Short circuit error of binary lambda signal of Downstream NOx sensor via the CAN message Short circuit error of binary lambda signal of Downstream NOx sensor via the CAN message 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 In the can be definition on the can be see sheet inhibit tables	Short circuit error of binary lambda signal of Downstream NOx sensor via the CAN message Short circuit error of binary lambda signal of Downstream NOx sensor via the CAN message Short circuit error of binary lambda signal of Downstream NOx sensor via the CAN message 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 Short circuit lambda binary error of downstream NOx sensor via CAN message Short circuit lambda binary error of downstream NOx sensor via CAN message Short circuit lambda binary error of downstream NOx sensor via CAN message Short circuit lambda binary error of downstream NOx sensor via CAN message Short circuit lambda binary error of downstream NOx sensor via CAN message For thin circuit lambda binary error of downstream NOx sensor via CAN message Short circuit lambda binary error of downstream NOx sensor via CAN message Short circuit lambda binary error of downstream NOx sensor via CAN message Short circuit lambda binary error of downstream NOx sensor via CAN message Short circuit lambda binary error of downstream NOx sensor via CAN message Short circuit lambda binary error of downstream NOx sensor via CAN message Short circuit lambda binary error of downstream NOx sensor dewpoint and tables a tables See sheet enable - see sheet enable	Short circuit error of binary lambda binary error of downstream NOx sensor via the CAN message Short circuit error of binary lambda binary error of downstream NOx sensor via the CAN message Short circuit error of binary lambda binary error of downstream NOx sensor via the CAN message Short circuit error of binary lambda binary error of downstream NOx sensor via the CAN message Short circuit error of binary lambda binary error of downstream NOx sensor via CAN message Short circuit error of binary lambda binary error of downstream NOx sensor via CAN message Short circuit error of binary lambda binary error of downstream NOx sensor via CAN message Short circuit error of binary lambda binary error of downstream NOx sensor via CAN message Short circuit error of binary lambda binary error of downstream NOx sensor via CAN message TRUE TRUE Into Short circuit lambda binary error of downstream NOx sensor via CAN message TRUE Into Short circuit lambda binary error of downstream NOx sensor via CAN message TRUE Into Short circuit lambda binary error of downstream error of binary lambda binary error of downstream NOx sensor via CAN message TRUE Into Short circuit lambda binary error of downstream error of binary lambda binary error of downstream error of binary lambda binary error of downstream error of binary lambda binary error of downstream error of binary lambda binary error of downstream lambda binary error of binary lambda binary error of downstream lambda binary error of lambda bin

Component /	Fault	Monitor Strategy	Primary Malfunction		Threshold		Secondary		Enable		Time	MIL
System	Code	Description	Criteria		Logic and Value		Parameters		Conditions		Required	Illum.
		Short circuit error of linear lambda signal of Downstream NOx sensor	Short circuit lambda linear error of downstream NOx sensor via CAN message	=	TRUE	-	following conditions for time	>	0.50	sec	fail conditions exists for	
		via the CAN message					battery voltage battery voltage	>= <=	11.00 655.34	V V	more than 13 s monitor runs	
							SCR downstream temperature SCR downstream temperature	>= <=	94.96 3003.56	°C	with 0.1 s rate	
							Engine Running for time Can Bus Initialized (CAN Bus is Active	= >= =	TRUE 20.00 TRUE	sec	whenever enable	
) consisting of:	_	THOL		conditions are met	
							ignition on for time	= >=	TRUE 3	- sec		
							battery voltage	>	9.8	V		
							battery voltage Downstream NOx sensor dewpoint	< =	655.34 TRUE	V -		
							achieved (please see the definition) no pending or confirmed faults	=	see sheet inhibit tables	-		
							basic enable conditions met:	=	see sheet enable tables	-		
										_		_
NOx Sensor Circuit High Bank 1 Sensor 2	P22A1	Detects an out of range high fault of the downstream NoX Sensor		>	2500.00	ppm	Downstream Nox sensor ready status (see parameter definition)	=	TRUE	-	fault exists for more than 10 sec;	В
T Sensor 2		Senson	seisui)				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 Sensor 2	P22A0	Detects an out of range low fault of the downstream NoX Sensor	Downstream Nox sensor signal (raw information received via CAN from Nox sensor)	<	-90.00	ppm	Engine Running (see parameter definition)	=	TRUE	-	conditions are met	
0011001 2		Geneel	Schooly				for time and	>	20.00	sec		
							Injection Quantity or	>	8.00	mm^3/rev		
							Downstream NOx sensor dewpoint achieved (please see the definition) for time	= >	TRUE 600.00	- sec		
							Tor time		000.00	300		
NOx Heater Control Circuit	P22A3	Downstream NOx sensor heater open circuit error via	Open circuit heater error of downstream NOx sensor via CAN message	=	TRUE		following conditions for time	>	0.50	sec	fail conditions	А
Bank 1 Sensor 2		the CAN message					battery voltage	>=	11.00	V	exists for more than	
							battery voltage SCR downstream temperature	<= >=	655.34 94.96	°C	13 s	
							SCR downstream temperature	>= <=	3003.56	°C	monitor runs with 0.1 s	
							Engine Running	=	TRUE	-	rate	
				1			for time	>=	20.00	sec	whenever	
										000	wherlever	
							Can Bus Initialized (CAN Bus is Active)	=	TRUE	-	enable conditions	
										-	enable	

Component /	Fault	Monitor Strategy	Primary Malfunction	Threshold	Secondary		Enable		Time	MIL
System	Code	Description	Criteria	Logic and Value	Parameters		Conditions		Required	Illum.
					battery voltage battery voltage Downstream NOx sensor dewpoint achieved (please see the definition) no pending or confirmed faults basic enable conditions met:	> < = = =	9.8 655.34 TRUE see sheet inhibit tables see sheet enable tables	V V - -		
		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: 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:	>	0.50 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	sec V V °C °C - sec - sec V V -	fail conditions exists for more than 13 s monitor runs with 0.1 s rate whenever enable conditions are met	
NOx Heater Performance Bank 1 Sensor 2	P22A7	Compare the time difference between the time ECU requested to enable sensor and the time sensor responding for the request against the threshold	the time difference between the time ECU requested to enable sensor and the time sensor responding for the request	> 150.00 sec	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	>= <= >= = >	11.00 655.34 94.96 3003.56 TRUE 20.00 TRUE	V V °C °C - 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

Component /	Fault	Monitor Strategy	Primary Malfunction	Threshold		Secondary		Enable		Time	MIL
System	Code	Description	Criteria	Logic and Va	alue	Parameters		Conditions		Required	Illum.
						basic enable conditions met: No Pending or Confirmed DTCs	=	see sheet enable tables see sheet inhibit tables	-		
N0x Sensor Performance Bank 1 Sensor 1	P22FA	Compare the measured NOx signal response time with the threshold when injection quantity changes from fueling to overrun	measured upstream NOx response time from 70% of the initial NOx value to 40% of the initial NOx value	> 2.30	sec	global enable conditions:				fail conditions exist for 1 event, test is performed in	В
			Or measured upstream NOx response time from the initial NOx value to 40% of the initial value.	> 5.00	sec	upstream NOx readiness Engine operation mode ≠ DPF Regeneration no post injection No Pending or Confirmed DTC	= = =	TRUE TRUE TRUE see sheet inhibit tables	-	the 0.01 ms rate when enable conditions are met	
						basic enable conditions met: state machine: inactive the following conditions moves the state machine from inactive state to steady-	=	see sheet enable tables	-		
						state operating point state: (engine speed injection quantity for combustion upstream NOx concentration)	>= >= >=	1200.00 120.00 100.00	rpm mm^3/rev ppm		
						state-machine: Check-Operating point the following conditions moves the state machine from steady-state operating point state to wait-for-overrun:					
						(engine speed upstream NOx concentration injection quantity for combustion injection quantity for combustion with (a) Reference injection quantity picked in Check-operating point state	>= >= <= >=	1200.00 100.00 (a) + (b) (a) - (b) measured parameter	rpm ppm mm^3/rev mm^3/rev mm^3/rev		
						(b) Maximum deviation of injection quantity for time	= >=	40.00 2.00	mm^3/rev		
						state-machine: Wait-for-Overrun the following conditions moves the state machine from wait-for-overrun to evaluate-edge state: (injection quantity for combustion with	<	(a) - (b)	mm^3/rev		

Component / System	Fault Code	Monitor Strategy Description	Primary Malfunction Criteria	L	Threshold ogic and Value		Secondary Parameters		Enable Conditions		Time Required	MIL Illum.
		,					(a) Reference injection quantity picked in Check-operating point state	=	measured parameter	mm^3/rev		
							(b) Maximum deviation of injection quantity	=	40.00	mm^3/rev		
							state-machine: evaluate-edge the following conditions moves the state machine from evaluate-edge state to overrun state: (injection quantity for combustion time since the last state	< <	2.00 1.05	mm^3/rev		
)		1.00	360		
Downstream NOx	P22FE	NOx sensor self-diagnosis,	average stored NOx sensor self-	>	143.99	%	Global Release conditions:				fault exists	В
sensor Self diagnostic Bank 1 Sensor 2		which occurs within the NOx sensor and reported to the ECM, which runs in the ECM afterrun, and measures the sensor drift by comparing to a reference	diagnostic result								for more than 3 events; monitor runs at 0.1 s once per trip	
		point.	Or				time interval between the runs of the	>	10.00	sec	during the afterrun	
			average stored NOx sensor self-	<	62.00	%	diagnostic tests status of downstream NOx sensor	=	True	-		
			diagnostic result				validity SCR downstream temperature SCR downstream temperature	>= <=	-7.04 399.96	°C		
							status of current engine operation system # Post Drive	=	TRUE	-		
							Engine operation mode = normal mode	=	TRUE	-		
							engine speed engine speed	<= >=	1500.00 0.00	rpm rpm		
							for time Modeled downstream NOx concentration	<	5.00 160.00	sec ppm		
							Battery voltage Battery voltage	<= >=	6553.40 10.00	V V		
							NO Pending or Confirmed DTCs: status of heater temperature validity for	=	see sheet inhibit tables TRUE	-		
							downstream Nox sensor (1200.00	FD 200		
							engine speed virtual pedal angle for time With	< < <=	1200.00 10.00 14400.00	rpm % sec		
							(((SCR downstream temperature for time	<= >=	129.96 40.00	°C sec		

Component /	Fault	Monitor Strategy	Primary Malfunction	Threshold	Secondary		Enable		Time	MIL
System	Code	Description	Criteria	Logic and Value	Parameters		Conditions		Required	Illum.
) for time	>=	600.00	sec		
) ((
					vehicle speed for time	<= >=	31.08 40.00	mph sec		
) for time))	>=	600.00	sec		
					(Status: DFP Regeneration active		FALSE			
					Or	=	FALSE	-		
					Status: DPF Regeneration not completed)	=	FALSE	-		
					Rising edge of the following conditions:	=	TRUE	-		
					(Ignition key on	=	TRUE	-		
					Engine operation status) with	=	Running	-		
					(Status: DPF Regeneration not completed	=	TRUE	-		
					Status: DFP Regeneration active	=	TRUE	-		
					Engine coolant temperature))	<=	59.96	°C		
					(Ignition key on Or	=	TRUE	-		
					status of over run condition for time	= <=	TRUE 12.00	- sec		
					status of over run condition	=	FALSE	-		
					for time	>	20.00	sec		
					(Estimated HC Load in SCR catalyst Or	<=	2.00	g		
					change of estimated HC Load in SCR catalyst	>=	(a) * (b)	g		
					within time (a) Estimated HC Load limit in SCR catalyst	<	0.20 -0.01	sec g/sec		
					(b) time factor)) And		0.20	sec		
					(Estimated HC Load in SCR catalyst	>=	32.00	g		
					engine speed	>= <=	4000.00	rpm		
					engine speed SCR downstream temperature	>= <=	500.00 199.96	rpm °C		
					SCR downstream temperature	<= >=	-40.04	°C		
					((

Component /	Fault	Monitor Strategy	Primary Malfunction		Threshold		Secondary		Enable		Time	MIL
System	Code	Description	Criteria	Lo	ogic and Value	•	Parameters		Conditions		Required	Illum.
5,513.11					gro anna ranna		SCR downstream temperature	<=	199.96	°C		
							for time	>=	1.00	sec		
							for time (see Look-Up-Table #99)	>=	100 to 900	sec		
							` j					
							((
							vehicle speed	<=	44.75	mph		
							for time	>=	1.00	sec		
)					
							for time (see Look-Up-Table #99)	>=	100 to 900	sec		
))					
							Additional release conditions:					
							vehicle speed	=	0	mph		
							number of possible test runs in after-run	<	20.00	counts		
							Engine operation status = Post Drive	=	True	-		
							for time	>=	100.00	sec		
							for time in ECM afterrun	>=	30.00	sec		
							for time in ECM afterrun	<=	300.00	sec		
J							status of heater temperature validity for	=	True	-		
							downstream Nox sensor		4.00			
							number of tests for averaging test result	<=	1.00	count		
							Status of downstream NOx sensor self	=	4	decimal		
							diagnosis (Bit2)					
							for time	>=	1	sec		
							Afternoon Constition of					
							Afterrun Conditions:					
							NO Pending or Confirmed DTCs:	=	see sheet inhibit	-		
							Facility and set to the Back Daily		tables			
							Engine operation status = Post Drive	=	True 0	-		
							vehicle speed measured downstream NOx	=	160.00	222		
								<=	160.00	ppm		
							concentration	=	FALSE	_		
							DPF regeneration active engine speed		0.00			
							engine speed engine speed	>= <=	1500.00	rpm rpm		
							NOx sensor signal is valid (e.g. No	=	TRUE	- Ipili		
J							CAN error of NOx CAN messages)	-	INOL	-		
ļ							maximum duration in afterrun	<=	300.00	sec		
							minimum duration to start self-diagnostic	<=	100.00	sec		
							and the second s	-				
ļ												
J							number of self-diagnostic attempts	<	20.00	count		
							basic enable conditions met:	=	see sheet enable	-		
									tables			
,												
	P2428	Detects implausible	Any two of the following four conditions:				basic enable conditions met:	=	see sheet enable	-	fail	Α
	P2428	temperatures in order to	((a) and (b)) or ((a) and (c)) or ((a) and				basic enable conditions met:	=	see sheet enable tables	-	conditions	Α
	P2428		((a) and (b)) or ((a) and (c)) or ((a) and (d)) or ((b) and (c)) or ((b) and (d)) or ((c)				basic enable conditions met:	=		-	conditions exists for 6 s	А
	P2428	temperatures in order to	((a) and (b)) or ((a) and (c)) or ((a) and (d)) or ((b) and (c)) or ((b) and (d)) or ((c) and (d))					=		-	conditions exists for 6 s test	A
	P2428	temperatures in order to	((a) and (b)) or ((a) and (c)) or ((a) and (d)) or ((b) and (c)) or ((b) and (d)) or ((c) and (d)) with				and		tables		conditions exists for 6 s test performed	A
	P2428	temperatures in order to	((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	>	799.96	°C		=	tables see sheet inhibit	-	conditions exists for 6 s test performed continuously	A
	P2428	temperatures in order to	((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	>	799.96	°C	and		tables		conditions exists for 6 s test performed	A
	P2428	temperatures in order to	((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				and		tables see sheet inhibit		conditions exists for 6 s test performed continuously	A
Exhaust Gas High Temperature	P2428	temperatures in order to	((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	>	799.96 799.96	°C	and		tables see sheet inhibit		conditions exists for 6 s test performed continuously	A
Exhaust Gas High Temperature	P2428	temperatures in order to	((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		tables see sheet inhibit		conditions exists for 6 s test performed continuously	A
	P2428	temperatures in order to	((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				and		tables see sheet inhibit		conditions exists for 6 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.
			and with (d) particulate filter downstream temperature	>	799.96	°C						
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 same as Downstream SCR Catalyst temperature	<	-50	v °c	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 0.00 -50.04 0.00 0.00 -45.04 0.00 see sheet inhibit tables see sheet enable tables	rpm rpm mm^3/rev mm^3/rev °C sec g/sec °C sec -	fail conditions exists for more than 5.0 sec. monitor runs with 0.1 s rate whenever enable conditions are met	A
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 same as Downstream SCR Catalyst temperature	>	2.21	V °C	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:	<pre><= >=</pre>	6000.00 0.00 800.00 0.00 -50.04 0.00 0.00 -45.04 0.00 see sheet inhibit tables see sheet enable tables	rpm rpm mm^3/rev mm^3/rev °C sec g/sec °C sec -	fail conditions exists for more than 5.0 sec. 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	ie	Secondary Parameters		Enable Conditions		Time Required	MIL Illum.
Diesel Particulate Filter Differential Pressure Sensor Performance	P2453	Detects in range faults on the DPF differential pressures sensor.	change in differential pressure	<	-1.00	kPa/s	(fail conditions exists for 3 s test	В
			or change in differential pressure	>	1.00	kPa/s	change in exhaust gas volume flow or change in exhaust gas volume flow	> <	375.00 -375.00	m^3/h/s m^3/h/s	performed continuously 0.1 s rate	
) and current exhaust gas volume flow and basic enable conditions met: and	> =	375.00 see sheet enable tables	m^3/h -		
							NO Pending or Confirmed DTCs:	=	see sheet inhibit tables	-		
			Path 1: differential pressure sensor or	>	3.20	kPa	Engine State for time and basic enable conditions met: and NO Pending or Confirmed DTCs:	= > = =	After Run 35.00 see sheet enable tables see sheet inhibit tables	sec -	fail conditions exists for 0.5 s monitor runs with 0.1 s rate whenever enable conditions are met	
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	-	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	>	4.67	V	ignition on	=	tables TRUE	_	fail conditions exists for 3 s test performed continuously	

Component / System	Fault Code	Monitor Strategy Description	Primary Malfunction Criteria		Threshold Logic and Value		Secondary Parameters		Enable Conditions		Time Required	MIL Illum.
			differential pressure	>	91.70	kPa	basic enable conditions met: and NO Pending or Confirmed DTCs:	=	see sheet enable tables see sheet inhibit tables	-		
Exhaust Gas Recirculation (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	-	following conditions for time	>=	120.00	sec	fail conditions exists for 120 s monitor runs	В
							engine speed and	>=	1100.00	rpm	with 0.1 s rate	1
							engine speed) and (<=	2000.00	rpm	whenever enable conditions are met	
							injection quantity and	>=	20.00	mm^3/rev		1
							injection quantity) and	<=	240.00	mm^3/rev		
							recirculated exhaust-gas mass flow downstream of the EGR cooler and	>=	16.68	g/sec		
							recirculated exhaust-gas mass flow downstream of the EGR cooler)	<=	40.28	g/sec		
							and EGR controller is active and (=	TRUE	-		
							(a) - (b) with (a) filtered temperature upstream of EGR-cooler and with (b) engine temperature) and	>=	210.00	°C		
							(a) - (b) with (a) filtered temperature upstream of EGR-cooler and with (b) engine temperature) and	<=	3276.70	°C		
							engine coolant temperature and	>=	69.96	°C		1
							engine coolant temperature and	<=	129.96	°C		l

Component /	Fault	Monitor Strategy	Primary Malfunction		Threshold		Secondary		Enable		Time	MIL
System	Code	Description	Criteria		Logic and Value		Parameters (Conditions		Required	Illum.
							actual valve position of exhaust-gas recirculation and	>=	9.9976	%		
							actual valve position of exhaust-gas recirculation) and	<=	399.99	%		
							control value provided for EGR cooling bypass and	>=	-400.00	%		
							control value provided for EGR cooling bypass for	<=	5.00	%		
							time) and	>	10.00	sec		
							ambient pressure and	>=	74.80	kPa		
							ambient temperature and	>=	-7.04	°C		
							ambient temperature) and	<=	3003.56	°C		
							DPF regeneration not active and	=	TRUE	-		
							diagnostic performed in current Drive Cycle and	=	FALSE	-		
							NO Pending or Confirmed DTCs:	=	see sheet inhibit tables	-		
							and 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 (measured used for determining DPF regeneration trigger)	>	((a) - (b)) + ((c) * (d))	g	particulate filter regeneration - transition false to true	=	TRUE		fail conditions exists for more than 1	В
			with (a) engine out soot mass flow in the exhaust-gas (function of vehicle speed only)	=	measured parameter	-	and last particulate filter regeneration successful	=	TRUE	-	event monitor runs 0.1 s rate whenever	
			and with (b) soot mass at the end of previous DPF regeneration and with	=	calculated parameter	-	or particulate filter regeneration must have been completed and	=	TRUE	-	enable conditions are met	
			and with (c) factor for calculation of a soot mass value offset depending on the simulated maximal base soot mass (see Look-Up-Table #65) and with	=	0 to 121.8	g	basic enable conditions met:	=	see sheet enable tables	-		
			(d) factor for determination of correction factor for ash in the particulate filter	=	1.00	factor	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	Enak Condit		Time Required	MIL Illum
Exhaust Gas Recirculation (EGR) Cooler Bypass Valve Control Circuit	P245A	Diagnoses the EGR Cooler Bypass low side driver circuit for circuit faults. The faults of the output circuit, that are detected with this diagnosis, are an open circuit or an overtemperature of the integrated circuit within the ECM.	Voltage low during driver off state (indicates open circuit)	= Open Circuit:≥ - 200 K Ω impedance between ECU pin and load	for time and starter is active cranking for time and EGR Cooling Bypass Solenoid Control Circuit for time and (open load diagnostics is triggered after offset learning of valve is completed or NO Pending or Confirmed DTCs) and basic enable conditions met:	> 11.0 > 3.00 = FALS > 3.00 = ACTIV > 3.00 = see sheet table = see sheet table	SE - Sec VE - Sec Sinhibit - Sec Sec	fail conditions exists for 7s (in engine postdrive/ afterun duration limited to 5s) monitor runs with 0.01s 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 and EGR Cooling Bypass Solenoid Control Circuit and	> 11.0 > 3.00 = FALS > 3.00 = ACTIV) sec SE -) sec	fail conditions exists for 3 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 Value	Secondary Parameters		Enable Conditions		Time Required	MIL Illum.
					(NO Pending or Confirmed DTCs) and basic enable conditions met:	=	see sheet inhibit tables see sheet enable tables	-		
Exhaust Gas Recirculation (EGR) Motor 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	for time and starter is active cranking for time and EGR Cooling Bypass Solenoid Control Circuit and	> = > =	3.00 FALSE 3.00 ACTIVE	v sec	fail conditions exists for 3 s monitor runs with 0.005 s rate whenever enable conditions are met	В
Exhaust Gas	P245D	Diagnoses the EGR Cooler	Voltage high during driver on state	= Short to power: -	NO Pending or Confirmed DTCs) and basic enable conditions met:	= =	see sheet inhibit tables see sheet enable tables	- - V	fail	В
Recirculation (EGR) Motor Control Circuit 1 High Voltage	. 2100	Bypass low side driver circuit for circuit faults.	(indicates short to power)	≤ 0.5 Ω impedance between signal and controller power	for time and starter is active cranking for time and EGR Cooling Bypass Solenoid Control Circuit and	> = >	3.00 FALSE 3.00 ACTIVE	sec - sec	conditions exists for 3 s monitor runs with 0.005 s rate whenever enable conditions are met	J

Component / System	Fault Code	Monitor Strategy Description	Primary Malfunction Criteria	ı	Threshold Logic and Value		Secondary Parameters		Enable Conditions		Time Required	MIL Illum.
							NO Pending or Confirmed DTCs) and basic enable conditions met:	=	see sheet inhibit tables see sheet enable tables	-		
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
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 condions 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	V °C	ignition on and basic enable condions met:	=	TRUE see sheet enable tables		fail conditions exists for 3 s monitor runs 0.05 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.
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:	> = = = = = = = = = = = = = = = = = = =	-7.04 FALSE TRUE 100.00 ACTIVE see sheet enable tables see sheet inhibit tables	°C - rpm	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 cooling bypass position circuit	raw voltage of EGR cooling bypass actuator position sensor same as EGR cooling bypass actuator position	<	0.25 -22.5	V %	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 0.01 s rate when enable conditions are met	А
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 cooling bypass position circuit	raw voltage of EGR cooling bypass actuator position sensor same as EGR cooling bypass actuator position	>	4.80	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 when enable conditions are met	А

Component / System	Fault Code	Monitor Strategy Description	Primary Malfunction Criteria	Threshold Logic and Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
				<u> </u>	NO Pending or Confirmed DTCs:	= see sheet inhibit - tables		
Closed loop Reductant Injection Control at Limit-Flow too high	P249D	Detects an out of range high of the long term Reductant quantity adaption factor	long term adaptation factor of Reductant quantity	> 1.40 fact	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 adaption factor	long term adaptation factor of Reductant quantity	< 0.41 fact	NO Pending or Confirmed DTCs basic enable conditions met:	= TRUE - = see sheet inhibit - tables = see sheet enable - tables	fail conditions exists for more than 5 sec. monitor runs with 0.01 s rate whenever enable conditions are met	В
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.	and deviation from the temperature setpoint for HCl control loop with (a) temperature threshold value and with (b) temperature value for threshold of monitoring	>= 0.00 - > maximum of (a) and (b+c) = 100.00 °C = 0.00 °C	exhaust gas temperature control is active	= 0 to 1 - > 30.00 sec = TRUE -	fail conditions exists for 300 s monitor runs with 0.1 s rate whenever enable conditions are met	В

Component / System	Fault	Monitor Strategy Description	Primary Malfunction		Threshold		Secondary		Enable		Time	MIL Illum.
System	Code	Description	and with (c) basic temperature threshold value for monitoring	=	Logic and Value	°C	Parameters (temperature upstream of the oxidation catalyst	>	Conditions 224.96	°C	Required	mum.
							and (particulate filter temperature and	>	229.96	°C		I
							(particulate filter temperature	<	719.96	°C		i
							or particulate filter temperature for activated post injection)	<	749.96	°C		İ
							and release status means (=	TRUE	-		ı
							vehicle speed and	>=	14.92	mph		i
							vehicle speed and	<=	124.30	mph		i
							Actual time spent in coastdown mode	<	60.00	sec		i
							and basic enable conditions met:	=	see sheet enable tables	-		I
							and NO Pending or Confirmed DTCs:	=	see sheet inhibit tables	-		ı
Closed Loop Particulate Filter	P24A1	Detects excessive HCI temperature. Actual HCI	commanded control value of the HCI temperature controller	<=	0.99		current engine operating point is suitable for monitoring deviation of exhaust gas	=	0 to 1	-	fail conditions	В
Regeneration Control At Limit - Temperature Too High		controller ratio and temperature readings are compared to desired HCI controller ratio and temperature values as an indication of an excessive					temperature control - depending on engine speed and injection quantity (see Look-Up-Table #26)				exists for 300 s monitor runs with 0.1 s rate whenever	ı
		exhaust gas temperature.	and deviation from the temperature setpoint for HCl control loop with (a)	<	minimum of (a) and (b+c-(d-e)) -75.00	°C	for time	>	30.00	sec	enable conditions are met	l
			and with (b) temperature value for threshold of monitoring	=	0.00	°C	exhaust gas temperature control is active	=	TRUE	-		I
			with (c) basic temperature threshold value for monitoring and with	=	100.00	°C	means (temperature upstream of the	>	224.96	°C		I
			(d) temperature setpoint for exhaust gas system control loop and with	=	calculated parameter	-	oxidation catalyst and (ı

Component /	Fault	Monitor Strategy	Primary Malfunction		Threshold		Secondary		Enable		Time	MIL
System	Code	Description	Criteria		ogic and Value		Parameters		Conditions		Required	Illum.
			(e) actual temperature for exhaust gas system control loop	=	measured parameter	-	particulate filter temperature and	>	229.96	°C		
							(particulate filter temperature or	<	719.96	°C		
							particulate filter temperature for activated post injection)	<	749.96	°C		
							and release status means	=	TRUE	-		
							vehicle speed and	>=	14.92	mph		
							vehicle speed)	<=	124.30	mph		
							and Actual time spent in coastdown mode)	<	60.00	sec		
							and basic enable conditions met:	=	see sheet enable tables	-		
							and NO Pending or Confirmed DTCs:	=	see sheet inhibit tables	-		
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.									fail conditions exists for 0.01 s monitor runs with 0.01 s rate	В
			difference between the max and min EGR cooler bypass valve offset values or	>	50.00	%					whenever enable conditions	
			Path 2: learned offset value for EGR cooler bypass valve in the present driving cycle	>	16.00	%	active cleaning mode of EGR cooler bypass valve - no movement in EGR cooling bypass valve	=	FALSE	-	are met	
			or learned offset value for EGR cooler bypass valve in the present driving cycle	<	-16.00	%	and engine post drive/ afterun	=	TRUE	-		
			or Path 3:		13.00	%	and (battery voltage		10.00	V		
			mean value for EGR cooling bypass valve offset learned at the open end during the current driving cycle over multiple open-close cycles	>	13.00	70		>=	10.00	V		
			or mean value for EGR cooling bypass valve offset learned at the open end during the current driving cycle over multiple open-close cycles	<	-16.00	%	and battery voltage	<=	30.00	V		

Component /	Fault	Monitor Strategy	Primary Malfunction		Threshold		Secondary		Enable		Time	MIL
System	Code	Description	Criteria		Logic and Value		Parameters		Conditions		Required	Illum.
ļ							and (
							engine coolant temperature	>=	5.06	°C		
							and		400.00	00		
							engine coolant temperature	<=	130.06	°C		
							6					
							or offset learning active	=	TRUE	_		
							or	_	TRUE	-		
							diagnosis tester present	=	FALSE	-		
) and					
							completion of offset learning	=	TRUE	-		
							and					
							basic enable conditions met:	=	see sheet enable tables	-		
							and					
							NO Pending or Confirmed DTCs:	=	see sheet inhibit	-		
									tables			
		Detects a jammed EGR	Path 1:				EGR cooler bypass valve is opening	-	TRUE	-	fail	
		cooling bypass valve during									conditions	
		opening or closing the valve.									exists for 5 s monitor runs	
			EGR cooler bypass valve stuck during	=	TRUE	-	or				with 0.01 s	
			opening				ECD and a borner color in classics		TDUE		rate	
			which means (EGR cooler bypass valve is closing and	=	TRUE	-	whenever enable	
			(a) + (b)	>=	75.01	%	(conditions	
			with (a) position of the EGR cooling bypass				(active cleaning mode of EGR cooler	=	FALSE	_	are met	
			valve				bypass valve - no movement in EGR	_	FALSE	-		
							cooling bypass valve					
<u>'</u>			and with (b) learned offset value of EGR cooler	=	calculated	_	and engine post drive/ afterun	=	TRUE			
<u>'</u>			bypass valve in the previous driving	_	parameter		engine post drive/ afterun	_	INOL			
			cycle									
			and (a) - (b)	>=	0.99	%	and (
			with		0.00	70	battery voltage	>=	10.00	V		
			(a) position of the EGR cooling bypass			-	and					
			valve and with				battery voltage	<=	30.00	V		
			(b) position of the EGR cooling bypass	=	calculated	-)			-		
			valve of the previous process cycle		parameter							
)				and					
			for time	>	5.00	sec	(
			or				engine coolant temperature and	>=	5.06	°C		
			or Path 2:				engine coolant temperature	<=	130.06	°C		
			EGR cooler bypass valve stuck during	=	TRUE	-)			-		
			closing				,					
i '	l		which means				or	1			1	

Component / System	Fault Code	Monitor Strategy Description	Primary Malfunction Criteria		Threshold Logic and Value		Secondary Parameters		Enable Conditions		Time Required	MIL Illum.
- Cyclom	0000	Dooription	position of the EGR cooling bypass valve	<	(a) * (b)	-	offset learning active	=	TRUE	-	. roquirou	mum.
			with (a) reference position of the EGR cooling bypass valve in open position	=	calculated parameter	-	or diagnosis tester present	=	FALSE	-		
			and with (b) calibrateable factor of the EGR cooling bypass valve close position	=	0.15	factor) and					
			and (a) - (b) with	<=	0.02	%	completion of offset learning and basic enable conditions met:	=	TRUE see sheet enable	-		
			(a) position of the EGR cooling bypass valve				and		tables			
			and with (b) position of the EGR cooling bypass valve of the previous process cycle	=	calculated parameter	-	NO Pending or Confirmed DTCs:	=	see sheet inhibit tables	-		
) for time	>	5.00	sec						
			ior unie		3.00	360						
ECM Power Relay Circuit Performance	P2510	Detection of Main Relay that has opened without a request from ECU	Number of detected occurrences of main relay opening without ECM request (stored in EEPROM)	>	1.00	counts	ignition on	=	TRUE	-	fail conditions exists for	В
							and engine pre drive and	=	TRUE	-	0.02 s monitor runs once per	
							Basic enable conditions met:	=	see sheet enable conditions	-	driving cycle during predrive with 0.02 s rate whenever enable conditions	
		Detection of main relay that is stuck and not opened when commanded by ECM	Time after request to open the main relay	>	1.40	sec	ignition on	=	FALSE	-	fail conditions exists for 0.02 s	В
							engine pre drive and	=	FALSE	-	monitor runs once per driving cycle	
							Basic enable conditions met:	=	see sheet enable conditions	-	during predrive with 0.02 s rate	
							and NO Pending or Confirmed DTCs:	=	see sheet inhibit tables	-	whenever enable conditions	
Torque Management Request Input Signal "A"	P2544	Detects implausible torque request information received from the TCM	Path 1:				ignition on	=	TRUE		fail conditions exist for 0.005 s	В

Component /	Fault	Monitor Strategy	Primary Malfunction		Threshold		Secondary		Enable		Time	MIL
System	Code	Description	Criteria number of messages with rolling count / protection value errors detected	>=	7.00	-	Parameters and		Conditions		test performed	Illum.
			with number of consecutive frames or	=	15.00	-	basic enable conditions met: and NO Pending or Confirmed DTCs:	=	see sheet enable tables see sheet inhibit tables	-	continuously 0.005 s rate	
			Path 2: internal calculated checksum value for transmission is not equal the received value and	=	TRUE	-						
			number of fault results	>	15.00	-						
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	>	4.75	V	ignition on	=	TRUE		fail conditions exists for 5 s test performed continuously	A
			same as boost pressure position	>	93,5	%	and basic enable conditions met:	=	see sheet enable tables	-	0.01 s rate	
							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	<	150.00	V	ignition on	=	TRUE	-	fail conditions exists for 5 s test performed continuously	A
			same as boost pressure position	<	4,6	%	and basic enable conditions met:	=	see sheet enable tables	-	0.01 s rate	
							and No Pending or Confirmed DTCs:	=	see sheet inhibit tables	-		
Turbocharger Boost Control Position Sensor "A" Circuit Range/Performanc e - Stuck Low	P2598		turbo charger control deviation calculated out of difference between desired and actual value	>	15.00	%	engine speed	>=	300.00	rpm	fail conditions exists for 10 s monitor runs with 0.02 s	В
							and adaption not active and	=	FALSE	-	rate whenever enable	

Component /	Fault	Monitor Strategy	Primary Malfunction		hreshold		Secondary		Enable		Time	MIL
System Turbocharger	Code P2599		Criteria turbo charger control deviation calculated	Logi <	-15.00	%	Parameters offset learned since last clearing of fault	=	Conditions TRUE	-	Required conditions	Illum.
Boost Control Position Sensor "A" Circuit Range/Performanc e - Stuck High		position errors by comparing desired vane position to actual vane position	out of difference between desired and actual value				code memory				are met	
							and engine running for	=	TRUE	-		
							time (see Look-Up-Table #92) and	>	30 to 327.67	sec		
							engine coolant temperature and	>=	69.96	°C		
							engine coolant temperature) and	<	129.96	°C		
							(environmental temperature and	>=	-15.04	°C		
							environmental temperature	<	199.86	°C		
							and basic enable conditions met:	=	see sheet enable tables	-		
							no pending or confirmed DTCs	=	see sheet inhibit tables	-		
							and no pending or confirmed DTCs	=	see sheet inhibit tables	-		
Unmetered Fuel - Forced Engine Shutdown	P25BD	Detects engine overspeed in the event that there is an error in the ECM or engine damage has occurred which is resulting in the engine speed increasing beyond desired control limits. Upon failure detection, the engine will be shutdown by closing the diesel intake air valve		>	4900.00	rpm	ignition on	=	TRUE	-	fail conditions exists for .01 s test performed continuously	А
		and disabling the fuel iniectors					and basic enable conditions met: and NO Pending or Confirmed DTCs:	= =	see sheet enable tables 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.
Control Module Power Off Timer Performance	P262B	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, if the difference between the calculated times exceeds a calibrated threshold a fault is set.	Path 1:		time since engine post drive/ afterun	<	20.00	c	fail conditions exists for 0.01 s monitor runs once per driving cycle with 0.01 s rate whenever enable conditions are met	В
			acquired engine off time or Path 2: acquired engine off time (where (a) Tolerance threshold for diagnosis of stop counter	7.5%)) / > (100% + ((a) - 7.5%))	 and engine post drive/ afterun and basic enable conditions met: 	= = S	TRUE see sheet enable tables	-		
		Detects Communication failure with on-board control unit (PCA8565) after the HW reset of PCA8565 was performed	Communication failure with on-board control unit (PCA8565)	= TRUE	- ignition on and basic enable conditions met:	= = s	TRUE see sheet enable tables	- c	fail conditions exists for1 event monitor runs once per driving cycle with 0.01 s rate whenever enable conditions are met	
		Detects an interrupted supply voltage of the engine off time circuit (permanent battery voltage supply line to ECM)	permanent supply voltage is interrupted via open circuit	= TRUE	- ignition on and basic enable conditions met:	= = s	TRUE see sheet enable tables	- r	fail conditions exists for more than 1 event monitor runs once per driving cycle with 0.01 s rate whenever	

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	
Fuel Transfer Pump Relay Control Circuit	P2632	Electronic out-put driver circuitry determines that the tank transfer pump circuit is open.	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		Electronic out-put driver circuitry determines that the tank transfer pump circuit is shorted to ground.	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
Fuel Transfer Pump Relay Control Circuit High	P2634	Electronic out-put driver circuitry determines that the tank transfer pump circuit is shorted to battery.	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

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 Performance	P2636	Detects an error in the fuel tank transfer pump performance by comparing the decrease of the fuel level in both tanks.	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	< < < >= < <	0.80 0.00 0.80 0.00 0.80	Engine Running 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 secondary tank)) vehicle speed and NO Pending or Confirmed DTCs:	= = < > > < > = > =	TRUE TRUE 1638.30 0.00 32767.00 137.40 0.00 0.00 see sheet inhibit tables 327.67 See sheet enable tables	l sec mph -	fail conditions exists for 327 s monitor runs 0.02 s rate whenever enable conditions are met	В
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 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.
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	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:	see sheet enable tables see sheet inhibit tables	continuously 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:	= TRUE - = see sheet enable tables = see sheet inhibit tables	fail conditions exist for 1 s test performed continuously with 1 s rate	А
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:	= TRUE - = see sheet enable - tables = see sheet inhibit - tables	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:	= TRUE - = see sheet enable tables = see sheet inhibit tables	fail conditions exist for 1 s test performed continuously with 1 s rate	A
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	А

Component /	Fault Code	Monitor Strategy	Primary Malfunction Criteria		Threshold Logic and Value		Secondary		Enable Conditions		Time	MIL Illum.
System 4WD Switch Circuit	P2771	Description 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		Parameters Current Transmission Gear	≠	Park/Neutral		fail conditions exists for 0.05 s test performed continuously 0.02 s rate	B
			and 4WD-Lo active based on transmission turbine speed, output shaft speed, and gear ratio	=	TRUE	-	and Current Transmission Gear	≠	Reverse	-		
							and Torque converter clutch open	=	FALSE	-		
							and Engine is Running and	=	TRUE	-		
							vehicle speed and	>	12.43	mph		
							accelerator pedal position and	r	100.00	%		
							accelerator pedal position and	>	10.00	%		
							engine speed and	<	6000.00	rpm		
							engine speed and	>	1000.00	rpm		
							basic enable conditions met:	=	see sheet enable tables	-		
							and NO Pending or Confirmed DTCs:	=	see sheet inhibit tables	-		
Exhaust Nox Concentration High - Unknown	P2BAD	Compare EWMA filtered NOx conversion efficiency of SCR catalyst with a	EWMA filtered delta SCR catalyst efficiency of (a) - (b)	<	0.00	factor	NO Pending or Confirmed DTCs:	=	see sheet inhibit tables	-	fail conditions exists for	А
Reason		threshold value	where (a) measured SCR catalyst efficiency	=	calculated	factor	for time	>	300.00	sec	more than 1 event monitor runs	
			(b) offset-corrected modeled SCR catalyst efficiency: (b) = ((c) * (d) * (e)) + (f)	=	parameter calculated parameter	factor	Status of NOx signal of upstream NOx sensor (please see the definition)	=	TRUE	-	with 0.01 s rate whenever	
			where				for time Status of NOx signal of downstream NOx sensor (please see the definition)	> =	60.00 True	sec -	enable conditions are met	
			(c) SCR modeled NOx conversion efficiency (d) correction map dependent on SCR catalyst temperature and upstream NOx	=	calculated parameter 1.00	factor factor	for time	>	60.00	sec		
			mass flow (e) correction map dependent on SCR catalyst temperature and exhaust mass flow	=	1.00	factor	(
			(f) Offset threshold (see Look-Up-Table #102)	=	0.1 to 0.125	factor	Release of dosing strategy (please see the definition)	=	TRUE	-		
		1	·				for time	>=	(a) + (b)	sec		

Component /	Fault	Monitor Strategy	Primary Malfunction	Threshold	Secondary		Enable		Time	MIL
System	Code	Description	Criteria	Logic and Value	Parameters		Conditions		Required	Illum.
					(a) Turn on delay time 1 of status		330.00	sec		
					metering strategy					
					(b) Turn on delay time 2 of status		20.00	sec		
					metering strategy					
					(
					Status for disabling SCR Efficiency	=	FALSE	-		
					monitoring following an SCR Adaptation					
					completion (please see the definition)					
					, , , ,					
					for time	>	(a) + (b)	sec		
					(a) Debounce time after pre controlled	>	0.50	sec		
					dosing over					
					(b) delay time the status of disabling	>	80.00	sec		
					SCR Efficiency monitoring					
					or					
					integrated upstream NOx	>=	3276.70	g		
)			3	j l	
					· · · · · · · · · · · · · · · · · · ·					
					(
					Status of pre controlled dosing (please	=	FALSE	_		
					see the definition)					
					for time	>	(a) + (b)			
					(a) Debounce time after pre controlled	=	0.50	sec		
					dosing off		0.00	000		
					(b) Delay time after pre controlled dosing	=	300.00	sec		
					off		000.00	300		
					or					
					integrated upstream NOx	>=	3276.70	g		
					integrated application (VOX	-	0210.10	9		
					1					
					Decrease of Reductant load level	=	FALSE	_		
					(please see the definition)		TALOL			
					for time	>	300.00	sec		
					101 time		000.00	300		
					/					
					(
					Average slow filtered NOx mass flow	<=	0.20	g/sec	j l	
					upstream SCR	\ -	5.20	9,300	j	
					for time	>	0.50	sec	j	
					Monitor disable time based on average	>	0.50 0 to 120	sec	j l	
					NOx mass flow and the time (see Look-		0 10 120	300		
					Up-Table #88)					
					Op-Table #66)					
					for time with	>	5.00	sec		
					ioi time with	_	5.00	Sec		
					Delta SCR temperature (see Look-Up-		59.96 to 64.96	°C		
						<	39.90 10 04.90	C		
					Table #85) Delta SCR temperature (see Look-Up-		50.04 to 0.04	°C	j l	
						>	-50.04 to -0.04	C		
					Table #101)		E24.06	°C	j	
					Delta SCR temperature	<=	524.96		[
					Delta SCR temperature	>=	199.96	°C	[
					Initialization time of temperature gradient	>=	2.50	sec	[
					calculation					
)					
					or D. H. OOD I					
					Delta SCR temperature	<	229.96	°C		
					or D. H. OOD I		105		[
				1	Delta SCR temperature	>	499.96	°C	I I	

Component /	Fault	Monitor Strategy	Primary Malfunction	Threshold	Secondary		Enable		Time	MIL
System	Code	Description	Criteria	Logic and Value	Parameters		Conditions		Required	Illum.
					for time		10.00	sec		
					(
					normalized HC load in SCR catalyst	>	21.00	factor		
					}					
					ambient pressure	>=	74.80	kPa		
					ambient temperature	>=	-7.04	°C		
					(
					Stuck reductant dosing valve fault was	=	FALSE	-		
					healed last particulate filter regeneration	=	TRUE	-		
					successful					
)					
					Status of the SCR adaptation plausibility	=	FALSE	-		
					check active (please see the definition)					
					for time	>	600.00	sec		
)		541.05			
					Reductant Delivery performance completed this drive cycle	=	FALSE	-		
					completed and dive eyele					
					()	>=	1000.00	FID 100		
					engine speed engine speed	>= <=	1000.00 3000.00	rpm rpm		
					for time	>	0.00	sec		
)					
					SCR estimated current Reductant load	>=	0.05 to 0.75	g		
					(see Look-Up-Table #77) SCR estimated current Reductant load	<=	2 to 2.2	0		
					(see Look-Up-Table #76)	\-		g		
					Difference between nominal and	>=	-0.5 to -0.1	g		
					estimated Reductant (see Look-Up- Table #79)					
					Difference between nominal and	<=	0.15 to 0.25	g		
					estimated Reductant (see Look-Up- Table #78)					
					SCR in Pre-Control State (please see	=	FALSE	-		
					the definition)					
					Disable after SCR adaptation	=	FALSE	-		
					for time	>	600.00	sec		
)					
					((
					(a) - (b) for time	<=	74.96 0.00	°C sec		
)	>	0.00	360		
					or					
					(a) - (b)	>=	14.96	°C		
					for time	>	0.00	sec		
					(a) upstream SCR catalyst temperature					
					(b) downstream SCR catalyst					
					temperature					

Component /	Fault	Monitor Strategy	Primary Malfunction	Threshold	Secondary		Enable		Time	MIL
System	Code	Description	Criteria	Logic and Value	Parameters		Conditions		Required	Illum.
					Integrated NOx mass upstream SCR	>	1.00	g		
					for time	>	0.00	sec		
		l			.or time	-	2.00			
					Average SCR Temperature	<=	399.96	°C		
					Average SCR Temperature	>=	-3549.94	°C		
					Downstream SCR catalyst temperature	<=	3003.56	°Č		
								-		
					Downstream SCR catalyst temperature	>=	241.96	°C		
					Filtered and delayed upstream NOx raw	<=	750.00	ppm		
					emission					
					Filtered and delayed upstream NOx raw	>=	175.00	ppm		
					emission			• • •		
					Filtered and delayed NOx raw emission	<=	0.17	g/sec		
					mass flow upstream of SCR			Ü		
					Filtered and delayed NOx raw emission	>=	0.01	g/sec		
		l			mass flow upstream of SCR			3		
					Filtered exhaust gas mass flow	<=	236.13	g/sec		
		l			Filtered exhaust gas mass flow	>=	-910.29	g/sec		
					MAP for valid engine operation points for	=	0 to 1	factor		
I		l			SCR efficiency monitoring (see Look-Up-					
					Table #84)					
					for time	>	0.00	sec		
					Inverse calculated accelerator pedal	>	5.00	%		
					value					
					for time	>	0.00	sec		
					EWMA fast initialization mode:					
					filter coefficient for fast initialization	=	0.35	factor		
					number of SCR efficiency measurements	>=	2.00	count		
					for fast initialization mode					
					EWMA Rapid Response mode:					
					EWMA filtered delta SCR catalyst	>	0.12	factor		
					efficiency					
					(a) - (b)	<	-0.01	factor		
					(a) measured SCR catalyst efficiency					
					(b) offset-corrected modeled SCR					
					catalyst efficiency (please see the					
		l			general description for details)					
		l			offset-corrected modeled SCR catalyst	>	0.00	factor		
		l			efficiency (please see the general					
		l			description for details)					
		l			filter coefficient for Rapid Respond mode	=	0.08	factor		
		l			number of SCR efficiency measurements	>=	6.00	count		
					for Rapid Response mode					
		l			.ctapia reopondo mode					
		l								
					EWMA filtered value too small in Fast					
		l			Init. And Rapid Respond modes:					
		l			EWMA filtered delta SCR catalyst	<	0.00	factor		
		l			efficiency of (a) - (b)	•	00			
					(a) measured SCR catalyst efficiency					
		l			(b) offset-corrected modeled SCR					
					catalyst efficiency (please see the					
1		l			general description for details)					
					goneral accompliant for details)					
		l			EWMA stabilized mode:					
•	ı	•			ETTITI (Stabilized IIIode.					

Component / System	Fault	Monitor Strategy Description	Primary Malfunction Criteria	, .	Threshold ogic and Value		Secondary Parameters		Enable Conditions		Time	MIL
System	Code	Description	Griteria	LC	gic and value		filter coefficient for stabilized mode number of SCR efficiency measurements for stabilized mode basic enable conditions met:	= =	0.04 1 see sheet enable tables	factor count	Required	Illum.
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	for time and battery voltage and battery voltage and battery voltage and basic enable conditions met: and NO Pending or Confirmed DTCs:	= >= <= =	3.00 9.00 6553.40 see sheet enable tables see sheet inhibit tables	sec V V	fail conditions exists for 10 s test performed continuously 0.01 s rate	В
Glow Plug Diagnostic Status Frame	U0106	Monitoring of the reception of glow plug control frame	Frame timeout error is detected when frame is not received within the timeout count	>	5.00	counts	ignition on	=	TRUE		test performed continuously	В

Component / System	Fault Code	Monitor Strategy Description	Primary Malfunction Criteria		Threshold gic and Value		Secondary Parameters		Enable Conditions		Time Required	MIL Illum.
							and Bus off or error passive on CAN and Frame enabled. The EMC is authorized to read the frame and basic enable conditions met:	=	FALSE TRUE see sheet enable	-	at 0.02 s rate whenever enable conditions are met	
							2000 0.1000 00101010 1101		tables			
Lost Communication with Reductant Control Module	U010E	CAN frame not received after a calibrated number of times	Counts up when message frame is not received in the time out interval	>	40.00	counts	CAN Bus is Active Can Bus Initialized (CAN Bus is Active)	=	TRUE	-	fail conditions exists for more than 5 sec monitor runs	А
							consisting of: ignition for time battery voltage	= > <	TRUE 5.00 6553.40	sec V	with 0.1 s rate	
		CAN frame rolling counter	DLS1 Sliding Window error counter	>=	8.00	counts	battery voltage CAN Bus is Active	>	9.00 TRUE	V	monitor runs	
		and protection value verification using a sliding window evaluation									with 1 s rate	
		Check of level sensor	within a number of message frames	=	9.00	counts	Can Bus Initialized (CAN Bus is Active) consisting of: ignition for	=	TRUE	-		
							time battery voltage battery voltage	> < >	5.00 6553.40 9.00	sec V V		
		CAN frame rolling counter and protection value verification using a sliding window evaluation	DLS2 Sliding Window error counter	>=	8.00	counts	CAN Bus is Active	=	TRUE	•	monitor runs with 1 s rate	
			within a number of message frames	=	9.00	counts	Can Bus Initialized (CAN Bus is Active)					
							consisting of: ignition for	=	TRUE	-		
							time battery voltage battery voltage	> < >	5.00 6553.40 9.00	sec V V		
		CAN frame rolling counter and protection value verification using a sliding window evaluation	DLS3 Sliding Window error counter	>=	8.00	counts	CAN Bus is Active	=	TRUE		monitor runs with 1 s rate	
		Check of error states	within a number of message frames	=	9.00	counts	Can Bus Initialized (CAN Bus is Active)					
							consisting of: ignition for	=	TRUE	-		
1		1					time	>	5.00	sec		

Component / System	Fault Code	Monitor Strategy Description	Primary Malfunction Criteria		Threshold Logic and Value	ıe	Secondary Parameters		Enable Conditions		Time Required	MIL
Oystem	Oode	Description	Ontena		Logic and van		battery voltage battery voltage	< >	6553.40 9.00	V V	required	IIIui
Engine Out NOx Sensor CAN Message #1	U029D	Engine out NOx sensor CAN message #1 frame not received after a calibrated number of times	Counts up when message frame is not received in the time out interval	>	5.00	counts	CAN Bus is Active Can Bus Initialized (CAN Bus is Active)	=	TRUE	-	fail conditions exists for more than 20 sec	A
							consisting of: ignition for	=	TRUE	-	monitor runs with 0.005 s rate	
							time battery voltage battery voltage	> < >	5.00 6553.40 9.00	sec V V		
		CAN frame rolling counter and protection value verification using a sliding window evaluation Check of engine out NOx cor	Sliding window error counter within a number of message frames	>=	9.00		CAN Bus is Active Can Bus Initialized (CAN Bus is Active)	=	TRUE	•	monitor runs whenever enable conditions are met	
							consisting of: ignition for	=	TRUE	-		
							time battery voltage battery voltage	> < >	5.00 6553.40 9.00	sec V V		
		CAN frame rolling counter and protection value verification using a sliding window evaluation	Sliding window error counter within a number of message frames	>=	9.00		CAN Bus is Active Can Bus Initialized (CAN Bus is Active)	=	TRUE	-	monitor runs whenever enable conditions are met	
		onesk of engine out wex ser	walling hamber of mesoage hames		0.00	oounio	consisting of: ignition for	=	TRUE	-	are met	
							time battery voltage battery voltage No pending or confirmed DTCs	> < > =	5.00 6553.40 9.00 see sheet inhibit tables	sec V V		
ingine Out NOx Sensor CAN Message #2		Engine out NOx sensor CAN message #2 frame not received after a calibrated number of times	Counts up when message frame is not received in the time out interval	>	5.00	counts	CAN Bus is Active	=	TRUE	-	fail conditions exists for more than	
							Can Bus Initialized (CAN Bus is Active) consisting of: ignition	=	TRUE	-	20 sec monitor runs with 0.005 s rate	
							for time battery voltage battery voltage	> < >	5.00 6553.40 9.00	sec V V		

Component / System	Fault Code	Monitor Strategy Description	Primary Malfunction Criteria		Threshold Logic and Value		Secondary Parameters		Enable Conditions		Time Required	N III
System	Code	CAN frame rolling counter and protection value verification using a sliding window evaluation	Sliding window error counter	>=	8.00		CAN Bus is Active	=	TRUE	-	monitor runs whenever enable conditions	- 111
			within a number of message frames	=	9.00	counts	Can Bus Initialized (CAN Bus is Active) consisting of: ignition for time battery voltage battery voltage No pending or confirmed DTCs	= > < > =	TRUE 5.00 6553.40 9.00 see sheet inhibit tables	sec V V	are met	
ngine Out NOx Sensor CAN Message #3		Engine out NOx sensor CAN message #3 frame not received after a calibrated number of times	Counts up when message frame is not received in the time out interval	>	5.00	counts	CAN Bus is Active Can Bus Initialized (CAN Bus is Active)	=	TRUE	-	fail conditions exists for more than 20 sec monitor runs	
							consisting of: ignition for time battery voltage battery voltage	= > < >	TRUE 5.00 6553.40 9.00	sec V V	with 0.005 s rate	
		CAN frame rolling counter and protection value verification using a sliding window evaluation Check of engine out NOx ser	Sliding window error counter within a number of message frames	>=	9.00	counts	CAN Bus is Active Can Bus Initialized (CAN Bus is Active)	=	TRUE	-	monitor runs whenever enable conditions are met	
							consisting of: ignition for time battery voltage battery voltage No pending or confirmed DTCs	= > < > =	TRUE 5.00 6553.40 9.00 see sheet inhibit tables	sec V V		
ngine Out NOx Sensor CAN Message #4		Engine out NOx sensor CAN message #4 frame not received after a calibrated number of times	Counts up when message frame is not received in the time out interval	>	25.00	counts	CAN Bus is Active Can Bus Initialized (CAN Bus is Active)	=	TRUE	-	fail conditions exists for more than 20 sec monitor runs	
							consisting of: ignition for time battery voltage battery voltage	= > < >	TRUE 5.00 6553.40 9.00	sec V V	with 0.02 s rate	
		CAN frame rolling counter and protection value verification using a sliding window evaluation	Sliding window error counter	>=	8.00	counts	CAN Bus is Active	=	TRUE	-	monitor runs whenever enable conditions	

Component /	Fault	Monitor Strategy	Primary Malfunction		Threshold		Secondary		Enable		Time	MIL
System	Code	Description	Criteria		Logic and Value		Parameters		Conditions		Required	Illun
		Check of engine out NOX ser	within a number of message frames	-	9.00	counts	Can Bus Initialized (CAN Bus is Active) consisting of: ignition for time battery voltage battery voltage No pending or confirmed DTCs	= > < > =	TRUE 5.00 6553.40 9.00 see sheet inhibit tables	sec V V	are met	
Engine Out NOx Sensor CAN Message #5		Engine out NOx sensor CAN message #5 frame not received after a calibrated number of times	Counts up when message frame is not received in the time out interval	>	25.00	counts	CAN Bus is Active Can Bus Initialized (CAN Bus is Active) consisting of: ignition for time battery voltage	= -> <	TRUE 5.00 6553.40	- sec V	fail conditions exists for more than 20 sec monitor runs with 0.1 s rate	
							battery voltage	>	9.00	V		
Post Catalyst NOx Sensor CAN Message #1	U029E	Post catalyst NOx sensor CAN message #1 frame not received after a calibrated number of times	Counts up when message frame is not received in the time out interval	>	5.00	counts	CAN Bus is Active Can Bus Initialized (CAN Bus is Active) consisting of: ignition for time	= = >	TRUE 5.00 6553.40	- sec V	fail conditions exists for more than 21 sec monitor runs with 0.005 s rate	A
							battery voltage battery voltage	< >	9.00	V		
		CAN frame rolling counter and protection value verification using a sliding window evaluation Check of post catalyst NOx of	Sliding window error counter within a number of message frames	>=	8.00 9.00	counts		=	TRUE	-	monitor runs whenever enable conditions are met	
							ignition for time battery voltage battery voltage No pending or confirmed DTCs	= > < > =	TRUE 5.00 6553.40 9.00 see sheet inhibit tables	sec V V		
		CAN frame rolling counter and protection value verification using a sliding window evaluation Check of post catalyst NOx s	Sliding window error counter within a number of message frames	>=	9.00		CAN Bus is Active Can Bus Initialized (CAN Bus is Active)	=	TRUE	-	monitor runs whenever enable conditions are met	
		1					consisting of: ignition	=	TRUE			

Component / System	Fault Code	Monitor Strategy Description	Primary Malfunction Criteria	- 1	Threshold ogic and Valu	ie	Secondary Parameters		Enable Conditions		Time Required	MIL Illum
							for time battery voltage battery voltage No pending or confirmed DTCs	> < > =	5.00 6553.40 9.00 see sheet inhibit tables	sec V V		
Post Catalyst NOx Sensor CAN Message #2		Post catalyst NOx sensor CAN message #2 frame not received after a calibrated number of times	Counts up when message frame is not received in the time out interval	>	5.00	counts	CAN Bus is Active Can Bus Initialized (CAN Bus is Active) consisting of:	=	TRUE	-	fail conditions exists for more than 21 sec monitor runs with 0.005 s	
							ignition for time battery voltage battery voltage	= > < >	TRUE 5.00 6553.40 9.00	sec V V	rate	
		CAN frame rolling counter and protection value verification using a sliding window evaluation Check of post catalyst NOx s	Sliding window error counter within a number of message frames	>=	9.00		CAN Bus is Active Can Bus Initialized (CAN Bus is Active)	=	TRUE	-	monitor runs whenever enable conditions are met	
							consisting of: ignition for time battery voltage battery voltage No pending or confirmed DTCs	= > < > =	TRUE 5.00 6553.40 9.00 see sheet inhibit tables	sec V V		
ost Catalyst NOx Sensor CAN Message #3		Post catalyst NOx sensor CAN message #3 frame not received after a calibrated number of times	Counts up when message frame is not received in the time out interval	>	5.00	counts	CAN Bus is Active Can Bus Initialized (CAN Bus is Active)	=	TRUE		fail conditions exists for more than 21 sec monitor runs	
							consisting of: ignition for time battery voltage battery voltage	= > < >	TRUE 5.00 6553.40 9.00	sec V V	with 0.005 s rate	
		CAN frame rolling counter and protection value verification using a sliding window evaluation Check of post catalyst NOx s	Sliding window error counter within a number of message frames	>=	8.00		CAN Bus is Active Can Bus Initialized (CAN Bus is Active)	=	TRUE		monitor runs whenever enable conditions are met	
							consisting of: ignition for time battery voltage battery voltage	= > < >	TRUE 5.00 6553.40 9.00	sec V V		

Component /	Fault	Monitor Strategy	Primary Malfunction		Threshold		Secondary		Enable		Time	MIL
System	Code	Description	Criteria		Logic and Valu	ie	Parameters No pending or confirmed DTCs	=	Conditions see sheet inhibit	_	Required	Illum.
							No pending of confirmed DTCs	=	tables	-		
Post Catalyst NOx Sensor CAN Message #4		Post catalyst NOx sensor CAN message #4 frame not received after a calibrated number of times	Counts up when message frame is not received in the time out interval	>	25.00	counts	CAN Bus is Active	=	TRUE		fail conditions exists for more than	
							Can Bus Initialized (CAN Bus is Active) consisting of: ignition for	=	TRUE	-	21 sec monitor runs with 0.02 s rate	
					_	_	time battery voltage battery voltage	> < >	5.00 6553.40 9.00	sec V V		
		CAN frame rolling counter and protection value verification using a sliding window evaluation Check of post catalyst NOx s	Sliding window error counter within a number of message frames	>=	9.00		CAN Bus is Active Can Bus Initialized (CAN Bus is Active)	=	TRUE	-	monitor runs whenever enable conditions are met	
							consisting of: ignition for time	=	TRUE 5.00	- sec		
							battery voltage battery voltage No pending or confirmed DTCs	> =	6553.40 9.00 see sheet inhibit tables	V V -		
Post Catalyst NOx Sensor CAN Message #5		Post catalyst NOx sensor CAN message #5 frame not received after a calibrated number of times	Counts up when message frame is not received in the time out interval	>	25.00	counts	CAN Bus is Active Can Bus Initialized (CAN Bus is Active)	=	TRUE	•	fail conditions exists for more than 21 sec	
							consisting of: ignition for	=	TRUE	-	monitor runs with 0.1 s rate	
							time battery voltage battery voltage	> < >	5.00 6553.40 9.00	sec V V		

End of Table

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 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	>	150	°C	ignition on and basic enable conditions met:	=	TRUE see sheet enable tables		fail conditions exists for 5 s test performed continuousl y 0.2 s rate	В
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 continuousl y 0.2 s rate	В
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:≥ 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:)	- > > = = =	1.00 11.00 3.00 TRUE see sheet enable tables	sec V sec	fail conditions exists for 1.99s 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.
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	H ^	FALSE	sec	fail conditions exists for 1s monitor runs with 0.2 s rate whenever enable conditions	В
							and battery voltage for	>	11.00	V	are met	
							time and (>	3.00	sec		
							ignition on and basic enable conditions met:	=	TRUE see sheet enable	-		
)	_	tables			
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:)	> > = =	1.00 11.00 3.00 TRUE see sheet enable tables	sec V sec	fail conditions exists for 2 s monitor runs with 0.2 s rate whenever enable conditions are met	В
Fuel Temperature Sensor 1 Circuit High	P111F	Detects an error in the fuel pump temperature sensor performance by comparing start-up temperatures between fuel pump temperature and fuel rail temperature	Path 1: (a) - (b) (see Look-Up-Table #41) where ((a) captured fuel temperature 1 at start	>	100 to 999 measured	°C	minimum engine-off time and ambient temperature and	>=	28800.00 -60.04	sec	fail conditions exists for 0.2 s monitor runs once per trip with 0.2 s rate whenever enable	В

Component /	Fault	Monitor Strategy	Primary Malfunction		Threshold		Secondary		Enable		Time	MIL
System	Code	Description	Criteria		Logic and Value		Parameters		Conditions		Required	Illum.
			and with (b) captured fuel temperature 2 at start	=	measured	-	engine speed (see Look-Up-Table #91) for	>	600 to 850	rpm	are met	
)		parameter		time and	>	0.00	sec		
			or Path 2:				engine post drive/ afterun and	=	FALSE	-		
			(a) - (b) (see Look-Up-Table #41) with (a) captured fuel temperature 1 at start	<= =	100 to 999 measured	°C	diagnostic performed in current dc and basic enable conditions met:	=	FALSE see sheet enable	-		
			and with	=	parameter	-	and	=	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	=	measured parameter	-						
			and with (b) captured fuel temperature 2 at start and	=	measured parameter	-						
			(status of block heater (see parameter definition)	=	FALSE	-						
Lost Communications with Auxiliary Heater Control	U0166	Detects loss of communication between ECM (on-board control unit) and Auxiliary Heater Control	time since last message from auxiliary heater control module was received	>	2.50	sec	ignition on	=	TRUE	-	fail conditions exists for 12 s	Special C
Module		Module					for time and	>=	3.00	sec	test performed	
							battery voltage and	>=	9.00	V	continuousl y 0.01 s rate	
							battery voltage and basic enable conditions met:	<= =	6553.40 see sheet enable	V -		
							and NO Pending or Confirmed DTCs:	=	tables 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.

End of Table

15 OBDG09 Diagnostic Parameter Definition Table - ECM (LML/LGH Common)

Component / System	State or Status Sub-Grouping	Description of State or Status found in 150BDG09	Defined by:	Enable Logic	Enable Values	Enable Units
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 for	>	500	rpm
			time	>	60	sec
			and (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	-
		etatus of Disability at a green from				
		status of Block Heater monitor time	active under following conditions			
			engine speed for	>	500	rpm
			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 and	>	300	sec
			engine speed (see Look-Up-Table #14) for	>	600 to 850	rpm
			time and	>	600	sec
			(a) - (b) with	>	4.5	°C

15 OBDG09 Diagnostic Parameter Definition Table - ECM (LML/LGH Common)

Component / System	State or Status Sub-Grouping	Description of State or Status found in 150BDG09	Defined by:	Enable Logic	Enable Values	Enable Units
			(a) intake at temperature at start and with (b) minimum intake air temperature value for the comparison with the reference temperature during driving cycle)		measured parameter measured parameter	-
		Status of Sun Load Detection time	active under following condition (Vehicle speed for time and engine speed (see Look-Up-Table #14) for time)	> > > > > > > > > > > > > > > > > > > >	14.92 300 600 to 850 600	mph sec rpm sec
ECM Operating States		Engine Pre-Drive	processor operating normally ignition processor powerup boot initialization or key off bookkeeping cleanup (accessory, post-wake-up, pre-sleep)		TRUE OFF complete 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 also includes "engine stopping" during engine spin down	processor operating normally ignition key off bookkeeping cleanup	= = =	TRUE OFF in process	- - -
Engine Operating Modes	Exhaust Operating Mode focus	Normal Mode				

Component / System	State or Status Sub-Grouping	Description of State or Status found in 150BDG09	Defined by:	Enable Logic	Enable Values	Enable Units
		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) Control is enabled	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			
			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			

Component / System	State or Status Sub-Grouping	Description of State or Status found in 150BDG09	Defined by:	Enable Logic	Enable Values	Enable Units
			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			
			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	engine running required actual engine torque		TRUE 1	- Nm

Component / System	State or Status Sub-Grouping	Description of State or Status found in 150BDG09	Defined by:	Enable Logic	Enable Values	Enable Units
		Decel Fuel Shut Off or Over-Run	-	-	-	-
		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	> = = = <= >	(a) + (b) 25.26 measured parameter 1.24 4	- % - mph sec
			Vehicle speed time)) or at initialization of Diesel fuel level	\ \	1.24 30 TRUE	mph sec
Idle Speed Control		Idle Speed Controller Active "normal" low idle speed governor	no overrides for: Gear-Shift Harmonization 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)			
NOx Sensor		Status of NOx signal of upstream NOx sensor	(
			following condition met for time: (Integrated heat quantity (see Look-Up-Table #1)	>=	30 375 to 500	sec kJ

Component / System	State or Status Sub-Grouping	Description of State or Status found in 150BDG09	Defined by:	Enable Logic	Enable Values	Enable Units
			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
			for time NO Pending or Confirmed DTCs:	> =	20 see sheet	sec
			-	-	inhibit tables	
))			
		Upstream Nox Sensor Signal Ready	following condition met for time:	>	30	sec
		Upstream Nox SensorDewpoint Reached or	(
		Lambda signal from NOx sensor ready	Integrated heat quantity (see Look-Up-Table #1)	>=	375 to 500	kJ
)			
		Status of NOx signal of downstream 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 and injection quantity	>	0.9	-
			for time		0.5	sec
			engine speed		100	rpm
			for time NO Pending or Confirmed DTCs:	> =	20 see sheet	sec -
			-	_	inhibit tables	-
))			
		Upstream Nox Sensor Signal Ready	following condition met for time:	>	30	sec

Component / System	State or Status Sub-Grouping	Description of State or Status found in 150BDG09	Defined by:	Enable Logic	Enable Values	Enable Units
		or Upstream Nox SensorDewpoint Reached or Lambda signal from NOx sensor ready	(Integrated heat quantity (see Look-Up-Table #2)	>=	0 to 350	kJ
		Enabling Downstream NOx sensor heater diagnosis				
			SCR Catalyst downstream temperature SCR Catalyst downstream temperature battery voltage battery voltage	>= <= >= <=	94.96 3003.56 11 655.34	°C °C V
			and Integrated heat quantity (see Look-Up-Table #2)	>=	0 to 350	kJ
			for time	>	30	sec
			and for time NO Pending or Confirmed DTCs:	> =	1 see sheet inhibit tables	sec -
		Enabling Downstream NOx sensor heater diagnosis				
			SCR Catalyst upstream temperature SCR Catalyst upstream temperature battery voltage battery voltage	>= <= >= <=	94.96 3003.56 11 655.34	°C °C V V
			and Integrated heat quantity (see Look-Up-Table #1)	>=	375 to 500	kJ
			for time	>	30	sec
			and for time	>	1	sec

Component / System	State or Status Sub-Grouping	Description of State or Status found in 150BDG09	Defined by:	Enable Logic	Enable Values	Enable Units
			NO Pending or Confirmed DTCs:	=	see sheet inhibit tables	-
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 (rail pressure or (a) - (b) (a)Fuel Rail Pressure Setpoint (b)Maximum Rail Pressure for last 10ms	<= >= < =	TRUE 300 15000 5000 measured paramter measured paramter	rpm kPa kPa -
		Rail Control - PCV Closed Loop Control Only PCV = Pressure Control Valve	Rail Pressure Precontrol (Just after start) and Number of Crankshaft revolutions since entering Rail Pressure Precontrol or (state machine rail pressure control transitioning pressure control valve mode and setpoint volume flow of the metering unit out of rail pressure control (see Look-Up-Table #6)	>=	TRUE 10 TRUE 60000 to 224000	revs - mm^3/rev

Component / System	State or Status Sub-Grouping	Description of State or Status found in 150BDG09	Defined by:	Enable Logic	Enable Values	Enable Units
			Fuel system pressure and high pressure pump outlet and engine status	<	0 RUNNING	kPa -
)			
		Rail Control - Metering Unit Closed Loop Control	state machine rail pressure control equal transitioning to metering unit pressure control mode and	=	TRUE	-
			Controller for PCV not wound-up (large corrective control)	=	TRUE	-
		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) and	=	TRUE	
			(a) + (b) (see Look-Up-Table #7)	<	12 to 400	mm^3/rev
			(a)Torque Generating fuel injection quantity		calculated parametet	-
			(b)Non-Torque generating fuel injection quantity	=	calculated parametet	-
		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			
			or state machine rail pressure control transitioning pressure control valve mode)			
			and (a) + (b) (a)Torque Generating fuel injection quantity	< =	(c) + (d) calculated parametet	- -

Component / System	State or Status Sub-Grouping	Description of State or Status found in 150BDG09	Defined by:	Enable Logic	Enable Values	Enable Units
			(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:	=	see sheet inhibit tables	-
			or (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
			and 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	-

Component / System	State or Status Sub-Grouping	Description of State or Status found in 150BDG09	Defined by:	Enable Logic	Enable Values	Enable Units
			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	-
			or state machine rail pressure control equal transitioning to metering unit pressure control mode	=	TRUE	-
			and (
			exhaust gas system regeneration mode) and	!=	REGEN	-
			NO Pending or Confirmed DTCs:	=	see sheet inhibit tables	-
		Switchover Between Metering Unit + PCV Closed Loop Control to PCV Closed Loop Control only	(
		Closed Loop Control only	state machine rail pressure control equals coupled pressure control (rail pressure is controlled by metering unit and pressure control valve)		TRUE	-
			or 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
			where (a)Torque Generating fuel injection quantity	=	calculated parametet	-
			(b)Non-Torque generating fuel injection quantity	=	calculated parametet	-

Component / System	State or Status Sub-Grouping	Description of State or Status found in 150BDG09	Defined by:	Enable Logic	Enable Values	Enable Units
Regeneration of the Diesel Particulate Filter SCR System	NOx Control System Reductant Dosing Strategy Active State	Status thermal regeneration active Release of dosing of the dosing strategy	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-Up-Table #5) (c) Basis value of produced soot mass flow dependent on actual soot mass (see Look-Up-Table #3) 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	\	0 0 to 4.0 0 to 2.97 0.02 to 0.29 Metering Control TRUE FALSE 0.02 300 0.01 179.96 89.96 -0.62 400	- factor - g/sec - sec °C/sec sec °C °C mph rpm
	NOx Control System Reductant Dosing Pressure	State of Reductant Pressure Control	NO Pending or Confirmed DTCs: ignition Dwell time in the state of standby	= <	see sheet inhibit tables on 5	- sec
	Control System States	System: Standby	NO Pending or Confirmed DTCs:	=	see sheet inhibit tables	-
		State of Reductant Pressure Control System: No Pressure control	Old SCR control state (please see the definition)	=	Stand by	-

Component / System	State or Status Sub-Grouping	Description of State or Status found in 150BDG09	Defined by:	Enable Logic	Enable Values	Enable Units
			ignition Dwell time in the state of standby Dwell time in the state of no pressure control NO Pending or Confirmed DTCs:	>= <	on 5 2 see sheet inhibit tables	sec sec
		State of Reductant Pressure Control System: Pressure control	Old SCR control state (please see the definition) ignition engine speed Dwell time in the state of no pressure control exhaust gas temperature Upstream SCR (Reductant Defrost check (please see the definition) or The component protection release of the heater control (please see the definition) or Preliminary release of the heater control for the main state machine (please see the definition) NO Pending or Confirmed DTCs:	= > >= >= == == == == == == == == == ==	NO Pressure Control on 550 2 169.96 TRUE TRUE TRUE	rpm sec °C -
		State of Reductant Pressure Control System: Refilling Reductant in pressure line (substate of Pressure control)	SCR control state (please see the definition) (Reductant filling state in the pressure line and Reductant Pump Module Pressure) Set-point duty cycle for Reductant dosing valve Set-point duty cycle for the Reductant Pump pressure Motor actuator NO Pending or Confirmed DTCs:	< < = =	Pressure Control 50 200 100 40.00 see sheet inhibit tables	- % kPa % %

Component / System	State or Status Sub-Grouping	Description of State or Status found in 150BDG09	Defined by:	Enable Logic	Enable Values	Enable Units
		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 or	>=	50	%
			Reductant Pump Module Pressure	>=	200	kPa
			for time	>	0.5	sec
			Reductant Pump Module Pressure	<	350	kPa
			Set-point duty cycle for Reductant dosing valve		0%	%
			Set-point duty cycle for the Reductant Pump pressure Motor actuator	=	80.00	%
			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 ventilation states		10	counts
			Set-point duty cycle for Reductant dosing valve Set-point duty cycle for the Reductant Pump pressure Motor actuator		100 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 NO Pending or Confirmed DTCs:	=	0 see sheet inhibit tables	% -
		State of Reductant Pressure Control System: Pressure reduction	ignition	=	off	-
			dwell time in the state of pressure reduction	<	5	sec

Component / System	State or Status Sub-Grouping	Description of State or Status found in 150BDG09	Defined by:	Enable Logic	Enable Values	Enable Units
			Activation state of Reductant reverting valve power stage Set-point duty cycle for Reductant dosing valve Set-point duty cycle for the Reductant Pump pressure Motor actuator NO Pending or Confirmed DTCs:	= =	On 0 15.00 see sheet inhibit tables	- % % -
	SCR Engine State required for operation	SCR Engine State	Ignition on engine speed	>	TRUE 550	- rpm
	Reductant Dosing Strategy based on DPF Fload	Status fill level decrease (please see the definition)	Particulate Filter Regeneration demand on or Reductant fill level of the SCR catalyst lowed to the target value under Particle filter Regeneration request (a) - (b) (a) Nominal value of Reductant fill level in the catalyst (b) Estimated current Reductant load (c) Reductant Dosing quantity limitation or SCR catalyst temperature too high to convert Reductant under Particle filter Regeneration request Average temperature inside the SCR catalyst:	>=	TRUE 0 100 999.96	- factor
	Reductant Heater and Defrost System Control States and Status	Reductant Defrost check	status of reductant tank heater temperature (please see the definition) State of the defrosting check of pressure line (please see the definition)	=	TRUE TRUE	-

Component / System	State or Status Sub-Grouping	Description of State or Status found in 150BDG09	Defined by:	Enable Logic	Enable Values	Enable Units
			State of the defrosting check of supply module (please see the definition)	=	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	status of reductant tank heater temperature			
		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
		State of the defrosting check of pressure line	State of the defrosting check of pressure line (please see the definition) time since pressure line heating on under pressure line defrost mode	>=	0 to 3276.7	sec
			or 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
			Pressure line defrost check in last driving cycle status of SCR control state (please see the definition)	= =	TRUE No Pressure Control	-
			Engine off Time		0	sec

Component / System	State or Status Sub-Grouping	Description of State or Status found in 150BDG09	Defined by:	Enable Logic	Enable Values	Enable Units
			NO Pending or Confirmed DTCs:	=	TRUE	-
		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	>=	0 to 3276.7	sec
			module defrost mode or			300
			status of SCR control state (please see the definition) Supply module defrost timer	=	No Pressure Control 0	- sec
			or ignition		on	sec
			engine speed (>	550	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
			status of reductant tank heater defrost status of reductant tank heater temperature (please see the definition)	=	FALSE FALSE	-
			State of the defrosting check of pressure line (please see the definition)	=	TRUE	-
			State of the defrosting check of supply module (please see the definition)	=	TRUE	-
			or (

Component / System	State or Status Sub-Grouping	Description of State or Status found in 150BDG09	Defined by:	Enable Logic	Enable Values	Enable Units
			ignition	=	on	sec
			engine speed	>	550	rpm
			Engine off Time	<=	0	sec
			State of the defrosting check of pressure line (please see the definition)	=	TRUE	-
			State of the defrosting check of supply module (please see the definition)	=	TRUE	-
			and if the following conditions were met in previous	=	TRUE	-
			driving cycle (
			ignition	=	on	sec
			engine speed	>	550	rpm
			Engine off Time	<=	0	sec
			State of the defrosting check of pressure line (please see the definition)	=	TRUE	-
			State of the defrosting check of supply module (please see the definition)	=	TRUE	-
))			
		Release of tank heater circuit	(0.4.4400	
			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
)			
			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 pressure line heater (see Look-Up-Table #18)	>=	0 to 3276.7	sec
			or Requested heating time for pressure line heater (see Look-Up-Table #20)	>=	0 to 3276.7	sec

Component / System	State or Status Sub-Grouping	Description of State or Status found in 150BDG09	Defined by:	Enable Logic	Enable Values	Enable Units
))			
			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
			(add 255k op 1456 # 17)) and			
			(Requested defrosting time for supply module heater (see Look-Up-Table #19)	>=	0 to 3276.7	sec
			or 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 pressure line heater (see Look-Up-Table #18)	>=	0 to 3276.7	sec
			or 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
			or Requested heating time for supply module heater (see Look-Up-Table #21)	>=	0 to 3276.7	sec
))			

Component / System	State or Status Sub-Grouping	Description of State or Status found in 150BDG09	Defined by:	Enable Logic	Enable Values	Enable Units
			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
			or 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
			or 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
			or 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	-
		Release of tank heater circuit	(Requested defrosting time for supply module heater (see Look-Up-Table #19)		0 to 3276.7	sec
			or Requested heating time for supply module heater (see Look-Up-Table #21)	>=	0 to 3276.7	sec
			or ((

Component / System	State or Status Sub-Grouping	Description of State or Status found in 150BDG09	Defined by:	Enable Logic	Enable Values	Enable Units
			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)) and	>=	0 to 3277	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
			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)) and	>=	0 to 3276.7	sec
			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))) or	>=	0 to 3276.7	sec
			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 pressure line heater	>=	0 to 3276.7	sec
			(see Look-Up-Table #18)		0 10 3270.7	Sec

Component / System	State or Status Sub-Grouping	Description of State or Status found in 150BDG09	Defined by:	Enable Logic	Enable Values	Enable Units
			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) or	>=	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
		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) Waiting time after tank heater release expired) or ((TRUE 0	sec

Component / System	State or Status Sub-Grouping	Description of State or Status found in 150BDG09	Defined by:	Enable Logic	Enable Values	Enable Units
			Waiting time before tank heater released started with	<	32767	sec
			status of reductant tank heater temperature (please see the definition)	=	FALSE	-
			and (
			status of reductant tank heater temperature (please see the definition)	=	TRUE	-
			Waiting time after tank heater release expired))	>	0	sec
			or ((
			Waiting time before tank heater released started with	>	32767	sec
			status of reductant tank heater temperature (please see the definition)	=	FALSE	-
			and (
			status of reductant tank heater temperature (please see the definition)	=	TRUE	-
			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%) Restriction (33.33%) < tank level < Warning (66.67%)		OK Warning	-
			Empty < tank level < Restriction (33.33%) Tank level < = 0.1%	= =	Restriction 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			
l		1	Derivation of the PT1 filtered level signal (DT1)	>=	1.00	%/sec

Component / System	State or Status Sub-Grouping	Description of State or Status found in 150BDG09	Defined by:	Enable Logic	Enable Values	Enable Units
			ignition on	=	TRUE	-
			engine speed	>	550	rpm
			Vehicle speed	>=	6.22	mph
			time since engine started	<=	(a) * (b)	
			(a) Time period for a positive slope to detect refueling	=	12	sec
			(b) Factor for the extension of the detection time for refueling		20	factor
			since the following conditions met:	=	TRUE	-
			Falling edge of ignition	=	TRUE	-
			or Reductant Refill enabling conditions reset timers	=	TRUE	-
)))			
			or			
			time since potential Reductant refill detection is set	>=	8	sec
			and with			
) Derivation of the PT1 filtered level signal (DT1)	>=	1.00	%/sec
			filter release for Reductant tank level calculation at ignition on on (Please see the definition)	=	TRUE	-
			and with (
			Frozen state is active during a certain warning level (please see the definition) and with	=	TRUE	-
			and with			
			Reductant tank Temperature	>=	-100.04	°C
			or Reductant low warning level (Please see the definition)	>=	0	level
)))			
		Status of Doductont Tools Level Delega-	atatua of radicatont took level selector (see			
		Status of Reductant Tank Level Release	status of reductant tank level release (please see the definition)		TDUE	
			Status of Filter release for reductant tank level calculation (please see the definition) and	=	TRUE	-
			(()			

Component / System	State or Status Sub-Grouping	Description of State or Status found in 150BDG09	Defined by:	Enable Logic	Enable Values	Enable Units
			ambient temperature ((>=	-100.04	°C
			status of reductant tank heater temperature (please see the definition)	=	FALSE	-
			Waiting time before tank heater released and	<	32767	sec
			status of reductant tank heater temperature (please see the definition)	=	TRUE	-
			Waiting time after tank heater release expired)	>	0	sec
			or (
			status of reductant tank heater temperature (please see the definition)	=	FALSE	-
			Waiting time before tank heater released and	>=	32767	sec
			status of reductant tank heater temperature (please see the definition)	=	TRUE	-
			Waiting time after tank heater release expired))	>=	0	sec
			or 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
			or Reductant low warning level (Please see the	>=	0	-
			definition) NO Pending or Confirmed DTCs:	=	TRUE	-
			or Frozen state is active during a certain warning level (please see the definition)	=	TRUE	-

Component / System	State or Status Sub-Grouping	Description of State or Status found in 150BDG09	Defined by:	Enable Logic	Enable Values	Enable Units
		Filter release for Reductant tank level calculation at Ignition on	ignition	=	on	-
			Engine on timer is expired (please see the definition)	=	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)	
			(a) Tank level for reserve mode (Restriction level) in [g]	=	2614	g
			(b) Tank level threshold range below Restriction threshold for ignition on refill detection release)	=	1015	g
			or			
			Raw Reductant tank level and with	>=	66.7	%
			(Remaining Reductant quantity (a) - (b):	<	(a) - (b)	
			(a) Tank level for reserve mode (Warning level) in [g]	=	5279	g
			(b) Tank level threshold range below WARNING threshold for ignition on refill detection release	=	1617	g
)			
			or Raw Reductant tank level and with	>=	100	%
			(Remaining Reductant quantity (a) - (b):	>=	(a) - (b)	
			(a) Tank level for reserve mode (Warning level) in	=	5279	g
			[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)			

Component / System	State or Status Sub-Grouping	Description of State or Status found in 150BDG09	Defined by:	Enable Logic	Enable Values	Enable Units
			Reductant tank level changed	=	TRUE	-
			(() Captured Reductant tank level at last tank level change	=	Empty	-
			or Captured Reductant tank level at last tank level change)	=	Restriction	-
			and (
			one or more of following conditions are met status of Reductant tank level (please see the definition) or	=	Warning	-
			status of Reductant tank level (please see the definition)	=	OK	-
			or status of Reductant tank level (please see the definition))) or	=	Full	-
			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 change	=	OK	-
			status of Reductant tank level (please see the definition)	=	Full	-

Component / System	State or Status Sub-Grouping	Description of State or Status found in 150BDG09	Defined by:	Enable Logic	Enable Values	Enable Units
		Engine on timer is expired	time since engine started	>=	(a) * (b)	sec
					12 20	sec -
			and with			
			ignition	=	on	sec
			engine speed Vehicle speed	> >=	550 6.22	rpm mph
)	, –	0.22	mpn
			or (
			Vehicle speed	>=	6.22 TRUE	mph
			NO Pending or Confirmed DTCs: for time	= >	1	sec
))			
			and with timer reset conditions			
			Falling edge of ignition	=	TRUE	-
			or Reductant Refill enabling conditions reset timers	=	TRUE	-
)			
	Reducant Tank Level Low	Normal_Operation_OK: 0 decimal,	Reductant tank level	=	Full	-
	Warning States	normal operation	and with			
			(Warning level	<=	49	_
			or	/-	43	_
			(Previous warning level	>	49	_
			vehicle speed	<=	98.75	mph
))			
			or Reductant Quality state	>	0	
			Neutotain Quality State	,	U	-
		Warning_Leve1: 1 decimal, Warning	Reductant tank level	<	Full	-
		level 1	Remaining mileage	>	1558.75	miles
			and with			

Component / System	State or Status Sub-Grouping	Description of State or Status found in 150BDG09	Defined by:	Enable Logic	Enable Values	Enable Units
			(Warning level	<=	49	Warning level
			or (Previous warning level	>	49	Warning
			vehicle speed))	<=	98.75	level mph
			and with Reductant Quality state	=	0	-
		Warning_Level2: 2 decimal, Warning	Reductant tank level	<	Full	-
		level 2	Remaining mileage and with	<=	1558.75	miles
			(Warning level	<=	49	Warning level
			or (
			Previous warning level	>	49	Warning level
			vehicle speed))	<=	98.75	mph
			and with Reductant Quality state	=	0	-
		Warning_Level3: 16 decimal, Warning level 3	Reductant tank level		Full	-
			Remaining mileage and with (>	855	miles
			Warning level	=	2	Warning level
			or Warning level	=	16	Warning level
			and with initialization phase after Reductant refill event is active	=	TRUE	-

Component / System	State or Status Sub-Grouping	Description of State or Status found in 150BDG09	Defined by:	Enable Logic	Enable Values	Enable Units
			Reductant Quality state	=	0	-
		Warning_Level4: 32 decimal, Warning level 4	Reductant tank level	<	Full	-
			Remaining mileage and with	<=	855	miles
			Warning level	<=	49	Warning level
			or (Previous warning level	>	49	Warning
			vehicle speed))	<=	98.75	level mph
			and with Reductant Quality state	=	0	-
		Warning_Level5: 48 decimal, Warning level 5	((_
		level 5	Reductant tank level Remaining mileage and with	< <=	Full 628.75	- miles
			(Warning level or	<=	49	Warning level
			(Previous warning level	>	49	Warning level
			vehicle speed))) or	<=	98.75	mph
			(Warning level	=	48	Warning level
			initialization phase after Reductant refill event is active	=	TRUE	-
			and with Reductant Quality state		0	-

Component / System	State or Status Sub-Grouping	Description of State or Status found in 150BDG09	Defined by:	Enable Logic	Enable Values	Enable Units
		Warning_Level6: 49 decimal, Warning level 6	((
			Warning level	=	49	Warning level
			initialization phase after Reductant refill event is active		TRUE	-
			or (
			Warning level	<	49	Warning level
			Failed Reductant system pressure build up	=	1	-
			and with Reductant Quality state		0	-
		Warning_Level8: 80 decimal, Vehicle	Warning level	=	80	Warning
		speed restriction mild	initialization phase after Reductant refill event is		TRUE	level
			active and with Reductant Quality state		0	
			Neduciani Quanty state	_	O	
		Warning_Level10: 112 decimal,Vehicle speed restriction aggressive	Warning level	=	112	Warning level
			initialization phase after Reductant refill event is active		TRUE	-
			and with Reductant Quality state		0	-
		Warning_Level12: 144 decimal, Vehicle	Warning level	=	144	Warning
		speed restriction severe	initialization phase after Reductant refill event is active		TRUE	level -
			and with Reductant Quality state		0	-

Component / System	State or Status Sub-Grouping	Description of State or Status found in 150BDG09	Defined by:	Enable Logic	Enable Values	Enable Units
		Warning_Level14: 176 decimal, Vehicle speed restriction final	Warning level initialization phase after Reductant refill event is active and with Reductant Quality state		176 TRUE	Warning level -
	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	- sec °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	< = = = = =	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	definition))) Reductant low warning level (Please see the definition) number of pressure build-up attempts and	>=	64 2	- counts

Component / System	State or Status Sub-Grouping	Description of State or Status found in 150BDG09	Defined by:	Enable Logic	Enable Values	Enable Units
			status of SCR control sub state (please see the definition) Reductant Pump Module Pressure Dwell time in Pressure Build up substate	= <	Pressure Build up 350	kPa
			system pressurizes in pressure buildup and ventilation states	> >=	10 10	sec counts
			Reductant Defrost check (please see the definition)	=	TRUE	-
			,			
SCR System Diagnosis	SCR System Long Term Adaptation Release States	Long-term Adaption Triggered				
			underdosing detected (please see the definition)	=	TRUE	-
			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	>=	10	g
			OR 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	<=	-6	g
			OR Difference between the NOx mass of the sensor and of the model during second functional evaluation	<=	-6	g

Component / System	State or Status Sub-Grouping	Description of State or Status found in 150BDG09	Defined by:	Enable Logic	Enable Values	Enable Units
			OR Difference between the NOx mass of the sensor and of the model during third functional evaluation (see Look-Up-Table #9)		-0.8 to -0.6	g
		Status of the SCR adaptation plausibility check active	(
		5.100.100.10	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
			Filtered Upstream NOx mass flow Filtered Upstream NOx mass flow	>=	10 500	mg/sec
				<=		mg/sec
			Upstream Nox mass flow difference : (a) - (b) Upstream Nox mass flow difference : (a) - (b)	>= <=	0 500	mg/sec mg/sec

Component / System	State or Status Sub-Grouping	Description of State or Status found in 150BDG09	Defined by:	Enable Logic	Enable Values	Enable Units
			and with			
			(a) Filtered Upstream NOx mass flow			
			(b) Filtered actual upstream NOx mass flow			
)			
			Status of pre controlled dosing (please see the definition)	=	FALSE	-
			Difference between nominal and estimated Reductant	<	0.125	g
			Difference between nominal 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	g
			Release of Reductant dosing		active	-
			engine operating condition based on engine speed and injection quantity (see Look-Up-Table #10)	>	0 to 1	factor
			and injection quantity (see Look-op-Table #10)			
			Difference between nominal and estimated Reductant	>	-0.05	g
			Reductant mass flow (see Look-Up-Table #8)	_	0 to 0.04	0
			Elapsed time of the fill level timer	>	20	g sec
)			
		Ctate of the NILI2 (Assume as is alim				
		State of the NH3 (Ammonia) slip detection				
		dottodion	Reductant concentration downstream SCR	<	32767	ppm
			and			
			(a) - (b)	<	0	g/sec
			(a) Filtered NOx mass flow downstream SCR measured by the sensor	=	measured parameter	-

Component / System	State or Status Sub-Grouping	Description of State or Status found in 150BDG09	Defined by:	Enable Logic	Enable Values	Enable Units
			(b) Filtered and delayed NOx raw emission mass flow upstream of SCR	=	measured	-
			now upstream or SCK		parameter	
		Deactivation of dosing to execute the NOx Offset test				
			SCR catalyst temperature	>	400.06	°C
			SCR catalyst temperature time	< >	999.96 60	°C sec
					00	000
			and Currently dosed Reductant mass flow	<=	0.005	g/sec
			time	>	30	sec
			and			
			Feed ratio			
			(a) / ((b) * (c)) (a) Currently dosed Reductant mass flow	<= =	0.1 measured	ratio -
					parameter	
			(b) NOx raw emission mass flow	=	measured parameter	-
			(c) Stoichiometric conversion factor NOx to	=	calculated	-
			Reductant time	>	parameter 10	sec
			une		10	300
			and Estimated current Reductant load	<=	0.3	g
			time	>	10	sec
		Release plausibility of Reductant Load				
			Delegas planeikilite timon ostina		000	
			Release plausibility timer active or	>=	600	sec
					50	
			Release plausibility timer active Integrated NOx raw emission since fill level	>= >=	50 2	sec g
			adaptation and plausibility have been locked			ŭ
)			

Component / System	State or Status Sub-Grouping	Description of State or Status found in 150BDG09	Defined by:	Enable Logic	Enable Values	Enable Units
		Status for disabling the SCR Efficiency monitor following an SCR Adaptation cycle completion			0.0	,
			Maximum dosing quantity	<	0.6	g/sec
			or (a) - (b)	>	0	-
			(a) Reductant Dosing quantity		measured parameter	-
			(b) Maximum Reductant Dosing quantity	=	calculated parameter	-
			or (a) - (b)		0	
			(a) Reductant Desired value		calculated parameter	-
			(b) Reductant Dosing quantity limitation due to frozen tank	=	calculated parameter	-
		Request for pre controlled dosing				
			Filtered exhaust gas mass flow (a) Correction factor for the upper hysteresis threshold for filtered exhaust-gas mass flow,		(a) * (b) 1	- factor
			dependent on HC- contamination (b) Upper hysteresis threshold for filtered exhaust- gas mass flow, dependent on thermal ageing	=	5040.00	g/sec
			and			
			Filtered NOx mass flow upstream SCR (a) Correction factor for the upper hysteresis threshold for filtered exhaust-gas mass flow,	> =	(a) * (b) 1	- factor
			dependent on HC- contamination SCR (b) Upper hysteresis threshold for filtered exhaustgas mass flow, dependent on thermal ageing SCR	=	0.25	g/s
			and Engine coolant temperature (a) Lower hysteresis threshold for engine temperature	=	(a) + (b) 105.06	- °C

Component / System	State or Status Sub-Grouping	Description of State or Status found in 150BDG09	Defined by:	Enable Logic	Enable Values	Enable Units
			(b) Offset for lower hysteresis switch on threshold	=	50	K
			for engine temperature			
			Engine coolant temperature	>	108.06	°C
			and ambient pressure		(a) , (b)	
			(a) Upper hysteresis threshold for environment	> =	(a) + (b) 74.5	- kPa
			pressure	_	74.5	кга
			(b) Offset for upper hysteresis switch on threshold	=	65.0	kPa
			for environment pressure	_	00.0	I G
			or			
			ambient pressure	<	74.0	kPa
			and			
			Intake air temperature	>	(a) + (b)	-
			(a) Lower hysteresis switch on threshold for inlet	=	-6.54	°C
			air temperature		40.5	0.0
			(b) Offset for upper hysteresis switch on threshold for inlet air temperature	=	49.5	°C
			· ·			
			or Intake air temperature	<	-8.04	°C
			intake ali temperature		-0.04	C
)			
			,			
			and			
			(
			ambient temperature	>=	-7.04	°C
			ambient pressure	>=	74.8	kPa
			Selected temperature used for locking pre	>=	209.96	°C
			controlled mode		000.00	00
			Selected temperature used for locking pre	<=	309.96	°C
			controlled mode			
			engine operation in normal mode	=	TRUE	_
			engine operation in normal mode	_	TROL	
			SCR Nox Catalyst Efficiency check was performed	=	FALSE	-
			this drive cycle			
			Incorrect Reductant Composition check was	=	FALSE	-
			performed this drive cycle			
			NO Pending or Confirmed DTCs:	=	TRUE	-
)			
			(()			
1			(k) + (l) + (m)	>	75	

Component / System	State or Status Sub-Grouping	Description of State or Status found in 150BDG09	Defined by:	Enable Logic	Enable Values	Enable Units
			(k) = (a) * (b) (a) entry condition for pre controlled dosing at sea level (see Look-Up-Table #13) (b) Altitude multiplier factor for sea level	=	0 to 100 measured paramter	- -
			(l) = (c) * (d) * (e) (c) entry condition for online dosing at Mid level (see Look-Up-Table #12) (d) Multiplier to Mid Level enable speed load map	=	0 to 100	- 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) (g) Multiplier to Hi Level enable speed load map	=	0 to 100	- factor
			(h) Altitude multiplier factor for high altitude	=	measured paramter	-
) and Low pass filtered rNOxNSCDs signal)	>	2000	-
	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
		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 or ice detection by tank temperature difference:	> =	60 TRUE	sec
			(a) - (b) (a) filtered current tank temperature	<= =	-0.14 measured paramter	°C -

Component / System	State or Status Sub-Grouping	Description of State or Status found in 150BDG09	Defined by:	Enable Logic	Enable Values	Enable Units
			(b) tank temperature captured at the beginning of	=	measured	-
			current monitoring cycle		paramter	
))			
			or (a) - (b)	<=	-0.14	°C
			(a) filtered current tank temperature	=	measured	-
			(5)		paramter	
			(b) tank temperature captured at the beginning of	=	measured	-
			current monitoring cycle		paramter	
			or			
			monitoring was performed in previous driving cycle			
		continuation of previously started tank temperature performance monitoring	temperature difference: (a) - (b)	<=	1.56	°C
		cycle	(a) filtered aureant took town areturn		magaurad	
			(a) filtered current tank temperature	=	measured paramter	-
			(b) tank temperature of the previous driving cycle	=	measured	_
			3.,		paramter	
			temperature difference: (a) - (b)		0	°C
			(a) tank temperature of the previous driving cycle	=	measured	-
			(b) filtered current tank temperature	_	paramter measured	_
			(b) ilitered current tank temperature	=	paramter	-
			temperature difference: (a) - (b)	>=	0	°C
			(a) tank temperature of the previous driving cycle	=	measured paramter	-
			start tank temperature of current monitoring cycle	=	measured	-
			from EEPROM (see definition)		paramter	
			Engine off Time	<=	2000	sec
			This monitor was complete in the last driving cycle	=	FALSE	
			ice detection by tank temperature difference:			
			(a) - (b)	>	-0.14	°C
			(a) filtered current tank temperature		measured	-
			· ·		paramter	
			(b) tank temperature captured at the beginning of	=	measured	-
			current monitoring cycle		paramter	
		State of Reductant injection valve	((
1		Component Protection				

Component / System	State or Status Sub-Grouping	Description of State or Status found in 150BDG09	Defined by:	Enable Logic	Enable Values	Enable Units
			status of SCR control sub state (please see the definition) and with	=	Metering control	-
			PM Filter Regeneration	=	not active	-
			Modeled Reductant injection valve tip temperature based on its coil temperature (see Look-Up-Table #15)		100.96 to 114.96	°C
			or (
			PM Filter Regeneration Reluctant dosing valve modeled temperature	>	active 19.96	°C
)) or			
			status of SCR control sub state (please see the definition) and with (≠	Metering control	-
			PM Filter Regeneration Modeled Reductant injection valve tip temperature based on its coil temperature (see Look-Up-Table #15)	>	not active 100.96 to 114.96	°C
			Or (PM Filter Regeneration Modeled Reductant injection valve tip temperature based on its coil temperature))))	= >	active 19.96	°C
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:			

Component / System	State or Status Sub-Grouping	Description of State or Status found in 150BDG09	Defined by:	Enable Logic	Enable Values	Enable Units
			avoid a binding of the VNT vanes due to soot accumulation during long idle operation with a cold engine.			

Component / System	State or Status Sub-Grouping	Closed Loop System Details found in 150BDG09	Defined by:	Enable Logic	Enable Values	Enable Units	Sensor Used	Sensor DTCs
Exhaust Gas Recirculation (EGR)	Exhaust Gas Recirculation (EGR) Closed Loop Control is enabled	EGR controller is active 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	Engine Speed Commanded Fuel	> <	1000 4		Crank Position Pedal Position 1 & 2	P0335,P0336, P0016 P2122, P2123, P2138, P2127, P2128
		Overlong Idle	Engine Speed Vehicle Speed Accelerator Pedal Above conditions true for Time Function of EGR Temperature (see Look-Up-Table #22)	< = =	1500 0 0 0 to 150		Crank Position Transmission output speed sensor Pedal Position 1 & 2 EGR Gas Temperature 1	P0335,P0336, P0016 P0722, P0721 P2122, P2123, P2138, P2127, P2128 P040C, P040D, P040F
		System error	DTC Pending or Confirmed	=	P0101, P0102, P0103, P0400, P1118, P1117, P2205, P2263, P0403, P140F, P0490, P140E, P0490, P140E, P0495, P2229, P2228, P2453, P2263, P0106, P0108, P0107, P0098, P0097, P007D, P007C, P02E0, P02EB, P02E3, P122F, P02E2, P122E, P122C, P02E9, P02E8, P006F, P006E, P0045, P0048, P0047, P2565, P2564	-	Engine off timer	P02610
		Error exhaust gas recirculation valve Engine Brake Status	DTC Pending or Confirmed DFCO Active	=	P0406, P0405 TRUE	-		
			Vehicle Speed	>	12.42	mph	Transmission output speed sensor	P0722, P0721
		Atmospheric pressure too low	Barometric Pressure Battery Voltage	<	72 8	kPa V	Barometric Pressure	P2228, P2229, P0106
		Battery voltage too low Switch-off coordinator	Not Used on our application will remove for future	<	δ	V		
		Environmental temperature too low	Intake Air Temperature	<	-8	°C	Intake Air Temperature 2	P0097, P0098, P111C
		Environmental temperature too high	Intake Air Temperature	>	80		Intake Air Temperature 2	P0097, P0098, P111C
		Engine temperature too low	Engine Coolant	<	44.5	°C	Engine Coolant Temperature Sensor	P0128, P0117, P0118, P008F
		Engine temperature too high	Engine Coolant	>	108	°C	Engine Coolant Temperature Sensor	P0128, P0117, P0118, P008F
		Cold start	Engine Cranking or Engine Running	= <	Active 30		Crank Position Engine off timer	P0335,P0336, P0016 P02610
		Injection quantity too large	Commanded Fueling (see table 23) Function of Engine Speed & Charge Air Cooler Temp	<	220 to 400	mm^3/rev	Pedal Position 1 & 2 Crank Sensor Charge Air Cooler Temperature Out	P02610 P2122, P2123, P2138, P2127, P2128 P0335, P0336, P0016 P007D, P007C, P111C

Component / System	State or Status Sub-Grouping	Closed Loop System Details found in 15OBDG09	Defined by:	Enable Logic	Enable Values	Enable Units	Sensor Used	Sensor DTCs
		Environmental Temperature too low	Calibrated out on our application					
		in Regeneration	Intake Air Temperature	<	-60	°C	Intake Air Temperature 2	P0097, P0098, P111C
		EGR Stroking	DFCO Active		TRUE	-	Engine off timer	P02610
			Exhaust Brake		Not Active			
		EGR controller is active in Overrun (warm exhaust system)	DFCO Active Regeneration Mode		TRUE Active	-		
		EGR controller is active in Overrun	DFCO Active		TRUE			
		(Cold exhaust system)	Regeneration Mode		Active			
		Atmospheric Pressure too low in	Calibrated out on our application					
		Regeneration	Barometric Pressure	<	52	kPa	Barometric Pressure	P2228, P2229, P0106
		Engine Temperature too low in Regeneration	Engine Coolant	<	50	°C	Engine Coolant Temperature Sensor	P0128, P0117, P0118, P008F
		Engine Temperature too high in Regeneration	Engine Coolant	>	118	°C	Engine Coolant Temperature Sensor	P0128, P0117, P0118, P008F
Fuel Balance Control		Command Fuel Quantity						
States	Closed Loop		injection quantity injection quantity (see Look-Up-Table #31)	≥ ≤	8 200 to 380	mm^3/rev mm^3/rev	Pedal Position 1 & 2 Pedal Position 1 & 2	P2122, P2123, P2138, P2127, P2128 P2122, P2123, P2138, P2127, P2128
		Engine Speed	engine speed	≥	(Look-Up-Table #91) - 150	rpm	Crank Position	P0335,P0336, P0016
			engine speed	≤	2750	rpm	Crank Position	P0335,P0336, P0016
		No Active System Errors	No DTC Pending OR Active	=	P0335, P0336, P0340, P0341, P2146, P2149, P2152, P2155, P0207, P0208, P1224, P1227, P1242, P1247, P1233, P1236, P1239	-		
	Open Loop	Command Fuel Quantity	injection quantity	=	6	mm^3/rev	Pedal Position 1 & 2	P2122, P2123, P2138, P2127, P2128
			or injection quantity	=	(Look-Up-Table #31) to (Look-Up-Table #31 + 20)	mm^3/rev	Pedal Position 1 & 2	P2122, P2123, P2138, P2127, P2128
		Engine Speed	engine speed range 1	=	(Look-Up-Table #91)- 250 to (Look-Up- Table #91) - 150	rpm	Crank Position	P0335,P0336, P0016
			engine speed range 2	=	2750 to 2850	rpm	Crank Position	P0335,P0336, P0016
		No Active System Errors	No DTC Pending OR Active	=	P0341, P0340, P0336, P0335, P2146, P2149, P2152, P2155, P0201, P0202, P0203, P0204, P0205, P0206, P0207, P0208, P1224, P1227, P1242, P1247, P1233, P1236, P1230, P1224	-		
	InActive	Command Fuel Quantity	injection quantity Range 1 or	<	6 (Look-Up-Table #31)	mm^3/rev	Pedal Position 1 & 2	P2122, P2123, P2138, P2127, P2128
			injection quantity Range 2	>	+ 20	minr S/16V	Pedal Position 1 & 2	P2122, P2123, P2138, P2127, P2128
		Engine Speed	Engine Speed Range 1	<	(Look-Up-Table #91)- 250	rpm	Crank Position	P0335,P0336, P0016

Component / System	State or Status Sub-Grouping	Closed Loop System Details found in 150BDG09	Defined by:	Enable Logic	Enable Values	Enable Units	Sensor Used	Sensor DTCs
			Engine Speed Range 2	>	2850	rpm	Crank Position	P0335,P0336, P0016
		Active Errors	No DTC Pending OR Active	=	P0341, P0340, P0336, P0335, P2146, P2149, P2152, P2155, P0201, P0202, P0203, P0204, P0205, P0206, P0207, P0208, P1224, P1227, P1242, P1247, P1233, P1236, P1239, P1236,			
HCI Loop	Closed Loop	Regen demand	time distance fuel soot	\(\) \(\) \(\) \(\) \(\) \(\)	70,200 802 325 44	sec miles liters grams	Delta Pressure Sensor	P2459, P2463 P2459, P2463 P2459, P2463 P2453, P2454, P2455
		DOC inlet temperature	upstream DOC temperature upstream DOC temperature for time	⊻ ≥ ≥	620 230 0.5	C C s	EGT 1 EGT 1	P0545, P0546, P20E2, P2080, P2428 P0545, P0546, P20E2, P2080
		DPF inlet temperature	DPF upstream temperature DPF upstream temperature for time	\(\frac{1}{2}\)	750 230 0.5	C C s	EGT 3 EGT 3	P242D, P242C, P242D, P113A, P242B, P2428 P242D, P242C, P242D, P113A, P242B
	Open Loop	Regen demand	time distance fuel soot	\(\) \(\) \(\) \(\) \(\)	70,200 802 325 44	s miles liters grams	Delta Pressure Sensor	P2459, P2463 P2459, P2463 P2459, P2463 P2453, P2454, P2455
		DOC inlet temperature	upstream DOC temperature for time	<u>/</u>	230 0.5	C s	EGT 1	P0545, P0546, P20E2, P2080
		DPF inlet temperature	DPF upstream temperature	>=	750	С	EGT 3	P242D, P242C, P242D, P113A, P242B, P2428
			or DPF upstream temperature for time	<u><=</u> ≥	230 0.5	C s	EGT 3	P242D, P242C, P242D, P113A, P242B
		No Active System Errors	No DTC Pending OR Active	=	P2084, P10CE, P10CD P20CE, P20CB, P20CD P10CC, P0420, P2463, P2033, P2032	-		
		Exhaust flow rate	exhaust flow rate	2	13.89	g/sec	Mass Air Flow Sensor	P0101, P0102, P0103
Intake Manifold Pressure	Intake Manifold Pressure	Manifold Pressure controller is active						
	Control is enabled	continuously with exceptions for Pending & Confirmed DTCs & under following conditions						
		Manifold Pressure Closed Loop	Manifold pressure dependent on Engine Speed, Commanded Fueling, EGR, and BARO pressure (see Look-Up-Table 25 - 30)				Crank Position Pedal Position 1 & 2	P0335,P0336, P0016 P2122, P2123, P2138, P2127, P2128
		Working Range (Manifold Pressure Open Loop)		#	Manifold Pressure Closed Loop			

Component / System	State or Status Sub-Grouping	Closed Loop System Details found in 150BDG09	Defined by:	Enable Logic	Enable Values	Enable Units	Sensor Used	Sensor DTCs
		Cold Start	Engine Run time a function of Engine Coolant (see Look Up-Table #24)	<	5 to 300	sec	Engine off timer	P02610
		System Error	No DTC Pending OR Active	=	P0102, P0103, P0118, P0117, P2263, P2229, P2228, P0107, P0108, P0C7D, P007C, P02E9, P02E8, P2565, P2564, P006F	-		
		Gear Shifting	Not Used in our Application Will Remove for Furture					
		Compressor Surge Detection	EGR Control Transmission Gear Engine Coolant Pressure Ratio (Manifold Pressure / Barometric Pressure) Modelled Exhaust Gas Pressure / Manifold Pressure Air Mass Engine Speed Gradient Engine Torque Demand Gradient	= = > < > < > < < < < < < < < < < < < <	Not Active R, 1, 2 -20 130 1.85 0.65 333.33 500 -720		Transmission Range Switch Engine Coolant Temperature Sensor Barometric Pressure Manifold Absolute Pressure Sensor Mass Air Flow Sensor Crank Position Pedal Position 1 & 2	P0706, P0708 P0128, P0117, P0118, P008F P2228, P2229, P0106 P0107, P0108, P0106 P0102, P0103, P0101 P0335, P0336, P0016 P2122, P2123, P2138, P2127, P2128
		Exhaust Brake	DFCO Active Vehicle Speed	= >	TRUE 12.42	- mph	Transmission output speed sensor	P0722, P0721
		Exhaust Pressure Control	Start Up Engine Coolant Temperature Intake Air Temperature Engine Coolant PTO Transmission Gear State Brake Pressed Engine Speed Vehicle Speed No DTC Pending OR Active	< < = = < < = = < < = = < < = = < < = = < < = = < < = = < < = = < < < = = < < < = = < < < = = < < < = < < < = < < < = < < < < < < < = < < < < < < < < < < < < < < < < < < < <	80 4 66 Not Active P, N Not Active 1300 15.53 P0571, P0118, P0117, P0336, P0335, P2123, P2128, P2122, P2127, P007D, P007C	°C °C °C rpm mph	Engine Coolant Temperature Sensor Intake Air Temperature 2 Engine Coolant Temperature Sensor Park Neutral Switch Brake Pedal Position Sensor Crank Position Transmission output speed sensor	P0128, P0117, P0118, P008F P0097, P0098, P111C P0128, P0117, P0118, P008F P0851, P0852 P057D, P057C, P0335, P0336, P0016 P0722, P0721
Inner Loop - Reneration Temperature Control	Closed Loop	DPF Regeneration demand Active	time distance fuel soot	2. 2. 2. 2.	70,200 802 325 44	s miles liters grams	Delta Pressure Sensor	P2459, P2463 P2459, P2463 P2459, P2463 P2453, P2454, P2455
		DOC inlet temperature	upstream DOC temperature upstream DOC temperature for time	\\ \\ \\ \\ \\ \\ \\ \\ \\ \\ \\ \\ \\	650 100 0.5	C C s	EGT 1 EGT 1	P0545, P0546, P20E2, P2080, P2428 P0545, P0546, P20E2, P2080
		No Active System Errors	No DTC Pending OR Active	=	P0420, P2463	-		
	Open Loop	DPF Regeneration demand Active	time distance fuel soot	2 2	70,200 802 325 44	s miles liters grams	Delta Pressure Sensor	P2459, P2463 P2459, P2463 P2459, P2463 P2453, P2454, P2455
		DOC inlet temperature	upstream DOC temperature	>=	650	С	EGT 1	P0545, P0546, P20E2, P2080, P2428

Component / System	State or Status Sub-Grouping	Closed Loop System Details found in 15OBDG09	Defined by:	Enable Logic	Enable Values	Enable Units	Sensor Used	Sensor DTCs
			upstream DOC temperature for time	<u><=</u> ≥	100 0.5	C s	EGT 1	P0545, P0546, P20E2, P2080
SCR System	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 Average temperature inside the SCR catalyst: engine speed Status of request for Service Quality Test NO Pending or Confirmed DTCs:	> > =	Metering Control TRUE 179.96 400 0 see sheet inhibit tables	- °C rpm -	Exh Temp Sensor 2 & 3 Crank Position	P2032, P2033, P20E2, P2084, P242C, P242D, P113A, P242B P0335,P0336, P0016
	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 -		
		State of Reductant Pressure Control System: Pressure control	Old SCR control state (please see the definition) ignition engine speed Dwell time in the state of no pressure control exhaust gas temperature Upstream SCR Reductant Defrost check (please see the definition) or The component protection release of the heater control (please see the definition) or Preliminary release of the heater control for the main state machine (please see the definition) NO Pending or Confirmed DTCs:	> >= >= = = = = = = = = = = = = = = = =	NO Pressure Control on 550 2 169.96 TRUE TRUE TRUE See sheet inhibit tables	rpm sec °C - -	Crank Position Exh Temp Sensor 2	P0335,P0336, P0016 P2032, P2033, P20E2, P2084
		State of Reductant Pressure Control System: Refilling Reductant in pressure line (substate of Pressure control)	SCR control state (please see the definition) (Reductant filling state in the pressure line and Reductant Pump Module Pressure Set-point duty cycle for Reductant dosing valve Set-point duty cycle for the Reductant Pump pressure Motor actuator NO Pending or Confirmed DTCs:	< = =	50 200 100 40.00 see sheet inhibit tables	- % kPa % %	Reductant Pump Pressure Sensor Reductant Injector Reductant Pump	P204C, P204D, P204B P1048, P2048, P1049, P2049, P2047, P202E P1043, P1044, P208B, P208A, P208D

Component / System	State or Status Sub-Grouping	Closed Loop System Details found in 15OBDG09	Defined by:	Enable Logic	Enable Values	Enable Units	Sensor Used	Sensor DTCs
		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 or	>=	50	%		
			Reductant Pump Module Pressure for time)	>= >	200 0.5	kPa sec	Reductant Pump Pressure Sensor	P204C, P204D, P204B
			Reductant Pump Module Pressure Set-point duty cycle for Reductant dosing valve Set-point duty cycle for the Reductant Pump pressure Motor actuator NO Pending or Confirmed DTCs:	< = = =	350 0% 80.00 see sheet inhibit tables	kPa % % -	Reductant Pump Pressure Sensor Reductant Injector Reductant Pump	P204C, P204D, P204B P1048, P2048, P1049, P2049, P2047, P202E P1043, P1044, P208B, P208A, P208D
		State of Reductant Pressure Control System: Ventilation (substate of Pressure control)	SCR control state (please see the definition)	=	Pressure Control	-		
		Pressure control)	Reductant Pump Module Pressure Dwell time in Pressure Build up substate system pressurizes in pressure buildup and ventilation states	< > <	350 10 10	kPa sec counts	Reductant Pump Pressure Sensor	P204C, P204D, P204B
			Set-point duty cycle for Reductant dosing valve Set-point duty cycle for the Reductant Pump pressure Motor actuator	= =	100 80.00	% %	Reductant Injector Reductant Pump	P1048, P2048, P1049, P2049, P2047, P202E P1043, P1044, P208B, P208A, P208D
			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 Set-point duty cycle for Reductant dosing valve NO Pending or Confirmed DTCs:	>= = =	350 0 see sheet inhibit tables	kPa % -	Reductant Pump Pressure Sensor Reductant Injector	P204C, P204D, P204B P1048, P2048, P1049, P2049, P2047, P202E
		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	< =	5 On	sec -	Reductant Pump Reverting Valve	P20A2, P1046, P20A3, P20A0, P20A1
			stage Set-point duty cycle for Reductant dosing valve Set-point duty cycle for the Reductant Pump pressure Motor actuator	= =	0 15.00	% %	Reductant Injector Reductant Pump	P1048, P2048, P1049, P2049, P2047, P202E P1043, P1044, P208B, P208A, P208D
			NO Pending or Confirmed DTCs:	=	see sheet inhibit tables	-		
	SCR Engine State required for operation	SCR Engine State	Ignition on	=	TRUE	-		
	Togaliou for operation		engine speed	>	550	rpm	Crank Position	P0335,P0336, P0016
	Reductant Heater and Defrost System Control States and Status							
		Reductant Defrost check	status of reductant tank heater temperature (please see the definition)	=	TRUE	-		
			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	-		

Component / System	State or Status Sub-Grouping	Closed Loop System Details found in 150BDG09	Defined by:	Enable Logic	Enable Values	Enable Units	Sensor Used	Sensor DTCs
			duration, for which the conditions for a hydraulic release reset of pressure line heater circuit are satisfied ambient temperature	<=	1200	sec °C	Intake Air Temperature 2	P0097, P0098, P111C
			Release heater pressure line and duration, for which the conditions for a hydraulic release	= <=	FALSE 1200	- sec	intake All Temperature 2	1 0031,1 0030,1 1110
			reset of supply module heater circuit are satisfied ambient temperature	>	-4.04	°C	Intake Air Temperature 2	P0097, P0098, P111C
			Release heater supply module)	=	FALSE	-		
		Status of reductant tank heater	status of reductant tank heater temperature (please					
		temperature	see the definition) Reductant tank heat temperature at Standby state	>	-0.04	°C	Reductant Tank Temperature Sensor	P205D, P205C, P205B
			Engine off Time Reductant tank heat temperature at Standby state	>	2147483647 -9.04	sec °C	Reductant Tank Temperature Sensor	P205D, P205C, P205B
		State of the defrosting check of pressure line	State of the defrosting check of pressure line (please see the definition) time since pressure line heating on under pressure line defrost mode	>=	0 to 3276.7	sec		
			or status of SCR control state (please see the definition) Pressure line defrost timer	= =	No Pressure Control 0	- sec		
			ignition engine speed (= >	on 550	sec rpm	Crank Position	P0335,P0336, P0016
			Pressure line defrost check in last driving cycle status of SCR control state (please see the definition) Engine off Time	= = >	TRUE No Pressure Control 0	- sec		
			NO Pending or Confirmed DTCs:	=	TRUE	•		
		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	>=	0 to 3276.7	sec		
			or status of SCR control state (please see the definition) Supply module defrost timer or	= =	No Pressure Control 0	- sec		
			ignition engine speed (= >	on 550	sec rpm	Crank Position	P0335,P0336, P0016
			Pressure line defrost check in last driving cycle status of SCR control state (please see the definition) Engine off Time	= = <	TRUE No Pressure Control 0	- - sec		
			NO Pending or Confirmed DTCs:	=	TRUE	-		
		The component protection release of the heater control	Current time for heating / not heating of heater circuit 1 (tank)	>=	0 to 299	sec		
			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	-	I	I

detaction of executant table between temperature (green one of personal field between the filed of the continued of the conti	Component / System	State or Status Sub-Grouping	Closed Loop System Details found in 150BDG09	Defined by:	Enable Logic	Enable Values	Enable Units	Sensor Used	Sensor DTCs
Source of the definitioning sheek of consequent fee (place) Source of the definitioning sheek of responsible places of the definition of					=	FALSE	-		
State of the definating dead of specify mode in places of the place of				State of the defrosting check of pressure line (please	=	TRUE	-		
Requested bending time for Peductars such houses of the Authority of the Reductars such houses of the Reductars such hous				State of the defrosting check of supply module (please	=	TRUE	-		
Requested destroaring time for Reduction time heater (pass Locks Lip Table 197) Requested destroaring time for Reduction time heater (pass Locks Lip Table 197) Requested destroaring time for Reduction time heater (pass Locks Lip Table 197) Requested destroaring time for Reduction time heater (pass Locks Lip Table 197) Requested destroaring time for Reduction time heater (pass Locks Lip Table 197) Requested destroaring time for Reduction time heater (pass Locks Lip Table 197) Requested destroaring time for Reduction time heater (pass Locks Lip Table 197) Requested destroaring time for Reduction time heater (pass Locks Lip Table 197) Requested destroaring time for Reduction time heater (pass Locks Lip Table 197) Requested destroaring time for Reduction time heater (pass Locks Lip Table 197) Requested destroaring time for Reduction time heater (pass Locks Lip Table 197) Requested destroaring time for Reduction time heater (pass Locks Lip Table 197) Requested defricating time for Reduction time heater (pass Locks Lip Table 197) Requested defricating time for Reduction time heater (pass Locks Lip Table 197) Requested defricating time for pressure in heater (pass Locks Lip Table 197) Requested defricating time for Reduction time heater (pass Locks Lip Table 197) Requested defricating time for Reduction time heater (pass Locks Lip Table 197) Requested defricating time for Reduction time heater (pass Locks Lip Table 197) Requested defricating time for Reduction time heater (pass Locks Lip Table 197) Requested defricating time for Reduction time heater (pass Locks Lip Table 197) Requested defricating time for Reduction time heater (pass Locks Lip Table 197) Requested defricating time for Reduction time heater (pass Locks Lip Table 197) Requested defricating time for Reduction time heater (pass Locks Lip Table 197) Requested defricating time for Reduction time heater (pass Locks Lip Table 197) Requested defricating time for Reduction time heater (pass Locks Lip Table 197) Requested defricating ti)					
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angine period Carpine of Irrine State of the defroating check of suppression of State of the defroating check of suppression of State of the defroating check of suppression of State of the defroating check of suppression of State of the defroating check of suppression of State of the defroating check of suppression of State of the defroating time for Reductant tank heater (see Lock Up-Table risk risk)) Requested heating time for supply module heater (see Lock Up-Table risk risk) Requested defroating time for supply module heater (see Lock Up-Table risk) (see Lock Up-Table risk)) Requested defroating time for supply module heater (see Lock Up-Table risk) (see Lock Up-Table risk) (see Lock Up-Table risk) (see Lock Up-Table risk) (see Lock Up-Table risk) (see Lock Up-Table risk) (see Lock Up-Table risk) (see Lock Up-Table risk) (see Lock Up-Table risk) (see Lock Up-Table risk) (see Lock Up-Table risk) (see Lock Up-Table risk) (see Lock Up-Table risk) (see Lock Up-Table risk) (see Lock Up-Table risk) (see Lock Up-Table ris				(=	on	sec		
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						0 to 3276.7	sec		

Component / System	State or Status Sub-Grouping	Closed Loop System Details found in 150BDG09	Defined by:	Enable Logic	Enable Values	Enable Units	Sensor Used	Sensor DTCs
))					
			() 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 pressure line heater (see Look-Up-Table #18)	>=	0 to 3276.7	sec		
			or 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		
			or Requested heating time for supply module heater (see Look-Up-Table #21)	1	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		
			or 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) or		0 to 3276.7	sec		
			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)	1	0 to 3276.7	sec		
			or 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	-		
		Release of tank heater circuit	(Requested defrosting time for supply module heater	>=	0 to 3276.7	sec		
			(see Look-Up-Table #19) or Requested heating time for supply module heater (see	>=	0 to 3276.7	sec		
			Look-Up-Table #21)					
	1		or	1				l l

Component / System	State or Status Sub-Grouping	Closed Loop System Details found in 150BDG09	Defined by:	Enable Logic	Enable Values	Enable Units	Sensor Used	Sensor DTCs
			()(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 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 (0.4- 0070 7			
			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		0 to 14400	sec		
			(see Look-Up-Table #16) or Requested heating time for Reductant tank heater (see	>=	0 to 3277	sec		
			Look-Up-Table #17)) and					
			(Requested defrosting time for pressure line heater (see Look-Up-Table #18)	>=	0 to 3276.7	sec		
			or 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		
			and NO Pending or Confirmed DTCs:	=	see sheet inhibit			
			NO Fending of Committee DTCs.	_	tables	-		
		Status of the battery voltage being in the valid working range for Reductant						
		tank heater	battery voltage battery voltage	>	100 11	V V		
			for time	>	2	sec		

Component / System	State or Status Sub-Grouping	Closed Loop System Details found in 150BDG09	Defined by:	Enable Logic	Enable Values	Enable Units	Sensor Used	Sensor DTCs
		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) Waiting time after tank heater release expired)	= >	TRUE 0	- sec		
			Waiting time before tank heater released started with status of reductant tank heater temperature (please see the definition)	< =	32767 FALSE	sec -		
			status of reductant tank heater temperature (please see the definition) Waiting time after tank heater release expired)) or		TRUE 0	- sec		
			Waiting time before tank heater released started with status of reductant tank heater temperature (please see the definition) and	> =	32767 FALSE	sec -		
			status of reductant tank heater temperature (please see the definition) Waiting time after tank heater release expired))		TRUE 0	- sec		
	Reductant Tank Level System States and Status	status of Reductant tank level	Tank level > full (100%) Warning (66.67%) < tank level < full (100%) Restriction (33.33%) < tank level < Warning (66.67%) Empty < tank level < Restriction (33.33%) Tank level < = 0.1%	= = =	Full OK Warning Restriction Empty	:		
		Status of Reductant tank level reset when refilling is detected (please see the definition)	time since potential Reductant refill detection is set and with (Derivation of the PT1 filtered level signal (DT1) ignition on engine speed Vehicle speed time since engine started (a) Time period for a positive slope to detect refueling	>= = > >= <= =	1.00 TRUE 550 6.22 (a) * (b)	sec %/sec - rpm mph sec	Crank Position Transmission output speed sensor	P0335,P0336, P0016 P0722, P0721
			(b) Factor for the extension of the detection time for refueling since the following conditions met:	=	20 TRUE	factor		

Component / System	State or Status Sub-Grouping	Closed Loop System Details found in 150BDG09	Defined by:	Enable Logic	Enable Values	Enable Units	Sensor Used	Sensor DTCs
			(Falling edge of ignition	=	TRUE	-		
			or Reductant Refill enabling conditions reset timers	=	TRUE	-		
)))					
			or (
			time since potential Reductant refill detection is set and with	>=	8	sec		
			(Derivation of the PT1 filtered level signal (DT1) filter release for Reductant tank level calculation at ignition on on (Please see the definition) and with	>= =	1.00 TRUE	%/sec -		
			Frozen state is active during a certain warning level (please see the definition) and with	=	TRUE	-		
			Reductant tank Temperature	>=	-100.04	°C	Reductant Tank Temperature Sensor	P205D, P205C, P205B
			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	Intake Air Temperature 2	P0097, P0098, P111C
			(() status of reductant tank heater temperature (please see		FALSE	-		
			the definition) Waiting time before tank heater released	<	32767	sec		
			and status of reductant tank heater temperature (please see	=	TRUE	-		
			the definition) Waiting time after tank heater release expired	>	0	sec		
			or					
			status of reductant tank heater temperature (please see the definition)	=	FALSE	-		
			Waiting time before tank heater released and	>=	32767	sec		
			status of reductant tank heater temperature (please see the definition)	=	TRUE	-		
			Waiting time after tank heater release expired ())	>=	0	sec		
			Frozen state is active during a certain warning level (please see the definition)	=	TRUE	-		
			Vehicle speed	>=	6.22	mph	Transmission output speed sensor	P0722, P0721
			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						
		tarix level calculation	Reductant tank Temperature	>=	-100.04	°C	Reductant Tank Temperature Sensor	P205D, P205C, P205B
			Reductant low warning level (Please see the definition)	>=	0	-		

Component / System	State or Status Sub-Grouping	Closed Loop System Details found in 15OBDG09	Defined by:	Enable Logic	Enable Values	Enable Units	Sensor Used	Sensor DTCs
			NO Pending or Confirmed DTCs: or	=	TRUE	-		
			Frozen state is active during a certain warning level (please see the definition)	=	TRUE	-		
			(please see all definition)					
		Filter release for Reductant tank level	ignition	=	on	-		
		calculation at Ignition on	Engine on timer is expired (please see the definition)	=	FALSE	-	T	DOZOG DOZOA
			Vehicle speed Reductant low warning level (Please see the definition)	>= >=	0.62 49	mph level	Transmission output speed sensor	P0722, P0721
			and with					
			((Raw Reductant tank level and with	>=	33.3	%		
			Remaining Reductant quantity (a) - (b):	<	(a) - (b)			
			(a) Tank level for reserve mode (Restriction level) in [g] (b) Tank level threshold range below Restriction	= =	2614 1015	g g		
			threshold for ignition on refill detection release)					
			Or Doducttlook		66.7	0/		
			Raw Reductant tank level and with	>=	66.7	%		
			Remaining Reductant quantity (a) - (b): (a) Tank level for reserve mode (Warning level) in [g]	<	(a) - (b)			
			(b) Tank level threshold range below WARNING	= =	5279 1617	g g		
			threshold for ignition on refill detection release)					
			or Raw Reductant tank level	>=	100	%		
			Raw Reductant tank level and with	>=	100	70		
			() Remaining Reductant quantity (a) - (b): (a) Tank level for reserve mode (Warning level) in [g]		(a) - (b) 5279	~		
			(a) Tank level for reserve mode (warning level) in [g] (b) Tank level threshold range below WARNING threshold for ignition on refill detection release	=	1617	g g		
			unesnoia for ignition on refili detection release))					
		Status of Refill detection of Reductant tank	Status of Refill detection of Reductant tank (please see the definition)					
			Reductant tank level changed ((=	TRUE	-		
			Captured Reductant tank level at last tank level change	=	Empty	-		
			or Captured Reductant tank level at last tank level change	=	Restriction	-		
)					
			and					
			one or more of following conditions are met					
			status of Reductant tank level (please see the definition)	=	Warning	-		
			or status of Reductant tank level (please see the	=	OK	-		
			definition) or					
			status of Reductant tank level (please see the definition)	=	Full	-		
)) or					
1 I			((I	I

Component / System	State or Status Sub-Grouping	Closed Loop System Details found in 150BDG09	Defined by:	Enable Logic	Enable Values	Enable Units	Sensor Used	Sensor DTCs
			Captured Reductant tank level at last tank level change	=	Warning	-		
			or 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 change	=	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		
			((ignition engine speed Vehicle speed)	= > >=	on 550 6.22	sec rpm mph	Crank Position Transmission output speed sensor	P0335,P0336, P0016 P0722, P0721
			or (Vehicle speed NO Pending or Confirmed DTCs: for time	>= = >	6.22 TRUE 1	mph sec	Transmission output speed sensor	P0722, P0721
			and with timer reset conditions					
			Falling edge of ignition 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			
			Warning level or	<=	49	-		
			(Previous warning level vehicle speed))	> <=	49 98.75	- mph	Transmission output speed sensor	P0722, P0721
			or Reductant Quality state	>	0	-		
		Warning_Leve1: 1 decimal, Warning level 1	Reductant tank level	<	Full	-		
		liover 1	Remaining mileage and with (>	1558.75	miles		
			Warning level	<=	49	Warning level		
			(

Component / System	State or Status Sub-Grouping	Closed Loop System Details found in 150BDG09	Defined by:	Enable Logic	Enable Values	Enable Units	Sensor Used	Sensor DTCs
			Previous warning level	>	49	Warning level		
			vehicle speed))	<=	98.75	mph	Transmission output speed sensor	P0722, P0721
			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	<=	49	Warning level		
			or (
			Previous warning level	>	49	Warning level		DOZGO DOZGI
			vehicle speed))	<=	98.75	mph	Transmission output speed sensor	P0722, P0721
			and with Reductant Quality state	=	0	-		
		Warning_Level3: 16 decimal, Warning	Reductant tank level	<	Full			
		level 3	Remaining mileage	>	855	miles		
			and with (
			Warning level	=	2	Warning level		
			or Warning level	=	16	Warning level		
			and with initialization phase after Reductant refill event is active Reductant Quality state	= =	TRUE 0	-		
		Warning_Level4: 32 decimal, Warning	Reductant tank level	<	Full			
		level 4	Remaining mileage and with	<=	855	miles		
			(Warning level	<=	49	Warning level		
			or (
			Previous warning level	>	49	Warning level		DOZGO DOZGI
			vehicle speed)) and with	<=	98.75	mph	Transmission output speed sensor	P0722, P0721
			Reductant Quality state	=	0	-		
		Warning_Level5: 48 decimal, Warning level 5	((
			Reductant tank level Remaining mileage and with	< <=	Full 628.75	miles		
			(Warning level	<=	49	Warning level		
			or (

Component / System	State or Status Sub-Grouping	Closed Loop System Details found in 150BDG09	Defined by:	Enable Logic	Enable Values	Enable Units	Sensor Used	Sensor DTCs
			Previous warning level vehicle speed))) or	> <=	49 98.75	Warning level mph	Transmission output speed sensor	P0722, P0721
			(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	=	49	Warning level		
			initialization phase after Reductant refill event is active) or (Warning level	= <	TRUE 49	- Warning		
			Failed Reductant system pressure build up)) and with Reductant Quality state	=	1	level -		
		Warning_Level8: 80 decimal,Vehicle speed restriction mild	Warning level initialization phase after Reductant refill event is active	=	80 TRUE	Warning level		
			Reductant Quality state		0			
		Warning_Level10: 112 decimal,Vehicle speed restriction aggressive	Warning level initialization phase after Reductant refill event is active	=	112 TRUE	Warning level		
			and with Reductant Quality state		0			
		Warning_Level12: 144 decimal, Vehicle speed restriction severe	Warning level initialization phase after Reductant refill event is active and with Reductant Quality state	= =	144 TRUE 0	Warning level - -		
		Warning_Level14: 176 decimal, Vehicle speed restriction final	Warning level initialization phase after Reductant refill event is active and with Reductant Quality state	= =	176 TRUE 0	Warning level - -		
	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	- sec °C level	Reductant Tank Temperature Sensor	P205D, P205C, P205B

Component / System	State or Status Sub-Grouping	Closed Loop System Details found in 150BDG09	Defined by:	Enable Logic	Enable Values	Enable Units	Sensor Used	Sensor DTCs
		Status of Reductant tank as frozen						
			(Engine off Time Reductant tank Temperature) or		14400 -11.04	sec °C	Reductant Tank Temperature Sensor	P205D, P205C, P205B
			(Engine off Time time since the following conditions are met (status of reductant tank heater defrost	<=	7200 7200 On or Defrost	sec sec		
			Vehicle speed Status of urea tank as frozen (please see the definition)	>	6.22 TRUE		Transmission output speed sensor	P0722, P0721
	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)		64	-		
			number of pressure build-up attempts and	>=	2	counts		
			status of SCR control sub state (please see the definition)		Pressure Build up	-		
			Reductant Pump Module Pressure Dwell time in Pressure Build up substate	< >	350 10	kPa sec	Reductant Pump Pressure Sensor	P204C, P204D, P204B
			system pressurizes in pressure buildup and ventilation		10	counts		
			states Reductant Defrost check (please see the definition)	=	TRUE	-		

ble no.	Fault Codes	Label (Interna	l Manufac	turer Refe	erence)												
1	P0101	AFS_rAirThres	Lo_MAP														
	Injection Qty (mm^3/rev) /Engine Speed (rpm)	0	950	1100	1650	2200	2750	3300	4400								
	4		0.75	0.8	0.8	0.8	0.8	0.8	0.8								
	8		0.75	0.8	0.8	0.8	0.8	0.8	0.8								
	14		0.75 0.75	0.8	0.8	0.8	0.8	0.8	0.8								
	120		0.75	0.8	0.8	0.8	0.8	0.8	0.8								
	240		0.8	0.8	0.8	0.8	0.8	0.8	0.8								
	280		0.8	0.8	0.8	0.8	0.8	0.8	0.8								
	380	0.8	8.0	8.0	8.0	8.0	8.0	8.0	8.0								
2	P2199	Air_tDiffMaxHi	TAFS_CUI	R													
	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_tDiffMaxHi	TCACDs_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	100	100	100
4	P040F	Air_tDiffMaxHi	TEGRCIr2	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_tDiffMaxLo	TAFS_CU	R													
	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_tDiffMaxLo	TCACDs_	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	27	27	27
7	P040F	Air_tDiffMaxLo	TEGRCIr2	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_facEnvP	resMinDvt	t_CUR													
	Ambient Pressure (kPa)	70	75	80	82.5	87.5	90	97.5	100								
	Correction Factor (-)	0.48	0.48	0.6	0.7	0.867	0.9	1	1								
9	P0401	AirCtl_mEGRM	linDvtLim_	CUR													
	Ambient Pressure (kPa)	67	70	73	76	79	82	85	88	91	94	97	100				
	Air Mass Flow (g/rev)	0.8	8.0	8.0	0.8	0.85	0.9	0.95	1	1.05	1.1	1.15	1.2				

able no.	Fault Codes	Label (Internal Manufacturer Reference)	
10	P0402	AirCtl_mMaxDvt_MAP	
	Injection Qty (mm^3/rev) / Engine Speed (rpm)	1000 1100 1200 1300 1400 1500 1600 1700	
		120 0.48 0.4 0.36 0.32 0.32 0.32 0.32 0.32	
		160 0.48 0.4 0.36 0.32 0.32 0.32 0.32 0.32	
		200 0.6 0.6 0.56 0.52 0.4 0.32 0.32 0.32	
		240 0.7 0.7 0.64 0.64 0.56 0.36 0.32 0.32	
		280 0.8 0.8 0.8 0.64 0.56 0.48 0.48	
		320 0.92 0.96 0.96 0.96 0.88 0.8 0.72 0.72	
		360 0.96 1 1 1.04 0.96 1.04 0.8 0.8	
		400 1 1.04 1.04 1.08 1.12 1.12 1.12 1.12	
11	P0400	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 2 2 2 2	
		0 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2	
		40 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2	
		40 2 2 2 2 2 2 2 60 2 2 2 2 2 2 2	
		80 2 2 2 2 2 2 2 2 81 1.8 1.8 1.8 2 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 1.6 1.0 1.0 1.0 2 2 380 2 2 2 2 2 2 2 2 2 2	
		, , , , , , , , =1 =1	
12	P0402	AirCtl_facEnvPresMaxDvt_CUR	
	Ambient Pressure (kPa)	65 70 75 80 83 90 95 100	
	Correction Factor (-)	2 2 1.75 1.594 1.5 1.208 1 1	
	, ,		
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	
	factor (-)	0 0 0 0 0 0 0 1 1	
15	P008F	CEngDsT_tDiffMaxHi_CUR	
13	FUUOF	CENGOS I_LUIIIWAXII_CON	
	Engine Off Time (sec)	600 700 800 900 1000 2000 3000 4000 5000 8000 17999 18000 28799 28800 30	0000 32767
	Delta Temperature (°C)	999 999 999 999 999 999 999 999 999 999 999 999 999 100	100 100
	Page 5		
16	P008F	CEngDsT_tDiffMaxLo_CUR	
	Engine Off Time (sec)		0000 32767
	Delta Temperature (°C)	999 999 999 999 999 999 999 999 999 999 999 999 999 20	20 20
17	P0336	EpmCrS_facGapPlausHigh_CA	
	-	8 5.8125 3.375 3.375	
		0 0.0120 0.010	
18	P0336	EpmCrS_facIncPlausHigh_CA	
	-	2 1.8125 1.5 1.5	
	-		

Table no.	Fault Codes	Label (Internal Manufacturer Reference)
	P02CD, P02CF, P02D1, P02D3, P02D5, P02D7, P02D9,	
19	P02DB	ETCIb_pRailSet_CA
	Rail Pressure Setpoint (kPa)	30000 70000 90000
20	P02CD, P02CF, P02D1, P02D3, P02D5, P02D7, P02D9, P02DB	ETCIb_tiET_MAX_CA
	Injector Energizing Time (usec)	670.8 384.4 353.2
21	P01CD, P01CF, P01D1, P01D3, P01D5, P01D7, P01D9, P01DB	ETCIb_tiETFbOfsMax_CA
	Injector Energizing Time (usec)	16 12 10
22	P01CD, P01CF, P01D1, P01D3, P01D5, P01D7, P01D9, P01DB	ETClb_tiETFbOfsMin_CA
	Injector Energizing Time (usec)	16 12 10
23	P144B	ETCtl_stPOpCtVILopMax_MAP
	Injection Qty (mm^3/rev) / Engine Speed (rpm)	750 900 2250 3000 0 0 1 1 0
	4	10 0 1 1 0
	20	
24	P144C	ETCtl_stPOpCtVILopMin_MAP
	Injection Qty (mm^3/rev) / Engine Speed (rpm)	750 900 2250 3000 0 0 1 1 0
	16	
	20	<u> </u>
25	P24A0	ETCtlHCI_stPOpCtVHCILopMaxInjMs_MAP
		700 900 2250 3000 0 0 1 1 1 1
	16	
	20	<u>00 0 1 1 1 1</u>
26	P24A1	ETCtlHCI_stPOpCtVHCILopMinInjMs_MAP
		700 900 2250 3000 0 0 1 1 1 1
	16	
	20	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
	•	

	Fault Codes	Labe	el (Internal	Manufac	turer Ref	ference)													
28	P11DB	Exh_	facLamSta	tNSCDs_	_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_	_stPOpMod	IPlausTM	on_MAP														
	Injection Qty (mm^3/rev) / Engine Speed (rpm)		700	1000	1500	2000	3000	3300											
		0	0	0	0	0	0	0											
		20 40	255 255	255 255	255	255	255 255	0											
		100	255	255	255 255	255 255	255	0											
		200	255	255	255	255	255	0											
		320	0	0	0	0	0	0											
		020	-	-			-	Ü											
30	P20E2	Exh_	_tDiffMaxHi	TOxiCat	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	100	100	100	
	,	-	500	200	200			200	300					300	500				
31	P20E2	Exh_	_tDiffMaxLo	TOxiCatl	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	30	30	30	
	Delta Temperature (0)		555	555	555	555	555	555	555	555	555	555	555	555	555	00	00	00	
32	P0483	Fan	Ctl_facDiaE	rvSpd_C	UR														
	F 0		100	4070	4000	4000	0000	0.400	0000	2000	0000	4000	4400	4000	5000	5000	0000	0.400	_
	Fan Speed (rpm) factor (-)		400	1679 0	1680	1800	2000	2400	2800	3200 1	3600 0.9	4000 0.8	4400 0.7	4800 0.6	5200 0.4	5600 0.2	6000	6400 0	6
	lactor ()		U	U	- '	'		•	- '		0.0	0.0	0.7	0.0	0.4	0.2	U	U	
33	P0483	FanC	Ctl_facDiaD	rvStab_0	CUR														
	For Consideration		4000	4000	700	400	0	400	700	4000	4000								
	Fan Speed (rpm) factor (-)		-1600 0	-1200 0	-700 0.6	-400 1	0	400	700	1200 0	1600 0								
	iactor (-)							1		U	U								
			U						0.6										
			0		5.5			·	0.6										
34	P0483	FanG	Ctl_facDiaE	·		·	.		0.6										
34		FanO	Ctl_facDiaE	CT_CUR					·										
34	Engine Coolant Temperature (°C)	FanO	Ctl_facDiaE	-7.04	19.96	68.96	69.96	79.96	99.96		124.96								
34		FanO	Ctl_facDiaE	CT_CUR		68.96 0	69.96	79.96 0.95	·	104.96 0.95									
34	Engine Coolant Temperature (°C)	Fano	Ctl_facDiaE	-7.04	19.96				99.96		124.96								
34 35	Engine Coolant Temperature (°C)		Ctl_facDiaE	-7.04	19.96				99.96		124.96								
	Engine Coolant Temperature (°C) factor (-)		Ctl_facDiaE -20.04 0 Ctl_facDiaI	-7.04 0 AT_CUR	19.96	0	0.6	0.95	99.96	0.95	124.96								
	Engine Coolant Temperature (°C) factor (-) P0483 Intake Air Temperature (°C)		-20.04 0 Ctl_facDial	-7.04 0 AT_CUR	19.96	9.96	14.96	19.96	99.96	0.95 69.96	124.96 0.9								
	Engine Coolant Temperature (°C) factor (-)		Ctl_facDiaE -20.04 0 Ctl_facDiaI	-7.04 0 AT_CUR	19.96	0	0.6	0.95	99.96	0.95	124.96								
	Engine Coolant Temperature (°C) factor (-) P0483 Intake Air Temperature (°C)		-20.04 0 Ctl_facDial	-7.04 0 AT_CUR	19.96	9.96	14.96	19.96	99.96	0.95 69.96	124.96 0.9								
	Engine Coolant Temperature (°C) factor (-) P0483 Intake Air Temperature (°C)	Fan	-20.04 0 Ctl_facDial/ -8.04 0	-7.04 0 AT_CUR -7.04 0.6	19.96 0	9.96	14.96	19.96	99.96	0.95 69.96	124.96 0.9								
35	Engine Coolant Temperature (°C) factor (-) P0483 Intake Air Temperature (°C) factor (-)	Fan	-20.04 0 Ctl_facDial	-7.04 0 AT_CUR -7.04 0.6	19.96 0	9.96	14.96	19.96	99.96	0.95 69.96	124.96 0.9								
35	Engine Coolant Temperature (°C) factor (-) P0483 Intake Air Temperature (°C) factor (-) P0495 Fan Drive Speed (rpm)	Fan	-20.04 0 Ctl_facDial8.04 0 Ctl_facDial8.04 0 Ctl_nDialHis	-7.04 0 AT_CUR -7.04 0.6 Spd_CUR	19.96 0 -0.04 0.62	9.96 0.7	14.96 0.8	0.95 19.96 1	99.96 1 44.96 1	0.95 69.96 1	99.96 0.9	3600	4000	4400	4800	5200	5600	6000	
35	Engine Coolant Temperature (°C) factor (-) P0483 Intake Air Temperature (°C) factor (-) P0495	Fan	-20.04 0 Ctl_facDial/	-7.04 0 AT_CUR -7.04 0.6 Spd_CUR	19.96 0 -0.04 0.62	9.96	0.6 14.96 0.8	19.96	99.96	0.95 69.96 1	99.96 0.9	3600 1500	4000 1500	4400 1500	4800 1500	5200 1500	5600 1500	6000 1500	
35	Engine Coolant Temperature (°C) factor (-) P0483 Intake Air Temperature (°C) factor (-) P0495 Fan Drive Speed (rpm)	Fan	-20.04 0 Ctl_facDial8.04 0 Ctl_facDial8.04 0 Ctl_nDialHis	-7.04 0 AT_CUR -7.04 0.6 Spd_CUR	19.96 0 -0.04 0.62	9.96 0.7	14.96 0.8	0.95 19.96 1	99.96 1 44.96 1	0.95 69.96 1	99.96 0.9								
35	Engine Coolant Temperature (°C) factor (-) P0483 Intake Air Temperature (°C) factor (-) P0495 Fan Drive Speed (rpm) Fan Speed (rpm)	Fano	-20.04 0 Ctl_facDial/ -8.04 0 Ctl_nDiaHiS	-7.04 0 AT_CUR -7.04 0.6 Spd_CUR 1200 1200	19.96 0 -0.04 0.62	9.96 0.7	14.96 0.8	0.95 19.96 1	99.96 1 44.96 1	0.95 69.96 1	99.96 0.9								
35	Engine Coolant Temperature (°C) factor (-) P0483 Intake Air Temperature (°C) factor (-) P0495 Fan Drive Speed (rpm)	Fano	-20.04 0 Ctl_facDial8.04 0 Ctl_facDial8.04 0 Ctl_nDialHis	-7.04 0 AT_CUR -7.04 0.6 Spd_CUR 1200 1200	19.96 0 -0.04 0.62	9.96 0.7	14.96 0.8	0.95 19.96 1	99.96 1 44.96 1	0.95 69.96 1	99.96 0.9								
35 36	Engine Coolant Temperature (°C) factor (-) P0483 Intake Air Temperature (°C) factor (-) P0495 Fan Drive Speed (rpm) Fan Speed (rpm)	Fano	-20.04 0 Ctl_facDial/ -8.04 0 Ctl_nDiaHiS	-7.04 0 AT_CUR -7.04 0.6 Spd_CUR 1200 1200	19.96 0 -0.04 0.62	9.96 0.7	14.96 0.8	0.95 19.96 1	99.96 1 44.96 1	0.95 69.96 1	99.96 0.9								6: 1:

Table no. Fault Codes Label (Internal Manufacturer Reference)

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
	-40.04	0	0	-48	-68	-68	-68	-68	-68
	103.96	0	0	-48	-68	-68	-68	-68	-68
	104.96	0	0	-48	-68	-68	-68	-68	-68
	105.96	0	0	-48	-68	-68	-68	-68	-68
	106.96	0	0	-48	-68	-68	-68	-68	-68
	107.96	0	0	-48	-68	-68	-68	-68	-68
	109.96	0	0	-48	-68	-68	-68	-68	-68
	134.96	0	0	-48	-68	-68	-68	-68	-68

9 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	48	68	68	68	68	68
	103.96	0	0	48	68	68	68	68	68
	104.96	0	0	48	68	68	68	68	68
	105.96	0	0	48	68	68	68	68	68
	106.96	0	0	48	68	68	68	68	68
	107.96	0	0	48	68	68	68	68	68
	109.96	0	0	48	68	68	68	68	68
	134.96	0	0	48	68	68	68	68	68

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 0	1	1	1	1	1	1	1
2	80 0	1	1	1	1	1	1	1
3	00 0	0	0	1	1	1	1	
3:	20 0	0	0	1	1	1	0	(
3.	40 0	0	0	1	1	1	0	(
3	60 0	0	0	0	1	1	0	(
3	80 0	0	0	0	0	0	0	(

44 P026D

FMO_qFISysThresMax_MAP

Injection Qty (mm^3/rev) / Engine Speed (rpm)		450	500	550	600	650	700	750	800
	28	8	8	8	8	13.2	13.2	13.2	15.2
	32	8	8	8	8	13.2	13.2	13.2	15.2
	36	8	10	10	10	14	14	14	16
	40	12	12	12	12	14.4	14.4	14.4	16.4
	44	14	14	14	14	16	16	16	18
	48	16	16	16	16	20	20	20	22
	52	20	20	20	20	24	24	24	26
	56	24	24	24	24	28	28	28	30

6 P0172

FMO_qOBDMax_MAP

Injection Qty (mm^3/rev) / Engine Speed (rpm)	500	700	900	1000	1100	1200	1300	1500
4	0 46.12	54.04	62	65.96	69.92	73.88	77.84	101.64
8	52.44	60.36	68.28	72.24	76.2	80.16	84.12	107.92
12	58.72	66.64	74.6	78.56	82.52	86.48	90.44	114.24
16	65.04	72.96	80.88	84.84	88.8	92.76	96.72	120.52
18	68.16	76.12	84.04	88	91.96	95.92	99.88	123.68
20	0 71.32	79.24	87.2	91.16	95.12	99.08	103.04	126.84
24	0 77.64	85.56	93.48	97.44	101.4	105.36	109.32	133.12
28	0 109.12	117.04	125	128.96	132.92	136.88	140.84	164.64

	o. Fault Codes		abel (Interna		cturer R	eference)							
7	P0171	F	MO_qOBDM	lin_MAP									
	Injection Qty (mm^3/rev) / Engine Speed (rpm)		500	700	900	1000	1100	1200	1300	1500			
	injection way (mini-s/rev) / Engine Speed (rpm)	40	-46.12	-52.44	-58.72	-65.04		-71.32	-77.64				
		80	-54.04	-60.36	-66.64	-72.96	-76.12	-79.24	-85.56				
		120	-62	-68.28	-74.6	-80.88	-84.04	-87.2	-93.48				
		160	-65.96	-72.24	-78.56	-84.84	-88	-91.16	-97.44				
		180	-69.92	-76.2	-82.52	-88.8	-91.96	-95.12	-101.4				
		200	-73.88	-80.16	-86.48	-92.76	-95.92	-99.08	-105.36				
		240	-77.84	-84.12	-90.44	-96.72	-99.88	-103.04					
		280	-101.64	-107.92	-114.24	-120.52	-123.68	-126.84	-133.12	-164.64			
8	P0171, P0172, P026C, P026D	F	MO_stOutOt	osvr_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	
		260	0	1	1	1		1	1	1	1	1	
		280	0	1	1	1		1	1	1	1	1	
		300 320	0	0	0	0		1	1		0	0	
		340	0	0	0			1	1		0	0	
		360	0	0	0			1	1		0	0	
		380	0	0	0			0	0		0	0	
	P11B4, P11B5 - factor (-)		legn_facLam 0 0.1	3 0.1	5 1.25	6 3.848	7 3.889	8	9 6.484	10 10			
	P054F ECT (°C) / Engine Speed (rpm)		njCtl_qDesGe	400	600	800		5000					
		20.04	244.4	244.4	244.4	244.4	244.4	244.4					
		10.04	217.6	217.6	217.6	217.6	217.6	217.6					
		-0.04	190.8	190.8	190.8	190.8	190.8	190.8					
		-0.04 19.96	190.8 160	190.8 160	190.8 160	190.8 160	190.8 160	190.8 160					
		-0.04 19.96 39.96	190.8 160 136	190.8 160 136	190.8 160 136	190.8 160 136	190.8 160 136	190.8 160 136					
		-0.04 19.96	190.8 160	190.8 160	190.8 160	190.8 160	190.8 160	190.8 160					
54	P0606	-0.04 19.96 39.96 69.96	190.8 160 136 122.8	190.8 160 136 122.8	190.8 160 136 122.8 MAP	190.8 160 136 128.8	190.8 160 136 128.8	190.8 160 136 128.8					
4		-0.04 19.96 39.96 69.96	190.8 160 136 122.8 10FCoOfs_rT	190.8 160 136 122.8 rqPtdOfs_	190.8 160 136 122.8 MAP	190.8 160 136 128.8	190.8 160 136 128.8	190.8 160 136 128.8	60.156				
4	P0606	-0.04 19.96 39.96 69.96	190.8 160 136 122.8 10FCoOfs_rT 0 99.609375	190.8 160 136 122.8 rqPtdOfs 10.156 99.609	190.8 160 136 122.8 MAP 19.922 99.609	190.8 160 136 128.8 30.078 99.609	190.8 160 136 128.8 39.844 99.609	190.8 160 136 128.8 50 99.609	99.609	99.609			
4	P0606	-0.04 19.96 39.96 69.96	190.8 160 136 122.8 MoFCoOfs_rT 0 99.609375 11.71875	190.8 160 136 122.8 rqPtdOfs 10.156 99.609 11.719	190.8 160 136 122.8 MAP 19.922 99.609 11.719	190.8 160 136 128.8 30.078 99.609 11.719	190.8 160 136 128.8 39.844 99.609 11.719	190.8 160 136 128.8 50 99.609 11.719	99.609 11.719	99.609 11.719			
i 4	P0606	-0.04 19.96 39.96 69.96	190.8 160 136 122.8 MoFCoOfs_rT 0 99.609375 11.71875	190.8 160 136 122.8 rqPtdOfs 10.156 99.609 11.719 11.719	190.8 160 136 122.8 MAP 19.922 99.609 11.719 11.719	190.8 160 136 128.8 30.078 99.609 11.719	190.8 160 136 128.8 39.844 99.609 11.719 11.719	190.8 160 136 128.8 50 99.609 11.719 11.719	99.609 11.719 11.719	99.609 11.719 11.719			
64	P0606	-0.04 19.96 39.96 69.96	190.8 160 136 122.8 10FCoOfs_rT 0 99.609375 11.71875 11.71875	190.8 160 136 122.8 rqPtdOfs 10.156 99.609 11.719 11.719	MAP 19.922 99.609 11.719 11.719	30.078 99.609 11.719 11.719	190.8 160 136 128.8 39.844 99.609 11.719 11.719	190.8 160 136 128.8 50 99.609 11.719 11.719	99.609 11.719 11.719 11.719	99.609 11.719 11.719 11.719			
44	P0606	-0.04 19.96 39.96 69.96 840 880 2000 3000 4000	190.8 160 136 122.8 10FCoOfs_rT 0 99.609375 11.71875 11.71875 11.71875	190.8 160 136 122.8 rqPtdOfs_ 10.156 99.609 11.719 11.719 11.719	MAP 190.8 160 136 122.8 MAP 19.922 99.609 11.719 11.719 11.719	30.078 99.609 11.719 11.719 11.719	39.844 99.609 11.719 11.719 11.719	190.8 160 136 128.8 50 99.609 11.719 11.719 11.719	99.609 11.719 11.719 11.719 11.719	99.609 11.719 11.719 11.719 11.719			
4	P0606	-0.04 19.96 39.96 69.96 840 880 2000 3000 4000 5000	190.8 160 136 122.8 10FCoOfs_rT 0 99.609375 11.71875 11.71875 11.71875	190.8 160 136 122.8 10.156 99.609 11.719 11.719 11.719 11.719	MAP 190.8 160 136 122.8 MAP 19.922 99.609 11.719 11.719 11.719 11.719	30.078 99.609 11.719 11.719 11.719 11.719	39.844 99.609 11.719 11.719 11.719 11.719	190.8 160 136 128.8 50 99.609 11.719 11.719 11.719 11.719	99.609 11.719 11.719 11.719 11.719 11.719	99.609 11.719 11.719 11.719 11.719 11.719			
4	P0606	-0.04 19.96 39.96 69.96 840 880 2000 3000 4000 5000 6000	190.8 160 136 122.8 MoFCoOfs_rT 0 99.609375 11.71875 11.71875 11.71875 11.71875 11.71875	190.8 160 136 122.8 rqPtdOfs 10.156 99.609 11.719 11.719 11.719 11.719	MAP 19.922 99.609 11.719 11.719 11.719 11.719 11.719	30.078 99.609 11.719 11.719 11.719 11.719 11.719	39.844 99.609 11.719 11.719 11.719 11.719 11.719	190.8 160 136 128.8 50 99.609 11.719 11.719 11.719 11.719 11.719	99.609 11.719 11.719 11.719 11.719 11.719	99.609 11.719 11.719 11.719 11.719 11.719 11.719			
54	P0606	-0.04 19.96 39.96 69.96 840 880 2000 3000 4000 5000 6000 7000	190.8 160 136 122.8 10FCoOfs_rT 0 99.609375 11.71875 11.71875 11.71875	190.8 160 136 122.8 rqPtdOfs 10.156 99.609 11.719 11.719 11.719 11.719 11.719	190.8 160 136 122.8 MAP 19.922 99.609 11.719 11.719 11.719 11.719 11.719	30.078 99.609 11.719 11.719 11.719 11.719	39.844 99.609 11.719 11.719 11.719 11.719 11.719	190.8 160 136 128.8 50 99.609 11.719 11.719 11.719 11.719	99.609 11.719 11.719 11.719 11.719 11.719	99.609 11.719 11.719 11.719 11.719 11.719 11.719			
	P0606 Engine Speed (rpm) / Torque (%) P0606	-0.04 19.96 39.96 69.96 840 880 2000 3000 4000 5000 6000 7000	190.8 160 1366 122.8 10FCOOfs_rT 99.609375 11.71875 11.71875 11.71875 11.71875 11.71875 11.71875	190.8 160 136 122.8 17qPtdOfs 10.156 99.609 11.719 11.719 11.719 11.719 11.719 11.719	190.8 160 136 122.8 MAP 19.922 99.609 11.719 11.719 11.719 11.719 11.719 (CUR	30.078 99.609 11.719 11.719 11.719 11.719 11.719 11.719	39.844 99.609 11.719 11.719 11.719 11.719 11.719 11.719	190.8 160 128.8 50 99.609 11.719 11.719 11.719 11.719 11.719 11.719	99.609 11.719 11.719 11.719 11.719 11.719	99.609 11.719 11.719 11.719 11.719 11.719 11.719			
	P0606 Engine Speed (rpm) / Torque (%) P0606 Rail Pressure (kPa)	-0.04 19.96 39.96 69.96 840 880 2000 3000 4000 5000 6000 7000	190.8 160 1366 122.8 MoFCoOfs_rT 0 99.609375 11.71875 11.71875 11.71875 11.71875 11.71875	190.8 160 136 122.8 rqPtdOfs 10.156 99.609 11.719 11.719 11.719 11.719 11.719	190.8 160 136 122.8 MAP 19.922 99.609 11.719 11.719 11.719 11.719 11.719	30.078 99.609 11.719 11.719 11.719 11.719 11.719 11.719	190.8 160 136 128.8 39.844 99.609 11.719 11.719 11.719 11.719 11.719	190.8 160 136 128.8 50 99.609 11.719 11.719 11.719 11.719 11.719 11.719	99.609 11.719 11.719 11.719 11.719 11.719	99.609 11.719 11.719 11.719 11.719 11.719 11.719			
	P0606 Engine Speed (rpm) / Torque (%) P0606	-0.04 19.96 39.96 69.96 840 880 2000 3000 4000 7000	190.8 160 1366 122.8 10FCOOIs_rT 0 99.609375 11.71875 11.71875 11.71875 11.71875 11.71875 11.71875 20000	190.8 160 136 122.8 10,156 99.609 11,719 11,719 11,719 11,719 11,719 11,719 11,719 11,719 11,719 11,709 10,709 10,	190.8 160 136 122.8 MAP 19.922 99.609 11.719 11.719 11.719 11.719 11.719 11.719 11.719 300	30.078 99.609 11.719 11.719 11.719 11.719 11.719 11.719	190.8 160 136 128.8 39.844 99.609 11.719 11.719 11.719 11.719 11.719	190.8 160 128.8 50 99.609 11.719 11.719 11.719 11.719 11.719 11.719	99.609 11.719 11.719 11.719 11.719 11.719	99.609 11.719 11.719 11.719 11.719 11.719 11.719			
55	P0606 Engine Speed (rpm) / Torque (%) P0606 Rail Pressure (kPa) Energizing Time (us)	-0.04 19.96 39.96 69.96 840 880 2000 3000 4000 7000	190.8 160 160 1366 122.8 MoFCoOfs_rT 9.009375 11.71875 11.71875 11.71875 11.71875 11.71875 11.71875 11.71875 00FlnjQnt_tiZ	190.8 160 136 122.8 10.156 99.609 11.719 11.719 11.719 11.719 11.719 11.719 2.FCETMax	190.8 160 136 122.8 MAP 19.922 99.609 11.719 11.719 11.719 11.719 11.719 11.719 5 CUR	30.078 99.609 11.719 11.719 11.719 11.719 11.719 11.719 90400 256	39.844 99.609 11.719 11.719 11.719 11.719 11.719 11.719 11.719	190.8 160 136 128.8 50 99.609 11.719 11.719 11.719 11.719 11.719 11.719	99.609 11.719 11.719 11.719 11.719 11.719	99.609 11.719 11.719 11.719 11.719 11.719 11.719			
	P0606 Engine Speed (rpm) / Torque (%) P0606 Rail Pressure (kPa) Energizing Time (us)	-0.04 19.96 39.96 69.96 840 880 2000 3000 4000 7000	190.8 160 1366 122.8 MoFCoOfs_rT 0 99.609375 11.71875 11.71875 11.71875 11.71875 11.71875 11.71875 11.71875 20000 500	190.8 160 136 122.8 10,156 99.609 11,719 11,719 11,719 11,719 11,719 11,719 11,719 11,719 11,719 11,709 10,709 10,	190.8 160 136 122.8 MAP 19.922 99.609 11.719 11.719 11.719 11.719 11.719 11.719 11.719 300	30.078 99.609 11.719 11.719 11.719 11.719 11.719 11.719 90400 256	190.8 160 136 128.8 39.844 99.609 11.719 11.719 11.719 11.719 11.719	190.8 160 136 128.8 50 99.609 11.719 11.719 11.719 11.719 11.719 11.719	99.609 11.719 11.719 11.719 11.719 11.719	99.609 11.719 11.719 11.719 11.719 11.719 11.719			

Table na	Foult Codes	Label (Internal Manufacturer Pafarana)
i able no.	Fault Codes	Label (Internal Manufacturer Reference)
57	P0606	MoFOvR_nEngStrtThres_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_tiLimET_CUR
	Engine Speed (rpm) Energizing Time (us)	0 2000 2040 4000 6000 6000 200 200
59	P2263	PCR_facMaxUndrBstDvt_CUR
	Environmental Pressure (kPa)	70 75 80 85 90 95 100 112.5
	factor (-)	0.900024 0.9 0.95 0.95 1 1 1 1 1
60	P0234	PCR_facPresDvtCorMin_CUR
	Environmental Pressure (kPa) factor (-)	50 75 80 85 90 97.5 106.4 125 0.800049 0.7 0.7 0.75 0.8 1 1 1
	racio (-)	0.000043 0.7 0.7 0.73 0.0 1 1 1
61	P0299	PCR_pMaxDvt_MAP
	Injection Qty (mm^3/rev) / Engine Speed (rpm)	0 1300 1500 1600 1800 2000 2500 3000
	14	
	20	00 27 27 25 25 25 25 25 25 25
	24	
	32	20 36 36 34 34 30 30 30 30 30
	36	
	40	0 40 40 40 40 40 40 40
62	P0234	PCR_pMinDvt_MAP
	Injection Qty (mm^3/rev) / Engine Speed (rpm)	0 1500 1600 1700 1800 2000 2500 3000
	14	
	20	00 -10 -10 -10 -10 -10 -14.5 -16 -27 -31.5
	24	
	32	
	36	
	40	10 -22.1 -22.1 -25.2 -30 -30 -30 -31.5
63	P2263	PCR_pOvrBstDvt_MAP
	Injection Qty (mm^3/rev) / Engine Speed (rpm)	500 750 1000 1500 2000 2500 3000 3500 0 -80 -80 -80 -80 -80 -60 -40 -40
	6	80 -80 -80 -80 -80 -80 -60 -40 -40
	12	
	18	
	30	00 -50 -50 -50 -50 -50 -50 -50 -50 -50
	36 48	
	48	טפ- טפ- טפ- טפר טפר טפר טפר טפר טפר טפר טפר טפר טפר

	Fault Codes		el (Internal			erence)												
	P2263		R_pUndrBst															
	Initiation Ote (mm A) (5.1.	1	=00	7-0	4000	4500	0000	0500	0000	0500								
	Injection Qty (mm^3/rev) / Engine Speed (rpm)	0	500 45	750 45	1000 45	1500 45	2000 45	2500 45	3000 45	3500 45								
		60	45	45	45	45	45	45	45	45								
		120	45	45	45	45	45	45	45	45								
		180	45	45	45	45	45	45	45	45								
		240	42.5	42.5	42.5	42.5	42.5	42.5	42.5	42.5								
		300	42.5	42.5	42.5	42.5	42.5	42.5	42.5	42.5								
		360	42.5	42.5	42.5	42.5	42.5	42.5	42.5	42.5								
		480	42.5	42.5	42.5	42.5	42.5	42.5	42.5	42.5								
65	P2459	PFIt	_mSotThre	sRgnFreq	_CUR													
	g		0	5	10	20	30	45										
	Soot Mass (g)		0	13.5	27.1	54.1	81.2	121.8										
67	P128E	Rail	_pCPCFltM	in_CUR														
	Engine Speed (rpm)		580	630														
	Rail Pressure (kPa)		0	15000														
68	P0087	Rail	_pMeUnDv	Max CUI	R													
	<u> </u>		-															
	Engine Speed (rpm)		580	630														
	Rail Pressure (kPa)		80000	11000														
69	P0088	Poil	_pMeUnDvi	Min CLIE	.													
03	1 0000	rtaii	_pivieOnDvi	IIVIIII_COI	`													
	Engine Speed (rpm)		580	630														
	Rail Pressure (kPa)		-80000	-18000														
70	P128E	Pail	_pMeUnFltf	Min CLIP														
70	FIZOE	Naii	_pivieOffFiti	WIII_COK														
	Engine Speed (rpm)		580	630														
	Rail Pressure (kPa)		0	15000														
71	P0087	D-11	_pPCVDvtN	4 OUD														
/ 1	F0067	Kali	_prcvDviii	nax_cor														
	Engine Speed (rpm)		580	630														
	Rail Pressure (kPa)		80000	11000														
72	P128E	Rail	_pPCVFltM	in_CUR														
	Engine Speed (rpm)		580	630														
	Rail Pressure (kPa)			15000														
	, , , , , , , , , , , , , , , , , , , ,																	
74	P11CB	SCF	RChk_idcPC	DpMaxNO	xUsPlaus	_GMAP												
	Injection Oty/mmA2/my// Foreign Oracod/m	ı					4200	1400	1500	1000	1700	1000	1000	2022	2004	2022	2400	2200
	Injection Qty (mm^3/rev) / Engine Speed (rpm)	40	600	1000	1199 0	1200 0	1300	1400	1500 0	1600 0	1700 0	1800 0	1900 0	2000	2001	2002	2100	2200 0
		60	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
		79.6	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
		80	0	0	0	1	1	1	1	1	1	1	1	1	0	0	0	0
		120	0	0	0	1	1	1	1	1	1	1	1	1	0	0	0	0
		160 200	0	0	0	1	1	1	1	1	1	1	1	1	0	0	0	0
		200.04	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
						0	0	0	0					0	0	0	0	0
		204	0	0	0	U	U	U	U	0	0	0	0	U	U	U	U	U

75	. Fault Codes	Label (Interna															
	P11CC	SCRChk_idcF	OpMinNO	OxUsPlau:	s_GMAP												
	Injection Qty (mm^3/rev) / Engine Speed (rpm)	500	600		800	900	1000	1100	1200	1400	1600	1800	2000	2001	2500		3000
	40			0	0	0	0	0	0	0	0	0	0	0	0	0	0
	79.6				0	0	0	0	0	0	0	0	0	0	0	0	0
	80				1	1	1	1	1	1	1	1	1	0	0	0	0
	120				1	1	1	1	1	1	1	1	1	0	0	0	0
	160				1	1	1	1	1	1	1	1	1	0	0	0	0
	200		0	0	1	1	1	1	1	1	1	1	1	0	0	0	0
	200.04				0	0	0	0	0	0	0	0	0	0	0	0	0
	204		-		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
76	P20EE, P2BAD	SCRChk_mEs	stNH3LdN	Max_CUR													
	SCR Temperature (°C)	249.96	259.96	264.96	269.96	279.96	289.96	299.96	324.96								
	Ammonia Load (g)	2.2	2.2	2.2	2.2	2	2	2	2								
77	P20EE, P2BAD	SCRChk_mEs															
	SCR Temperature (°C)			264.96	269.96		289.96		349.96								
	Ammonia Load (g)	0.75	0.65	0.55	0.45	0.35	0.25	0.15	0.05								
78	P20EE, P2BAD	SCRChk_mNl	H3LdDvtN	/lax_CUR													
	SCR Temperature (°C)	249.96	259.96	269.96	279.96	289.96	299.96	309.96	319.96								
	Ammonia Load (g)	0.25	0.25	0.25	0.25	0.2	0.15	0.15	0.15								
79	P20EE, P2BAD SCR Temperature (°C)	249.96 -0.5	259.96	269.96				309.96	319.96								
	Ammonia Load (g)	-0.5	-0.0	-0.45	-0.4	-0.35	-0.1	-0.1	0.1								
80	P11CC	SCRChk_rNO	xDiffThre	sBasMinU	ls_GMAP		·										
80	P11CC Injection Qty (mm^3/rev) / Engine Speed (rpm)	SCRChk_rNO	xDiffThre	sBasMinU	Is_GMAP	1600	1800	2000	2001	2200	2400						
80	P11CC Injection Qty (mm^3/rev) / Engine Speed (rpm) 40	SCRChk_rNO	xDiffThre 1199 -1	sBasMinU 1200 -1	1400 -1	1600	1800 -1	2000	2001	-1	-1						
80	P11CC Injection Qty (mm^3/rev) / Engine Speed (rpm) 40 60	SCRChk_rNO 1100 -1 -1	xDiffThre: 1199 -1 -1	sBasMinU 1200 -1 -1	1400 -1 -1	1600 -1 -1	1800 -1 -1	2000 -1 -1	2001 -1 -1	-1 -1	-1 -1						
80	P11CC Injection Qty (mm^3/rev) / Engine Speed (rpm) 40 60 79.6	SCRChk_rNO 1100 -1 -1 -1	xDiffThre 1199 -1 -1 -0.5358	sBasMinU 1200 -1 -1 -0.5358	1400 -1 -1 -0.5233	1600 -1 -1 -0.4972	1800 -1 -1 -0.549	2000 -1 -1 -0.4863	2001 -1 -1 -0.4863	-1 -1 -1	-1 -1 -1						
80	P11CC Injection Qty (mm^3/rev) / Engine Speed (rpm) 40 60 79.6	SCRChk_rNO 1100 -1 -1 -1 -1 -1	xDiffThre 1199 -1 -1 -0.5358 -0.5358	1200 -1 -1 -0.5358 -0.5358	1400 -1 -1 -0.5233 -0.5233	1600 -1 -1 -0.4972 -0.4972	1800 -1 -1 -0.549 -0.549	2000 -1 -1 -0.4863 -0.4863	2001 -1 -1 -0.4863 -0.4863	-1 -1 -1 -1	-1 -1						
80	P11CC Injection Qty (mm^3/rev) / Engine Speed (rpm) 40 60 79.6	SCRChk_rNO 1100 -1 -1 -1 -1 -1 -1	xDiffThre 1199 -1 -1 -0.5358	sBasMinU 1200 -1 -1 -0.5358	1400 -1 -1 -0.5233	1600 -1 -1 -0.4972 -0.4972 -0.5458	1800 -1 -1 -0.549	2000 -1 -1 -0.4863	2001 -1 -1 -0.4863	-1 -1 -1	-1 -1 -1 -1						
80	P11CC Injection Qty (mm^3/rev) / Engine Speed (rpm) 40 60 79.6 80	SCRChk_rNO 1100 -1 -1 -1 -1 -1 -1 -1	xDiffThre- 1199 -1 -1 -0.5358 -0.5358 -0.5674	1200 -1 -1 -0.5358 -0.5358 -0.5674	1400 -1 -1 -0.5233 -0.5233 -0.5975	1600 -1 -1 -0.4972 -0.4972 -0.5458 -0.5867	1800 -1 -1 -0.549 -0.549 -0.5417	2000 -1 -1 -0.4863 -0.4863 -0.5541	2001 -1 -1 -0.4863 -0.4863 -0.5541	-1 -1 -1 -1	-1 -1 -1 -1						
80	P11CC Injection Qty (mm^3/rev) / Engine Speed (rpm) 40 60 79.6 80 120 160 200.04	SCRChk_rNO 1100 -1 -1 -1 -1 -1 -1 -1 -1 -1 -1	xDiffThre 1199 -1 -0.5358 -0.5358 -0.5674 -0.5092 -0.5237 -0.5237	1200 -1 -1 -0.5358 -0.5358 -0.5674 -0.5092 -0.5237 -0.5237	1400 -1 -1 -0.5233 -0.5233 -0.5975 -0.5607 -0.561	1600 -1 -1 -0.4972 -0.4972 -0.5458 -0.5867 -0.5796 -0.5796	1800 -1 -1 -0.549 -0.549 -0.5417 -0.5824 -0.5466 -0.5466	2000 -1 -1 -0.4863 -0.5541 -0.5643 -0.5643 -0.5643	2001 -1 -1, -0.4863 -0.4863 -0.5541 -0.5643 -0.5643	-1 -1 -1 -1 -1 -1 -1 -1	-1 -1 -1 -1 -1 -1 -1						
80	P11CC Injection Qty (mm^3/rev) / Engine Speed (rpm) 40 60 79.6 80 120 160 200.04	SCRChk_rNO 1100 -11 -1 -1 -1 -1 -1 -1 -1 -1 -1 -1 -1 -1	xDiffThre 1199 -1 -1 -0.5358 -0.5358 -0.5674 -0.5092 -0.5237 -0.5237	\$BasMinL 1200 -1 -0.5358 -0.5358 -0.5674 -0.5092 -0.5237 -0.5237 -1	1400 -1 -0.5233 -0.5233 -0.5975 -0.5607 -0.561 -0.561	1600 -1 -1 -0.4972 -0.5458 -0.5867 -0.5796 -0.5796	1800 -1 -0.549 -0.549 -0.5417 -0.5824 -0.5466 -0.5466	2000 -1 -0.4863 -0.4863 -0.5541 -0.5643 -0.5643 -0.5643	2001 -1 -0.4863 -0.4863 -0.5541 -0.5643 -0.5643 -0.5643	-1 -1 -1 -1 -1 -1 -1 -1	-1 -1 -1 -1 -1 -1 -1 -1						
80	P11CC Injection Qty (mm^3/rev) / Engine Speed (rpm) 40 60 79.6 80 120 160 200.04	SCRChk_rNO 1100 -11 -1 -1 -1 -1 -1 -1 -1 -1 -1 -1 -1 -1	xDiffThre 1199 -1 -0.5358 -0.5358 -0.5674 -0.5092 -0.5237 -0.5237	1200 -1 -1 -0.5358 -0.5358 -0.5674 -0.5092 -0.5237 -0.5237	1400 -1 -1 -0.5233 -0.5233 -0.5975 -0.5607 -0.561	1600 -1 -1 -0.4972 -0.4972 -0.5458 -0.5867 -0.5796 -0.5796	1800 -1 -1 -0.549 -0.549 -0.5417 -0.5824 -0.5466 -0.5466	2000 -1 -1 -0.4863 -0.5541 -0.5643 -0.5643 -0.5643	2001 -1 -1, -0.4863 -0.4863 -0.5541 -0.5643 -0.5643	-1 -1 -1 -1 -1 -1 -1 -1	-1 -1 -1 -1 -1 -1 -1						
	P11CC Injection Qty (mm^3/rev) / Engine Speed (rpm) 40 60 79.6 80 120 160 200.04	SCRChk_rNO 1100 -11 -1 -1 -1 -1 -1 -1 -1 -1 -1 -1 -1 -1	xDiffThre 1199 -1 -0.5358 -0.5358 -0.5674 -0.5092 -0.5237 -0.5237 -1	1200 -1 -1 -0.5358 -0.5358 -0.5674 -0.5092 -0.5237 -0.5237 -1 -1	1400 -1 -0.5233 -0.5233 -0.5975 -0.5607 -0.561 -1 -1	1600 -1 -1 -0.4972 -0.5458 -0.5867 -0.5796 -0.5796	1800 -1 -0.549 -0.549 -0.5417 -0.5824 -0.5466 -0.5466	2000 -1 -0.4863 -0.4863 -0.5541 -0.5643 -0.5643 -0.5643	2001 -1 -0.4863 -0.4863 -0.5541 -0.5643 -0.5643 -0.5643	-1 -1 -1 -1 -1 -1 -1 -1	-1 -1 -1 -1 -1 -1 -1 -1						
80	P11CC Injection Qty (mm^3/rev) / Engine Speed (rpm) 40 60 79.6 80 120 160 200.4 204 P11CB, P11CC	SCRChk_rNO 1100 -1 -1 -1 -1 -1 -1 -1 -1	xDiffThre 1199 -1 -0.5358 -0.5358 -0.5674 -0.5092 -0.5237 -0.5237 -1 -1	1200 -1 -1 -0.5358 -0.5358 -0.5674 -0.5092 -0.5237 -0.5237 -1 -1	1400 -1 -0.5233 -0.5233 -0.5975 -0.5607 -0.561 -1 -1	1600 -1 -1 -0.4972 -0.5458 -0.5867 -0.5796 -0.5796	1800 -1 -0.549 -0.549 -0.5417 -0.5824 -0.5466 -0.5466	2000 -1 -0.4863 -0.4863 -0.5541 -0.5643 -0.5643 -0.5643	2001 -1 -0.4863 -0.4863 -0.5541 -0.5643 -0.5643 -0.5643	-1 -1 -1 -1 -1 -1 -1 -1	-1 -1 -1 -1 -1 -1 -1 -1						
	P11CC Injection Qty (mm^3/rev) / Engine Speed (rpm) 40 60 79.6 80 120 120 200.04 240	SCRChk_rNO 1100 -1 -1 -1 -1 -1 -1 -1 -1 -1 -1 -1 -1 -1	xDiffThre 1199 -1 -1 -0.5358 -0.5358 -0.5674 -0.5092 -0.5237 -0.5237 -1 -1 chTempRI	1200 -1 -1 -0.5358 -0.5358 -0.5674 -0.5092 -0.5237 -0.5237 -1 -1	1400 -1 -0.5233 -0.5233 -0.5975 -0.5607 -0.561 -1 -1	1600 -1 -1 -0.4972 -0.5458 -0.5867 -0.5796 -0.5796	1800 -1 -0.549 -0.549 -0.5417 -0.5824 -0.5466 -0.5466	2000 -1 -0.4863 -0.4863 -0.5541 -0.5643 -0.5643 -0.5643	2001 -1 -0.4863 -0.4863 -0.5541 -0.5643 -0.5643 -0.5643	-1 -1 -1 -1 -1 -1 -1 -1	-1 -1 -1 -1 -1 -1 -1 -1						
	P11CC Injection Qty (mm^3/rev) / Engine Speed (rpm) 40 60 79.6 80 120 160 200.04 200.44 240 P11CB, P11CC Exhaust Temp (°C)	SCRChk_rNO 1100 -1 -1 -1 -1 -1 -1 -1 -1	xDiffThre 1199 -1 -1 -0.5358 -0.5358 -0.5674 -0.5092 -0.5237 -0.5237 -1 -1 chTempRI	1200 -1 -1 -0.5358 -0.5358 -0.5674 -0.5092 -0.5237 -0.5237 -1 -1	1400 -1 -0.5233 -0.5233 -0.5975 -0.5607 -0.561 -1 -1	1600 -1 -1 -0.4972 -0.5458 -0.5867 -0.5796 -0.5796	1800 -1 -0.549 -0.549 -0.5417 -0.5824 -0.5466 -0.5466	2000 -1 -0.4863 -0.4863 -0.5541 -0.5643 -0.5643 -0.5643	2001 -1 -0.4863 -0.4863 -0.5541 -0.5643 -0.5643 -0.5643	-1 -1 -1 -1 -1 -1 -1 -1	-1 -1 -1 -1 -1 -1 -1 -1						
81	P11CC Injection Qty (mm^3/rev) / Engine Speed (rpm) 40 60 79.6 80 120 160 200.04 200.44 240 P11CB, P11CC Exhaust Temp (°C)	SCRChk_rNO 1100 -1 -1 -1 -1 -1 -1 -1 -1	xDiffThre 1199 -1 -0.5358 -0.5358 -0.5674 -0.5092 -0.5237 -0.5237 -1 -1 chTempRI 88.96	sBasMinL 1200 -1 -1 -0.5358 -0.5358 -0.5092 -0.5237 -0.5237 -1 -1 sUsPlaus	1400 -11 -0.5233 -0.5233 -0.5975 -0.5607 -0.561 -1 -1	1600 -1 -1 -0.4972 -0.5458 -0.5867 -0.5796 -0.5796	1800 -1 -0.549 -0.549 -0.5417 -0.5824 -0.5466 -0.5466	2000 -1 -0.4863 -0.4863 -0.5541 -0.5643 -0.5643 -0.5643	2001 -1 -0.4863 -0.4863 -0.5541 -0.5643 -0.5643 -0.5643	-1 -1 -1 -1 -1 -1 -1 -1	-1 -1 -1 -1 -1 -1 -1 -1						
	P11CC Injection Qty (mm^3/rev) / Engine Speed (rpm) 40 60 79.6 80 120 160 200.04 200.04 240 P11CB, P11CC Exhaust Temp (°C) factor (·)	SCRChk_rNO 1100 -1 -1 -1 -1 -1 -1 -1 -1 -1 -1 -1 -1 -1	xDiffThre 1199 -1 -1 -0.5358 -0.5358 -0.5674 -0.592 -0.5237 -1 -1 thTempRI 88.96 1 CharNOx	sBasMinU 1200 -1 -1 -1,-0.5358 -0.5358 -0.5674 -0.5092 -0.5237 -1 -1 sUsPlaus	1400 -11 -0.5233 -0.5233 -0.5975 -0.5607 -0.561 -1 -1	1600 -1 -1 -0.4972 -0.5458 -0.5867 -0.5796 -0.5796	1800 -1 -0.549 -0.549 -0.5417 -0.5824 -0.5466 -0.5466	2000 -1 -1 -0.4863 -0.4863 -0.5541 -0.5643 -0.5643 -0.5643 -1 -1	2001 -1 -0.4863 -0.4863 -0.5541 -0.5643 -0.5643 -0.5643	-1 -1 -1 -1 -1 -1 -1 -1	-1 -1 -1 -1 -1 -1 -1 -1						

3		Label (Interna			eference))											
	P20EE	SCRChk_stP0	OpSelEta1	_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	329.9
	61.11	0	0	0	0		0	0		0	0	0		0	0		020.
	69.44	0	0	0	0		1	1	1	1	0	0		0	0	0	
	80.56	0	0	0	0	1	1	1	1	1	0	0	0	0	0	0	
	83.33	0	0	0	1	1	1	1	1	1	0	0	0	0	0	0	
	97.22	0	0	0	1	1	1	1	1	1	0	0	0	0	0	0	
	102.78	0	0	0	1	1	1	1	1	1	1	0	0	0	0	0	
	111.11	0	0	0	1	1	1	1	1	1	1	1	0	0	0	0	
	119.44	0	0	0	1	1	1	1	1	1	1	1	1	0	0	0	
	127.78	0	0	0	1		1	1			1	1		0	0		
	136.11	0	0	0	1		1	1	1	1	1	1		0	0		
	144.44	0	0	0	1		1	1	1	1	1	1		0	0		
	152.78	0	0	0	1		1	1			1			0	0		
	161.11	0	0	0	0		0				1	1		0	0		
	169.44	0	0	0	0						1	1		0	0		
	177.78	0	0	0	0						0			0	0		
	186.11	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
	Filtered Exh Mass Flow (g/s) / SCR Upstream Temp (°C)	219.96	239.96	244.96	249.96						279.96				299.96		
	61.11	0	0	0	0		0	0			0	0		0	0		
	69.44	0	0	0	0		0				1	1		1	1	-	
	83.33	0	0	0	0						1	1		1	1	v	
	97.22	0	0	0	0						1	1		1	1		
	100.00	0	0	0	1		1	1			1	1		1	1		
	102.78	0	0	0	1		1	1		1	1	1		1	1		
	111.11	0	0	0	1		1	1			1	1		1	1		
	119.44	0	0	0	1		1	1		1	1	1		1			
	127.78 136.11	0	0	0	1		1	1			1	1		1	1		
	130.11	0	0	0	1		1	1		1	1	1		1	1		
	152.78	0	0	0	0						0	0		0	0		
	161.11	0	0	0	0						0	0		0	0		
	175.00	0	0	0	0						0			0	0		
	177.78	0	0	0	0						0			0	0		
	186.11	0	0	0	0						0	0		0	0		
5	P20EE, PBAD (Filtered SCR Temp (°C)	SCRChk_tDel	259.96	CRMax_C 269.96		289.96	299.96	309.96	319.96]							
	Delta SCR Temp (°C)	59.96	59.96	59.96													
8	P20EE, P2BAD	SCRChk_tiAd	dDisbl_M/	ΑP						•							
	Nox Peak Duration (s) / Nox Mass Flow (g/s)	0.05	0.1	0.15	0.2		0.3	0.35									
	0	0	0	0	0		0.2	0.3									
	1	0.3	0.3	0.3	0.3			1.5									
	3	0.5	0.5	0.5	0.5		2										
	4	1	1	1	1												
	6	1.5	1.5	1.5	1.5		6										
		2.5	2.5	2.5	2.5												
	10		-	-	_												
	10 20 60	5	5 5	5 5	5 15												

 0
 299
 300
 28799
 28800
 32000
 32500
 32767

 3276.7
 3276.7
 3276.7
 3276.7
 30
 30
 30
 30

Engine Off Time (sec)
Delta Temperature (°C)

ole no.	Fault Codes	Label (Interna	I Manufa	cturer Re	ference)												
91	Engine Running	StSys_nStrtCu															
	BARO Pressure (kPa) / ECT at Start (°C)	-40.04	-30.04	-16.04	-10.04	9.96	19.96	29.96	39.96								
	6		800	735	735	735	735	675	600								
	7		800	735	735	735	735	675	600								
	7		800	735	735	735	735	675	600								
	8		800	735	735	735	735	675	600								
	8		800 790	735 720	735 720	735 720	735 720	675 660	600 600								
	9		790	720	720	720	720	660	600								
	10		790	720	720	720	720	660	600								
92	P2598, P2599	TrbCh_tiDiaEn	blDly_CU	R		•		•	•								
	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								
	P01CB, P01CD, P01D7, P01D9, P01D1, P01D3, P01D5, P01CF, P01CC, P01CE, P01D8, P01DA, P01D2, P01D4, P01D6, P01D0 Gear (-)	ZFC_stGearRI	1	2	3	ام	E	E	7	о							
	- Cear (-)	0	0	0	1	0	5	6	0	8							
	P01CB, P01CD, P01D7, P01D9, P01D1, P01D3, P01D5, P01CF, P01CC, P01CE, P01D8, P01DA, P01D2, P01D4, P01D6, P01D0	ZFC_tiCldChar															
	ECT (°C)	0.06	9.96	16.86	26.86	36.86	46.86	56.86	66.86	76.86	86.86	96.86					
	Time (sec)	0.06	9.96 15	16.86 20	26.86 27	36.86 30	46.86 30	56.86 30	66.86	76.86 30	86.86 30	96.86	106.86 30				
5	Time (sec) P113A Engine Off Time (sec)	5	15 299	300	28799	28800	32000	32500	30								
95	Time (sec) P113A Engine Off Time (sec) Delta Temperature (°C)	0 3276.7	299 3276.7	300 3276.7	27	30	30	30	30								
95 96	Time (sec) P113A Engine Off Time (sec) Delta Temperature (°C) P054E	0 3276.7 InjCtl_qDesGe	299 3276.7 arMonMir	300 3276.7	28799 3276.7	28800 30	32000 30	32500	30								
95 96	Time (sec) P113A Engine Off Time (sec) Delta Temperature (°C) P054E ECT (°C) / Engine Speed (rpm	0 3276.7 InjCtl_qDesGe	299 3276.7 arMonMir	300 3276.7 1_MAP	28799 3276.7	28800 30	32000 30 5000	32500	30								
95 96	Time (sec) P113A Engine Off Time (sec) Delta Temperature (°C) P054E ECT (°C) / Engine Speed (rpm -20.0	0 3276.7 InjCtl_qDesGe	299 3276.7 arMonMir 400 161.6	300 3276.7 a_MAP 600 161.6	28799 3276.7 800 161.6	28800 30 1000 161.6	32000 30 5000 161.6	32500	30								
95 96	Time (sec) P113A Engine Off Time (sec) Delta Temperature (°C) P054E ECT (°C) / Engine Speed (rpm -20.0 -10.0	0 3276.7 InjCtl_qDesGe 0 4 161.6 4 134.8	299 3276.7 arMonMir 400 161.6 134.8	300 3276.7 3_MAP 600 161.6 134.8	28799 3276.7 800 161.6 134.8	28800 30 1000 161.6 134.8	32000 30 5000 161.6 134.8	32500	30								
95 96	Time (sec) P113A Engine Off Time (sec) Delta Temperature (°C) P054E ECT (°C) / Engine Speed (rpm -20.0 -10.0	0 3276.7 InjCtl_qDesGe 0 4 161.6 4 134.8 4 108	299 3276.7 arMonMir 400 161.6 134.8 108	300 3276.7 1_MAP 600 161.6 134.8 108	28799 3276.7 800 161.6 134.8 108	28800 30 1000 161.6 134.8 108	32000 30 5000 161.6 134.8 108	32500	30								
95 96	Time (sec) P113A Engine Off Time (sec) Delta Temperature (°C) P054E ECT (°C) / Engine Speed (rpm -20.0 -10.0 19.9	0 3276.7 InjCtl_qDesGe 0 4 161.6 4 134.8 4 108 6 77.2	299 3276.7 arMonMir 400 161.6 134.8 108 77.2	300 3276.7 1_MAP 600 161.6 134.8 108 77.2	28799 3276.7 800 161.6 134.8 108 77.2	28800 30 1000 161.6 134.8 108 77.2	32000 30 5000 161.6 134.8 108 77.2	32500	30								
95 96	Time (sec) P113A Engine Off Time (sec) Delta Temperature (°C) P054E ECT (°C) / Engine Speed (rpm -20.0 -10.0 -0.0 19.9 39.9	0 3276.7 InjCtl_qDesGe 0 4 161.6 4 134.8 4 108 6 77.2 6 53.2	299 3276.7 arMonMir 400 161.6 134.8 108 77.2 53.2	300 3276.7 3276.7 600 161.6 134.8 108 77.2 53.2	28799 3276.7 800 161.6 134.8 108 77.2 53.2	28800 30 1000 161.6 134.8 108 77.2 53.2	32000 30 5000 161.6 134.8 108 77.2 53.2	32500	30								
95 96	Time (sec) P113A Engine Off Time (sec) Delta Temperature (°C) P054E ECT (°C) / Engine Speed (rpm -20.0 -10.0 19.9	0 3276.7 InjCtl_qDesGe 0 4 161.6 4 134.8 4 108 6 77.2 6 53.2	299 3276.7 arMonMir 400 161.6 134.8 108 77.2	300 3276.7 1_MAP 600 161.6 134.8 108 77.2	28799 3276.7 800 161.6 134.8 108 77.2	28800 30 1000 161.6 134.8 108 77.2	32000 30 5000 161.6 134.8 108 77.2	32500	30								
95 96 97	Time (sec) P113A Engine Off Time (sec) Delta Temperature (°C) P054E ECT (°C) / Engine Speed (rpm -20.0 -10.0 -10.0 19.9 39.9 P0299	0 3276.7 InjCtl_qDesGe 0 4 161.6 4 134.8 4 108 6 77.2 6 53.2 6 40 PCR_facPresL	299 3276.7 arMonMir 400 161.6 134.8 108 77.2 53.2 40	300 3276.7 0_MAP 600 161.6 134.8 108 77.2 53.2 40	28799 3276.7 800 161.6 134.8 108 77.2 53.2 46	28800 30 1000 161.6 134.8 108 77.2 46	3000 3000 300 5000 161.6 134.8 108 77.2 53.2 46	32500 30	32767 30								
96	Time (sec) P113A Engine Off Time (sec) Delta Temperature (°C) P054E ECT (°C) / Engine Speed (rpm -20.0 -10.0 -19.9 39.9 69.9 P0299 Environmental Pressure (kPa)	0 3276.7 InjCtl_qDesGe 0 4 161.6 6 77.2 6 53.2 6 40 PCR_facPresE	299 3276.7 arMonMir 400 161.6 134.8 108 77.2 53.2 40 OvtCorMa:	300 3276.7 1_MAP 600 161.6 134.8 108 77.2 53.2 40	28799 3276.7 800 161.6 134.8 108 77.2 46	30 28800 30 1000 161.6 134.8 108 77.2 53.2 46	32000 30 5000 161.6 134.8 108 77.2 53.2 46	32500 30 30	32767 30								
96	Time (sec) P113A Engine Off Time (sec) Delta Temperature (°C) P054E ECT (°C) / Engine Speed (rpm -20.0 -10.0 -10.0 19.9 39.9 P0299	0 3276.7 InjCtl_qDesGe 0 4 161.6 4 134.8 4 108 6 77.2 6 53.2 6 40 PCR_facPresL	299 3276.7 arMonMir 400 161.6 134.8 108 77.2 53.2 40	300 3276.7 0_MAP 600 161.6 134.8 108 77.2 53.2 40	28799 3276.7 800 161.6 134.8 108 77.2 53.2 46	28800 30 1000 161.6 134.8 108 77.2 46	3000 3000 300 5000 161.6 134.8 108 77.2 53.2 46	32500 30	32767 30								
95	Time (sec) P113A Engine Off Time (sec) Delta Temperature (°C) P054E ECT (°C) / Engine Speed (rpm -20.0 -10.0 -0.0 19.9 39.9 P0299 Environmental Pressure (kPa) factor (-)	0 3276.7 InjCtl_qDesGe 0 4 161.6 4 134.8 4 108.6 77.2 6 53.2 6 40 PCR_facPresL 50 1.099976 CAClg_dmThr	299 3276.7 arMonMir 400 161.6 134.8 108 77.2 53.2 40 OvtCorMax 59.4 1.1	300 3276.7 600 161.6 134.8 108 77.2 53.2 40 CCUR 68.8 1.1	28799 3276.7 800 161.6 134.8 108 77.2 46	30 28800 30 1000 161.6 134.8 108 77.2 53.2 46	32000 30 5000 161.6 134.8 108 77.2 53.2 46	32500 30 30	32767 30								
95	Time (sec) P113A Engine Off Time (sec) Delta Temperature (°C) P054E ECT (°C) / Engine Speed (rpm -20.0 -10.0 -10.0 19.9 39.9.9 P0299 Environmental Pressure (kPa) factor (-)	0 3276.7 InjCtl_qDesGe 0 4 161.6 4 134.8 4 108 6 77.2 6 53.2 6 40 PCR_facPresL 50 1.099976 CAClg_dmThr	299 3276.7 arMonMir 400 161.6 134.8 77.2 53.2 40 DvtCorMa: 59.4 1.1	300 3276.7 600 161.6 134.8 108 77.2 53.2 40 CCUR 68.8 1.1	28799 3276.7 800 161.6 134.8 108 77.2 46	30 28800 30 1000 161.6 134.8 108 77.2 53.2 46	32000 30 5000 161.6 134.8 108 77.2 53.2 46	32500 30 30	32767 30								
96	Time (sec) P113A Engine Off Time (sec) Delta Temperature (°C) P054E ECT (°C) / Engine Speed (rpm -20.0 -10.0 -10.0 19.9 39.9 P0299 Environmental Pressure (kPa) factor (-) P026A Vehicle Speed (mph)	0 3276.7 InjCtl_qDesGe 0 4 161.6 4 134.8 4 108 6 77.2 6 53.2 6 40 PCR_facPresL 50 1.099976 CAClg_dmThr	299 3276.7 arMonMir 400 161.6 134.8 108 77.2 53.2 40 ovtCorMa: 59.4 1.1	300 3276.7 MAP 600 161.6 134.8 108 77.2 53.2 40 CCUR 68.8 1.1	28799 3276.7 800 161.6 134.8 108 77.2 46	30 28800 30 1000 161.6 134.8 108 77.2 53.2 46	32000 30 5000 161.6 134.8 108 77.2 53.2 46	32500 30 30	32767 30								
96 97 98	Time (sec) P113A Engine Off Time (sec) Delta Temperature (°C) P054E ECT (°C) / Engine Speed (rpm -20.0 -10.0 -19.9 39.9 69.9 P0299 Environmental Pressure (kPa) factor (-) P026A Vehicle Speed (mph) Air Mass Flow (g/sec)	0 3276.7 InjCtl_qDesGe	299 3276.7 arMonMir 400 161.6 134.8 108 77.2 53.2 40 ovtCorMa: 59.4 1.1	300 3276.7 MAP 600 161.6 134.8 108 77.2 53.2 40 CCUR 68.8 1.1	28799 3276.7 800 161.6 134.8 108 77.2 53.2 46	30 28800 30 1000 161.6 134.8 108 77.2 53.2 46	32000 30 5000 161.6 134.8 108 77.2 53.2 46	32500 30 30	32767 30					900	1800	3600	7200

Table no.	Fault Codes	Label (Interna			eference)				
100	P20EE	SCRChk_facE	taEstOfs1	I_MAP	-			-	
	Exhaust Mass Flow (g/sec) / SCR Temperature (°C)	239.96		259.96	269.96		289.96	299.96	309.96
	61.11	-0.3	-0.3	-0.3	-0.3	-0.3	-0.3	-0.3	-0.3
	69.44	-0.225	-0.225	-0.225	-0.225	-0.225	-0.225	-0.225	-0.225
	77.78	-0.15	-0.15	-0.15	-0.15	-0.15	-0.15	-0.15	-0.15
	86.11	-0.125	-0.125	-0.125	-0.125	-0.125	-0.125	-0.125	-0.125
	94.44	-0.1	-0.1	-0.1	-0.1	-0.1	-0.1	-0.1	-0.1
	102.78	-0.1	-0.1	-0.1	-0.1	-0.1	-0.1	-0.1	-0.1
	111.11	-0.1	-0.1	-0.1	-0.1	-0.1	-0.1	-0.1	-0.1
	119.44	-0.1	-0.1	-0.1	-0.1	-0.1	-0.1	-0.1	-0.1
101	P20EE, P2BAD Filtered SCR Temp (°C)	SCRChk_tDelt				289.96	299.96	304.96	319.96
						289.96			
	Delta SCR Temp (°C)	-50.04	-50.04	-25.04	-25.04	-5.04	-5.04	-0.04	-0.04
102	P2BAD	SCRChk_facE	taEstOfs2	2_MAP			-5.04	-0.04	-0.04
102	P2BAD Exhaust Mass Flow (g/sec) / SCR Temperature (°C)	SCRChk_facE	taEstOfs2	2_MAP 259.96	269.96	279.96	-5.04 289.96	-0.04 299.96	-0.04 309.96
102	P2BAD Exhaust Mass Flow (g/sec) / SCR Temperature (°C) 61.11	SCRChk_facE 239.96 0.1	249.96 0.1	2_MAP 259.96 0.1	269.96 0.1	279.96 0.1	-5.04 289.96 0.1	-0.04 299.96 0.1	-0.04 309.96 0.1
102	P2BAD Exhaust Mass Flow (g/sec) / SCR Temperature (°C) 61.11 69.44	SCRChk_facE 239.96 0.1 0.1	249.96 0.1 0.1	2_MAP 259.96 0.1 0.1	269.96 0.1 0.1	279.96 0.1 0.1	-5.04 289.96 0.1 0.1	-0.04 299.96 0.1 0.1	-0.04 309.96 0.1 0.1
102	P2BAD Exhaust Mass Flow (g/sec) / SCR Temperature (°C) 61.11 69.44 77.78	SCRChk_facE 239.96 0.1 0.1 0.1	249.96 0.1 0.1 0.1	2_MAP 259.96 0.1 0.1	269.96 0.1 0.1 0.1	279.96 0.1 0.1 0.1	-5.04 289.96 0.1 0.1 0.1	-0.04 299.96 0.1 0.1	-0.04 309.96 0.1 0.1
102	P2BAD Exhaust Mass Flow (g/sec) / SCR Temperature (°C) 61.11 69.44 77.78 86.11	SCRChk_facE 239.96 0.1 0.1 0.1 0.1	249.96 0.1 0.1 0.1 0.1	2_MAP 259.96 0.1 0.1 0.1 0.1	269.96 0.1 0.1 0.1 0.1	279.96 0.1 0.1 0.1 0.1	-5.04 289.96 0.1 0.1 0.1	-0.04 299.96 0.1 0.1 0.1	-0.04 309.96 0.1 0.1 0.1
102	P2BAD Exhaust Mass Flow (g/sec) / SCR Temperature (°C) 61.11 69.44 77.78 86.11	SCRChk_facE 239.96 0.1 0.1 0.1 0.1 0.125	249.96 0.1 0.1 0.1 0.1 0.1 0.125	2_MAP 259.96 0.1 0.1 0.1 0.1 0.125	269.96 0.1 0.1 0.1 0.1 0.125	279.96 0.1 0.1 0.1 0.1 0.125	-5.04 289.96 0.1 0.1 0.1 0.1 0.125	-0.04 299.96 0.1 0.1 0.1 0.1	-0.04 309.96 0.1 0.1 0.1 0.1 0.125
102	P2BAD Exhaust Mass Flow (g/sec) / SCR Temperature (°C) 61.11 69.44 77.78 86.11 94.44 102.78	SCRChk_facE 239.96 0.1 0.1 0.1 0.1 0.125 0.125	249.96 0.1 0.1 0.1 0.1 0.1 0.125 0.125	2_MAP 259.96 0.1 0.1 0.1 0.1 0.125 0.125	269.96 0.1 0.1 0.1 0.1 0.125 0.125	279.96 0.1 0.1 0.1 0.125 0.125	-5.04 289.96 0.1 0.1 0.1 0.1 0.125 0.125	-0.04 299.96 0.1 0.1 0.1 0.1 0.125	-0.04 309.96 0.1 0.1 0.1 0.125 0.125
102	P2BAD Exhaust Mass Flow (g/sec) / SCR Temperature (°C) 61.11 69.44 77.78 86.11	SCRChk_facE 239.96 0.1 0.1 0.1 0.1 0.125	249.96 0.1 0.1 0.1 0.1 0.1 0.125 0.125	2_MAP 259.96 0.1 0.1 0.1 0.1 0.125	269.96 0.1 0.1 0.1 0.1 0.125	279.96 0.1 0.1 0.1 0.1 0.125	-5.04 289.96 0.1 0.1 0.1 0.1 0.125	-0.04 299.96 0.1 0.1 0.1 0.1	-0.04 309.96 0.1 0.1 0.1 0.1 0.125

15 OBDG09 Diagnostic Calibration Status and State Tables - ECM (LML/LGH Common)

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
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

15 OBDG09 Diagnostic Calibration Status and State Tables - ECM (LML/LGH Common)

				_													
Table no.	Status or State	Label (Interna	Manufa	cturer Re	ference)												
5	Status thermal regeneration active	PFltLd_facTem	pSimRgr	_CUR													
	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	2.81				
	Rail Control - PCV Closed Loop Control Only	Rail_dvolMeUn	· .														
	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
7	Rail Control - Metering Unit + PCV Closed Loop Control	Rail_qMeUnCtl	Type_CL	JR													
	Engine Speed (rpm)	900	901	1200	1400	1600	1800	2000	4800								
	Injection Qty (mm^3/rev)	100	15	15	15	3	3	3	3								

8 Status of the SCR adaptation plausibility check active SCRAd_mNH3MinTrg_MAP

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
0.8	0	0	0	0.04	0.04	0.04
1	0	0	0	0.04	0.04	0.04

Overdosing detected 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
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
1800		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

15 OBDG09 Diagnostic Calibration Status and State Tables - ECM (LML/LGH Common)

Table no.	Status or State	Label (Interna	al Manufa	acturer Re	eference)								
11	Request for pre controlled dosing	SCRFFC_stN	QntCurrH	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
2200	10	10	8	6	4	2	0	0	0	0	0	3
2400	10	10	8	6	4	2	0	0	0	0	0	3
2600	10	8	6	4	3	0	0	0	0	0	0	3
2800	10	8	5	4	3	0	0	0	0	0	0	3
3000	10	8	5	4	3	0	0	0	0	0	0	3
3200	10	8	7	5	4	4	4	4	4	4	4	4

15 OBDG09 Diagnostic Calibration Status and State Tables - ECM (LML/LGH Common)

ble no.	Status or State	Label (Interna	al Manufa	cturer Re	eference)				
14	Engine Running	StSys_nStrtCu	utOut_MA	P	,				
		• -							
	BARO Pressure (kPa) / ECT at Start (°C)	-40.04	-20.04	-10.04	-0.04	9.96	19.96	34.96	59.90
	6		770	755	755	755	680	600	600
	70		770	755	755	755	680	600	60
	7:		770	755	755	755	680	600	60
	86		770	755	755	755	680	600	60
	85		770	755	755	755	680	600	60
	90		770	755	755	755	680	600	60
	99		740 740	720 720	720 720	720 720	650 650	600 600	60 60
15	State of Reductant injection valve Component Protection	UDC_tUDosV	lvCoPrAc	tv_MAP			·	·	
	Vehicle Speed (mph) / SCR Upstream Temp (°C)	99.96	199.96	299.96	399.96	499.96	599.96		
		104.96	104.96	104.96	104.96	95.46	89.96		
	20		109.96	109.96	107.96	100.26	94.96		
	50		109.96	109.96	108.96	107.96	103.96		
	60		109.96	109.96	109.96	109.96	105.96		
	100		109.96	109.96	109.96	109.96	107.96		
	150	109.96	109.96	109.96	109.96	109.96	109.96		
	Reductant Tank Temp. (°C) Reductant Heater Time (sec)	-30.04 3277	-18.04 3277	-15.04 3277	-11.04 3277	-8.04 300	-0.04 300	4.96 300	5.06
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	(
18	Release of tank heater circuit Reductant Tank Temp. (°C) Reductant Heater Time (sec)	UHC_tiDfrstC2 -35.04 3276.7	2_CUR -25.04 3276.7	-18.04 3000	-10.04 600	-8.04 300	-5.04 300	-0.14 200	-0.04
19	Release of tank heater circuit	UHC_tiDfrstC3	3_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	(
20	Release of tank heater circuit	UHC_tiOnC2_	CUR						
	Reductant Tank Temp. (°C)	-30.04	-18.04	-15.04	-11.04	-7.04	-0.04	4.96	5.0
	Reductant Heater Time (sec)	3276.7	3276.7	3276.7	3276.7	600	300	90	0.0
	Reductant Heater Time (Sec)								

15 OBDG09 Diagnostic Calibration Status and State Tables - ECM (LML/LGH Common)

Table no.	Status or State	Label (Internal Manufacturer Reference)
21	Release of tank heater circuit	UHC_tiOnC3_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)	3276.7 3276.7 3276.7 3276.7 600 300 90 0

15 OBDG09 Closed Loop Enable Conditions Calibration Tables - ECM (LML/LGH Common)

Table no	Closed Loop Enable Condition Parameter Summary	Label (Internal Manufactu	urer Reference)						
22	EGR Closed Loop - Overlong Idle Time Delay	AirCtl_tiDbShOffExtdldl_MA	AP						
		79.96 129.96 1 0.30 0 0	40 50 60	0 80 135					
		0.40 0 0 0.50 0 0		0 80 135 0 80 135					
		0.60 0 0	40 60 70	90 145					
		0.70 0 0		90 145					
		0.80 0 0 0.90 0 0		95 150 15 95 150					
		1.00 0 0		95 150					
23	EGR Closed Loop - Injection Quantity too Large	AirCtl_q2HiEOM_MAP							
	CAC Downstream Temperature / Engine Speed		1200 1400 1800 22						
		40.04 220 220 20.04 220 220	340 340 380 3 320 320 380 3	380 380 380 380 380 380 380					
		-0.04 220 220 -0.04 220 220	320 320 380 3						
		19.96 220 220	300 300 340 3						
		39.96 220 220 19.96 220 220	300 300 300 3 220 220 260 3						
24	Intake Manifold Pressure Cold Start	PCR_tiCldStrt_CUR							
	Coolant Temperature (°C)	-50.14 -45.14	-40.14 -35.14 -30.14 -25.			9.86 14.86 19.86 24.86	29.86 34.86 39.86 44.86 49	.86 54.86 59.86 64.86 69.86	74.86 79.86 84.86 89.86 94.86
	Engine Run Time (sec)	300 250	200 180 150 1	5 120 110 100	90 75 45	35 25 15 5	5 5 5 5	5 5 5 5	5 5 5 5
25	Intake Manifold Closed Loop EGR Contol OFF High Altit	ude PCR_GovOnEGROffHi_CU	UR 600 800 1000 12	0 1400 1600 1800	2000 2200 2400	2600 2800 3000 3200	3400 3600 3800 4000 42	200 4400 4600 4800 5000	
	Commanded Fuel (mm3/rev)	340 340		0 180 140 120		100 80 80 80		80 80 80 80 80	
26	Intake Manifold Closed Loop EGR Contol OFF Medium A	Altitur PCR_GovOnEGROffMed_0	CUR						
	Engine RPM (RPM)	200 400	600 800 1000 12	0 1400 1600 1800	2000 2200 2400	2600 2800 3000 3200	3400 3600 3800 4000 42	200 4400 4600 4800 5000	
	Commanded Fuel (mm3/rev)	340 340	340 340 280 2	0 180 180 140	120 120 100	100 100 80 80	80 80 80 80	80 80 80 80	
27	Intake Manifold Closed Loop EGR Contol OFF Low Altitude	ude PCR_GovOnEGROffSea_0	CUR						
	Engine RPM (RPM)	200 400	600 800 1000 12			2600 2800 3000 3200		200 4400 4600 4800 5000	
	Commanded Fuel (mm3/rev)	340 340	340 340 280 2	0 180 180 140	120 120 100	100 100 80 80	80 80 80 80	80 80 80 80	
28	Intake Manifold Closed Loop High Altitude	PCR_GovOnHi_CUR							
	Engine RPM (RPM) Commanded Fuel (mm3/rev)	200 400 340 340	600 800 1000 12 340 340 280 2			2600 2800 3000 3200 100 100 80 80		200 4400 4600 4800 5000 80 80 80 80 80	
29	Intake Manifold Closed Loop Medium Altitude	PCR_GovOnMed_CUR	340 340 280 2	0 160 160 140	J 120 120 100	100 100 80 80	0 80 80 80	80 80 80 80	
	Engine RPM (RPM)	200 400	600 800 1000 12	0 1400 1600 1800	2000 2200 2400	2600 2800 3000 3200	3400 3600 3800 4000 42	200 4400 4600 4800 5000	
	Commanded Fuel (mm3/rev)	340 340		0 180 180 140		100 100 80 80		80 80 80 80	
30	Intake Manifold Closed Loop Low Altitude	PCR_GovOnSea_CUR							
	Engine RPM (RPM)	200 400	600 800 1000 12		2000 2200 2400	2600 2800 3000 3200	3400 3600 3800 4000 42	200 4400 4600 4800 5000	
	Commanded Fuel (mm3/rev)	340 340	340 340 280 2	0 180 180 140	120 120 100	100 100 80 80	80 80 80 80	80 80 80 80	
31	FBC Closed Loop Fuel Quantity	FBC_qGvrnThresMax_CUR							
	Engine Speed (rpm)		2000 2700						
	Fuel Quantity (mm3/rev)	200 380	380 200						

Active DTC P0016 - Crankshaft to Camshaft	P0191 - Fuel Rail Pressure Sensor P031	15 - Crankshaft Position System	ı	Inhibited DTCs													
Correlation P0045 - Turbocharger Boost	Performance	Variation Not Learned 0299 - Turbocharger Engine	P0401 - Exhaust Gas Recirculation	n P0402 - Exhaust Gas Recirculation	1												
Control Circuit P0047 - Turbocharger Boost	Overboost	Underboost	Flow Insufficient P0401 - Exhaust Gas Recirculation	Flow Excessive n P0402 - Exhaust Gas Recirculation													
Control Circuit Low Voltage	Overboost	Underboost 10299 - Turbocharger Engine	Flow Insufficient P0401 - Exhaust Gas Recirculation	Flow Excessive													
Control Circuit High Voltage	Overboost	Underboost	Flow Insufficient	Flow Excessive	1												
P006E - Turbocharger Boost High Control Circuit Low Voltage	P0234 - Turbocherger Engine P0 Overboost	0299 - Turbocharger Engine Underboost	P0401 - Exhaust Gas Recirculation Flow Insufficient	P0402 - Exhaust Gas Recirculation Flow Excessive		_											
P006F - Turbocharger Boost High Control Circuit High Voltage	P0234 - Turbocharger Engine P0 Overboost	0299 - Turbocharger Engine Underboost	P0401 - Exhaust Gas Recirculation Flow Insufficient	n P0402 - Exhaust Gas Recirculation Flow Excessive	P2510 - ECM Power Relay Circuit Performance												
P007C - CAC Temperature		0299 - Turbocharger Engine	P0401 - Exhaust Gas Recirculation	n P0402 - Exhaust Gas Recirculation	P2080 - Exhaust Temperature	P2084 - Exhaust Temperature Sensor 2 Performance	P242B - Exhaust Temperature	P246F - Exhaust Temperature	1								
Sensor Circuit Low Voltage P007D - CAC Temperature Sensor Circuit Hinh Voltage		Underboost 0299 - Turbocharger Engine	Flow Insufficient P0401 - Exhaust Gas Recirculation Flow Insufficient	Flow Excessive P0402 - Exhaust Gas Recirculation Flow Excessive	Sersor 1 Performance P2080 - Exhaust Temperature Sersor 1 Performance	Sensor 2 Performance P2084 - Exhaust Temperature	Sensor 3 Performance P2428 - Exhaust Temperature	Sersor 4 Performance P246F - Exhaust Temperature									
P008F - Engine Coolant		Underboost	Flow Insufficient	Flow Excessive	Sensor 1 Performance	Sersor 2 Performance	Sensor 3 Performance	Sensor 4 Performance	J								
Temperature (ECT)-Fuel Temperature Not Plausible	P0101 - Mass Air Flow Sensor Performance																
P0097 - Intake Air Temperature	P2080 - Exhaust Temperature P2	2084 - Exhaust Temperature	P242B - Exhaust Temperature Sensor 3 Performance	P246F - Exhaust Temperature Sensor 4 Performance	1												
Sensor 2 Circuit Low P0098 - Intake Air Temperature Sensor 2 Circuit High		Sensor 2 Performance 2084 - Exhaust Temperature Sensor 2 Performance	P242B - Exhaust Temperature Sensor 3 Performance	P246F - Exhaust Temperature Sensor 4 Performance	1												
P00CA - Fuel Pressure Regulator 1 High Control Circuit High	P2S10 - ECM Power Relay Circuit				-												
Voltage	Performance								Posts President Street			DOMOR CONTRACTOR RECEIVED	POINT Classed are Dad attent	1			
P0101 - Mass Air Flow Sensor Performance	P0401 - Exhaust Gas Recirculation P040 Flow Insufficient	02 - 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	P2453 - Diesel Particulate Filter Differential Pressure Sensor Performance	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 P0	0234 - Turbocharger Engine	P0299 - Turbocharger Engine	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	P246F - Exhaust Temperature Sensor 4 Performance			LOW	ngi	1			
Circuit Low P0103 - Mass Air Flow Sensor Circuit High	Performance P0101 - Mass Air Flow Sensor P0 Performance	Overboost 0234 - Turbocharger Engine Overboost	P0299 - Turbocharger Engine			P2080 - Exhaust Temperature Sensor 1 Performance	Sersor 2 Performance P2084 - Exhaust Temperature Sersor 2 Performance	Sensor 3 Performance P242B - Exhaust Temperature Sensor 3 Performance	P246F - Exhaust Temperature Sensor 4 Performance	1							
Circuit High P0106 - Manifold Absolute	Performance P0101 - Mass Air Flow Sensor P0	Overboost 0234 - Turbocharger Engine	Underboost P0299 - Turbocharger Engine	P0401 - Exhaust Gas Recirculation	P0402 - Exhaust Gas Recirculation	Sergor 1 Performance	densor 2 Performance	dersor 3 Performance	dergor 4 Performance	1							
Pressure Sensor Performance P0107 - Manifold Absolute	Performance P0101 - Mass Air Flow Sensor P010	Overboost 06 - Manifold Absolute Pressure	Underboost P0234 - Turbocharger Engine	P0299 - Turbocharger Engine	Flow Excessive 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 Low Voltage P0108 - Manifold Absolute	Performance	Sensor Performance	Overboost	Underboost	Flow Insufficient	Flow Excessive	Sensor 1 Performance	Sensor 2 Performance	Performance	Sensor 3 Performance	Sersor 4 Performance						
Pressure (MAP) Sensor Circuit	P0101 - Mass Air Flow Sensor P010 Performance	06 - 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	P242B - Exhaust Temperature Sensor 3 Performance	P246F - Exhaust Temperature Sensor 4 Performance						
High Voltage		01 - Exhaust Gas Recirculation		P040F - Exhaust Gas Recirculation	P2080 - Exhaust Temperature	P2084 - Exhaust Temperature	P20F2 - Evhaust Gas Temperature	P242B - Exhaust Temperature	P246F - Exhaust Temperature	Jenaci J Fenomia EV	Jenso 41 enormation	ı					
Sersor 1 Circuit Low	Performance Po40	Flow Insufficient	Flow Excessive	(EGR) Temperature Sensor 1-2 Correlation	Sersor 1 Performance	Sersor 2 Performance	(EGT) Sensors 1-2 not plausible	Sersor 3 Performance	Sersor 4 Performance								
P0113 - Intake Air Temperature Sensor 1 Circuit High	P0101 - Mass Air Flow Sensor P040	01 - Exhaust Gas Recirculation Flow Insufficient	P0402 - Exhaust Gas Recirculation Flow Excessive	P040F - Exhaust Gas Recirculation (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								
	P0106 - Manifold Absolute Pressure P019	91 - Fuel Rail Pressure Sersor	P0234 - Turbocharger Engine	Correlation P0263 - Clv 1 Balance System	P0266 - Clv 2 Balance System	P0269 - Clv 3 Balance System	P0272 - Clv 4 Balance System	P0275 - Clv 5 Balance System	P0278 - Clv 6 Balance System	P0281 - Clv 7 Balance System	P0284 - Clv 8 Balance System	P0299 - Turbocharger Engine		P0301 - Cylinder 1 Misfire Detected P0302 -			
P0117 - Engine Coolant Temperature Sensor Circuit Low	Sensor Performance P0305 - Cvinder 5 Misfire Detected P030	Performance	Overboost	,	P0401 - Exhaust Gas Recirculation	P0402 - Exhaust Gas Recirculation	P0272 - Cly 4 Balance System P0506 - Idle Speed Low	P0275 - Cly 5 Balance System P0507 - Idle Speed High	P2080 - Exhaust Temperature	P2084 - Exhaust Temperature	P0284 - Cly 8 Balance System P242B - Exhaust Temperature	Underboost P246F - Exhaust Temperature	PU300 - Engine Mistire Detected	P0301 - Cylinder 1 Mishire Detected P0302 -	Cylinder 2 Mishire Detected	PU3U3 - Cylinder 3 Mishire Detected	P0304 - Cylinder 4 Mishire Detecte
	P0305 - Cylinder 5 Mishre Detected P030 P0106 - Manifold Absolute Pressure P019	,	P0307 - Cylinder 7 Mistire Describ P0234 - Turbocharger Engine	d PUSUS - Cylinder 8 Mistire Detected	Flow Insufficient	Flow Excessive	PUSUS - Idle Speed Low	P0507 - Idle Speed High	Sensor 1 Performance	Sensor 2 Performance	Sensor 3 Performance	Sensor 4 Performance P0299 - Turbocharger Engine					1
P0118 - Engine Coolent	Sensor Performance	91 - Fuel Mail Pressure Sensor Performance	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	Underboost	P0300 - Engine Misfire Detected	P0301 - Cylinder 1 Misfire Detected P0302 -	Cylinder 2 Misfire Detected	P0303 - Cylinder 3 Misfire Detected	P0304 - Cylinder 4 Misfire Detecte
Temperature Sensor Circuit High	P0305 - Cylinder 5 Misfire Detected P030	06 - Cylinder 6 Misfire Detected	PODES OF STATE STREET, Process		P0401 - Exhaust Gas Recirculation	P0402 - Exhaust Gas Beninglation	ĺ		P2080 - Exhaust Temperature	P2084 - Exhaust Temperature	P242B - Exhaust Temperature	P246F - Exhaust Temperature					•
								P0507 - Idle Speed High	P2080 - Exhaust Temperature			P246F - Exhaust remperature					
P0128 - Engine Coolant	POLOS Mary Na Plan Parana		PUSO7 - Cylinder 7 Missine Desicol	d PUSUS - Cylinder 8 Mistire Detected	Flow Insufficient	Flow Excessive	P0506 - Idle Speed Low	P0507 - Idle Speed High	Sensor 1 Performance	Sensor 2 Performance	Sensor 3 Performance	Sensor 4 Performance					
P0128 - Engine Coolant Temperature Below Thermostat Regulating Temperature	P0101 - Mass Air Flow Sensor Performance		POSO7 - Cylinder 7 Missine Delected	a PUSUS - Cylinder 8 Mistrie Detected			P0506 - Idle Speed Low	P0507 - Idle Speed High	Sensor 1 Performance			Sensor 4 Performance					
P0128 - Engine Coolant Temperature Below Thermostat Regulating Temperature P014C - H028 Slow Response Rich to Lean Sensor 1	Performance			w P026D - Injection Quantity Too High	Flow Insufficient	Flow Excessive	P0506 - Idle Speed Low	P0507 - Idle Speed High	Sensor 1 Performance			Sensor 4 Performance					
Regulating Temperature P014C - HO2S Slow Response	Porformance P0171 - Fuel Trim System Lean P0 P11CB - NOx Sensor Performance - P11C	0172 - Fuel Trim System Rich			Flow Insufficient	Flow Excessive	P0506 - Idle Speed Low	P0507 - Idle Speed High	Sersor 1 Performance			Sensor 4 Performance					
Regulating Temperature P014C - H02S Slow Response Rich to Lean Sensor 1 P0171 - Fuel Trim System Lean	Performance P0171 - Fuel Trim System Lean P0: P11CB - NOx Sensor Performance - Signal High Bank 1 Sensor 1	3172 - Fuel Trim System Rich CC - NOx Sensor Performance - Signal Low Bank 1 Sensor 1			Flow Insufficient	Flow Excessive	P0506 - Idle Speed Low	P0507 - Idle Speed High	P.2000 - Extractor, Furtiper surre Sensor 1 Performance			Sersor 4 Performance					
Regulating Temperature P014C + P025 Stow Response Rich to Lean Sensor 1 P0171 - Fuel Trim System Lean P0172 - Fuel Trim System Rich	Performance P0171 - Fuel Trim System Lean P0 P11CB - NOx Sensor Performance - Signal High Bank 1 Sensor 1 P11CB - NOX Sensor Performance - Signal High Bank 1 Sensor 1 S	2172 - Fuel Trim System Rich CC - NOx Sersor Performance - Signal Low Bank 1 Sersor 1 CC - NOx Sersor Performance - Signal Low Bank 1 Sersor 1	P026C - Injection Quantity Too Los	w P026D - Injection Quartify Too High	Flow Insufficient P11CB - NOx Sensor Performance - Signal High Bank 1 Sensor 1	Flow Excessive P11CC - NOx Sensor Performance - Signal Low Bank 1 Sensor 1	P0506 - Idle Speed Low	P0507 - Idle Speed High	P2001 - Exhalact i emperiante Sergor 1 Performance			Sersor 4 Performance					
Regulating Temperature PO14C - NEUS Slow Response Rich to Lean Sensor 1 PO171 - Fuel Trim System Lean PO172 - Fuel Trim System Rich PO182 - Fuel Trim System Rich PO182 - Fuel Trimperature Sensor 1 Climital Fee	Performance P0171 - Fuel Trim System Lean P0 P11CB - NOx Sensor Performance - Signal High Bank 1 Sensor 1 P11CB - NOX Sensor Performance - Signal High Bank 1 Sensor 1 S	2172 - Fuel Trim System Rich CC - NOx Sersor Performance - Signal Low Bank 1 Sersor 1 CC - NOx Sersor Performance - Signal Low Bank 1 Sersor 1	P026C - Injection Quantity Too Los		Flow Insufficient P11CB - NOx Sensor Performance - Signal High Bank 1 Sensor 1	Flow Excessive P11CC - NOx Sensor Performance - Signal Low Bank 1 Sensor 1]	P0507 - Idle Speed High P0102 - Cylinder 4 Injection Timing Advanced	Pot03 - Cylinder 5 trijection Timing P01D3 - Cylinder 5 trijection Timing			Potte - Cylinder 6 injection Timing	P01D7 - Cylinder 7 Injection Timing	POTDS - Cylinder 7 Sylaction Timing POTDS - Advanced	- Cylinder 8 Injection Timing Retarded	P01DA - Cylinder 8 Injection Timing Advanced	ī
Regulating Temperature PO14C - HO25 Slow Response Rich to Lean Sensor 1 PO171 - Fuel Trim System Lean PO172 - Fuel Trim System Rich PO182 - Fuel Temperature Sensor 1 Circuit Low PO183 - Fuel Temperature Sensor PO183 - Fuel Temperature Sensor	Performance P0171 - Fuel Trim System Lean P11CB - NOL Sunner Performance - P11CB Signal High Bank 1 Sensor 1 S P11CB - NOL Sunner Performance - P11C Signal High Bank 1 Sensor 1 P11C Signal High Bank 1 Sensor 1 P11CB P01CB - Cylendar 1 Injection Timing P01CB P01CB - Cylendar 1 Injection Timing P01CB P01CB - Cylendar 1 Injection Timing P01CB	20172 - Fuel Trim System Rich CC - NOx Sensor Performance - Gignal Low Barel: 1 Sensor 1 CC - NOx Sensor Performance - Gignal Low Barel: 1 Sensor 1 CC - Opinder 1 Injection Timing Advanced	P028C - Injection Quantity Too Los P01CD - Oylinder 2 Injection Timin Retarded	P026D - Injection Quartity Too High P01CE - Cylinder 2 Injection Timing Advanced	Flow Insufficient PHCB - NOx Sensor Performance - Signal High Bank 1 Sensor 1 P01CF - Cylinder 3 Injection Timing Retarded	Flow Excessive PH1CC - NDr. Sensor Pentremance - Signal Low Bank 1 Sensor 1 P01D0 - Cylinder 3 Injection Timing Advanced	P01D1 - Cylinder 4 lityaction Timing Ratardod	P01D2 - Cylinder 4 lityaction Timing Advanced	Sensor 1 Performance P01D3 - Cylinder 5 linjection Timing Retarded	Sensor 2 Performance P01D4 - Cylinder 5 Injection Timing Advanced	Sensor 3 Performance P01D5 - Cylinder 6 Injection Timing Ratarded	Sensor 4 Performance PO1D6 - Cylinder 6 Injection Timing Advanced	Retarded		Retarded	Advanced	7 1
Regulating Temperature P014C-10255 Sew Regionaria Rich to Lean Sensor 1 P0171 - Fuel Trim System Lean P0172 - Fuel Trim System Rich P0172 - Fuel Temperature Sensor 1 Circuit Lean P0183 - Fuel Temperature Sensor P0183 - Fuel Temperature Sensor P0183 - Fuel Temperature Sensor P0182 - Fuel Temperature Sensor Circuit I rev	Performance POTT: Fuel Trem System Lean. POP PSTCB: NOS scancer Performance - PSTCB NOS scancer 1 S PSTCB NOS scancer Performance - PSTCB NOS scancer 1 S PSTCB NOS scancer Performance - PSTCB NOS scancer 1 S PSTCB - Cylender 1 speciols Triming PSTC PSTCB - Cylender 1 speciols Triming PSTC PSTCB - Cylender 1 speciols Triming PSTC PSTCB - Cylender 1 speciols Triming PSTC PSTCB - Cylender 1 speciols Triming PSTC PSTCB - Cylender 1 speciols Triming PSTC PSTCB - Cylender 1 speciols Triming PSTC PSTCB - Cylender 1 speciols Triming PSTC PSTCB - Cylender 1 speciols Triming PSTC PSTCB - Cylender 1 speciols Triming PSTC PSTCB - Cylender 1 speciols Triming PSTCB PSTCB - Cylender 1 speciols Triming PSTCB PSTCB - Cylender 1 special Stancer 1 S PSTCB - Cylender 1 S PSTCB - Cylender 1 S PSTCB - Cylender 1 S PSTCB - Cylender 1 S PSTCB - Cylender 1 S PSTCB - Cylender 1 S PSTCB - Cylender 1 S PSTCB - Cylender 1 S PSTCB - Cylender 1 S PSTCB - Cylender 1 S PSTCB - Cylender 1 S PSTCB - Cylender 1 S	20172 - Fuel Trim System Rich CC - NOx Sensor Performance - Gignal Low Barel: 1 Sensor 1 CC - NOx Sensor Performance - Gignal Low Barel: 1 Sensor 1 CC - Opinder 1 Injection Timing Advanced	P028C - Injection Quantity Too Los P01CD - Oylinder 2 Injection Timin Retarded	P026D - Injection Quartity Too High P01CE - Cylinder 2 Injection Timing Advanced	Flow Insufficient PHCB - NOx Sensor Performance - Signal High Bank 1 Sensor 1 P01CF - Cylinder 3 Injection Timing Retarded	Flow Excessive PH1CC - NDr. Sensor Pentremance - Signal Low Bank 1 Sensor 1 P01D0 - Cylinder 3 Injection Timing Advanced	P01D1 - Cylinder 4 lityaction Timing Ratardod	P01D2 - Cylinder 4 lityaction Timing Advanced	Sensor 1 Performance P01D3 - Cylinder 5 linjection Timing Retarded	Sensor 2 Performance P01D4 - Cylinder 5 Injection Timing Advanced	Sensor 3 Performance P01D5 - Cylinder 6 Injection Timing Ratarded	Sensor 4 Performance PO1D6 - Cylinder 6 Injection Timing Advanced	Retarded	Advanced	Retarded	Advanced	7 7
Regulating Temperature P014C-1025S bew Response Rich to Lean Sensor 1 P0171 - Fuel Trim System Rich P0172 - Fuel Trim System Rich P0172 - Fuel Tem System Rich P0182 - Fuel Temperature Sensor 1 Circust Low P0183 - Fuel Temperature Sensor Sensor Circuit Low P0183 - Fuel Temperature Sensor Sensor Circuit Low P0193 - Ren Rich P0193 - Ren Rich P0193 - Ren Rich Pmessare P0193 - Ren Rich Pmessare P0193 - Ren Rich Pmessare P0193 - Ren Rich Pmessare	Performance P0171 - Fuel Trim System Lean P11CB - NOL Sunner Performance - P11CB Signal High Bank 1 Sensor 1 S P11CB - NOL Sunner Performance - P11C Signal High Bank 1 Sensor 1 P11C Signal High Bank 1 Sensor 1 P11CB P01CB - Cylendar 1 Injection Timing P01CB P01CB - Cylendar 1 Injection Timing P01CB P01CB - Cylendar 1 Injection Timing P01CB	20172 - Fuel Trim System Rich CC - NOx Sensor Performance - Gignal Low Barel: 1 Sensor 1 CC - NOx Sensor Performance - Gignal Low Barel: 1 Sensor 1 CC - Opinder 1 Injection Timing Advanced	P028C - Injection Quantity Too Los P01CD - Oylinder 2 Injection Timin Retarded	P026D - Injection Quartity Too High P01CE - Cylinder 2 Injection Timing Advanced	Flow Insufficient PHCB - NOx Sensor Performance - Signal High Bank 1 Sensor 1 P01CF - Cylinder 3 Injection Timing Retarded	Flow Excessive PH1CC - NDr. Sensor Pentremance - Signal Low Bank 1 Sensor 1 P01D0 - Cylinder 3 Injection Timing Advanced	P01D1 - Cylinder 4 lityaction Timing Ratardod	P01D2 - Cylinder 4 lityaction Timing Advanced	Sensor 1 Performance P01D3 - Cylinder 5 linjection Timing Retarded	Sensor 2 Performance P01D4 - Cylinder 5 Injection Timing Advanced	Sensor 3 Performance P01D5 - Cylinder 6 Injection Timing Ratarded	Sensor 4 Performance PO1D6 - Cylinder 6 Injection Timing Advanced	Retarded	Advanced	Retarded	Advanced	7
Regulating Temperature P014C-10255 Sew Regionaria Rich to Lean Sensor 1 P0171 - Fuel Trim System Lean P0172 - Fuel Trim System Rich P0172 - Fuel Temperature Sensor 1 Circuit Lean P0183 - Fuel Temperature Sensor P0183 - Fuel Temperature Sensor P0183 - Fuel Temperature Sensor P0182 - Fuel Temperature Sensor Circuit I rev	Performance Portomance	20172 - Fuel Trim System Rich CC - NOx Sensor Performance - Gignal Low Barel: 1 Sensor 1 CC - NOx Sensor Performance - Gignal Low Barel: 1 Sensor 1 CC - Opinder 1 Injection Timing Advanced	P028C - Injection Quantity Too Los P01CD - Oylinder 2 Injection Timin Retarded	P026D - Injection Quartity Too High P01CE - Cylinder 2 Injection Timing Advanced	Flow Insufficient PHCB - NOx Sensor Performance - Signal High Bank 1 Sensor 1 P01CF - Cylinder 3 Injection Timing Retarded	Flow Excessive PH1CC - NDr. Sensor Pentremance - Signal Low Bank 1 Sensor 1 P01D0 - Cylinder 3 Injection Timing Advanced	P01D1 - Cylinder 4 lityaction Timing Ratardod	P01D2 - Cylinder 4 lityaction Timing Advanced	Sensor 1 Performance P01D3 - Cylinder 5 linjection Timing Retarded	Sensor 2 Performance P01D4 - Cylinder 5 Injection Timing Advanced	Sensor 3 Performance P01D5 - Cylinder 6 Injection Timing Ratarded	Sensor 4 Performance PO1D6 - Cylinder 6 Injection Timing Advanced	Retarded	Advanced	Retarded	Advanced	7
Regulating Temperature PRIGE - 1802/SIEW Response Rich to Lean Sensor I Rich to Lean Sensor I PO171 - Fuel Time System Lean P0172 - Fuel Time System Rich P0182 - Fuel Time System Rich P0182 - Fuel Time System Rich P0182 - Fuel Temperature Sensor F0182 - Fuel Temperature Sensor P0182 - Fuel Rich Pressure P0183 - Fuel Rich Pressure P0193 - Fuel Rich Pressure P0193 - Fuel Rich Pressure P0193 - Fuel Rich Pressure P0193 - Fuel Rich Pressure P0193 - Fuel Rich Pressure P0193 - Fuel Rich Pressure P0193 - Fuel Rich Puel Rich P0193 - Fuel	Pottomacos POTT-Feat Triguena Lais PTCT State Triguena Lais PTCT State Triguena Carlo PTCT State T	20172 - Fuel Trim System Rich CC - NOx Sensor Performance - Signal Low Bank 1 Sensor 1 CC - NOx Sensor Performance - Signal Low Bank 1 Sensor 1 CC - NOX Sensor Sensor 1 CC - Cylinder 1 Injection Timing Advanced CC - Cylinder 1 Injection Timing Advanced	PODEC - Injection Quantity Too Los POTCO - Cylinder 2 Injection Timin Relatedd POTCO - Cylinder (Injection Timin Relatedd		Plan Insufficient Patromance Signal High Bank 1 Sensor 1 Signal High Bank 1 Sensor 1 Resided PotCP - Cylinder 3 bycoton Timing Resided PotCP - Cylinder 3 bycoton Timing Resided	Flow Excessive FITCS - NOS Series Performance Signal Lew Bank 1 Series 1 FOTDS - Cylinder 3 System Times Advanced FOTDS - Cylinder 3 System Times Advanced FOTDS - Cylinder 3 System Times Advanced	POID1 - Cyleder 4 Nycoten Tenarg Resarded POID1 - Cyleder 4 Nycoten Tenarg Resarded	POTCE - Cylindar 4 trijection Tening Advanced POTCE - Cylindar 4 trijection Tening Advanced	Sensor 1 Performance Portion: Cylinder 5 typeston Training Resided Portion - Cylinder 5 typeston Training Resided Portion - Cylinder 5 typeston Training Resided Resided	Sersor 2 Performance R0104 - Cylinder 5 hycoton Transp Advanced P0104 - Cylinder 5 hycoton Transp Advanced P0104 - Cylinder 5 hycoton Transp Advanced	Sensor 3 Performance POTOS - Cylinder 6 hyuciton Timing Resided POTOS - Cylinder 6 hyuciton Timing Resided POTOS - Cylinder 6 hyuciton Timing Resided	Sersor 4 Parformance POTDs - Cylinder 8 Injection Timing Advanced POTDs - Cylinder 8 Injection Timing Advanced Advanced Advanced	Retarded P01D7 - Cylinder 7 Injection Timing Retarded	Advanced P01D8 - Cylinder Tijlindson Timing Advanced P01D9 - Advanced	Retarded - Cylinder 8 Injection Timing Retarded	Advanced P01DA - Cylinder 8 Injection Timing Advanced	7
Regulating Temperature P014C-1802S Sew Response Rich to Lean Servico 1 P0171 - Fuel Trim System Rich P0172 - Fuel Trim System Rich P0182 - Fuel Trim System Rich P0182 - Fuel Trim System Rich P0182 - Fuel Trim System Rich P0183 - Fuel Temperature Service 1 Corcust Ley P0183 - Fuel Temperature Service Service Circuit Ley P0193 - Fuel Repressure Service Circuit Felgh P0193 - Fuel Repressure Service Circuit Felgh P0193 - Fuel Repressure Service Circuit Felgh P0193 - Fuel Repressure Service Circuit Felgh P0193 - Fuel Repressure Service Circuit Felgh P0193 - Fuel Repressure D193 - Fuel Repressure	Proformance Proformance PTO Proformance PTO PTO 1- Not Server Performance PTO 1- Not Server Performance PTO 1- Not Server Performance PTO 1- Not Server Performance PTO 1- Not Server Performance PTO 1- Not Server Performance PTO 1- Not Server Performance PTO 1- Not Server Performance PTO 1- Not Server Performance PTO 1- Not Server Performance PTO 1- Not Server Performance PTO 1- Not Server Performance PTO 1- Not Server Performance PTO 1- Not Server Performance PTO 1- Not Server Performance PTO 1- Not Server Performance PTO 1- Not Server PT	20172 - Faul Trim System Rich CC - NOX Serios Performance Signal Los Bean 1 Serios 1	P026C - Injection Quantity Too Los P01CD - Cylinder 2 Injection Trimm Relateded P01CD - Cylinder 2 Injection Trimm Relateded P01CD - Cylinder 1 Injection Trimm Relateded		Plan Insufficient Patromance Signal High Bank 1 Sensor 1 Signal High Bank 1 Sensor 1 Resided PotCP - Cylinder 3 bycoton Timing Resided PotCP - Cylinder 3 bycoton Timing Resided	Flow Excessive FITCS - NOS Series Performance Signal Lew Bank 1 Series 1 FOTDS - Cylinder 3 System Times Advanced FOTDS - Cylinder 3 System Times Advanced FOTDS - Cylinder 3 System Times Advanced	POID1 - Cyleder 4 Nycoten Tenarg Resarded POID1 - Cyleder 4 Nycoten Tenarg Resarded	POTCE - Cylindar 4 trijection Tening Advanced POTCE - Cylindar 4 trijection Tening Advanced	Sensor 1 Performance Portion: Cylinder 5 typeston Training Resided Portion - Cylinder 5 typeston Training Resided Portion - Cylinder 5 typeston Training Resided Resided	Sersor 2 Performance R0104 - Cylinder 5 hycoton Transp Advanced P0104 - Cylinder 5 hycoton Transp Advanced P0104 - Cylinder 5 hycoton Transp Advanced	Sensor 3 Performance POTOS - Cylinder 6 hyuciton Timing Resided POTOS - Cylinder 6 hyuciton Timing Resided POTOS - Cylinder 6 hyuciton Timing Resided	Sersor 4 Parformance POTDs - Cylinder 8 Injection Timing Advanced POTDs - Cylinder 8 Injection Timing Advanced Advanced Advanced	Retarded P01D7 - Cylinder 7 Injection Timing Retarded	Advanced	Retarded - Cylinder 8 Injection Timing Retarded	Advanced P01DA - Cylinder 8 Injection Timing Advanced	9 POTOP - Cylundur & Ryucson Tenen
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Regulating Temperature PRIF42 - H202 Som Regorius Rich to Lean Tiener 1 PO171 - Fast Trim System Lean PO172 - Fast Trim System Rich PO172 - Fast Trim System Rich PO172 - Fast Temperature Somoto PO182 - Fast Temperature Somoto 1 Circuit High PO192 - Fast Rampearature Somoto 1 Circuit High PO192 - Fast Ram Pressure Sensor Circuit High PO193 - Fast Ram Pressure Somoto Circuit High PO193 - Fast Ram Pressure Somoto Circuit High PO193 - Fast Ram Pressure Somoto Circuit High PO193 - Fast Ram Pressure Somoto Circuit High PO193 - Fast Ram Pressure Somoto Circuit High PO193 - Fast Rampearature Dispension Somoto Circuit High Regulation Circuit High PO193 - Fast Rampearature Dispension Somoto Circuit High PO193 - Fast Rampearature Dispension Somoto Circuit High Regulation Cir	Performance PST/17- Fall Tim Sighen Lases PST/17- Fall Tim Sighen	1772 - Fual Yran System Rich CC: NOS Specie Pedermanese Species Lore Basis Species Pedermanese Species Lore Basis Species Lore Basis Species CC: Optionar Topicon Temperature Advanced CC: Optionar Topicon Tempe Advanced CC: Optionar Topicon Tempe Advanced CC: Optionar Topicon Tempe Advanced CC: Optionar Topicon Tempe Advanced CC: Optionar Topicon CC: Optionar Topicon CC: Optionar Topicon CC: Optionar Tempe CC:	POSIC - Injection Guardity Too Los POSICO - Cylinder 2 Injection Time Riseriald POICO - Cylinder 2 Injection Time Riseriald POICO - Cylinder 2 Injection Time Riseriald POICO - Cylinder 2 Injection Time POICO -	POSO - Figurion Quertly Too High POSO - Figurion Chartery Too High POTCE - Cylindar 2 Separation Training POTCE - Cylindar 2 Separation Training Advanced POTCC - Cylindar 1 Separation Training Advanced POTCC - Cylindar 1 Separation Training Advanced POTCC - Cylindar 1 Separation Training Advanced POTCC - Cylindar 1 Separation Training POTCC - Cylindar 1 Separation Training POTCC - Cylindar 1 Separation Training	Plan Insufficient Patromance Signal High Bank 1 Sensor 1 Signal High Bank 1 Sensor 1 Resided PotCP - Cylinder 3 bycoton Timing Resided PotCP - Cylinder 3 bycoton Timing Resided	Flore Exceptive PTICO - Note Surgor Performance Signal Line Resh 1 Sensor 1 POIDS - Cylinder 3 syection Treng Advanced NOTOS - Cylinder 3 syection Treng Advanced Activities - Cylinder 2 syection Treng Advanced	POID1 - Cylinder 4 syloidon Timing POID1 - Cylinder 4 syloidon Timing Relacido Relacido POID2 - Cylinder 3 syloidon Treang Relacido	POTD2 - Cylindar 4 typeddon Timing Portb2 - Cylindar 4 typeddon Timing Advanced Advanced Portbo - Cylindar 3 typeddon Timing Advanced	Berson 1 Performance FOTD3 - Cylinder 6 typecion Transp Resided FOTD3 - Cylinder 6 typecion Transp Resided FOTD3 - Cylinder 6 typecion Transp Resided	Sensor 2 Performance POTD4 - Cylinder 5 trycolon Transp. Advanced FOTD4 - Cylinder 5 trycolon Transp. Advanced FOTD4 - Cylinder 4 trycolon Transp. Advanced	Sensor 3 Performance POTOS - Cylinder 6 hyuciton Timing Resided POTOS - Cylinder 6 hyuciton Timing Resided POTOS - Cylinder 6 hyuciton Timing Resided	Sersor 4 Partnimance POIDS - Cylinder 8 syscillon Timing Advanced POIDS - Cylinder 8 syscillon Timing Advanced POIDS - Cylinder 8 syscillon Timing Advanced	Retarded P0107 - Cylinder 7 Injection Timing Retarded P0105 - Cylinder 6 Injection Timing Retarded	Advanced P01D8 - Cylinder Tijlindson Timing Advanced P01D9 - Advanced	Retarded - Cylinder 8 Injection Timing Retarded - Cylinder 7 Injection Timing Retarded	Advanced P01DA - Cylinder 8 trijectorn Timing Advanced P01DB - Cylinder 7 trijection Timing Advanced	
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March Marc	Active DTC				Inhibited DTCs					
Page Control Professor Page Page Control Professor Page P	P026C - Injection Quantity Too Low	P026D - Injection Quantity Too High	Sinnal High Bank 1 Sensor 1	P11CC - NOx Sensor Performance - Signal Low Bank 1 Sensor 1	minioted DTCs					
March Marc	P026D - Injection Quantity Too High P02E7 - Diesel Intake Air Flow		P11CB - NOx Sensor Performance - Signal High Bank 1 Sensor 1	P11CC - NOx Sensor Performance - Signal Low Bank 1 Sensor 1						
Proceedings Control	Position Sensor Circuit Range	P0401 - Exhaust Gas Recirculation Flow Insufficient	P0402 - Exhaust Gas Recirculation Flow Excessive							
Control Cont	P02E8 - Diesel Intake Air Flow Position Sensor Circuit Low	P0234 - Turbocharger Engine Overboost	P0299 - Turbocharger Engine Underboost	P0401 - Exhaust Gas Recirculation Flow Insufficient	P0402 - Exhaust Gas Recirculation Flow Excessive	Position Sensor Exceeded 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
Control Cont	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 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
Second Second	P02EB - Intake Air Flow Valve Control Motor Current Performance	Overboost	Underboost	Flow Insufficient	Flow Excessive	Position Sensor Exceeded Learning				
The Control of Control	P0335 - Crankshaft Position Sensor Circuit	Circuit Low	P0103 - Mass Air Flow Sersor Circuit High	Performance	Variation Not Learned	P0506 - Idle Speed Low	P0507 - Idle Speed High]		
Section Processing Proces	P0338 - Crankshaft Position Sensor Performance P0340 - Camshaft Position	Circuit Low	Circuit High	P0191 - Fuel Rail Pressure Sensor Performance	P0315 - Crankshaft Position System Variation Not Learned	P0506 - Idle Speed Low	P0507 - Idle Speed High]		
See Consult in Section 1997 (1997) (1	Sensor Circuit P0341 - Camshaft Position	Performance P0191 - Fuel Rail Pressure Sensor	Variation Not Learned P0315 - Crankshaft Position System							
Separate Description Control	Sensor Performance P0400 - Exhaust Gas Recirculation (EGR) Flow	P11CB - NOx Sensor Performance -	P11CC - NOx Sensor Performance -	P249D - Closed Loop Reductant Injection Control & Limit - Flow Ton	P249E - Closed Loop Reductant Injection Control At Limit - Flow Too	1				
Selection for the control of growing bear from the fourth of the control of the c	Incorrect B0401 - Exhaust Gos			Low	High	P242R - Evhaust Temperature	P2459 - Diesel Particulate Filter	P246F - Evhaust Temperature	P249D - Closed Loop Reductant	P249E - Closed Loop Reductant
Seed Federal Services Seed Processors Seed Pro	Recirculation Flow Insufficient	Signal High Bank 1 Sensor 1	Signal Low Bank 1 Sensor 1	Sersor 1 Performance	Sensor 2 Performance	Sersor 3 Performance	Regeneration Frequency	Sensor 4 Performance	Low	High
According to the control of the cont									Injection Control At Limit - Flow Too Low	Injection Control At Limit - Flow Too High
The students was all the common of the formation of the f	Recirculation Position Sensor Circuit Low	Flow Insufficient	Flow Excessive	Learned	Sersor 1 Performance	Sensor 2 Performance	Sensor 3 Performance	Sensor 4 Performance	1	
New County Count	Recirculation Position Sensor	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 Sersor 2 Performance	P242B - Exhaust Temperature Sensor 3 Performance	P246F - Exhaust Temperature Sensor 4 Performance]	
MOC Flower day Proposed and Service (Contract and Frequency Contract	P040C - Exhaust Gas Recirculation (EGR) Temperature Sensor 2 Circuit Low Voltage	P040F - Exhaust Gas Recirculation (EGR) Temperature Sensor 1-2 Correlation			· · · · · · · · · · · · · · · · · · ·					
A Committed (M.C. Fleated East) Will F. Eleader East (M.C. Fleated East	P040D - Exhaust Gas	P040F - Exhaust Gas Recirculation								
MID Coloned Services Foliation Services Foli	Sensor 2 Circuit High Voltage	Correlation								
Min George Services (Cont.) Transposance Services 1-2 Min Collaboration (Services) Min Collabo	P041C - Exhaust Gas Recirculation (EGR) Temperature Sensor 1 Circuit Low Voltage	P040F - Exhaust Gas Recirculation (EGR) Temperature Sensor 1-2 Correlation								
HIND C Clarge of Theory The Part Section Control (Lain) The Policy Control (Lain)	P041D - Exhaust Gas Recirculation (EGR) Temperature Sensor 1 Circuit High Voltage	P040F - Exhaust Gas Recirculation (EGR) Temperature Sensor 1-2 Correlation								
Table 1 - State Plant Principal State	P0420 - NMHC Catalyst Efficiency		P249E - Closed Loop Reductant							
Distance Call Printmance Policy - Executed State Policy - Po	Below Threshold Bank 1 P046C - Exhaust Ges	Low	High	90299 - Turborbassor Engine	P2090 - Exhaust Tamouratura	DODGE - Exhaust Temporature	P242B - Exhaust Tomogratum	P246E - Exhaust Tomographys	1	
Securit Fredminusco Securit Securit Fredminusco Securit Securit Fredminusco Securit Securit Fredminusco Securit Securit Fredminusco Securit Securit Fredminusco Securit Securit Fredminusco Securit Securit Securit Fredminusco Securit Securit Fredminusco Securit Securit Fredminusco Securit Securit Securit Fredminusco Securit Securit Securit Fredminusco Securit Securit Securit Fredminusco Securit Securit Securit Fredminusco Securit Securit Securit Fredminusco Securit Securit Securit Fredminusco Securit Securit Securit Fredminusco Securit Securit Securit Fredminusco Securit Securit Securit Fredminusco Securit Securit Securit Securit Fredminusco Securit Securit Securit Securit Fredminusco Securit Securit Securit Securit Fredminusco Securit Securi	Recirculation(EGR) Position Sensor Performance P0545 - Exhaust Gas	Performance	Overboost	Underboost	Sensor 1 Performance	Sersor 2 Performance	Sersor 3 Performance	Sersor 4 Performance]	
PORT - Count Control (register) Count Count (register) PORT - Count Count (register) PORT - Count Count (register) PORT - Count Count (register) PORT - Count Count (register) PORT - Count Count (register) PORT - Count Count (register) PORT - Count Count (register) PORT - Count Count (register) PORT - Count Count (register) PORT - Count Count (register) PORT - Count Count (register) PORT - Count Count (register) PORT - Count Count (register) PORT - Count Count (register) PORT - Count Count (register) PORT - Count Count (register) PORT - Count Count (register) PORT - Count Count (register) PORT - Register (register) POR	Temperature (EGT) Sensor 1 Circuit Low Voltage	Sensor 1 Performance	Sensor 2 Performance	(EGT) Sensors 1-2 not plausible	P2428 - Exhaust Gas High Temperature					
The Charles Provided	Temperature (EGT) Sensor 1 Circuit High Voltage		P2084 - Exhaust Temperature Sensor 2 Performance	P20E2 - Exhaust Gas Temperature (EGT) Sensors 1-2 not plausible	P2428 - Exhaust Gas High Temperature					
1. Policia Facilia Position Control Madain Service Performance Per	P0575 - Cruise Control Input Circuit	Switch Circuit	P0568 - Cruise Control Set Switch Circuit			•				
Pricing ACE and 15 interest 1 interest 2 int	P057C - Brake Pedal Position Sensor Circuit High Voltage P057D - Brake Pedal Position	P057D - Brake Pedal Position Sensor Circuit Low Voltage P057C - Brake Pedal Position								
Pricing ACE and 15 interest 1 interest 2 int	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	ו				
See Reference 2 Center Livery Visitory Fig. 2. Accounter Propriotory Place Processor Place Processor Fig. 2. Accounter Propriotory Place Processor Fig. 2. Accounter Propriotor Fig. 3. Accounter Propriotor Fig. 3. Accounter Propriotor Fig. 3. Accounter Propriotor Fig. 3. Accounter Propriotor Fig. 3. Accounter Propriotor Fig. 3. Accounter Propriotor Fig. 3. Accounter Propriotor Fig. 3. Accounter Propriotor Fig. 4. Accounter Propriotor Fig. 4. Accounter Propriotor Fig. 4. Accounter Propriotor Fig. 4. Accounter Propriotor Fig. 4. Accounter Propriotor Fig. 4. Accounter Propriotor Fig. 4. Accounter Propriotor Fig. 4. Accounter Propriotor Fig. 5. Accounter Propriotor Fig. 5. Accounter Propriotor Fig. 5	Performance P064C - Glow Plug Control Module Performance	P11DB - NOx Sensor Current	P2209 - N0x Heater Performance	Control Circuit Group 3	Control Circuit Group 4	ı				
S Vall Ralburson 2 Circuit Fresh Assard Prototo Server C Circuit Love Server C Circuit C Circuit Server C Circu	P0651 - 5 Volt Reference 2 Circuit	P2127 - Accelerator Pedal Position Sensor 2 Circuit Low	P2128 - Accelerator Pedal Position (APP) Sensor 2 Circuit High Voltage							
PRODUCT CONTROL POWER TO A PROTECT CONTROL POWER	P0897 - 5 Volt Reference 3 Circuit	P2122 - Accelerator Pedal Position	P2123 - Annelerator Parial Position							
1. Franchiscus Fallows (Paul Court March Walley) Filedown Strage (Paul Court March Walley) Filedown Strage (Paul Court March Walley) Filedown Strage (Paul March Walley) Filed	P0851 - Park/Neutral Position (PNP) Switch Circuit Low Voltage	P0852 - Park/Neutral Position (PNP)	, 0.000 - 0.000 - 0.000	1						
PROCESS PROCESS CONTROL (1997) PROCESS PROCESS CONTROL (1997) PROCES	P0852 - Park/Neutral Position	P0851 - Park/Neutral Position (PNP)								
PRODUCT HEADOURY INJURY AND THE STATE OF THE										
PAGE Closed Loop Reductors PA	P1049 - Reductant Injector High	P202E - Reductant Injector		1						
C. NOS. Bases Career Benefit State Career Service Control Control Stocked Protect - Control Control Protect - Control Co	P11DB - NOv Socool Current	P249D - Closed Loop Reductant Injection Control At Limit - Flow Too	P249E - Closed Loop Reductant Injection Control At Limit - Flow Too							
Nexes Control Const.** **Post - Special Format Const.** **Post - Spe	P11DC - NOx Sensor Current Performance Bank 1 Sensor 2		P249E - Closed Loop Reductant Injection Control At Limit - Flow Too							
Petitor - Control Cinital Petitor - Control	P1224 - Injector 1 Control Circuit Shorted	P0201 - Injector 1 Control Circuit	P0606 - Control Module Internal	P2146 - Injector Positive Voltage Control Circuit Group 1						
Design Exceed Format Coast Proper Octoordary Engine Post Post Service Exceeding Post Post Service Exceeding Post Post Service Exceeding Post Post Service Exceeding Post Post Service Exceeding Post Post Service Exceeding Post Post Service Exceeding Post Post Service Exceeding Post Post Post Exceeding Post Post Post Exceeding Post Post Post Exceeding Post Post Post Exceeding Post Post Post Exceeding Post Post Post Exceeding Post Post Post Post Post Post Post Post	P1227 - Injector 2 Control Circuit Shorted	P0202 - Injector 2 Control Circuit	P0606 - Control Module Internal Performance	P2152 - Injector Positive Voltage Control Circuit Group 3						
Soci Sieuro E Escassible Overlocot Poss Indicator Poss A Escassible	P122A - Injector 3 Control Circuit Shorted P122D - Diesel Intake Air Flow		renomiace			1				
Special Security Control Contr	Position Sensor Exceeded Learning Limit	Overboost	Underboost	Flow Insufficient		J				
Special Security Control Contr	P1233 - Injector 4 Control Circuit Shorted P1236 - Injector 5 Control Circuit		Performance	P2146 - Injector Positive Voltage Control Circuit Group 1 P2152 - Injector Positive Voltage						
Policy - Special Circuit Policy - Special Ci	Shorted P1239 - Injector 6 Control Circuit		Performance P0606 - Control Module Internal	Control Circuit Group 3						
Pipeze S Corres Circus Pipeze S Corres Circus	P1242 - Injector 7 Control Circuit Shorted	P0207 - Injector 7 Control Circuit	P0606 - Control Module Internal Performance							
	P1247 - Injector 8 Control Circuit Shorted	P0208 - Injector 8 Control Circuit	P0606 - Control Module Internal Performance	P2155 - Injector Positive Voltage Control Circuit Group 4						

Active DTC				Inhibited DTCs									
P125B - Fuel Pressure Regulator 2 High Control Circuit High	P2510 - ECM Power Relay Circuit Performance												
Voltage P140B - Exhaust Gas Recirculation Slow Response-	P11CB - NOx Sensor Performance -	P11CC - NOx Sensor Performance -	P249D - Closed Loop Reductant Injection Control At Limit - Flow Too	P249E - Closed Loop Reductant Injection Control At Limit - Flow Too	1								
Recirculation Slow Response- Increasing Flow P140C - Exhaust Gas	Signal High Bank 1 Sensor 1	Signal Low Bank 1 Sensor 1	Low	High P249E - Closed Loop Reductant									
Recirculation Slow Response-	P11CB - NOx Sensor Performance - Signal High Bank 1 Sensor 1	P11CC - NOx Sensor Performance - Signal Low Bank 1 Sensor 1	Injection Control At Limit - Flow Too Low	Injection Control At Limit - Flow Too High									
P140F - Exhaust Gas Recirculation (EGR) Motor	P0101 - Mass Air Flow Sensor Performance	P0234 - Turbocharger Engine	P0299 - Turbocharger Engine		P0402 - Exhaust Gas Recirculation	P049D - EGR Control Position Not]						
Current Performance P1414 - Exhaust Gas Recirculation (EGR) Cooler Bypass Valve Current	P0401 - Exhaust Gas Recirculation Flow Insufficient	P0402 - Exhaust Gas Recirculation	P140A - EGR Cooler BY Pass Position Sensor Exceded Learning	Paw Insulicans	FILM EXCHANGE	Laurino	J						
Performance P163C - Glow Plug Control	P11DB - NOx Sensor Current	P2209 - N0x Heater Performance	Limit]									
Module Primary Circuit P2002 - Diesel Particulate Filter	Performance Bank 1 Sensor 1 P2459 - Diesel Particulate Filter	Bank 1 Sensor 1	J										
(DPF) Low Efficiency P2032 - Exhaust Gas	Regeneration Frequency P2080 - Exhaust Temperature	P2084 - Exhaust Temperature	P20E2 - Exhaust Gas Temperature	P2428 - Exhaust Gas High	P242B - Exhaust Temperature	1							
Temperature (EGT) Sensor 2 Circuit Low Voltage P2033 - Exhaust Gas	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	P242B - Exhaust Temperature Sensor 3 Performance								
P2033 - Exhaust Gas Temperature (EGT) Sensor 2 Circuit High Voltage P2047 - Reductant Injector Control Circuit P2048 - Reductant Injector	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	P242B - Exhaust Temperature Sensor 3 Performance								
P2047 - Reductant Injector Control Circuit	P202E - Reductant Injector Performance					,							
P2048 - Reductant Injector Control Circuit Low Voltage	Performance P202E - Reductant Injector Performance												
P2049 - Reductant Injector Control Circuit High Voltage	Performance P202E - Reductant Injector Performance P204F - Reductant System	P2510 - ECM Power Relay Circuit Performance	1										
P204B - Reductant Pump	P204F - Reductant System Performance Bank 1 (cannot build	P20E8 - Reductant Pressure Too	P20E9 - Reductant Pressure Too	1									
Pressure Sensor Performance P204C - Reductant Pump	pump pressure) P204B - Reductant Pump Pressure	Low P20A1 - Reductant Purge Valve	High	1									
P204C - Reductant Pump Pressure Sensor Circuit Low P204D - Reductant Pump	Sensor Performance P204B - Reductant Pump Pressure	Performance P20A1 - Reductant Purge Valve	1										
Pressure Sensor Circuit High P205C - Reductant Tank	Sensor Performance P20BA - Reductant Heater 1	Performance	1										
Temperature Sensor Circuit Low	Performance		1										
P205D - Reductant Tank Temperature Sensor Circuit High	P205B - Reductant Tank Temperature Sensor Performance	P20BA - Reductant Heater 1 Performance			_								
P208A - Reductant Pump Control Circuit	P204F - Reductant System Performance Bank 1 (cannot build pump pressure)	P20A1 - Reductant Purge Valve Performance	P20E8 - Reductant Pressure Too Low	P20E9 - Reductant Pressure Too High									
P208D - Reductant Pump Control Circuit High Voltage	pump pressure) P204F - Reductant System Performance Bank 1 (cannot build pump pressure) P204F - Reductant System	P20A1 - Reductant Purge Valve Performance	P20E8 - Reductant Pressure Too Low	P20E9 - Reductant Pressure Too High	P2510 - ECM Power Relay Circuit Performance								
P20A0 - Reductant Purge Valve Control Circuit	Performance Bank 1 (cannot build	P20A1 - Reductant Purge Valve Performance	P20E8 - Reductant Pressure Too Low	P20E9 - Reductant Pressure Too High		:							
P20A2 - Reductant Purge Valve Control Circuit Low Voltage	pump pressure) P204F - Reductant System Performance Bank 1 (cannot build	P20A1 - Reductant Purge Valve Performance	P20E8 - Reductant Pressure Too Low		1								
P20A3 - Reductant Purge Valve Control Circuit High Voltage	pump pressure) P204F - Reductant System Performance Bank 1 (cannot build	P20A1 - Reductant Purge Valve		P20E9 - Reductant Pressure Too	P2510 - ECM Power Relay Circuit								
P20CB - Exhaust Atlantacemons	pump pressure) P2510 - ECM Power Relay Circuit	Performance	LOW	High	Performance	l							
Fuel Injector Control Circuit P20CE - Exhaust Aftertreatment Fuel Injector Control Circuit High	Performance P2510 - ECM Power Relay Circuit Performance												
Voltage P20E2 - Exhaust Gas Temperature (EGT) Sensors 1-2 not plausible	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								
P2122 - Accelerator Pedal Position Sensor 1 Circuit Low	P2138 - Accelerator Pedal Position (APP) Sensor 1-2 Correlation					ı							
P2123 - Accelerator Pedal	P2138 - Accelerator Pedal Position												
Position Sensor 1 Circuit High	(APP) Sensor 1-2 Correlation												
P2127 - Accelerator Pedal Position Sensor 2 Circuit Low P2128 - Accelerator Pedal	P2138 - Accelerator Pedal Position (APP) Sensor 1-2 Correlation												
	P2138 - Accelerator Pedal Position (APP) Sensor 1-2 Correlation												
High Voltage P2146 - Injector Positive Voltage Control Circuit Group 1	P0606 - Control Module Internal Performance												
P2149 - Injector Positive Voltage Control Circuit Group 2	P0606 - Control Module Internal Performance												
P2152 - Injector Positive Voltage Control Circuit Group 3	P0606 - Control Module Internal												
P2155 - 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	1								
P2200 - N0x Sensor Circuit Bank 1 Sensor 1	P11DB - NOx Sensor Current Performance Bank 1 Sensor 1	P2209 - N0x Heater 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									
P2202 - 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	Low	Hgn	4								
P2203 - NOv Sensor Circuit Hinh	Low P249D - Closed Loop Reductant	High P249E - Closed Loop Reductant	1										
Bank 1 Sensor 1 P2205 - N0x Heater Control	Low	Injection Control At Limit - Flow Too High P2209 - N0x Heater Performance	P249D - Closed Loop Reductant	P249E - Closed Loop Reductant	1								
Circuit Bank 1 Sensor 1	Performance Bank 1 Sensor 1	Bank 1 Sensor 1	Injection Control At Limit - Flow Too Low	Injection Control At Limit - Flow Too High	1								
P2209 - N0x Heater Performance Bank 1 Sensor 1		P249E - Closed Loop Reductant Injection Control At Limit - Flow Too											
P220A - N0x Sensor Supply Voltage Out Of Range Bank 1	P11DB - NOx Sensor Current Performance Bank 1 Sensor 1	High P2209 - N0x Heater Performance Bank 1 Sensor 1	1										
P220B - N0x Sensor Supply Voltage Out Of Range Bank 1	P11DB - NOx Sensor Current Performance Bank 1 Sensor 1	P2209 - N0x Heater Performance Bank 1 Sensor 1	1										
Sensor 2 P2228 - Barometric Pressure	P0106 - Manifold Absolute Pressure	P0234 - Turbocharger Engine	P0299 - Turbocharger Engine	P0401 - Exhaust Gas Recirculation	P0402 - Exhaust Gas Recirculation	P11CB - NOx Sensor Performance -	P11CC - NOx Sensor Performance -	P2002 - Diesel Particulate Filter (DPF) Low Efficiency	P2080 - Exhaust Temperature	P2084 - Exhaust Temperature	P2428 - Exhaust Temperature Sensor 3 Performance	P246F - Exhaust Temperature	1
Sensor Circuit Low P2229 - Barometric Pressure	Sensor Performance P0106 - Manifold Absolute Pressure	Overboost P0234 - Turbocharger Engine	Underboost P0299 - Turbocharger Engine	Flow Insufficient P0401 - Exhaust Gas Recirculation	Flow Excessive P0402 - Exhaust Gas Recirculation	Signal High Bank 1 Sensor 1 P11CB - NOx Sensor Performance -	Signal Low Bank 1 Sensor 1 P11CC - NOx Sensor Performance -		Sensor 1 Performance P2080 - Exhaust Temperature Sensor 1 Performance	Sensor 2 Performance P2084 - Exhaust Temperature Sensor 2 Performance		Sensor 4 Performance P2459 - Diesel Particulate Filter Regeneration Frequency	P246F - Exhaust Temperature
Sensor Circuit High P2263 - Turbo Boost System	Sensor Performance P0101 - Mass Air Flow Sensor	Overboost P0106 - Manifold Absolute Pressure	Underboost P0234 - Turbocharger Engine	Flow Insufficient P0299 - Turbocharger Engine	Flow Excessive P0401 - Exhaust Gas Recirculation	P11CB - NOx Sensor Performance - Signal High Bank 1 Sensor 1 P0402 - Exhaust Gas Recirculation	P11CC - NOx Sensor Performance - Signal Low Bank 1 Sensor 1	(DPF) Low Efficiency	Sersor 1 Performance	Sensor 2 Performance	Sensor 3 Performance	Regeneration Frequency	Sersor 4 Performance
Performance P229E - NOx Sensor Circuit Bank				Underboost P249E - Closed Loop Reductant	Flow Insufficient	Flow Excessive	l						
1 Sensor 2	High During Moderate Load Bank 1 Sensor 2	Low During Moderate Load Bank 1 Sensor 2	P249D - Closed Loop Reductant Injection Control At Limit - Flow Too Low	Injection Control At Limit - Flow Too High	1								

Active DTC				Inhibited DTCs														
P229F - NOx Sensor	P249D - Closed Loco Reductant	P249E - Closed Loop Reductant		Illillotted DTGS														
Performance Bank 1 Sensor 2		Injection Control At Limit - Flow Too High	P249D - Closed Loop Reductant	P249E - Closed Loop Reductant	1													
P22A3 - NOx Heater Control Circuit Bank 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														
P22A7 - NOx Heater Performance Bank 1 Sensor 2	Injection Control At Limit - Flow Too Low	P249E - Closed Loop Reductant Injection Control At Limit - Flow Too High			-													
P2413 - Exhaust Gas Recirculation (EGR) System Performance	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 Low	P249E - Closed Loop Reductant Injection Control At Limit - Flow Too High														
P242C - Exhaust Gas Temperature (EGT) Sensor 3 Circuit Low Voltage	P2428 - Exhaust Gas High Temperature	P242B - Exhaust Temperature Sensor 3 Performance	P246F - Exhaust Temperature Sensor 4 Performance		-													
P242D - Exhaust Gas Temperature (EGT) Sensor 3 Circuit High Voltage	P2428 - Exhaust Gas High Temperature	P242B - Exhaust Temperature Sersor 3 Performance	P246F - Exhaust Temperature Sensor 4 Performance	1														
P2453 - Diesel Particulate Filter Differential Pressure Sensor Performance	P0234 - Turbocharger Engine Overboost	P0299 - Turbocharger Engine Underboost	P0401 - Exhaust Gas Recirculation Flow Insufficient	P0402 - Exhaust Gas Recirculation Flow Excessive	P2002 - Diesel Particulate Filter (DPF) Low Efficiency	P2459 - Diesel Particulate Filter Regeneration Frequency												
Performance P2454 - Diesel Particulate Filter Differential Pressure Sensor Circuit Low Voltage	P2002 - Diesel Particulate Filter (DPF) Low Efficiency	P2453 - Diesel Particulate Filter Differential Pressure Sensor Performance	P2455 - Diesel Particulate Filter Differential Pressure Sensor Circuit High Voltage	P2459 - Diesel Particulate Filter Regeneration Frequency														
P2455 - Diesel Particulate Filter Differential Pressure Sensor Circuit High Voltage	P2002 - Diesel Particulate Filter (DPF) Low Efficiency	P2453 - Diesel Particulate Filter Differential Pressure Sensor	P2454 - Diesel Particulate Filter Differential Pressure Sensor Circuit Low Voltage	P2459 - Diesel Particulate Filter Regeneration Frequency														
P245A - Exhaust Gas Recirculation (EGR) Cooler Bypass Valve Control Circuit	P0401 - Exhaust Gas Recirculation Flow Insufficient	P0402 - Exhaust Gas Recirculation Flow Excessive	D4 404 FOD Castes DV Dass	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										
P2463 - Diesel Particulate Filter - Soot Accumulation	P2002 - Diesel Particulate Filter (DPF) Low Efficiency		Jiill						1									
P2470 - Exhaust Gas Temperature (EGT) Sensor 4 Circuit Low Voltage	P2428 - Exhaust Gas High Temperature	P246F - Exhaust Temperature Sensor 4 Performance	1															
P2471 - Exhaust Ges Temperature (EGT) Sensor 4 Circuit High Voltage P2493 - EGR Cooler BY Pass	P2428 - Exhaust Gas High Temperature	P246F - Exhaust Temperature Sensor 4 Performance	1															
P2493 - EGR Cooler BY Pass Position Sensor Performance	P0401 - Exhaust Gas Recirculation Flow Insufficient	P0402 - Exhaust Gas Recirculation Flow Excessive																
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 - Turbocherger 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 - Turbocherger Engine Overboost	P0299 - Turbocharger Engine Underboost	P0401 - Exhaust Gas Recirculation Flow Insufficient	P0402 - Exhaust Gas Recirculation Flow Excessive	1													
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 U0101 - Lost Communications	Switch Circuit Low Voltage]															
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	Injection Control At Limit - Flow Too Low	P249E - Closed Loop Reductant Injection Control At Limit - Flow Too High	·														
U029D - N0x 1 loss of comm		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		P249E - Closed Loop Reductant Injection Control At Limit - Flow Too High															
Fuel Level less than 15%		P0088 - Fuel Rail Pressure Too High	Performance	P0263 - Cly 1 Balance System P11AF - H02S Performance - Signal	P0266 - Cly 2 Balance System P11B2 - H02S Performance - Signal	P0269 - Cly 3 Balance System P128E - Fuel Rail Pressure	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 Dete	P0302 - Cylinder 2 Misfine Detec	P0303 - Cylinder 3 Misfire I	Detected P0304 - Cylinder 4 N	isfire Detected P0305	Cylinder 5 Misfire Detected
	P0306 - Cylinder 6 Misfire Detected	P0307 - Cylinder 7 Misfire Detected	P0308 - Cylinder 8 Misfire Detected	High During Moderate Load Bank 1 Sensor 2	Low During Moderate Load Bank 1 Sensor 2	Performance												

DTO			Additional Basic Enable Conditions							
P0016 - Crankshaft to Camshaft Correlation	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	Engine is running which means the engine speed is greater than 600 to 850 rpm	when the ignition is on or following a stall of						
P003A - Turbocharger Boost Control Position Not Learned	Engine not in afterrun mode (defined as engine speed greater than 0 rpm)	after-run) Engine speed greater than 600 to 850 rpm	engine is not in standby state (standby state	the engine) 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)	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			•			
P0047 - Turbocharger Boost Control Circuit Low Voltage	Engine not in afterrun mode (defined as engine speed greater than 0 rpm)	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 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						
P006F - Turbocharger Boost High Control Circuit High Voltage	engine is not in standby state (standby state occurs after ECM initialization or following after-run)	9								
P007C - CAC Temperature 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)			
P007D - CAC Temperature 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	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)							
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	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)	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						
P0091 - Fuel Pressure Regulator 1 Control Circuit Low	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						
P0092 - Fuel Pressure Regulator 1 Control Circuit High	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						
P0097 - Intake Air Temperature 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)			
P0098 - Intake Air Temperature 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)			
P00C9 - Fuel Pressure Regulator 1 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						
100CA - Fuel Pressure Regulator 1 High Control Circuit High Voltage	engine is not in standby state (standby 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 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)			
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	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)			
P0101 - Mass Air Flow 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)	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	e 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)			

DTC			Additional Basic Enable Conditions						
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 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)			_	
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 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)		
P0113 - Intake Air 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)		
P0117 - Engine Coolant Temperature Sensor Circuit Low	after-run)	battery voltage is above 11 V for at least 3s	3						
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)				-
P0131 - H02S 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		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	İ							
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 Performance	engine is not in ready state (which is active when the ignition is on or following a stall of the engine)							•	
P0192 - Fuel Rail Pressure Sensor 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	3						
P0193 - Fuel Rail Pressure 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							
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 a stall of the engine)						
P01CD - Cylinder 2 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)						
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)						
P01CF - Cylinder 3 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)						

DTC			Additional Basic Enable Conditions						
P01D0 - Cylinder 3 Injection Timing			engine is not in ready state (which is active						
Advanced	ambient air temperature is above -7 deg C	ambient pressure is above 74.8kPa	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 a stall of the engine)						
P01D2 - Cylinder 4 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)						
P01D3 - Cylinder 5 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)						
P01D4 - Cylinder 5 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)						
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 a stall of the engine)						
P01D6 - Cylinder 6 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)						
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 engine)						
P01D8 - Cylinder 7 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)						
P01D9 - Cylinder 8 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)						
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)				
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	Engine Run Time greater than 10 seconds 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	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 P0269 - Cly 3 Balance System	Power Take-Off (PTO) is not engaged Power Take-Off (PTO) is not engaged Power Take-Off (PTO) is not engaged								
P026A - CAC Efficientcy Below Threshold	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	Engine Run Time greater than 10 seconds 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	engine is not in ready state (which is active when the ignition is on or following a stall of the engine)
P026C - Injection Quantity Too Low	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					
P026D - Injection Quantity Too High	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					
P0272 - Cly 4 Balance System	Power Take-Off (PTO) is not engaged								
P0275 - Cly 5 Balance System P0278 - Cly 6 Balance System	Power Take-Off (PTO) is not engaged Power Take-Off (PTO) is not engaged	1							
P0281 - Cly 7 Balance System	Power Take-Off (PTO) is not engaged	1							
P0284 - Cly 8 Balance System	Power Take-Off (PTO) is not engaged	1							
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	Engine Run Time greater than 10 seconds 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	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 Control Circuit	after-run)	battery voltage is above 11 V for at least 3s	3						
P02E2 - Intake Air Flow Valve Control Circuit 1 Low Voltage	after-run)	battery voltage is above 11 V for at least 3s	3						
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	3						
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 engir 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 engir 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 engir 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	3						
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)		_						

DTC	engine is not in ready state (which is active		Additional Basic Enable Conditions							
0301 - Cylinder 1 Misfire Detected	when the ignition is on or following a stall of									
	the engine)									
0302 - 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)									
0303 - 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)									
	engine is not in ready state (which is active									
0304 - Cylinder 4 Misfire Detected	when the ignition is on or following a stall of the engine)									
	engine is not in ready state (which is active									
0305 - Cylinder 5 Misfire Detected	when the ignition is on or following a stall of									
-	the engine)									
0306 - 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)									
	engine is not in ready state (which is active									
0307 - Cylinder 7 Misfire Detected	when the ignition is on or following a stall of the engine)									
	engine is not in ready state (which is active									
0308 - Cylinder 8 Misfire Detected	when the ignition is on or following a stall of									
	the engine)	engine is not in standby state (standby state		engine is not in ready state (which is active	1					
0335 - Crankshaft Position Sensor	Engine not in afterrun mode (defined as	occurs after ECM initialization or following	Engine is running which means the engine	when the ignition is on or following a stall of	ı					
Circuit	engine speed greater than 0 rpm)	after-run)	speed is greater than 600 to 850 rpm	the engine)	1					
0336 - Crankshaft Position Sensor	Engine not in afterrun mode (defined as	engine is not in standby state (standby state occurs after ECM initialization or following	Engine is running which means the engine	engine is not in ready state (which is active	ı					
Performance	engine speed greater than 0 rpm)	after-run)	speed is greater than 600 to 850 rpm	when the ignition is on or following a stall of the engine)	ı					
20340 - Camshaft Position Sensor	Engine not in afterrun mode (defined as	engine is not in standby state (standby state	Engine is running which means the engine	engine is not in ready state (which is active	ı					
Circuit	engine not in alterror mode (defined as engine speed greater than 0 rpm)	occurs after ECM initialization or following	speed is greater than 600 to 850 rpm	when the ignition is on or following a stall of	ı					
		after-run) engine is not in standby state (standby state	.,	the engine) engine is not in ready state (which is active)	ı					
P0341 - Camshaft Position Sensor Performance	Engine not in afterrun mode (defined as engine speed greater than 0 rpm)	occurs after ECM initialization or following	Engine is running which means the engine speed is greater than 600 to 850 rpm	when the ignition is on or following a stall of	ı					
renormance	engine speed greater trian 0 rpm)	after-run)	speed is greater than out to 650 rpm	the engine)	ı					
20381 - Wait to Start Lamp Control	Engine not in afterrun mode (defined as	engine is not in standby state (standby state	battery voltage is above 11 V for at least 3s	Engine is running which means the engine	ı					
Circuit	engine speed greater than 0 rpm)	after-run)	Summy voltage is above 11 v 101 at least 38	speed is greater than 600 to 850 rpm	<u> </u>					_
			engine is not in standby state (standby state				Engine Run Time greater than 10 seconds		engine is not in ready state (which is active	Í
20400 - 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	occurs after ECM initialization or following	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	Engine is running which means the engine speed is greater than 600 to 850 rpm	when the ignition is on or following a stall of	1
(LGK) Flow incollect	engine speed greater trian 0 rpm)	•	after-run)	_	, I		to indicate the engine is running)	Specia is greater triain boo to 650 rpm	the engine)	i
			engine is not in standby state (standby state				Engine Run Time greater than 10 seconds			engine is not in ready state (which is active
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	occurs after ECM initialization or following	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	System is not in active regeneration mode	Engine is running which means the engine speed is greater than 600 to 850 rpm	when the ignition is on or following a stall of
riow insufficient	engine speed greater than 0 rpm)		after-run)				to indicate the engine is running)		speed is greater than 600 to 850 rpm	the engine)
			anging is not in standby state (str = #				Engine Bun Time greater than 10			ongine is not in ready state (which !*! :-
20402 - Exhaust Gas Recirculation	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	ambient air temperature is above -7 dea 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	System is not in active regeneration mode	Engine is running which means the engine	engine is not in ready state (which is active when the ignition is on or following a stall of
Flow Excessive	engine speed greater than 0 rpm)		after-run)				to indicate the engine is running)		speed is greater than 600 to 850 rpm	the engine)
20403 - Exhaust Gas Recirculation	engine is not in standby state (standby state									
(EGR) Motor Control Circuit	occurs after ECM initialization or following	battery voltage is above 11 V for at least 3s	8							
	after-run)							1		
0405 - Exhaust Gas Recirculation	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	hattan unitage is about 11 V for -1112-	Engine Run Time greater than 10 seconds (engine speed greater than 600 to 850 rpm	Engine is running which means the engine	engine is not in ready state (which is active when the ignition is on or following a stall of			
Position Sensor Circuit Low	engine speed greater than 0 rpm)	English Speed greater than 000 to 850 fpm	after-run)	outling rollage is above it it in at least 38	to indicate the engine is running)	speed is greater than 600 to 850 rpm	the engine)			
P0406 - Exhaust Gas Recirculation	Engine not in afterrun mode (defined as	F	engine is not in standby state (standby state	h-m	Engine Run Time greater than 10 seconds	Engine is running which means the engine	engine is not in ready state (which is active			
Position Sensor Circuit High	engine speed greater than 0 rpm)	Engine speed greater than 600 to 850 rpm	occurs after ECM initialization or following after-run)	patiery voitage is above 11 v. for at least 3s	(engine speed greater than 600 to 850 rpm to indicate the engine is running)	speed is greater than 600 to 850 rpm	when the ignition is on or following a stall of the engine)			
			,							
040C - Exhaust Gas Recirculation	Engine not in afterrun mode (defined as		engine is not in standby state (standby state		Engine Run Time greater than 10 seconds	Engine is running which means the engine	engine is not in ready state (which is active			
GR) Temperature Sensor 2 Circuit Low Voltage	engine speed greater than 0 rpm)	Engine speed greater than 600 to 850 rpm	occurs after ECM initialization or following after-run)	battery voltage is above 11 V for at least 3s	(engine speed greater than 600 to 850 rpm to indicate the engine is running)	speed is greater than 600 to 850 rpm	when the ignition is on or following a stall of the engine)			
LOW YORaye			alter-turi)		to indicate the engine is runfilling)		uie englie)			
040D - Exhaust Gas Recirculation	Engine not in afterrun mode (defined as		engine is not in standby state (standby state		Engine Run Time greater than 10 seconds	Engine is running which means the engine	engine is not in ready state (which is active			
GR) Temperature Sensor 2 Circuit High Voltage	engine speed greater than 0 rpm)	Engine speed greater than 600 to 850 rpm	occurs after ECM initialization or following after-run)	battery voltage is above 11 V for at least 3s	(engine speed greater than 600 to 850 rpm to indicate the engine is running)	speed is greater than 600 to 850 rpm	when the ignition is on or following a stall of the engine)			
	1 2 117		,				trie erigine)			
040F - Exhaust Gas Recirculation (EGR) Temperature Sensor 1-2	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	Engine is running which means the engine	engine is not in ready state (which is active when the ignition is on or following a stall of					
Correlation	engine speed greater than 0 rpm)	English Speed greater than 000 to 650 fpm	after-run)	speed is greater than 600 to 850 rpm	the engine)					
041C - Exhaust Gas Recirculation			engine is not in standby state (standby state		Engine Run Time greater than 10 seconds		engine is not in ready state (which is active			
GR) Temperature Sensor 1 Circuit	Engine not in afterrun mode (defined as	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	when the ignition is on or following a stall of			
Low Voltage	engine speed greater than 0 rpm)		after-run)		to indicate the engine is running)	speed is greater than 600 to 850 rpm	the engine)			
041D - Exhaust Gas Recirculation			engine is not in standby state (standby state		Engine Run Time greater than 10 seconds		engine is not in ready state (which is active			
GR) Temperature Sensor 1 Circuit	Engine not in afterrun mode (defined as	Engine speed greater than 600 to 850 rpm	occurs after ECM initialization or following	battery voltage is above 11 V for at least 3s	(engine speed greater than 600 to 850 rpm	Engine is running which means the engine	when the ignition is on or following a stall of			
High Voltage	engine speed greater than 0 rpm)	greater was ooo to 600 ipili	after-run)	,age is above 11 v ioi at least 35	to indicate the engine is running)	speed is greater than 600 to 850 rpm	the engine)			
									1	
P0420 - NMHC Catalyst Efficiency	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	ambient air temperature is above 7 des C	ambient pressure is above 74.8kPa	Engine Run Time greater than 10 seconds (engine speed greater than 600 to 850 rpm	Engine is running which means the engine	engine is not in ready state (which is active when the ignition is on or following a stall of	1	
Below Threshold Bank 1	engine speed greater than 0 rpm)	English Speed greater than 000 to 650 fpm	after-run)	unacons an temperature is above -7 deg C	anoran pressure is above 14.0KPd	to indicate the engine is running)	speed is greater than 600 to 850 rpm	the engine)	1	
P0461 - Fuel Level Sensor	Engine not in afterrun mode (defined as	Engine around greater than 600 to 050	engine is not in standby state (standby state	hattany valtage is above 44 V for -+ 1 2-	Engine Run Time greater than 10 seconds	Engine is running which means the engine	engine is not in ready state (which is active			
	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	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					
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	after-run)	battery voltage is above 11 V for at least 3s	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	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)		
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				
P0483 - 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 - Exhaust Gas Recirculation (EGR) Motor Control Circuit 1 Low Voltage P0490 - Exhaust Gas Recirculation	after-run)	battery voltage is above 11 V for at least 3s						
(EGR) 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	1
P0495 - 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)	
P049D - 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						
P0506 - 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)						
P0507 - 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	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 - Exhaust Gas Temperature (EGT) 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	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 - Exhaust Gas Temperature (EGT) 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)		Engine is running which means the engine speed is greater than 600 to 850 rpm			
P0567 - 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 - 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	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)	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 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)	
P057C - Brake Pedal Position Sensor Circuit High Voltage	engine is not in standby state (standby state occurs after ECM initialization or following after-run)							
P057D - Brake Pedal Position Sensor Circuit Low Voltage	engine is not in standby state (standby state occurs after ECM initialization or following after-run)						_	
P0606 - 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 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)		
P0627 - Fuel Pump Relay Control Circuit	battery voltage is above 11 V for at least 3s						=	
P0628 - Fuel Pump Relay Control Circuit Low	battery voltage is above 11 V for at least 3s	3						
P0629 - Fuel Pump Relay Control Circuit High	battery voltage is above 11 V for at least 3s							
P062F - Control Module Long Term Memory Performance	engine is not in standby state (standby state occurs after ECM initialization or following after-run)		_					
P0640 - Intake Air (IA) Heater Switch/Control Circuit	after-run)	battery voltage is above 11 V for at least 3s						
P0641 - 5 Volt Reference 1 Circuit	engine is not in standby state (standby state occurs after ECM initialization or following after-run) engine is not in standby state (standby state	battery voltage is above 11 V for at least 3s						
P064C - Glow Plug Control Module Performance		battery voltage is above 11 V for at least 3s						
	unor rony		•					

DTC		popular in not in standbu state (standbu state	Additional Basic Enable Conditions		1			
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 - 5 Volt Reference 2 Circuit	after-run)	battery voltage is above 11 V for at least 3s						
P0671 - Glow Plug 1 Control Circuit	after-run)	battery voltage is above 11 V for at least 3s						
P0672 - Glow Plug 2 Control Circuit	after-run)	battery voltage is above 11 V for at least 3s						
P0673 - Glow Plug 3 Control Circuit	after-run)	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	after-run)	battery voltage is above 11 V for at least 3s						
P0676 - Glow Plug 6 Control Circuit	after-run)	battery voltage is above 11 V for at least 3s						
P0677 - Glow Plug 7 Control Circuit	after-run)	battery voltage is above 11 V for at least 3s						
P0678 - Glow Plug 8 Control Circuit	after-run)	battery voltage is above 11 V for at least 3s						
P0697 - 5 Volt Reference 3 Circuit	after-run)	battery voltage is above 11 V for at least 3s						
P06A3 - 5 Volt Reference 4 Circuit	after-run)	battery voltage is above 11 V for at least 3s						
P06D2 - 5 Volt Reference 5 Circuit	after-run)	battery voltage is above 11 V for at least 3s						
P0700 - Transmission Control Module Requested Malfunction Indicator Lamp Illumination	engine is not in standby state (standby state occurs after ECM initialization or following after-run)							
P0851 - Park/Neutral Position (PNP) Switch Circuit Low Voltage	engine is not in standby state (standby state occurs after ECM initialization or following after-run)							
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 o the engine)	e d	
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 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				
P10CD - Exhaust Aftertreatment 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)		Engine is running which means the engine speed is greater than 600 to 850 rpm				
P10D0 - Reductant Injector Temperature - Exhaust Gas Temperature 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 engine speed is greater than 600 to 850 rpm	when the ignition is on or following a stall of the engine)			
P111F - Fuel Temperature Sensor 1 Fuel Temperature Sensor 2 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	when the ignition is on or following a stall of the engine)			
P113A - Exhaust Gas Temperature Sensors 3-4 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)			
P11A6 - HO2S Performance - Signal High 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		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 not in ready state (which is active when the ignition is on or following a stall o the engine)

DTC			Additional Basic Fnable Conditions							
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 (valu of 0 means ECM is locked and out of assembly plant mode)	e battery voltage is above 11 V for at least 3	Engine Run Time greater than 10 seconds s (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 (valuo of 0 means ECM is locked and out of assembly plant mode)	e battery voltage is above 11 V for at least 3	Engine Run Time greater than 10 seconds s (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)			
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)	e battery voltage is above 11 V for at least 3	Engine Run Time greater than 10 seconds s (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 - HO2S 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)	e battery voltage is above 11 V for at least 3	Engine Run Time greater than 10 seconds s (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)	e battery voltage is above 11 V for at least 3	Engine Run Time greater than 10 seconds s (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)	e 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 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)
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 (valuo of 0 means ECM is locked and out of assembly plant mode)		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 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)
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)	e battery voltage is above 11 V for at least 3	Engine Run Time greater than 10 seconds s (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)	e battery voltage is above 11 V for at least 3	Engine Run Time greater than 10 seconds s (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)		
P122C - Intake Air Flow Valve Control Circuit Shorted P122D - Diesel Intake Air Flow	engine is not in standby state (standby state occurs after ECM initialization or following after-run) engine is not in standby state (standby state	battery voltage is above 11 V for at least 3s								
Position Sensor Exceeded Learning Limit P122E - Intake Air Flow Valve	occurs after ECM initialization or following after-run) engine is not in standby state (standby state occurs after ECM initialization or following	battery voltage is above 11 V for at least 3s								
Control Circuit 2 Low Voltage P122F - Intake Air Flow Valve Control Circuit 2 High Voltage	after-run) engine is not in standby state (standby state occurs after ECM initialization or following	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	à						
P125B - Fuel Pressure Regulator 2 High Control Circuit High Voltage	engine is not in standby state (standby state occurs after ECM initialization or following after-run) engine is not in ready state (which is active									
Performance Performance P1407 - Exhaust Gas Recirculation	when the ignition is on or following a stall of the engine) engine is not in standby state (standby state		Ī							
(EGR) Motor Control Circuit Shorted	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 activ when the ignition is on or following a stall 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 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 activ when the ignition is on or following a stall the engine)	e of
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	3							
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	battery voltage is above 11 V for at least 3s	3							
P144B - Closed Loop Diesel Particulate Fitter (DPF) Regeneration Control At Limit - Stage 1 Temperature Too Low	after-run) 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 cocurs 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 not in ready state (which is active when the ignition is on or following a stall of the engine)					
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 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								

DIC	engine is not in standby state (standby state	e	Additional Basic Enable Conditions		•			
P154B - Intake Air (IA) Heater Voltage Signal Circuit	occurs after ECM initialization or following	battery voltage is above 11 V for at least 3s	8					
P154C - Intake Air (IA) Heater Current Signal Circuit	engine is not in standby state (standby state occurs after ECM initialization or following after-run)	e 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-run)	, , , , , , , , , , , , , , , , , , , ,	3					
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)	e 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)	,	3	_				
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)	-	3	-				
P163D - Glow Plug Control Module Secondary Circuit	Engine not in afterrun mode (defined as engine speed greater than 0 rpm)	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	3					
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	3					
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 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	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 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)
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 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)	е						
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)	e						•
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 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)		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)		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)	
								•

DTC			Additional Basic Enable Conditions				
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	Engine Run Time greater than 10 seconds is (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		Engine Run Time greater than 10 seconds (engine speed greater than 600 to 850 pm to indicate the engine is running) Engine is running which means the engine 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)	f		•
P2084 - Exhaust Temperature Sensor 2 Performance	Engine speed greater than 600 to 850 rpm		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)	1		_
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 3	Engine Run Time greater than 10 seconds is (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)	e Manufacturer Enable Counter is zero (value of 0 means ECM is locked and out of assembly plant mode)	Status of the Reductant Tank is not Froze battery voltage is above 11 V for at least 3s 7°C and the reductant tank temperature is >= -7°C >= -7°C.	n =- 3		_	
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 second (engine speed greater than 600 to 850 rpn 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)		
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 cocurs after ECM initialization or following after-run) Engine Run Time greater than 10 second (engine speed greater than 600 to 850 rpn 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)	e battery voltage is above 11 V for at least 3s	5			_	
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 second (engine speed greater than 600 to 850 rpn to indicate the engine is running)	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)	f		
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 warning definition)	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) 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]	
P20BB - Reductant Heater 1 Control Circuit Low	engine is not in standby state (standby state occurs after ECM initialization or following after-run)	e battery voltage is above 11 V for at least 3s	3			_	
P20BC - Reductant Heater 1 Control Circuit High	engine is not in standby state (standby state occurs after ECM initialization or following after-run)	e battery voltage is above 11 V for at least 3s	s				
P20BD - Reductant Heater 2 Control Circuit	engine is not in standby state (standby state occurs after ECM initialization or following after-run)	1	3				
P20BF - Reductant Heater 2 Control Circuit Low	engine is not in standby state (standby state occurs after ECM initialization or following after-run)		5				
P20C0 - Reductant Heater 2 Control Circuit High	engine is not in standby state (standby state occurs after ECM initialization or following after-run)		5				
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	s				
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	5	_			
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 pm		-		
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	after-run) speed is greater than 600 to 650 rpm	engine is not in ready state (which is active when the ignition is on or following a stall of the engine)	f		
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)			_		
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)	speed is greater than 600 to 850 rpm		-		
P20E2 - Exhaust Gas Temperature (EGT) Sensors 1-2 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	e engine is not in ready state (which is active when the ignition is on or following a stall of the engine)	f		
P20E8 - Reductant Pressure 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 is not in standby state (standby state) Engine speed greater than 600 to 850 rpm 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 s 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						
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 occurs after ECM initialization after-run)	standby state or following battery voltage is above 11 V for at least 3	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 Status of the Reductant Tank is not Frozen	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 occurs after ECM initialization after-run)	(standby state Manufacturer Enable Counter is zero (valu of 0 means ECM is locked and out of assembly plant mode)		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 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 occurs after ECM initialization after-run)		Engine Run Time is greater than 10 8s 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 second (engine speed greater than 600 to 850 rpr 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)			
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 second (engine speed greater than 600 to 850 rpr 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)			
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 second (engine speed greater than 600 to 850 rpr 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)			
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 second (engine speed greater than 600 to 850 rpr 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 occurs after ECM initialization after-run)		Engline Run Time is greater than 10 8s seconds (engline speed greater than 600 to 850 rpm to indicate the engline 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 of 0 means ECM is locked assembly plant mo	and out of battery voltage is above 11 V for at least 3	Engine Run Time greater than 10 seconds 3s (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)		
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 of 0 means ECM is locked assembly plant mo	and out of battery voltage is above 11 V for at least 3	Engine Run Time greater than 10 seconds 3s (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)		
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 of 0 means ECM is locked assembly plant mo	and out of battery voltage is above 11 V for at least 3	Engine Run Time greater than 10 second: 3s (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)		
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 damulacturer Enable Counter of 0 means ECM is locked after-run) Manufacturer Enable Counter of 0 means ECM is locked assembly plant mo	and out of battery voltage is above 11 V for at least 3	Engine Run Time greater than 10 second: as (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)		
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 of 0 means ECM is locked assembly plant mo	and out of battery voltage is above 11 V for at least 3	Engine Run Time greater than 10 seconds as (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)		
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) engine is not in standby state (standby state	battery voltage is above 11 V for at least 3:							
P220B - N0x Sensor Supply Voltage Out Of Range Bank 1 Sensor 2	occurs after ECM initialization or following	battery voltage is above 11 V for at least 3							
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 after ECM initialization after-run)		Engine Run Time is greater than 10 8s 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)		
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 occurs after ECM initialization after-run)		Engine Run Time is greater than 10 is 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)		
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 occurs after ECM initialization after-run)	standby state or following battery voltage is above 11 V for at least 3	Engine Run Time is greater than 10 is 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)		
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 after ECM initialization after-run)		Engine Run Time is greater than 10 as 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)		
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	Engine Run Time greater than 10 second for at least 3s (engine speed greater than 600 to 850 rpr 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)			
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)	Engine Run Time greater than 10 second for at least 3s (engine speed greater than 600 to 850 rpr 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)			
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)	Engine Run Time greater than 10 second for at least 3s (engine speed greater than 600 to 850 rpr 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)			
P2295 - Fuel Pressure Regulator 2 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 mea speed is greater than 600	ns the engine			=		

DTC		engine is not in standby state (standby state	Additional Basic Enable Conditions		1					
P2296 - Fuel Pressure Regulator 2 Control Circuit High Voltage	Engine not in afterrun mode (defined as engine speed greater than 0 rpm)	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					•	
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		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 s (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)		
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 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)
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 s (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)		
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 s (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)		
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 s (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)		
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		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)		
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 s 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)	
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)	1				•
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 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)					
P242C - Exhaust Gas Temperature (EGT) 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 is running which means the engine speed is greater than 600 to 850 rpm					
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	engine is not in standby state (standby state	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]				
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		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)		
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)			
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)			_
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 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)	
P2459 - Diesel Particulate Filter Regeneration Frequency	ambient air temperature is above -7 deg C	ambient pressure is above 74.8kPa								=
P245A - Exhaust Gas Recirculation (EGR) Cooler Bypass Valve 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	3							
P245C - Exhaust Gas Recirculation (EGR) Cooler Bypass Valve Control Circuit 1 Low Voltage	engine is not in standby state (standby state	battery voltage is above 11 V for at least 3s	3							
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	3							
P2459 - Diesel Particulate Filter Regeneration Frequency	ambient air temperature is above -7 deg C	ambient pressure is above 74.8kPa	Ī							
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)				
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)	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 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]				
P2471 - Exhaust Gas Temperature (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	engine is not in standby state (standby state	hattery voltage is above 11 V for at least 3s	Engine is running which means the engine speed is greater than 600 to 850 rpm	1				

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	Engine Run Time greater than 10 seconds s (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 3:	Engine Run Time greater than 10 seconds s (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)		
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)	t f			•	
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)	t t				
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)		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)	t t	•			
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)	t t				
P2610 - Control Module Ignition Off Timer Performance	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)										
P268C - Cylinder 1 Injector Data Incorrect	Manufacturer Enable Counter is zero (value of 0 means ECM is locked and out of assembly plant mode) Manufacturer Enable Counter is zero (value	•									
P268D - Cylinder 2 Injector Data Incorrect	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) Manufacturer Enable Counter is zero (value										
P268F - Cylinder 4 Injector Data Incorrect	of 0 means ECM is locked and out of assembly plant mode) Manufacturer Enable Counter is zero (value										
P2690 - Cylinder 5 Injector Data Incorrect	of 0 means ECM is locked and out of assembly plant mode) Manufacturer Enable Counter is zero (value										
P2691 - Cylinder 6 Injector Data Incorrect	of 0 means ECM is locked and out of assembly plant mode) Manufacturer Enable Counter is zero (value										
P2692 - Cylinder 7 Injector Data Incorrect	of 0 means ECM is locked and out of assembly plant mode) Manufacturer Enable Counter is zero (value										
P2693 - Cylinder 8 Injector Data Incorrect	of 0 means ECM is locked and out of assembly plant mode)		T	T		1	Status of the Reductant Tank is not Frozen		1		
P2BAD - Exhaust NOx Concentration High - Unknown Reason	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)	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 3:	1111 11 11 11 11 11 11	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)	
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)	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								
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)						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 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							

DIC			Additional Basic Enable Conditions	
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 3	Engine is running which means the engine speed is greater than 600 to 850 rpm

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	GP switch	and Glow plug is commanded	< 6.6 = On	A	glow plugs are commanded on DTCs P163E, P163C, P0671-P0678	= True	500ms (Internal) + 75% failure	:
			and voltage at glow plug	= 0	volts			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)	
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.	
RAM error		Compariarson of read write values	Read write values match	= NO		Module power	= On	200ms (internal) + 75% failure rate over 4 seconds.	:
EEPROM error		Checksum error between calculated and stored values	Checksums match	= NO	-	Module power	= On	200ms (internal) + 75% failure rate over 4 seconds.	:
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 volt	130ms (internal) + 75% failure rate over 4 seconds.	:
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 volt	160ms (internal) + 75% failure rate over 4 seconds.	:

Component /	Fault	Monitor Strategy	Malfunction	Th	reshold		Secondary		Enable		Time	MIL
System	Code	Description	Criteria		Value		Parameters		Conditions		Required	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		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	=	On 6 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		nts in a ow		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 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	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	> 1	55	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	Path 1: DC/DC booster current. For Path 2: DC/DC booster current. Path 3: Voltage at main switch Path 4: (DC/DC Booster voltage - GPCM	> 60 a hard protect = varie	25 640 amps by dware ion (time es with erature)	amps msec amps	Battery voltage at the GPCM	>	6	volts	6 seconds (internal) + 75% failure rate over 4 seconds.	В
			battery voltage)		0 ± 3	volts	Battery voltage at the GPCM	=	8 to 14	volts		
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

Component /	Fault	Monitor Strategy	Malfunction		Threshol	d	Secondary		Enable		Time	MIL
System	Code	Description	Criteria		Value		Parameters		Conditions	_	Required	Illum.
Cylinder 1 - glow plug open	P0671	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	130ms (internal) + 66% failure rate over 1.5	В
Cylinder 1 - 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 A	Ignition glow plug command over temperature condition over voltage condition abs[Battery supply at GPCM - IGN voltage at GPCM]	= = = = <	on on false false	Volts	seconds. Condition 1 : 130ms, Condition 2: 260ms (internal) + 66%failure over 1.5	В
Cylinder 1 - 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	seconds. 160ms (internal) + 66% failure over 1.5 seconds.	В
Cylinder 1 - 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
Cylinder 2 - glow plug open	P0672	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	130ms (internal) + 66% failure rate over 1.5 seconds.	В
Cylinder 2 - 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 A	Ignition glow plug command over temperature condition over voltage condition abs[Battery supply at GPCM - IGN voltage at GPCM]	= = = = <	on on false false	Volts	Condition 1: 130ms, Condition 2: 260ms (internal) + 66%failure over 1.5 seconds.	В
Cylinder 2 - 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	160ms (internal) + 66% failure over 1.5 seconds.	В

Component / System	Fault Code	Monitor Strategy Description	Malfunction Criteria		Threshold Value		Secondary Parameters		Enable Conditions		Time Required	MIL Illum.
Cylinder 2 - glow plug low resistance			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
Cylinder 3 - glow plug open	P0673	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	= > n	On 5 not set 6	secs volts	130ms (internal) + 66% failure rate over 1.5 seconds.	В
Cylinder 3 - 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 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
Cylinder 3 - glow plug high resistance		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 false false	volts	160ms (internal) + 66% failure over 1.5 seconds.	В
Cylinder 3 - 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
Cylinder 4 - glow plug open	P0674	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	= > n	On 5 not set 6	secs volts	130ms (internal) + 66% failure rate over 1.5 seconds.	В
Cylinder 4 - glow plug short		exists on GP circuit	Path 1: Glow Plug Current Path 2: Hardware over current	>	60 80	A 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

Component / System	Fault Code	Monitor Strategy Description	Malfunction Criteria		Threshold Value		Secondary Parameters	Enable Conditions		Time Required	MIL Illum.
Cylinder 4 - 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	160ms (internal) + 66% failure over 1.5 seconds.	В
Cylinder 4 - 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
Cylinder 5 - glow plug open	P0675	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	130ms (internal) + 66% failure rate over 1.5 seconds.	В
Cylinder 5 - 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 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
Cylinder 5 - 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	160ms (internal) + 66% failure over 1.5 seconds.	В
Cylinder 5 - 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
Cylinder 6 - glow plug open	P0676	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	130ms (internal) + 66% failure rate over 1.5 seconds.	В

Component /	Fault	Monitor Strategy	Malfunction		Threshold	ı	Secondary		Enable		Time	MIL
System	Code	Description	Criteria		Value		Parameters		onditions		Required	Illum.
Cylinder 6 - glow plug short		exists on GP circuit	Path 1: Glow Plug Current Path 2: Hardware over current	>	60 80	A A	Ignition glow plug command over temperature condition over voltage condition	= = fa	on on alse alse		Condition 1 : 130ms, Condition 2: 260ms	В
							abs[Battery supply at GPCM - IGN voltage at GPCM]	<	6.0 \	/olts	(internal) + 66%failure over 1.5 seconds.	
Cylinder 6 - 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]	> = = f:	on alse alse	olts/olts	160ms (internal) + 66% failure over 1.5 seconds.	В
Cylinder 6 - 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]	= fa	on alse alse	volts	160ms (internal) + 66% failure over 1.5 seconds.	В
Cylinder 7 - glow plug open	P0677	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	>	ot set	secs volts	130ms (internal) + 66% failure rate over 1.5 seconds.	В
Cylinder 7 - 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 A	Ignition glow plug command over temperature condition over voltage condition abs[Battery supply at GPCM - IGN voltage at GPCM]	= = f: = f:	on on alse alse	/olts	Condition 1 : 130ms, Condition 2: 260ms (internal) + 66%failure over 1.5 seconds.	В
Cylinder 7 - 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]	> = = f:	on alse alse	olts/olts	160ms (internal) + 66% failure over 1.5 seconds.	В
Cylinder 7 - 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]	= fa	on alse alse 7.0 v	/olts	160ms (internal) + 66% failure over 1.5 seconds.	В

Component / System	Fault Code	Monitor Strategy Description	Malfunction Criteria		Threshold Value	d	Secondary Parameters	Enable Conditions		Time Required	MIL Illum.
Cylinder 8 - glow plug open	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	130ms (internal) + 66% failure rate over 1.5 seconds.	В
Cylinder 8 - 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
Cylinder 8 - 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	160ms (internal) + 66% failure over 1.5 seconds.	В
Cylinder 8 - 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	volts	650ms (internal) + 75% failure over 4 seconds.	В

Component /	Fault	Monitor Strategy	Malfunction		Threshold	ı	Secondary		Enable		Time	MIL
System	Code	Description	Criteria		Value		Parameters		Conditions		Required	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 OR PATH3: IAH Battery voltage	>	1.5	Volt Volt	Path 2 IAH Commanded Path 3 DTCs not active	=	OFF for more then 65 msec			
			AND GPCM IGN voltage AND GPCM Battery Voltage IAH Battery voltage	> < >	6.9 16.0 9.5	Volt volt Volt	IAH Commanded	=	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 /	Fault	Monitor Strategy	Malfunction		Threshold		Secondary		Enable		Time	MIL
System	Code	Description	Criteria		Value		Parameters		Conditions		Required	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	=	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	°C	or 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	=	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		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	>	16.5	Volt	GPCM Ignition voltage	> <	9.0 14	Volts Volts	1000ms (internal) + 75% failure over 4.0	В
			PATH 2: Voltage supply to GPCM or	<	6.0	volts	GPCM Ignition voltage	> <	9.0 16	Volts Volts	seconds.	
			PATH 3: (IGN - Voltage supply to GPCM)	>	+/-5	volts	or GPCM Voltage supply GPCM Ignition Voltage	> >	6.0 4.0	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	P163D	Electronic GPCM circuitry determines	Path 1 glow plug activation request from	_	ON		Path 1: Key state (Ign 1)	=	OFF		1000ms	В
Secondary Circuit			ECM or	_	OIV		or	_	or		(internal) + 75% failure over 4.0	
			Path 2: Electronic circuitry determines voltage at glow plug pin	>	6.0	Volt	Path 2 GP commanded	=	Off		seconds.	
			or				or		or			
			Path 3: [GPCM ground - GP ground]	>	1.5	Volts	Path 3 GP commanded DTCs not set IAH dutycycle	=	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
Glow Plug Control Module Temperature- Intake Air Heater Temperature Not	P16A8	ECM monitors serial data from GPCM for P16A8 Error Message indicating GPCM detects GPCM temperature and IAH temperature are not plausible	Tenperature difference between internal temperature of GPCM and internal temperature of IAH module	>	absolute 22	°C	Engine Off Timer (GMLAN) and Intake Air Temperature (GMLAN) and IAH Battery Voltage and IAH PWM and DTC P154D	>= > = =	8 -7 10,5 100 not set	hours °C V %	83% failure over 3.0 seconds.	В

Component /	Fault	Monitor Strategy	Malfunction	Threshold	Secondary	Enable		Time	MIL
System	Code	Description	Criteria	Value	Parameters	Conditions		Required	Illum.
Intake Air Heater Temperature Sensor Circuit Low Voltage	P16AA	ECM monitors serial data from GPCM for P16AA Error Message indicating GPCM detects IAH temperature sensore voltage out of range low	IAH temperature sensor voltage	< threshold mV selected by look-up table refer to table 1 in sheet "Look- Up Tables"	Engine Off Timer (GMLAN) and Intake Air Temperature (GMLAN) and IAH Battery Voltage and IAH PWM and DTC P154D	>= 8 >= -7 > 11 = 100 = not set	hours °C V %	inner loop: 1310 ms total time: 1810 ms	В
					IAH Run Time and IAH PWM Intake Air Temperature (GMLAN) IAH Battery Voltage and DTC P154D	> 120 = 100 > -35 > 11 = not set	sec % °C V		
					or Intake Air Temperature (GMLAN) and IAH Battery Voltage and IAH PWM and DTC P154D	> 25 > 11 = 100 = not set	°C V %		
Intake Air Heater Temperature Sensor Circuit High Voltage	P16AB	ECM monitors serial data from GPCM for P16AB Error Message indicating GPCM detects IAH temperature sensore voltage out of range high	PATH1: IAH temperature sensor voltage	> IAH Battery V Voltage * 158/512	Engine Off Timer (GMLAN) and Intake Air Temperature (GMLAN) and DTC P154D or	>= 8 >= -7 = not set	hours °C	inner loop: 655 ms total time: 1155 ms	В
					IAH Run Time and IAH PWM and Intake Air Temperature (GMLAN) and DTC P154D	> 120 > 90 > -35 = not set	sec % °C		
			PATH2: IAH temperature sensor voltage	> V	Intake Air Temperature (GMLAN) and DTC P154D	> 25 = not set	°C		
				IAH Battery Voltage* 146/512	(Engine Off Timer (GMLAN) or Intake Air Temperature (GMLAN)) and	< 8 < -7	hours °C		
					(IAH Run Time or IAH PWM or Intake Air Temperature (GMLAN)) and	< 120 < 90 < -35	sec % °C		
					(Engine Coolant Temperature (GMLAN)	< 60	°C		

Component / System	Fault Code	Monitor Strategy Description	Malfunction Criteria		Threshold Value		Secondary Parameters		Enable Conditions		Time Required	MIL Illum.
Glow Plug Control Module Temperature Sensor Circuit Low Voltage	P16AD	ECM monitors serial data from GPCM for P16AD Error Message indicating GPCM detects GPCM temperature sensore voltage out of range low	PATH 1: GPCM temperature sensor voltage	<	210	mV	Engine Off Timer (GMLAN) and Intake Air Temperature (GMLAN) or Engine Coolant Temperature (GMLAN) and Intake Air Temperature (GMLAN)	>= >= >	8 -7 70 -10	hours °C °C °C	inner loop: 1310 ms total time: 1810 ms	В
			PATH 2: GPCM temperature sensor voltage	<	615	mV	(Engine Off Timer (GMLAN) or Intake Air Temperature (GMLAN)) and (Engine Coolant Temperature (GMLAN) or Intake Air Temperature (GMLAN))	< < <= <=	8 -7 60 -10	hours °C °C °C		
Glow Plug Control Module Temperature Sensor Circuit High Voltage	P16AE	ECM monitors serial data from GPCM for P16AE Error Message indicating GPCM detects GPCM temperature sensore voltage our of range high	GPCM temperature sensor voltage	>	4,94	V	Engine Off Timer (GMLAN) and Intake Air Temperature (GMLAN) or Engine Coolant Temperature (GMLAN) and Intake Air Temperature (GMLAN)	>= >= >= >	8 -7 70 -10	hours °C °C °C	inner loop: 1310 ms total time: 1810 ms	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
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	=	ON 123 7.0 16.5 or ON 123	°C Volts Volts or	1000ms (internal) + 50% failure over 1.0 seconds.	В
			Patri 2. Hardware over current	>	60	A	GPCM Battery supply voltage	> <	7.0 16.5	Volts Volts		
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

Component /	Fault	Monitor Strategy	Malfunction	Т	hreshold		Secondary		Enable		Time	MIL
System Reductant Heater 2 Control Circuit	P20BD	Description 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		Value		Parameters DTCs not set: reductan heater commanded: GPCM temperature GPCM battery supply voltage and	=	P20BF ON 123 7.0	°C Volts	Required 3440ms (internal) + 50% failure over 1.0 seconds.	B B
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	>	25 or	A	reductan heater commanded:	= < > < or	ON 123 7.0 16.5	°C Volts Volts	1000ms (internal) + 50% failure over 1.0 seconds.	В
			Path 2: Hardware over current	>	80	Α	reductan heater commanded: GPCM temperature GPCM supply voltage KL30	= < >	ON 123 7.0 16.5	°C Volts Volts		
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
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	= < > < or	ON 123 7.0 16.5	°C Volts Volts or	1000ms (internal) + 50% failure over 1.0 seconds.	В
			Path 2: Hardware over current	>	80	А	reductan heater commanded: GPCM temperature GPCM supply voltage KL30	= < > <	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