Component / System	Fault Code	Monitor Strategy Description	Primary Malfunction Criteria		Threshold Logic and Valu	ie	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	-	continuously 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 once per trip	В
			mean offset learned value at fully closed valve position	<	68.01	%	and				with 0.01 s	
			or mean offset learned value at fully closed valve position	>	95.61	%	injection quantity and	<=	100.00	mm^3/rev	whenever enable	
			valve position				accelerator pedal position and	<=	0.10	%	conditions are met	
							Engine Speed and	>=	500.00	rpm		
							Engine Speed and	<=	760.00	rpm		
							Vehicle speed and	>=	0.00	mph		
							Vehicle speed and	<=	3.11	mph		
							Battery voltage and engine coolant temperature	>=	10.00	v °C		
							and engine coolant temperature engine coolant temperature	>= <=	71.96 99.96	°C		
							and Barometric pressure	>=	65.00	kPa		
							and Barometric pressure	<=	110.00	kPa		
							and time since start	>	10.08	sec		
							and Engine is Idling	=	TRUE	-		
							and Rich idle regeneration and	=	inactive	-		
							Rich idle and	=	inactive	-		

Component / System	Fault Code	Monitor Strategy Description	Primary Malfunction Criteria	Threshold Logic and Value	Secondary Parameters		Enable Conditions		Time Required	MIL Illum.
j					Adaption is finished for this driving cycle	=	FALSE	-		
					and turbocharger offset adaption timer	>=	0.60	sec		
					and 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	-		
									4.00	
			Path 2: time taken to learn the mean offset learned value at fully closed valve	> 30.00	injection quantity sec and	>=	0.00	mm^3/rev	fail conditions exists for	
			position		injection quantity and	<=	100.00	mm^3/rev	0.01 s monitor runs once per trip	
					accelerator pedal position and	<=	0.10	%	with 0.01 s	
					Engine Speed and	>=	500.00	rpm	whenever enable	
					Engine Speed and Vehicle speed	<= >=	760.00 0.00	rpm mph	conditions are met	
					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 time since start	<= >	110.00 10.08	kPa sec		
					and Engine is Idling	=	TRUE	-		
					and Rich idle regeneration	=	inactive	-		
					and Rich idle and	=	inactive	-		
					Adaption is finished for this driving cycle	=	FALSE	-		

Component /	Fault	Monitor Strategy	Primary Malfunction		Threshold		Secondary		Enable		Time	I
System	Code	Description	Criteria	Lo	gic and Value		Parameters		Conditions		Required	I
							turbocharger offset adaption timer	>=	0.60	sec		
							and mean offset learned value at fully open		5.54	%		
							valve position	>=	5.54	70		
							and					
							mean offset learned value at fully open	<=	36.94	%		
							valve position					
							and					
							valve closed	=	TRUE			
							and					
							turbocharger offset adaption timer and	>=	0.15	sec		
							No Pending or confirmed DTCs	=	see sheet inhibit	_		
							140 T chaing of committee BT 63	_	tables			
							and		tables			
							basic enable conditions met:	=	see sheet enable	-		
									tables			
			Path 3:				injection quantity	>=	0.00	mm^3/rev	fail	1
			mean offset learned value at fully open	<	5.54	%	and				conditions	
			valve position								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				accelerator pedal position	<=	0.10	%	once per trip	
							and	<=	0.10	70	with 0.01 s rate	
							Engine Speed	>=	500.00	rpm	whenever	
							and			'	enable	
							Engine Speed	<=	760.00	rpm	conditions	
							and				are met	
							Vehicle speed	>=	0.00	mph		
							and Vehicle speed	<=	3.11	mph		
							and	\ <u>-</u>	3.11	Прп		
							Battery voltage	>=	10.00	V		
							and					
							engine coolant temperature	>=	71.96	°C		
							and					
							engine coolant temperature	<=	130.06	°C		
							and Barometric pressure	>=	65.00	kPa		
							and	>=	05.00	ĸга		
							Barometric pressure	<=	110.00	kPa		
							and					
							time since start	>	10.08	sec		
							and		TOUE			
							Engine is Idling	=	TRUE	-		
							and Rich idle regeneration	=	inactive	_		l
							and	=	mactive	-		l
							Rich idle	=	inactive	-		
							and					
		1					Adaption is finished for this driving cycle	=	FALSE	-		
							and					
							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	MIL Illum.
·				-	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	-		
			Path 4: time taken to learn the mean offset learned value at fully open valve position	> 30.00 sec	injection quantity and	>=	0.00	mm^3/rev	fail conditions exists for	
					injection quantity	<=	100.00	mm^3/rev	0.01 s monitor runs	
					and 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	>=	0.00	mph		
					Vehicle speed and Battery voltage	<= >=	3.11 10.00	mph V		
					and engine coolant temperature	>=	71.96	°C		
					and engine coolant temperature	<=	130.06	°C		
					and Barometric pressure	>=	65.00	kPa		
					and Barometric pressure	<=	110.00	kPa		
					and time since start and	>	10.08	sec		
					Engine is Idling and	=	TRUE	-		
					Rich idle regeneration and	=	inactive	-		
					Rich idle and	=	inactive	-		
					Adaption is finished for this driving cycle	=	FALSE	-		
					and valve closed	=	TRUE	-		
					and turbocharger offset adaption timer and	>=	0.60	sec		
					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	-		

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 inhib tables = see sheet enab tables	fail conditions exists for 3 s monitor runs with 0.01 s rate whenever enable conditions are met	В
		Diagnoses the Turbocharger Boost Control 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 starter is active cranking No Pending or confirmed DTCs and basic enable conditions met:	> 11.00 > 3.00 = FALSE = see sheet inhib tables = see sheet enab 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: - ≤ 0.5 Ω impedance between signal and controller 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 inhib tables = see sheet enab tables	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	>	11.00	V	fail conditions exists for 1 s monitor runs with 0.01 s rate whenever enable	В
					and 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	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)	v	-80000 to -18000	kPa	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 /	Fault	Monitor Strategy	Primary Malfunction	Threshold	Secondary	Enable	Time	MIL
System	Code	Description	Criteria	Logic and Value	Parameters	Conditions	Required	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 fuel temperature at start and (c) captured fuel temperature at start and (d) captured fuel temperature at start and (d) block heater detected (see parameter definition)	<pre><= 100 to 999 °C = measured - parameter = measured - parameter > 20 to 999 °C = measured - parameter = measured - parameter = FALSE -</pre>	and engine post drive/ afterun and diagnostic performed in current drive cycle (once per trip monitor) and 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	battery voltage 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	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 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	A
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	A

Component / System	Fault Code	Monitor Strategy Description	Primary Malfunction Criteria	L	Threshold ogic 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	А
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)	≤ in be ai	hort to ground: i 0.5 Ω npedance etween signal nd controller round		ignition on and Basic enable conditions met	п	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)	0. be ai	hort to power: ≤ .5 Ω impedance etween signal nd controller ower		battery voltage for time and	>	3.00	V	fail conditions exists for 0.1 s monitor runs with 0.1 s rate whenever enable	А

Component / System	Fault	Monitor Strategy Description	Primary Malfunction Criteria		Threshold gic and Value		Secondary Parameters		Enable		Time	MIL
System	Code	Description	Criteria	Lo	gic and value		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	P00EA	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	P00EB	Detects high voltage readings on the intake air temperature sensor 3 circuit, indicating an OOR high condition.	intake air temperature sensor 3 voltage same as temperature of intake air temperature sensor 3	>	4.93 -53	°C	ignition on and basic enable conditions met: and NO Pending or Confirmed DTCs:	=	TRUE see sheet enable tables see sheet inhibit tables	-	fail conditions exists for 5 s test performed continuously 0.1 s rate	В
Humidity Sensor Circuit Low	P00F4	Detects a low duty cycle signal from the humidity sensor, indicating an OOR low condition on the humidity sensor circuit	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 /	Fault	Monitor Strategy	Primary Malfunction	Threshold	Secondary	Enable	Time
System	Code	Description	Criteria	Logic and Value	Parameters	Conditions	Required I
		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	Path 2:		Engine Running (please see the definition)	= TRUE -	fail conditions exists for 0.1 s test performed continuously
		sensor circuit.	Internal ECM PWM circuit low voltage and ECM PWM circuit maximum period detected or Internal ECM PWM period not received	= TRUE - = TRUE - = TRUE -	and following conditions for time: battery voltage battery voltage and basic enable conditions met: and no pending or confirmed DTCs	> 1.00 sec > 11.00 V < 655.34 V = see sheet enable tables = see sheet inhibit tables	with 0.1 s rate
umidity Sensor ircuit High	P00F5	Detects a high duty cycle signal from the humidity sensor, indicating an OOR high condition on the humidity sensor circuit	Path 1:	05.00	Engine Running (please see the definition)	= TRUE -	fail 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 basic enable conditions met: and no pending or confirmed DTCs	> 1.00 sec > 11.00 V < 655.34 V = see sheet enable tables = see sheet inhibit tables	performed continuously with 0.1 s rate
		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	= TRUE -	Engine Running (please see the definition)	= TRUE -	fail conditions exists for 0.1 s test performed continuously with 0.1 s rate
			and ECM PWM circuit maximum period detected or	= TRUE -	following conditions for time: battery voltage battery voltage	> 1.00 sec > 11.00 V < 655.34 V	rate

Component /	Fault	Monitor Strategy	Primary Malfunction		Threshold		Secondary		Enable		Time	MIL
System	Code	Description	Criteria		Logic and Value		Parameters		Conditions		Required	Illum.
			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 and with (b) air temperature dependent correction factor curve (see Look-Up-Table #1) or measured air mass flow signal with (c) Engine load dependent MAP for calculating higher threshold and with (b) air temperature dependent correction factor curve (see Look-Up-Table #1)	< = = > = = = = = = = = = = = = = = = =	(a) - (b) 0.80 0 to 0.05 (c) + (b) 1.2 0 to 0.05	ratio - ratio - ratio	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	>	74.80 69.96 129.96 -2.00 2.00 TRUE 90.00	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 Value	•	Parameters		Conditions		Required	Illum.
							control value of the throttle valve and control value of the throttle valve and	>= <=	-400.00 5.00	%		
							(setpoint valve position of exhaust-gas recirculation and	>=	-400.00	%		
							setpoint valve position of exhaust-gas recirculation for	<=	2.00	%		
							time) and	>	3.00	sec		
							injection quantity and	<=	300.00	mm^3/rev		
							air pressure in the induction volume and	<= >=	280.00 -16325.00	kPa		
							engine speed and engine speed	>=	3100.00	rpm		
							and intake air temperature and	>=	-7.04	°C		
							intake air temperature basic enable conditions met:	<= =	51.96 see sheet enable tables	°C -		
							NO Pending or Confirmed DTCs:	=	see sheet inhibit tables	-		
Mass Air Flow	P0102	Detects low frequency	signal period of air mass flow sensor	>	881.00	usec	ignition on	=	TRUE			A
(MAF) Sensor Circuit High Voltage		readings on the MAF circuit, indicating an OOR low condition on the MAF circuit		<	14.04	g/sec	and basic enable conditions met: and NO Pending or Confirmed DTCs:	=	see sheet enable tables see sheet inhibit tables	-	fail conditions exists for 3 s monitor runs 0.01 s rate whenever enable conditions are met	
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) same as	<	50.00	usec	and basic enable conditions met:	=	see sheet enable tables	-	whenever enable conditions	
			air mass flow	>	7354.80	g/sec	NO Pending or Confirmed DTCs:	=	see sheet inhibit tables	-	are met	

Component / System	Fault Code	Monitor Strategy Description	Primary Malfunction Criteria		Threshold Logic and Value		Secondary Parameters		Enable Conditions		Time Required	MIL Illum.
Manifold Absolute Pressure (MAP) Sensor Performance	P0106	Detects a skewed MAP or BARO sensor by comparing MAP readings to the BARO sensor	Path 1:		45.00	kDe	engine coolant temperature	>	-3549.94	°C	fail conditions exists for 5 s monitor runs with 0.01 s	В
			(a) - (b) or Path 2: (a) - (b) where (a) MAP sensor measured pressure and	> =	-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 % -	rate whenever enable conditions are met	
	and	(b) BARO sensor measured pressure	=	measured parameter	-	engine speed and engine speed) and vehicle speed and basic enable conditions met: and NO Pending or Confirmed DTCs:	>= <= < =	0.00 100.00 3.11 see sheet enable tables see sheet inhibit tables	rpm rpm mph -			
Manifold Absolute Pressure (MAP) Sensor Circuit Low Voltage	P0107	Detects low voltage readings on the MAP circuit, indicating an OOR low condition on the MAP circuit	Path 1:				engine synchronization completed which means	=	TRUE	•	fail conditions exists for 5 s test performed	А
	(sensor voltage of manifold at pressure same as manifold absolute pressure	same as	<	0.91	V kPa	number of crankshaft revolutions and crankshaft reference mark detected (reference mark is the 2 missing teeth in the 50-2 tooth-wheel configuration)	>=	4.00 TRUE	revs -	continuously 0.01 s rate		
		actuator position of throttle valve) or	<=	20.00	%	and basic enable conditions met:	=	see sheet enable tables	-			
			(sensor voltage of manifold absolute pressure same as manifold absolute pressure	<	0.38	V kPa						

Component / System	Fault Code	Monitor Strategy Description	Primary Malfunction Criteria		Threshold Logic and Valu	e	Secondary Parameters		Enable Conditions		Time Required	MIL Illum.
			and actuator position of throttle valve)	>	20.00	%						
Manifold Absolute Pressure (MAP) Sensor Circuit High Voltage	ressure (MAP) reensor Circuit in	Detects high voltage readings on the MAP circuit, indicating an OOR high condition on the MAP circuit	sensor voltage of manifold absolute pressure	>	4.75	V	engine synchronization completed	=	TRUE	·	fail conditions exists for 5 s test performed	A
			same as manifold absolute pressure	>	371.3	kPa	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) and basic enable conditions met:	>= = =	4.00 TRUE see sheet enable tables	revs - -	continuously 0.01 s rate	
Intake Air Temperature Sensor 1 Circuit Low	P0112	Detects a low PWM period from the humidity temperature sensor, indicating an OOR low condition on the humidity temperature sensor circuit	Path 1: Humidity Temperature sensor period same as humidity temperature	>	0.26 145.96	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 low condition on the humidity sensor circuit.	Path 2: Internal ECM PWM circuit low voltage and ECM PWM circuit maximum period detected or	= =	TRUE TRUE	-	Engine Running (please see the definition) and following conditions for time: battery voltage battery voltage	= >>	1.00 11.00 655.34	sec V	fail conditions exists for 0.1 s test performed continuously with 0.1 s rate	

Component /	Fault	Monitor Strategy	Primary Malfunction		hreshold		Secondary		Enable		Time	MIL
System	Code	Description	Criteria Internal ECM PWM period not received		c and Value TRUE	-	Parameters and		Conditions		Required	Illum.
							basic enable conditions met: and no pending or confirmed DTCs	=	see sheet enable tables see sheet inhibit tables	-		
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	centised 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		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 engine coolant temperature	>	Logic and Value 149	°C	Parameters basic enable conditions met:	=	conditions see sheet enable tables	-	continuously 0.2 s rate	Illum.
Engine Coolant Temperature (ECT) Sensor	P0118	Detects high voltage readings on the ECT circuit, indicating an OOR high	voltage of engine coolant temperature sensor	>	4.90	V	ignition on	=	TRUE	-	fail conditions exists for 60	A
Circuit High Voltage		condition on the ECT circuit	same as engine coolant temperature	<	-53	°C	and basic enable conditions met:	=	see sheet enable tables	-	s test performed continuously 0.2 s rate	
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)		>=	59.96	°C	engine pre drive	Ξ	FALSE		fail conditions exists for 0.2 s monitor runs once per trip with 0.2 s rate	В
			and measured engine coolant temperature	<	49.96	°C	and time since start and measured engine coolant temperature	<	1440.00 -53.04	sec °C	whenever enable conditions	
		Low Region Engine Temperature at start < 31 degC AND ambient air temperature <= 10 degC.					and	>=	-53.04	C	are met	
							captured value of coolant temperature during start and	<=	30.96	°C		
							ambient temperature and	>	-7.04	°C		
							ambient temperature)	<	59.96	°C		
							and ambient temperature (used for low region determination)	<=	9.96	°C		
							and engine idle time ratio which is defined by (idle time divided by	<	0.50	%		

Component / System	Fault Code	Monitor Strategy Description	Primary Malfunction Criteria	L	Threshold ogic and Value		Secondary Parameters		Enable Conditions		Time Required	MIL Illum
							time since start) where idle time is incremented when:					
							(accelerator pedal value	<=	10.01	%		
							and vehicle speed and	<=	9.94	mph		
							engine speed)	<=	500.00	rpm		
							and diagnostic performed in current dc and	=	FALSE	-		
							basic enable conditions met:	=	see sheet enable tables	-		
							NO Pending or Confirmed DTCs:	=	see sheet inhibit tables	-		
		thermostat by comparing actual engine coolant heat	modeled coolant temperature (model derived from injection quantity, coolant temperature at start, and ambient temperature)	>=	81.96	°C	engine pre drive	=	FALSE	·		
		start up conditions (high and low regions)	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)	>	9.96	°C		
							and engine idle time ratio which is defined by (idle time divided by time since start)	<	0.50	%		

Component /	Fault	Monitor Strategy	Primary Malfunction	Threshold	Secondary		Enable		Time	MIL
System	Code	Description	Criteria	Logic and Value	Parameters where idle time is incremented		Conditions		Required	Illum.
					when: (accelerator pedal value and vehicle speed and engine speed) and diagnostic performed in current dc and basic enable conditions met: and NO Pending or Confirmed DTCs:	<= <= = = =	10.01 9.94 500.00 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 cou (-150 counts = 1100 Lambda = ~27 %O2)	nts Valid upstream NOx signal from CAN is received (no Nox sensor communication failures) Engine Running (see parameter definition) for time (required for the NOx sensor to give valid response) and basic enable conditions met:	= >	TRUE TRUE 20.00 see sheet enable tables	- sec	fault exists for more than 3 sec; monitor runs at 0.1 s when enable conditions are met	В
HO2S 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 cou (1550 counts = 0.65 Lambda = - 0.1178 %O2)	nts Valid upstream NOx signal from CAN is received (no Nox sensor communication failures) Engine Running (see parameter definition) for time (required for the NOx sensor to give valid response) and basic enable conditions met:	=	TRUE TRUE 20.00 see sheet enable tables	- sec	fault exists for more than 3 sec; monitor runs at 0.1 s when enable conditions are met	В
HO2S Bank1 Sensor2 Circuit Low	P0137	Detects an out of range low fault of the downstream Nox sensor lambda signal	Downstream Nox sensor lambda signal received via CAN	< -150.00 cou (-150 counts = 1100 Lambda = ~27 %O2)	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 /	Fault	Monitor Strategy	Primary Malfunction		Threshold		Secondary		Enable		Time	MIL
System	Code	Description	Criteria		Logic and Value		Parameters for time (required for the NOx sensor to give valid response)	>	20.00	sec	conditions are met	Illum.
							and basic enable conditions met:	=	see sheet enable tables	-		
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 O2 response time of upstream NOx sensor until O2 concentration reaches the calibrated upper limit of the modeled O2 concentration in overrun	measured O2 response time	<	2.00	sec	global enable condition:	_			fault exists for more than 2 sec; monitor runs at 0.1 s when enable	В
		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	<= = =	((0.2095 - (a)) * (b)) + (a) modelled O2 concentration 0.60	factor factor factor	Engine speed Engine speed Battery voltage Ambient Air Pressure Ambient Air Pressure	> < > >= <=	600.00 4000.00 11.00 74.80 106.00	rpm rpm V kPa kPa	conditions are met	
	concentration				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	>= <= = = = = = >= <=	-7.04 124.96 normal inactive active see sheet inhibit tables active -0.04 1299.96	℃ - - - - - - - - - - - - - - - - - - -				
					Additional enable conditions for transitioning state machine from inactive state to stable operation state: following conditions for time:	>	1.80	sec				

Component /	Fault	Monitor Strategy	Primary Malfunction	Threshold	Secondary		Enable		Time	MIL
System	Code	Description	Criteria	Logic and Value	Parameters		Conditions		Required	Illum.
					modeled O2 signal (based on injection quantity, air mass and fuel density)	<	0.12	-		
					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 and	>=	18.00	mm^3/rev		
					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 and	>=	18.00	mm^3/rev		
					Engine speed	>	600.00	rpm		
					Additional enable conditions for transitioning state machine from wait-Injection falling state to wait-overrun state: Fuel Injection Quantity	<	120.00	mm^3/rev		
					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		
					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		

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 with a) Measured Minimum Fuel Injection Quantity b) Maximum fluctuation of Injection Quantity	< = =<	a+b measured parameter 16.00	- mm^3/rev		
					Additional enable conditions for transitioning state machine from overrun state to delay state: actual valve position of exhaust-gas recirculation and actual valve position of exhaust-gas recirculation Deviation from maximum O2 concentration during overrun	>= <= <	0.00 80.00 0.06	% % -		
					Additional enable conditions for transitioning from delay state to diagnostic completion state: actual valve position of exhaust-gas recirculation and actual valve position of exhaust-gas recirculation Deviation from maximum O2 concentration during overrun	>= <= <	0.00 80.00 0.06	% % -		
Fuel Trim System Lean		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/i	means (lambda-signal from NOx sensor ready (see parameter definition) fuel system is in fuel cut off (see parameter definition) Particulate Filter Regeneration Mode ((= = = =	TRUE TRUE FALSE FALSE	- - - -	fail conditions exists for 12 s monitor runs with 0.02 s rate whenever enable conditions are met	В
					((fraction of total fuel injected that is involved in combustion (Fuel Mass for Combustion / Total fuel injected) or calculated EGR rate) for time)) AND Controller status of the observer	>= >= >	1 0 1.00 TRUE	- sec		

Fuel Trim System Rich P0172 Monitors the fuel mass observer emission correction specified file for containity exceeds the feedback limit. Fuel Trim System Rich P0172 Monitors the fuel mass observer emission correction quantity. Detects if the correction quantity exceeds the feedback limit. Fuel Trim System Rich P0172 Monitors the fuel mass observer emission correction quantity exceeds the feedback limit. Fuel Trim System Rich P0172 Monitors the fuel mass observer emission correction quantity. Detects if the correction quantity exceeds the feedback limit. Fuel Trim System Rich P0172 Monitors the fuel mass observer emission correction quantity exceeds the feedback limit. Fuel Trim System Rich P0172 Monitors the fuel mass observer emission correction quantity. Detects if the correction quantity exceeds the feedback limit.	Component / System	Fault Code	Monitor Strategy Description	Primary Malfunction Criteria	Threshold Logic and Value	Secondary Parameters		Enable Conditions		Time Required	MIL Illum.
First Trim System P0172 Mornitors the fluid mass observer emission correction parently species the eostback time. P0172 Mornitors the fluid mass observer emission correction parently exceeds the eostback time. P0172 Mornitors the fluid mass observer emission correction parently exceeds the eostback time. P0174 Mornitors the fluid mass observer emission correction parently exceeds the eostback time. P0175 Mornitors the fluid mass observer emission correction parently exceeds the eostback time. P0176 Mornitors the fluid mass observer emission correction parently exceeds the eostback time. P0177 Mornitors the fluid mass observer emission correction parently exceeds the eostback time. P0178 Mornitors the fluid mass observer emission correction parently exceeds the eostback time. P0179 P0170 Mornitors the fluid mass observer emission correction parently exceeds the eostback time. P0170 P0170 Mornitors the fluid mass observer emission correction parently exceeds the eostback time. P0171 Mornitors the fluid mass observer emission correction parently exceeds the eostback time. P0171 Mornitors the fluid mass observer emission correction parently exceeds the eostback time. P01712 Mornitors the fluid mass observer emission correction parently exceeds the eostback time. P0172 Mornitors the fluid mass observer emission correction parently exceeds the eostback time. P0172 Mornitors the fluid mass observer function's parently exceeds the eostback time. P0172 P0172 Mornitors the fluid mass observer function's parently exceeds the eostback time. P0172 P0172 Mornitors the fluid mass observer function's parently exceeds the eostback time. P0172 P0172 Mornitors the fluid mass observer function's parently exceeds the eostback to parently exceeds the eostback time. P0172 P0172 Mornitors the fluid mass observer function's parently exceeds the eostback time. P0172 P0172 Mornitors the fluid mass observer function's parently exceeds the eostback time. P0172 P0172 P0172 Mornitors the flu						means					
Fuel Trim System Rich P0172 Momitors the fuel mass observer emission correction quantity (see Look-Up Table #46) Detects the correction quantity exceeds the feedback limit. Puel Trim System Rich P0172 Momitors the fuel mass observer emission correction quantity (see Look-Up Table #46) Detects the correction quantity exceeds the feedback limit. P0173 P0174 Momitors the fuel mass observer emission correction quantity (see Look-Up Table #46) Detects the correction quantity. Detects the correction quantity (see Look-Up Table #46) Detects the correction quantity (see Look-Up Table #46) Detects the correction quantity (see Look-Up Table #46) P0174 P0175 P0175 P0176 P0176 P0177 P						(see look up table #48) AND	=		-		
Fuel Trim System Nich P0172 Monitors the fuel mass observer emission correction observer correction quantity (see Lock-Up Table #46) Detects the correction quantity exceeds the flee fund. Poly and the correction observer correction quantity (see Lock-Up Table #46) Poly and the correction observer correction observer correction quantity exceeds the flee fund. Poly and the correction observer correction observed correcti						(see look up table #43)	>	0 to 1	-		
Fuel Trim System Rich P0172 Monitors the fuel mass observer emission correction observer correction quantity (see Look-Up Table #46) Detects if the correction quantity exceeds the feedback limit. P0172 Monitors the fuel mass observer emission correction observer correction quantity (see Look-Up Table #46) Detects if the correction quantity exceeds the feedback limit. P0172 Monitors the fuel mass observer emission correction observer correction quantity (see Look-Up Table #46) Detects if the correction quantity exceeds the feedback limit. P0172 Monitors the fuel mass observer emission correction observer correction quantity (see Look-Up Table #46) and the feedback limit. P0172 Monitors the fuel mass observer emission correction observer correction quantity (see Look-Up Table #46) and the feedback limit. P1742 Trim System Representation observer function's associated and signal from NOx sensor ready (see parameter definition) fuel system is in fuel cut off (see parameter definition) Particular Filer Representation Mode and the feedback limit is represented by the feedback limit. P1742 Trim System Representation of total fuel injected that is involved in combination (feel Mass for Combustion / Total fuel injected) or conditions are met involved in combination (feel Mass for Combustion / Total fuel injected) or conditions are met involved in combination (feel Mass for Combustion / Total fuel injected) or conditions are met involved in combination (feel Mass for Combustion / Total fuel injected) or combination (feel Mass for Combustion / Total fuel injected) or conditions are met involved in combination (feel Mass for Combustion / Total fuel injected) or conditions are met involved in combination (feel Mass for Combustion / Total fuel injected) or conditions are met involved in combination (feel Mass for Combustion / Total fuel injected) or conditions are met involved in combination (feel Mass for Combustion / Total fuel injected) or conditions are met involved in combination (feel Mass for Combustion / Total) ′	<=	199.96	°C		
Ambient temperature No Pending or Confirmed DTCs: No Pending or Confirmed DTCs: basic enable conditions met: P0172 Monitors the fuel mass observer emission correction parently (see Look-Up Table #46) See Look-Up Table #46) P0173 P0174 Monitors the fuel mass observer emission correction quantity exceeds the feedback limit. P0175 P0176 Monitors the fuel mass observer emission correction quantity (see Look-Up Table #46) P0177						Normal Injection Mode	=	TRUE	-		
NO Pending or Confirmed DTCs: See sheet enable tables See sheet enable See sheet e											
Fuel Trim System Rich P0172 Monitors the fuel mass observer correction quantity. Detects if the correction quantity. Detects if the correction quantity (see Look-Up Table #46) Potential from NOx sensor ready (ambda-signal from NOx sensor ready (see parameter definition)) Particular file Rich Regeneration Mode = FALSE - PALSE - FALSE - FALSE - Combustion / Total fuel injected that is involved in combustion / Total fuel injected that is involved in combustion / Total fuel injected that is involved in combustion / Total fuel injected that is involved in combustion / Total fuel injected of Combustion / Total fuel injected / Total fuel							=	see sheet inhibit			
Observer correction quantity. Quantity (see Look-Up Table #46) Detects if the correction quantity exceeds the feedback limit. The feedback limit. Detects if the correction quantity exceeds the feedback limit. The fe						basic enable conditions met:	=	see sheet enable	-		
Detects if the correction quantity exceeds the feedback limit. TRUE		P0172					=	TRUE			В
reedback limit. means (ambda signal from NOx sensor ready (see parameter definition) (see parameter d	Rich		Detects if the correction	quantity (see Look-Up Table #46)	ev	lambda-signal				exists for 12	
(ambda signal from NOx sensor ready (see parameter definition) tuel system is in tuel cut off (see parameter definition) Particulate Filter Regeneration Mode = FALSE - ((fraction of total fuel injected that is involved in combustion (Fuel Mass for Combustion / Total fuel injected) or calculated EGR rate >= 0 -) for time > 1.00 sec)) AND Controller status of the observer means (Load dependent release state (see look up table #48) AND Component Protection release state > 0 to 1 - (see look up table #48) AND Component Protection release state > 0 to 1 -										monitor runs with 0.02 s	
lambda signal from NOx sensor ready (see parameter definition) fuel system is in fuel cut off (see parameter definition)						means (
fuel system is in fuel cut off (see parameter definition) Particulate Filter Regeneration Mode ((fraction of total fuel injected that is involved in combustion (Fuel Mass for Combustion / Total fuel injected) or calculated EGR rate) for time)) AND Controller status of the observer means (Load dependent release state (see look up table #48) AND Component Protection release state) 0 to 1 - TRUE -							=	TRUE	-	enable	
Particulate Filter Regeneration Mode						fuel system is in fuel cut off (see	=	FALSE	-		
fraction of total fuel injected that is involved in combustion (Fuel Mass for Combustion / Total fuel injected) or calculated EGR rate >= 0) for time > 1.00 sec)) AND Controller status of the observer = TRUE - means (Load dependent release state (see look up table #48) AND Component Protection release state > 0 to 1 -							=	FALSE	-		
or calculated EGR rate >= 0 -) for time > 1.00 sec)) AND Controller status of the observer means (Load dependent release state (see look up table #48) AND Component Protection release state > 0 to 1 -						fraction of total fuel injected that is involved in combustion (Fuel Mass for	=	1	-		
Calculated EGR rate >= 0											
)) AND Controller status of the observer							>=	0	-		
Controller status of the observer = TRUE - means (Load dependent release state = 0 to 1 - (see look up table #48) AND Component Protection release state > 0 to 1 -))	>	1.00	sec		
(see look up table #48) AND Component Protection release state > 0 to 1 -						Controller status of the observer	=	TRUE	-		
Component Protection release state > 0 to 1 -						(see look up table #48)	=	0 to 1	-		
						Component Protection release state	>	0 to 1	-		
)) engine coolant temperature <= 199.96 °C)		400.00			

Component /	Fault	Monitor Strategy	Primary Malfunction		Threshold		Secondary		Enable		Time	MIL
System	Code	Description	Criteria	Lo	gic and Value		engine coolant temperature Normal Injection Mode Barometric pressure Ambient temperature NO Pending or Confirmed DTCs: basic enable conditions met:	>= = >= >= =	64.96 TRUE 74.80 -7.04 see sheet inhibit tables see sheet enable tables	°C - kPa °C -	Required	Illum.
Fuel pump Temperature Sensor 1 Circuit Low	P0182	Detects low voltage readings in the fuel pump temperature sensor 1 circuit, indicating an OOR low condition on the fuel pump temperature sensor 1 circuit	voltage of fuel temperature sensor 1 same as fuel temperature	^	59	V °C	ignition on and basic enable conditions met:	=	TRUE see sheet enable tables		fail conditions exists for 5 s test performed continuously 0.2 s rate	В
Fuel pump Temperature Sensor 1 Circuit High	P0183	Detects high voltage readings in the fuel pump temperature sensor 1 circuit, indicating an OOR high condition on the fuel pump temperature sensor 1 circuit	voltage of fuel temperature sensor 1 same as fuel temperature	<	4.71 -50.04	V °C	ignition on and basic enable conditions met:	=	TRUE see sheet enable tables		fail conditions exists for 5 s test performed continuously 0.2 s rate	В
Fuel Temperature Sensor 2 Circuit Low	P0187	Detects low voltage condition of the fuel temperature sensor circuit, indicating an OOR low condition	fuel temperature sensor voltage same as fuel temperature	>	0.60	°C	ignition on and basic enable conditions met:	=	TRUE see sheet enable tables		fail conditions exists for 5 s test performed continuously 0.2 s rate	В

Component / System	Fault Code	Monitor Strategy Description	Primary Malfunction Criteria		Threshold Logic and Value	ie	Secondary Parameters		Enable Conditions		Time Required	MIL Illum.
		,										
Fuel Temperature Sensor 2 Circuit High	P0188	Detects high voltage condition of the fuel temperature sensor circuit, indicating an OOR high condition	fuel temperature sensor voltage same as fuel temperature	>	4.75 -50	V °C	ignition on and basic enable conditions met:	=	TRUE see sheet enable tables	-	fail conditions exists for 5 s test performed continuously 0.2 s rate	В
Fuel Rail Pressure	P0191	Detects a drifted fuel rail	fuel pressure regulator 2 adaptation	>=	1.25	factor	fuel pressure regulator 2 in closed loop	=	TRUE		fail	A
[FRP] Sensor Performance	. 0101	pressure sensor by determining the adaptation factor of the fuel rail pressure regulator 2.	factor		1.20	140101	control	_	1102		conditions exists for 0.01 s monitor runs	, ,
			or fuel pressure regulator 2 adaptation factor	<=	0.75	factor	and adaptation for fuel pressure regulator 2 active means	=	TRUE	-	with 0.01 s rate whenever enable	
							counter for successful adaption or	>	0	counts	conditions are met	
							counter for the successful calculation of the adaptation and	>	9.00	counts		
							engine speed	>	400.00	rpm		
							and engine speed \	<	1000.00	rpm		
							and vehicle speed and	<=	1.86	mph		
							(state machine rail pressure control equal to pressure control valve or	=	TRUE	-		
							state machine rail pressure control equal coupled pressure control (rail pressure is controlled by metering unit and pressure control valve)	=	TRUE	-		
							and basic enable conditions met:	=	see sheet enable tables	-		

Component /	Fault	Monitor Strategy	Primary Malfunction		Threshold		Secondary		Enable		Time	MIL
System	Code	Description Detects a biased sensor by determining the FRP sensor voltage to be in the correct range for atmospheric pressure at engine off and with sufficient pressure bleed-off time.	Criteria (rail pressure sensor voltage	<	Logic and Value	V	Parameters engine post drive/ afterun	=	Conditions TRUE		Required all conditions exists for more than 30 monitor runs once per driving cycle with 0.01 s rate	Illum.
			or rail pressure sensor voltage)	>	0.65	٧	fuel temperature and engine has already run in this driving cycle	> =	-0.04 TRUE	°C -	whenever enable conditions are met	
							and rail pressure is reduced means	=	TRUE	-		
							rail pressure and fuel pressure regulator 2 current	<=	0.00 1.70	Kpa Amps		
							and time since engine off and	>	30.08	sec		
							number of fault measurements during engine postdrive/ afterun and	>	10.00	counts		
							basic enable conditions met:	=	see sheet enable tables	-		
							NO Pending or Confirmed DTCs:		see sheet inhibit tables	-		
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	<	0.19	V	ignition on	=	TRUE		fail conditions exists for 0.14 s monitor runs with 0.01 s rate whenever enable conditions are met	A
			rail pressure	<	0	kPa	basic enable conditions met: and NO Pending or Confirmed DTCs:	=	see sheet enable tables	-		
									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	А
i I			same as				and				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.
бузсын	Couc	Description	rail pressure	>	220000.00	kPa	basic enable conditions met: and NO Pending or Confirmed DTCs:	=	see sheet enable tables see sheet inhibit tables		rate whenever enable conditions are met	muil.
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 and	>	-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 and with	=	384.4	usec	fuel temperature and fuel temperature	>=	0.06 79.96	°C	are met	
			(b) offset of the maximum filtered energizing time)) for rail pressure point	=	70000.00	usec kPa	and engine temperature and	>	49.96	°C		
							battery voltage and combustion chamber is not cold off means time since last combustion (see Look-	>=	10.00 5 to 30	V		
							Up-Table #94) and intake manifold pressure	>	75.00	kPa		
							and intake manifold pressure and	<	150.00	kPa		
							accelerator pedal position and Fuel system status and	=	0.05 Fuel cut off	%		
							(engine speed	>	(b) - (a)	-		
							and engine speed with	<	(a) + (c)	-		
							(a) value of engine speed and with (b) gear specific minimum engine speed	=	30.00 950.00	rpm		

Component / System	Fault Code	Monitor Strategy Description	Primary Malfunction Criteria		Threshold Logic and Value)	Secondary Parameters		Enable Conditions		Time Required	MIL Illum.
,							(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	>	0.00	mph		
							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:	=	see sheet enable tables	-		
İ							NO Pending or Confirmed DTCs:	=	see sheet inhibit tables	-		
Cylinder 2 Injection Timing Retarded	P01CD	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 2	>	(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	В
			(with		384.4		(fuel temperature and	>=	0.06	°C	are met	
1			(a) maximum injection energizing time and with (b) offset of the maximum filtered	=	12	usec	fuel temperature	<=	79.96	°C		
			energizing time	_	12	4000	and					
) for				engine temperature	>	49.96	°C		
			rail pressure point	=	70000.00	kPa	and battery voltage	>	10.00	V		
							and combustion chamber is not cold off means					
							time since last combustion (see Look- Up-Table #94)	>=	5 to 30	sec		
							and intake manifold pressure and	>	75.00	kPa		
							intake manifold pressure	<	150.00	kPa		

Component /	Fault	Monitor Strategy	Primary Malfunction		Threshold		Secondary		Enable		Time	MIL
System	Code	Description	Criteria	L	ogic and Value		Parameters		Conditions		Required	Illum.
							and 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	=	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: and	=	see sheet enable tables	-		
							NO Pending or Confirmed DTCs:	=	see sheet inhibit tables	-		
Cylinder 7 Injection Timing Retarded	P01D7	Monitors the correction values for the energizing time of each cylinder. A	(environmental temperature	>	-7.04	°C	fail conditions exists for	В
		correction value for the energizing time is learned for each cylinder at a calibrated rail pressure									more than 0.01 s monitor runs with 0.01 s	
		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	>	(a) - (b)	-	and .				rate 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 energizing time	=	12	usec	fuel temperature)	<=	79.96	°C		

Component /	Fault	Monitor Strategy	Primary Malfunction		Threshold		Secondary		Enable		Time	MIL
System	Code	Description	Criteria		Logic and Value		Parameters		Conditions		Required	Illum.
)) 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)	>=	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	=	30.00	rpm		
							(b) gear specific minimum engine speed and with	=	950.00	rpm		
							(c) gear specific maximum engine speed) and	=	1850.00	rpm		
							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	-		
							NO Pending or Confirmed DTCs:	=	see sheet inhibit tables	-		
				-	_	-		-	_	_		_

Component /	Fault	Monitor Strategy	Primary Malfunction		Threshold		Secondary		Enable		Time	MIL
System	Code	Description	Criteria		Logic and Value		Parameters		Conditions		Required	Illum.
Cylinder 8 Injection Timing Retarded	P01D9	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 8	>	(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		
) 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	<	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		
							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	<	5000.00	kPa		

Component / System	Fault Code	Monitor Strategy Description	Primary Malfunction Criteria	ı	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 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 (with (a) maximum injection energizing time and with (b) offset of the maximum filtered energizing time)	> = =	(a) - (b) 384.4 12	usec	environmental temperature and (fuel temperature and fuel temperature) and	>= <=	-7.04 0.06 79.96	°C	fail conditions exists for more than 0.01 s monitor runs with 0.01 s rate whenever enable conditions are met	В
			for rail pressure point	=	70000.00	kPa	engine temperature and battery voltage and combustion chamber is not cold off means time since last combustion (see Look- Up-Table #94) and intake manifold pressure and intake manifold pressure and caccelerator pedal position and Fuel system status and (engine speed and engine speed with (a) value of engine speed and with	> >= >= < < < = = < < = = < < = = < < = = < < = = < < = = < < < = = < < < = = < < < = = < < < = = < < < < < = = < < < = = < < < < < < < < < < < < < < < < < < < <	49.96 10.00 5 to 30 75.00 150.00 0.05 Fuel cut off (b) - (a) (a) + (c) 30.00	°C V sec kPa kPa - - -		

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	<	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 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 (with (a) maximum injection energizing time	>	(a) - (b) 384.4	- usec	environmental temperature and (fuel 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
			and with (b) offset of the maximum filtered energizing time	=	12	usec	fuel temperature) and	<=	79.96	°C		
) for				engine temperature	>	49.96	°C		
			rail pressure point	=	70000.00	kPa	and battery voltage	>	10.00	V		
							and combustion chamber is not cold off means time since last combustion (see Look- Up-Table #94) and	>=	5 to 30	sec		

Component /	Fault	Monitor Strategy	Primary Malfunction		Threshold		Secondary		Enable		Time	MIL
System	Code	Description	Criteria	Lo	ogic and Value		Parameters		Conditions		Required	Illum.
							intake manifold pressure and	>	75.00	kPa		
							intake manifold pressure and	<	150.00	kPa		
							accelerator pedal position and	<	0.05	%		
							Fuel system status and (=	Fuel cut off	-		
							engine speed and	>	(b) - (a)	-		
							engine speed with	<	(a) + (c)	-		
							(a) value of engine speed and with	=	30.00	rpm		
							(b) gear specific minimum engine speed	=	950.00	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	>	0.00	mph		
							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:	=	see sheet enable tables	-		
							and NO Pending or Confirmed DTCs:	=	see sheet inhibit tables	-		
Culindar 6 Injection	DO4DE	Manitora the correction					an ironmental temperature		7.04	°C	foil	D.
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 for the rail	>	(a) - (b)	-	environmental temperature	>	-7.04	-0	fail conditions exists for more than 0.01 s monitor runs with 0.01 s rate whenever	В
		corrected energizing time exceeds the allowed limit.	pressure calibration points and cylinder 6								enable conditions are met	
			with (a) maximum injection energizing time	=	384.4	usec	fuel temperature and	>=	0.06	°C		

Component / System	Fault Code	Monitor Strategy Description	Primary Malfunction Criteria		Threshold Logic and Value		Secondary Parameters		Enable Conditions		Time Required	MIL Illum.
System	Code	Description	and with		Logic and value		fuel temperature	<=	79.96	°C	Required	mum.
			(b) offset of the maximum filtered energizing time	=	12	usec	and	\-	79.90	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) 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)	-		
							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	-		

Component /	Fault	Monitor Strategy	Primary Malfunction		Threshold		Secondary		Enable		Time	MIL
System	Code	Description	Criteria		Logic and Value		Parameters		Conditions		Required	Illum.
Cylinder 3 Injection Timing Retarded	P01CF	Monitors the correction values for the energizing time of each cylinder. A correction value for the energizing time is learned for each cylinder at a calibrated rail pressure operating point. Detects a fault when the corrected energizing time exceeds the allowed limit.	corrected energizing time for the rail pressure calibration points and cylinder 3	>	(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					
			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)	>=	10.00 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 (b) gear specific minimum engine	=	30.00 950.00	rpm		
							speed and with	=	1850.00			
							(c) gear specific maximum engine speed) and			rpm		
							current gear (see Look-Up-Table #93) (diagnostic enabled when equal to 1) and	=	0 to 1	- mph		
							vehicle speed and rail pressure deviation from setpoint calculated out of difference between	> <	5000.00	mph 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 1 Injection Timing Advanced	P01CC	Monitors the correction values for the energizing time of each cylinder. A correction value for the energizing time is learned for each cylinder at a calibrated rail pressure 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 0.01 s monitor runs with 0.01 s rate whenever	В
		corrected energizing time falls below the allowed limit.	(with (a) minimum injection energizing time and with (b) offset of the minimum filtered	=	107.2	usec	(fuel temperature and fuel temperature)	>=	0.06 79.96	°C	enable conditions are met	
			energizing time)) for rail pressure point	=	70000.00	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	>=	5 to 30 75.00	sec kPa		
							and intake manifold pressure and accelerator pedal position and Fuel system status	< < =	150.00 0.05 Fuel cut off	kPa % -		
							and (engine speed and engine speed with (a) value of engine speed	> < =	(b) - (a) (a) + (c) 30.00	- - rpm		

Component /	Fault	Monitor Strategy	Primary Malfunction		Threshold	_	Secondary		Enable		Time	MIL
System	Code	Description	Criteria		Logic and Valu	e	Parameters and with		Conditions		Required	Illum.
							(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 and	>	0.10	sec		
							no gear change is occurred and	=	TRUE FALSE	-		
							4 wheel mode and basic enable conditions met:	=	see sheet enable	-		
							and	_	tables			
							NO Pending or Confirmed DTCs:	=	see sheet inhibit tables	-		
Cylinder 2 Injection Timing Advanced	P01CE	Monitors the correction values for the energizing time of each cylinder. A correction value for the energizing time is learned for each cylinder at a calibrated rail pressure operating point. Detects a fault when the corrected energizing time falls below the allowed limit.	corrected energizing time for the rail pressure calibration points and cylinder 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 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		
					. 5550.00	u	battery voltage	>	10.00	٧		
							and combustion chamber is not cold off means					

Component /	Fault	Monitor Strategy	Primary Malfunction	Threshold	Secondary		Enable		Time	MIL
System	Code	Description	Criteria	Logic and Value	Parameters current gear (see Look-Up-Table #93)	>=	Conditions 5 to 30	sec	Required	Illum.
					(diagnostic enabled when equal to 1) and					
					intake manifold pressure and	>	75.00	kPa		
					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)	=	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 7 Injection	P01D8	Monitors the correction	(environmental temperature	>	-7.04	°C	fail	В
Timing Advanced	. 0.150	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) -	and			Š	conditions exists for more than 0.01 s monitor runs with 0.01 s rate whenever enable conditions	J

Component /	Fault	Monitor Strategy	Primary Malfunction		Threshold		Secondary		Enable		Time	MIL
System	Code	Description	Criteria		Logic and Value		Parameters		Conditions		Required	Illum.
			(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		
)) for				and engine temperature	>	49.96	°C		
			rail pressure point	=	70000.00	kPa	and battery voltage	>	10.00	٧		
							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	=	30.00	rpm		
							(b) gear specific minimum engine speed and with (c) gear specific maximum engine	=	950.00 1850.00	rpm		
							speed)			.,		
							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	-		

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:	=	see sheet inhibit tables	-		
Cylinder 8 Injection Timing Advanced	P01DA	Monitors the correction values for the energizing time of each cylinder. A correction value for the energizing time is learned for each cylinder at 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 8	<	(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)	>=	10.00 5 to 30	V		
							and intake manifold pressure and	>	75.00	kPa		
							intake manifold pressure and	<	150.00	kPa		
							accelerator pedal position and Fuel system status and	=	0.05 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 (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)	=	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	Criteria		Logic and value		and		Conditions		Required	mum.
							vehicle speed and	>	0.00	mph		
							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	=	TRUE	-		
							and 4 wheel mode	=	FALSE	-		
							and basic enable conditions met:	=	see sheet enable			
								_	tables			
							and NO Pending or Confirmed DTCs:	=	see sheet inhibit	_		
									tables			
Cylinder 4 Injection	P01D2	Monitors the correction	(environmental temperature	>	-7.04	°C	fail	В
Timing Advanced	. 0.52	values for the energizing	`				on monaton porataro			Ü	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. Detects a fault when the	corrected energizing time for the rail	<	(a) + (b)	_	and				rate whenever	
		corrected energizing time	pressure calibration points and cylinder 4		(=) - (=)						enable	
		falls below the allowed limit.									conditions are met	
			(with				(fuel temperature	>=	0.06	°C		
			(a) minimum injection energizing time	=	107.2	usec	and	/-	0.00	C		
			and with				fuel temperature	<=	79.96	°C		
			(b) offset of the minimum filtered	=	47.2	usec)					
			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					
							time since last combustion (see Look- Up-Table #94)	>=	5 to 30	sec		
							and					
							intake manifold pressure and	>	75.00	kPa		
							intake manifold pressure	<	150.00	kPa		
							and accelerator pedal position	<	0.05	%		
							and Fuel system status	=	Fuel cut off	_		
							and	=	ruei cui oii	-		

Component /	Fault	Monitor Strategy	Primary Malfunction		Threshold		Secondary		Enable		Time	MIL
System	Code	Description	Criteria		Logic and Value	е	Parameters		Conditions		Required	Illum.
							engine speed	>	(b) - (a)	-		
							and engine speed	<	(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	<	5000.00	kPa		
							for time	>	0.10	sec		
							and no gear change is occurred	=	TRUE	-		
							and 4 wheel mode and	=	FALSE	-		
							basic enable conditions met:	=	see sheet enable tables	-		
							and NO Pending or Confirmed DTCs:	=	see sheet inhibit tables	-		
	DO4D4	Marita and a second con-							7.04	20	6.3	
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		

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)	/-	3 10 30	300		
					and					
					intake manifold pressure	>	75.00	kPa		
					and .					
					intake manifold pressure	<	150.00	kPa		
					and					
					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		()			
					(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					
) and					
					current gear (see Look-Up-Table #93)	=	0 to 1	_		
					(diagnostic enabled when equal to 1)	_	0 10 1			
					and					
					vehicle speed	>	0.00	mph		
					and					
					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	-	INOL	-		
					4 wheel mode	=	FALSE	_		
					and					
					basic enable conditions met:	=	see sheet enable	-		
							tables			
					and					
					NO Pending or Confirmed DTCs:	=	see sheet inhibit	-		
							tables			

Component /	Fault	Monitor Strategy	Primary Malfunction		Threshold		Secondary		Enable		Time	MIL
System	Code	Description	Criteria		Logic and Value		Parameters		Conditions		Required	Illum.
Cylinder 6 Injection Timing Advanced	P01D6	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. 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)	-	and				0.01 s monitor runs with 0.01 s rate 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)	<=	79.96	°C		
)) 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	>	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) value of engine speed	< =	(a) + (c) 30.00	- rpm		
							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) and	=	0 to 1	-		
							vehicle speed and	>	0.00	mph		

Component / System	Fault Code	Monitor Strategy Description	Primary Malfunction Criteria		Threshold Logic and Value	e	Secondary Parameters		Enable Conditions		Time Required	MIL Illum.
							rail pressure deviation from setpoint calculated out of difference between desired and actual value for time and no gear change is occurred and 4 wheel mode and basic enable conditions met: and NO Pending or Confirmed DTCs:	> = = = =	5000.00 0.10 TRUE FALSE see sheet enable tables see sheet inhibit tables	kPa sec		
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		
) for				engine temperature	>	49.96	°C		
			rail pressure point	=	70000.00	kPa	and battery voltage	>	10.00	٧		
							and combustion chamber is not cold off means time since last combustion (see Look- Up-Table #94)	>=	5 to 30	sec		
							and intake manifold pressure	>	75.00	kPa		
							and intake manifold pressure	<	150.00	kPa		
							and 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	L	ogic and Value)	Parameters		Conditions		Required	Illum.
							engine speed with (a) value of engine speed	< =	(a) + (c) 30.00	- rpm		
							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) and	=	0 to 1	-		
							vehicle speed	>	0.00	mph		
							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:	=	see sheet enable tables	-		
							and NO Pending or Confirmed DTCs:	=	see sheet inhibit tables	-		
Coolant Temperature Dropped Below	P01F0	thermostat by monitoring for a decrease of the engine	engine coolant temperature	<	70.96	°C	engine pre drive	=	FALSE	-	fail conditions exists for 0.2	В
Diagnostic Monitoring Temperature		coolant temperature below the OBD monitoring threshold during normal operating conditions			400.00						s monitor runs with 0.2 s rate whenever	
			for fault counter which is equivalent to fault time	>= >=	400.00 80.00	- sec	and ambient temperature	>=	-7.04	°C	enable conditions	
							and engine coolant temperature at least once in driving cycle	>=	70.96	°C	are met	
							and instantaneous fuel consumption (low-pass filtered)	>=	9.00	liters / hr		
							and 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 Injector 1 Control Circuit	Code P0201	Description Diagnoses the Fuel Injector Cylinder #1 low side driver circuit for circuit faults.	Criteria Voltage low during driver off state (indicates open circuit)	Logic and Value = Open Circuit: 200 K Ω impedance between ECU pin and load	Parameters Engine Running (see parameter definition)	Conditions = TRUE -	Required fail conditions exists for more than 0.04 s monitor runs with 0.01 s rate whenever enable conditions are met	A 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
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

Component /	Fault	Monitor Strategy	Primary Malfunction	Threshold	Secondary	Enable	Time	MIL
System Injector 4 Control Circuit	Code P0204	Description Diagnoses the Fuel Injector Cylinder #4 low side driver circuit for circuit faults.	Criteria Voltage low during driver off state (indicates open circuit)	Logic and Value = Open Circuit: 2 - 200 K Ω impedance between ECU pin and load	Parameters Engine Running (see parameter definition)	Conditions = TRUE -	Required fail conditions exists for more than 0.04 s monitor runs with 0.01 s rate whenever enable conditions are met	A A
Injector 5 Control Circuit	P0205	Diagnoses the Fuel Injector Cylinder #5 low side driver circuit for circuit faults.	Voltage low during driver off state (indicates open circuit)	= Open Circuit:≥ - 200 K Ω impedance between ECU pin and load	Engine Running (see parameter definition)	= TRUE -	fail conditions exists for more than 0.04 s monitor runs with 0.01 s rate whenever enable conditions are met	A
Injector 6 Control Circuit	P0206	Diagnoses the Fuel Injector Cylinder #6 low side driver circuit for circuit faults.	Voltage low during driver off state (indicates open circuit)	= 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	Α

Component /	Fault	Monitor Strategy	Primary Malfunction		Threshold		Secondary		Enable		Time	MIL
System	Code	Description	Criteria		Logic and Value		Parameters		Conditions		Required	Illum.
Injector 7 Control Circuit	P0207	Diagnoses the Fuel Injector Cylinder #7 low side driver circuit for circuit faults.	Voltage low during driver off state (indicates open circuit)	Ш	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)	п	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
Turbocharger/Sup ercharger "A" Overboost Condition	P0234	Detects an permanent negative control deviation of the boost pressure indicating and overboost condition	control deviation of the boost pressure calculated out of difference between desired and actual value (see Look-Up-Table #4) with (d) The lower threshold pressure (see Look-Up-Table #62)	=	(d*e*f) -31.5 to -10 0.699951 to 1	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	=	FALSE		fail conditions exists for 10 s monitor runs with 0.02 s rate whenever enable conditions are met	В
			(f) ECB valve based lower limit correction factor	=	1.00	factor	VNT turbocharger wiping is active	=	FALSE	-		

Component /	Fault	Monitor Strategy	Primary Malfunction		Threshold		Secondary		Enable		Time	MIL
System	Code	Description	Criteria		Logic and Value		Parameters		Conditions		Required	Illum.
System		Description						= < >= <= = > > = > >		- (mm^3/rev) /s - rpm/s mm^3/rev mm^3/rev rpm rpm - rpm mm^3/rev - sec		
							for time and Basic enable conditions met	> =	2.00 see sheet enable tables	sec -		
Turbocharger/Sup ercharger "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)	>	(a*b*c)	- 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	=	FALSE		fail conditions exists for 10 s monitor runs with 0.02 s rate whenever enable conditions are met	В
			(b) Correction factor (see Look-Up- Table #97) (c) ECB valve based upper limit correction factor	=	1 to 1.099976 1.00	factor	for opening and closing are averaged and used for the calculation of offset drift of the valve and VNT turbocharger wiping is active	=	FALSE	-		

Component / System	Fault Code	Monitor Strategy Description	Primary Malfunction Criteria	L	Threshold	ie	Secondary Parameters		Enable Conditions		Time Required	MIL Illum.
Component / System		Monitor Strategy Description		L	Threshold .ogic and Valu	ie	- 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 and working range of boost pressure is in closed-loop means (engine speed and injection quantity)	= < > >= < > >= = > >	TRUE 40.00 TRUE 35.00 112.00 1308.00 1600.00 3000.00 TRUE	(mm^3/rev) /s - rpm/s mm^3/rev mm^3/rev rpm rpm - rpm mm^3/rev	Required	
							NO Pending or Confirmed DTCs:) for time and Basic enable conditions met:	> =	see sheet inhibit tables 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	<	(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)	> =	(c) * (b) -68 to 0	- mm^3/r ev	and current commanded injection quantity current commanded injection quantity engine coolant temperature	> < >=	52.00 380.00 39.96	mm^3/rev mm^3/rev °C	with 0.01 s rate whenever enable conditions	
			and with (b) factor for correction quantity and with	=	0.95	factor	vehicle speed	>= > < <=	0.00 590.00 3000.00 186.45	kpa rpm rpm mph	are met	
			(c) upper limitation (see Look-Up-Table #39)	=	0 to 68	mm^3/r ev	basic enable conditions met:	=	see sheet enable tables	-		

Component / System	Fault Code	Monitor Strategy Description	Primary Malfunction Criteria		Threshold Logic and Valu	ie	Secondary Parameters		Enable Conditions		Time Required	MIL Illum.
.,		2000,			g		and NO Pending or Confirmed DTCs:	=	see sheet inhibit tables	-		
Clyinder 2 Balance System	P0266	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	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 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)	> = =	(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 4 Balance System	P0272	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	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	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	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	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 6 Balance System	P0278	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

Component /	Fault	Monitor Strategy	Primary Malfunction		Threshold		Secondary		Enable		Time	MIL
System	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	mm^3/r ev factor mm^3/r ev	engine coolant temperature ambient pressure engine speed engine speed vehicle speed and basic enable conditions met: and NO Pending or Confirmed DTCs:	>= >> < <= =	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	
Clyinder 7 Balance System	P0281	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 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/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	>	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	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.
				basic enable conditions met: and NO Pending or Confirmed DTCs:	=	see sheet enable tables see sheet inhibit tables	-		
CAC Efficiency Below Threshold	Detects insufficient charge- air cooler efficiency. The efficiency is calculated out of temperature upstream of the charge air cooler, temperature downstream of	filtered charge-air cooler efficiency	< 0.25 -	vehicle speed	>=	37.29	mph	fail conditions exists for 30 s monitor runs once per driving cycle	В
	the charge air cooler and ambient temperature.			air mass flow air mass flow 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 and control value of the throttle valve control value of the throttle valve and (a) - (b) with (a) charge air cooler upstream temperature and with (b) modeled ambient air temperature and injection quantity injection quantity injection quantity ambient pressure modeled ambient air temperature and basic enable conditions met: and NO Pending or Confirmed DTCs:	>=	83.33 152.77 69.96 129.96 129.96 1.22 measured parameter measured parameter -400.00 5.00 50.00 measured parameter measured parameter sesured parameter measured parameter sesured parameter	g/s g/s °C °C - - - *% °C - mm^3/rev kPa °C -	with 100 ms rate whenever enable conditions are met	

Component /	Fault	Monitor Strategy	Primary Malfunction	Threshold	Secondary		Enable		Time	MIL
System	Code	Description	Criteria	Logic and Value	Parameters		Conditions		Required	Illun
njection Quantity oo Low	P026C	Monitors the fuel mass observer correction quantity. Detects if the correction quantity exceeds the emissions limit.	Unlimited fuel mass observer correction quantity - emission control correction quantity (see Look-Up-Table #45)	<= -34.8 to -20 mm/3/r ev	((Status of the Observer function's lambda-signal	=	TRUE	-	fail conditions exists for 12 s monitor runs	В
		crinosiono ilirini.							with 0.02 s	
					means				rate	
					(lambda signal from NOx sensor ready	=	TRUE	_	whenever	
					(see parameter definition)	_	INOL		enable conditions	
					fuel system is in fuel cut off (see parameter definition)	=	FALSE	-	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	>	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	<=	199.96	°C		
					engine coolant temperature	>=	64.96	°C		
					Normal Injection Mode (not in DPF regeneration)	=	TRUE	-		
					Barometric pressure	>=	74.80	kPa		
					Ambient temperature	>=	-7.04	°C		
					Vehicle speed	<	1.86	mph		
					NO Pending or Confirmed DTCs:	=	see sheet inhibit tables			
) 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	-		

Component / System	Fault Code	Monitor Strategy Description	Primary Malfunction Criteria		Threshold Logic and Value	9	Secondary Parameters		Enable Conditions		Time Required	MIL Illum.
Injection Quantity Too High	P026D	Monitors the fuel mass observer correction quantity. Detects if the correction quantity exceeds the emissions limit.	Unlimited fuel mass observer correction quantity - emission control correction quantity (see look up table #44)	>=	16 to 34.8	mm^3/r ev	((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	=	FALSE	-	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) or	=	1	-		
							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) AND	=	0 to 1	-		
							Component Protection release state (see look up table #43)	>	0 to 1	-		
) engine coolant temperature	<=	199.96	°C		
							engine coolant temperature	>=	64.96	°C		
							Normal Injection Mode (not in DPF regeneration)	=	TRUE	-		
							Barometric pressure	>=	74.80	kPa		
							Ambient temperature Vehicle speed	>= <	-7.04 1.86	°C mph		
							NO Pending or Confirmed DTCs:	=	see sheet inhibit tables	Шрп		
							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	-		

Component / System	Fault Code	Monitor Strategy Description	Primary Malfunction Criteria		Threshold Logic and Value		Secondary Parameters		Enable Conditions		Time Required	MIL
5,5.5	0000											
Cylinder 1 Injection Fiming Reached Feedback Limit	P02CD	Monitors the correction values for the energizing time of each cylinder. A correction value for the energizing time is learned for each cylinder at three different rail pressure operating point. Detects a fault when the corrected energizing time exceeds the feedback control limit.	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 0.5 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)	=	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 and	>	49.96	°C		
			corrected energizing time for the rail pressure calibration points and cylinder 1	<	(a) + (b)	-	battery voltage	>	10.00	V		
		(with (a) minimum injection energizing time and with	=	107.2	usec	and combustion chamber is not cold off means						
			(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		
							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		

Component / System	Fault Code	Monitor Strategy Description	Primary Malfunction Criteria		Threshold Logic and Value		Secondary Parameters		Enable Conditions		Time Required	MIL Illum.
·					•		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	>	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 2 Injection Timing Reached Feedback Limit	P02CF	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 2	>	(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)	=	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		
)				and		40.00	00		
			OR (() ()		engine temperature and	>	49.96	°C		
			corrected energizing time for the rail pressure calibration points and cylinder 2	<	(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) 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.
) for rail pressure point (see Look-Up-Table	= 30000 to 90000 kPa	intake manifold pressure and intake manifold pressure	> <	75.00 150.00	kPa kPa		
			#19)	= 30000 to 30000 ki a	and					
					accelerator pedal position and Fuel system status	=	0.05 Fuel cut off	%		
					and (_	i dei cut on	-		
					engine speed and	>	(b) - (a)	-		
					engine speed with (a) value of engine speed	=	(a) + (c) 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) and					
					current gear (see Look-Up-Table #93) (diagnostic enabled when equal to 1) and	=	0 to 1	-		
					vehicle speed and	>	0.00	mph		ļ
					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	-		
Cylinder 7 Injection Timing Reached	P02D9	Monitors the correction values for the energizing	(environmental temperature	>	-7.04	°C	fail conditions	В
Feedback Limit		time of each cylinder. A correction value for the energizing time is learned for each cylinder at three different rail pressure operating point.							exists for more than 0.5 s monitor runs with 0.01 s rate	
		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) -	and				whenever enable conditions are met	
			with		fuel temperature	>=	0.06	°C		l

Component /	Fault Code	Monitor Strategy	Primary Malfunction Criteria		Threshold Logic and Value		Secondary Parameters		Enable Conditions		Time	MIL Illum.
System	Code	Description	(a) maximum injection energizing time	=	353.2 to 670.8	usec	and		Conditions		Required	illum.
			(see Look-Up-Table #20) 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		
			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		
			for rail pressure point (see Look-Up-Table #19)	=	30000 to 90000	kPa	and intake manifold pressure	<	150.00	kPa		
			#10)				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)	=	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	-		

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 8 Injection Timing Reached Feedback Limit	P02DB	Monitors the correction values for the energizing time of each cylinder. A correction value for the energizing time is learned for each cylinder at three different rail pressure operating point. Detects a fault when the corrected energizing time exceeds the feedback control limit.	corrected energizing time for the rail pressure calibration points and cylinder 8	>	(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 #21)) OR (corrected energizing time for the rail	= = <	353.2 to 670.8 10 to 16 (a) + (b)	usec usec	fuel temperature and fuel temperature) and engine temperature and battery voltage	>= <= >	0.06 79.96 49.96 10.00	°C V		
			pressure calibration points and cylinder 8 (with (a) minimum injection energizing time and with (b) offset of the minimum filtered energizing time (see Look-Up-Table #22)	=	107.2 10 to 16	usec	and combustion chamber is not cold off means time since last combustion (see Look- Up-Table #94)	>=	5 to 30	sec		
			for rail pressure point (see Look-Up-Table #19)	=	30000 to 90000	kPa	and intake manifold pressure and intake manifold pressure and accelerator pedal position and Fuel system status and	> < < =	75.00 150.00 0.05 Fuel cut off	kPa kPa %		
							(engine speed and engine speed with (a) value of engine speed and with	> < =	(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		
							and 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 and	=	FALSE	-		
							basic enable conditions met:	=	see sheet enable tables	-		
							NO Pending or Confirmed DTCs:	=	see sheet inhibit tables	-		
Cylinder 4 Injection	P02D3	Monitors the correction	(environmental temperature	>	-7.04	°C	fail	В
Cylinder 4 injection Timing Reached Feedback Limit	FUZUS	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 4	>	(a) - (b)	-	and	>	-7.04	C	conditions exists for more than 0.5 s monitor runs with 0.01 s rate whenever enable conditions are met	Б
			with		050.04.070.0		fuel temperature	>=	0.06	°C		
			(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 10 to 16	usec	and fuel temperature)	<=	79.96	°C		
			<u> </u>				and					
			OR				engine temperature	>	49.96	°C		
			corrected energizing time for the rail pressure calibration points and cylinder 4	<	(a) + (b)	-	and battery voltage	>	10.00	V		
1 1			(

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 (b) offset of the minimum filtered energizing time (see Look-Up-Table #22)	=	107.2 10 to 16	usec	combustion chamber is not cold off means time since last combustion (see Look- Up-Table #94)	>=	5 to 30	sec		
			#22)) 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	-		
							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) 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	-		
							NO Pending or Confirmed DTCs:	=	see sheet inhibit tables	-		
						_		_				

nditions 7.04 °(0.06 °(0.996 °(Required fail conditions exists for more than 0.5 s monitor runs with 0.01 s rate whenever enable conditions are met
0.06 °(conditions exists for more than 0.5 s monitor runs with 0.01 s rate whenever enable conditions are met
	0.5 s monitor runs with 0.01 s rate whenever enable conditions are met
	rate whenever enable conditions are met
'9.96 °(
19.96 °(
0.00 V	
to 30 se	с
'5.00 kP	'a
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l cut off -	
) - (a) -	
) + (c) -	
50.00 rpi	" [
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50.00 0.05 ol cut off ol - (a) ol + (c) ol - (c) ol - (c) ol - (d) ol - (d) o	kP % - - rpi rpi

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 vehicle speed	=	0 to 1	- mph		
							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:	=	see sheet enable tables	-		
							and NO Pending or Confirmed DTCs:	=	see sheet inhibit tables	-		
Cylinder 6 Injection	P02D7	Monitors the correction					an iron montal temporatura		-7.04	°C	fail	В
Cylinider 8 injection Timing Reached Feedback Limit	FUZDI	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)	-	environmental temperature and	>	-7.04	C	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)	=	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 6	<	(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		
)				and intake manifold pressure	>	75.00	kPa		

Component /	Fault	Monitor Strategy	Primary Malfunction		Threshold		Secondary		Enable		Time	MIL
System	Code	Description	Criteria	L	ogic and Value		Parameters		Conditions		Required	Illum.
			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 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 3 Injection	P02D1	Monitors the correction	(environmental temperature	>	-7.04	°C	fail	В
Cylinder's Injection Timing Reached Feedback Limit	ΓυΖΟΙ	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 3	>	(a) - (b)	-	and	*	-7.04	C	conditions exists for more than 0.5 s monitor runs with 0.01 s rate whenever enable	D
		control limit.									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 (b) offset of the maximum filtered energizing time (see Look-Up-Table)	=	353.2 to 670.8 10 to 16	usec	and fuel temperature)	<=	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	=	30000 to 90000	kPa	and intake manifold pressure and intake manifold pressure	> <	75.00 150.00	kPa kPa		
			#19)				and accelerator pedal position and Fuel system status	< =	0.05 Fuel cut off	%		
							and (engine speed and engine speed	> <	(b) - (a) (a) + (c)	-		
							with (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		
) and current gear (see Look-Up-Table #93) (diagnostic enabled when equal to 1) and	=	0 to 1	-		
							vehicle speed and rail pressure deviation from setpoint calculated out of difference between desired and actual value	> <	0.00 5000.00	mph kPa		
							for time and	>	0.10	sec		
							no gear change is occurred and 4 wheel mode and	=	TRUE FALSE	-		

Component /	Fault	Monitor Strategy	Primary Malfunction	Threshold	Secondary		Enable		Time	IN
System	Code	Description	Criteria	Logic and Value	Parameters		Conditions		Required	III
					basic enable conditions met: and NO Pending or Confirmed DTCs:	=	see sheet enable tables see sheet inhibit tables	-		
ce Air Flow re Control uit	P02E0	Diagnoses the Throttle 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	battery voltage for time and starter is active cranking for time and	> = > =	3.00 FALSE 3.00 ACTIVE	V sec	fail conditions exists for 7s monitor runs with 0.005 s rate whenever enable conditions are met	
					Circuit and basic enable conditions met and NO Pending or Confirmed DTCs:	= =	see sheet enable tables 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.		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 sec -	fail conditions 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	>	11.00	V	fail conditions exists for 3 s	

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 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	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: - ≤ 0.5 Ω impedance between signal and controller ground	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	В
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 power	battery voltage for time and starter is active cranking for	> =	11.00 3.00 FALSE	V	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	Thresh		Secondary		Enable		Time	MIL
System	Code	Description	Criteria	Logic and	l Value	Parameters		Conditions		Required	Illum.
						time and Throttle Valve Actuator Solenoid Control Circuit and basic enable conditions met and NO Pending or Confirmed DTCs:	= =	3.00 ACTIVE see sheet enable tables see sheet inhibit tables	- - -		
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	< 10.0	0 %	throttle valve controller bypass is active	=	FALSE		fail conditions exists for 10 s monitor runs with 0.005 s	В
			or throttle valve control deviation calculated out of difference between desired and actual value	> -10.0	0 %	throttle valve is driven to a mechanical stop and Throttle Governor Active	=	FALSE TRUE	-	rate whenever enable conditions	
						and Throttle Valve Permanent Control Deviation	=	FALSE	-	are met	
						and Engine Coolant Temperature and	<	198.96	°C		
						Engine Running and	=	TRUE	-		
						basic enable conditions met	=	see sheet enable tables	-		
						NO Pending or Confirmed DTCs:	=	see sheet inhibit tables	-		
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
						basic enable conditions met	=	see sheet enable tables	-		
						analog digital converter error present and NO Pending or Confirmed DTCs:	=	FALSE 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.
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 and	=	TRUE	-		
							SENT frame correctly received and	=	FALSE	-		
							NO Pending or Confirmed DTCs:	=	see sheet inhibit tables	-		
Intake Air Flow	P02EB	Electronic out-put driver	The ECM detects that the commanded				battery voltage	>	11.00	V	fail	В
Valve Control Motor Current Performance		circuitry determines circuit integrity on the intake air flow valve.	state of the driver and the actual state of the control circuit do not match.				for				conditions exists for 2 s monitor runs with 0.005 s	
							time and	>	3.00	sec	rate whenever	
							starter is active cranking for	=	FALSE		enable conditions	
							time and	>	3.00	sec	are met	
							Throttle Valve Actuator Solenoid Control Circuit and	=	ACTIVE	-		
							basic enable conditions met	=	see sheet enable tables	-		
							NO Pending or Confirmed DTCs:	=	see sheet inhibit tables	-		
Engine Misfire	P0300	Indicates engine has	angular acceleration of the crankshaft	<	-1.40	s^(2)	(fail	В
Detected		experienced more than one cylinder misfiring	and				Engine Running (see parameter definition)	=	TRUE	-	conditions exists for 0.02 ms monitor runs	
			evaluated crankshaft revolutions with (a) number of crankshaft revolutions	>=	(a) * (b) 20.00	- counts	and engine speed	>	448.00	rpm	with 0.02 s rate whenever	
			per block (see general description document for details) and with				engine speed	<	1560.00	rpm	enable conditions are met	
			(b) number of test blocks and	=	20.00	counts	and					
			misfires exist on more than one cylinder	=	TRUE	-	(a) - (b)	<	200.00	rpm		

Component /	Fault	Monitor Strategy	Primary Malfunction		Threshold		Secondary		Enable		Time	MIL
System	Code	Description	Criteria	L	ogic and Valu	ie	Parameters		Conditions		Required	Illum.
							(a) actual desired idle speed and with (b) engine speed	=	calculated parameter measured parameter	-		
							and (current injection quantity and current injection quantity)	> <	12.00 400.00	mm^3/rev mm^3/rev		
							and engine coolant temperature and	>=	39.96	°C		
							vehicle speed and	<=	1.86	mph		
							time since start and deletion of error memory (Mode\$4) not executed since last check of the monitoring conditions	>= =	10.00 TRUE	sec -		
							and adaptation value for tooth wheel has been learned and	=	TRUE	-		
							number of detected misfires and	>	140.00	counts		
							basic enable conditions met:	=	see sheet enable tables	-		
							and NO Pending or Confirmed DTCs:	=	see sheet inhibit tables	-		
Cylinder 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 combustion event.	angular acceleration of the crankshaft	<	-1.40	s^(2)	(fail conditions exists for 0.02 s monitor runs with 0.02 s rate whenever	В
			and evaluated crankshaft revolutions	>=	(a) * (b)	-	Engine Running (see parameter definition) and	=	TRUE	-	enable conditions are met	
			with (a) number of crankshaft revolutions per block (see general description document for details)	=	20.00	counts	engine speed and	>	448.00	rpm		
			and with (b) number of test blocks	=	20.00	counts	engine speed) and	<	1560.00	rpm		
							i(a) - (b) with (a) actual desired idle speed	<	200.00 calculated	rpm		

Component / System	Fault Code	Monitor Strategy Description	Primary Malfunction Criteria	L	Threshold ogic and Valu	ıe	Secondary Parameters		Enable Conditions		Time Required	MIL Illum.
9,000		2000	5				(b) engine speed	=	measured parameter	-	rtoquii ou	
							(current injection quantity and	>	12.00	mm^3/rev		
							current injection quantity) and	<	400.00	mm^3/rev		
							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	>	140.00	counts		
							basic enable conditions met:	=	see sheet enable tables	-		
							NO Pending or Confirmed DTCs:	=	see sheet inhibit tables	-		
Cylinder 2 Misfire Detected	P0302	Detects cylinder misfire. The minimum average angle acceleration is calculated every 2 rotations and represents the average angle acceleration that all cly are rotating at after a combustion event.		<	-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		<	1560.00	rpm		
							and (a) - (b) with	<	200.00	rpm		
							(a) actual desired idle speed	=	calculated parameter	-		

Component /	Fault	Monitor Strategy	Primary Malfunction		Threshold		Secondary		Enable		Time	MIL
System	Code	Description	Criteria	L	ogic and Value		Parameters		Conditions		Required	Illum.
							and with (b) engine speed and	=	measured parameter	-		
							(current injection quantity and	>	12.00	mm^3/rev		ļ
							current injection quantity	<	400.00	mm^3/rev		ļ
							and engine coolant temperature	>=	39.96	°C		
		Calculates angle					and vehicle speed and	<=	1.86	mph		
		acceleration after an injection event for the cylinder under test and compares it to the minimum					anu					
		threshold.					time since start	>=	10.00	sec		ļ
							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	>	140.00	counts		
							basic enable conditions met:	=	see sheet enable tables	-		
							and NO Pending or Confirmed DTCs:	=	see sheet inhibit tables	-		
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				Engine Running (see parameter definition)	=	TRUE	-	conditions are met	
			evaluated crankshaft revolutions with (a) number of crankshaft revolutions	>=	(a) * (b) 20.00	counts	and engine speed and	>	448.00	rpm		
			per block (see general description document for details) and with				engine speed	<	1560.00	rpm		
			(b) number of test blocks	=	20.00	counts) and (a) - (b) with	<	200.00	rpm		

Component /	Fault	Monitor Strategy	Primary Malfunction		Threshold		Secondary		Enable		Time	MIL
System	Code	Description	Criteria	L	Logic and Value	Э	Parameters		Conditions		Required	Illum.
							(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					vehicle speed and	<=	1.86	mph		
		cylinder under test and compares it to the minimum threshold.					time since start	>=	10.00	sec		
							deletion of error memory (Mode\$4) not executed since last check of the monitoring conditions and	=	TRUE	-		
							adaptation value for tooth wheel has been learned and	=	TRUE	-		
							number of detected misfires and	>	140.00	counts		
							basic enable conditions met: and	=	see sheet enable tables	-		
							NO Pending or Confirmed DTCs:	=	see sheet inhibit tables	-		
									_			
Cylinder 4 Misfire Detected	P0304	Detects cylinder misfire. The minimum average angle acceleration is calculated every 2 rotations and represents the average angle acceleration that all 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				Engine Running (see parameter definition)	=	TRUE	-	conditions are met	
			evaluated crankshaft revolutions with	>=	(a) * (b)	-	and engine speed	>	448.00	rpm		
			(a) number of crankshaft revolutions per block (see general description document for details)	=	20.00	counts						
			and with (b) number of test blocks	=	20.00	counts	engine speed) and	<	1560.00	rpm		
							and (a) - (b)	<	200.00	rpm		

Component /	Fault	Monitor Strategy	Primary Malfunction		Threshold		Secondary		Enable		Time	MIL
System	Code	Description	Criteria	L	ogic and Valu	e	Parameters		Conditions		Required	Illum.
							with (a) actual desired idle speed and with (b) engine speed and (current injection quantity	= = >	calculated parameter measured parameter	- - mm^3/rev		
							and 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		
							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	-		
Cylinder 5 Misfire Detected		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	
			evaluated cranksnart revolutions 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		

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

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

Component /	Fault	Monitor Strategy	Primary Malfunction		Threshold		Secondary		Enable		Time	MIL
System	Code	Description	Criteria		ogic and Valu		Parameters		Conditions		Required	Illum.
System	Code	Calculates angle acceleration after an injection event for the cylinder under test and compares it to the minimum threshold.	Criteria (b) number of test blocks	= Lc	ogic and Valu	counts		<pre></pre>	200.00 calculated parameter measured parameter 12.00 400.00 39.96 1.86 10.00 TRUE TRUE 140.00 see sheet enable tables see sheet inhibit	rpm mm^3/rev mm^3/rev °C mph sec counts -	Required	Illum.
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.	angular acceleration of the crankshaft and evaluated crankshaft revolutions with (a) number of crankshaft revolutions per block (see general description document for details)	>= =	-1.40 (a) * (b) 20.00	s^(2)	Engine Running (see parameter definition) and engine speed and	= >	TRUE 448.00	- rpm	fail conditions exists for 0.02 ms 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		Logic and Value					Required	Illum.
System	Code	Calculates angle acceleration after an injection event for the cylinder under test and compares it to the minimum threshold.	and with (b) number of test blocks	= 20.00 counts	engine speed) and (a) - (b) with (a) actual desired idle speed and with (b) engine speed and (current injection quantity and current injection quantity) and engine coolant temperature and vehicle speed and time since start and deletion of error memory (Mode\$4) not executed since last check of the monitoring conditions and adaptation value for tooth wheel has been learned and number of detected misfires and basic enable conditions met: and NO Pending or Confirmed DTCs:	<pre></pre>	Conditions 1560.00 200.00 calculated parameter measured parameter 12.00 400.00 39.96 1.86 10.00 TRUE TRUE 140.00 see sheet enable tables see sheet inhibit tables	rpm rpm mm^3/rev mm^3/rev °C mph sec counts -	Required	Illum.
Crankshaft Position System Variation Not Learned		Wheel Learn - Fuel Balance System - Tooth Wheel Variation and Crankshaft Dynamics not learned quickly enough	fuel balance wheel learn complete		fuel system is in fuel cut off engine speed engine speed engine speed	= > <	TRUE 900 2700	rpm rpm	fail conditions exists for 5000 s cumulative time monitor runs	В

Component / Faul System Cod		Primary Malfunction Criteria	Threshold Logic and Value	Secondary Parameters	Enable Conditions		Time Required	MIL Illum.
System	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		Logic and value	fuel balance wheel learn values stored in EEPROM Inhibit Status (no inhibiting faults) (No pending or stored DTC)	= FALSE = see sheet inhibit tables	-	with 1 s rate whenever enable conditions are met	mun.
Crankshaft Position [CKP] Sensor Circuit	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	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)) or starter is active cranking)) and ((vehicle speed or vehicle speed and engine speed)) and basic enable conditions met:	= TRUE = FALSE >= 400.00 = TRUE >= 4.00 = TRUE = TRUE = 0 > 16 > 200.00 = see sheet enable tables	rpm - revs - mph mph rpm	fail conditions exists for more than 6 events monitor runs with 0.1 s rate whenever enable conditions are met	A

Component /	Fault	Monitor Strategy	Primary Malfunction		Threshold		Secondary		Enable		Time	MIL
System	Code	Description	Criteria		Logic and Value	•	Parameters		Conditions		Required	Illum.
Crankshaft Position Sensor Performance	P0336	Detects implausible crankshaft sensor operation by detecting incorrect crank sensor signal patterns.	number of disturbances in crankshaft signal	>=	10.00	counts	Engine Running (see parameter definition)	=	TRUE	-	fail conditions exists for 0.1 s monitor runs	А
			crankshaft signal disturbance detected under the following conditions: Current tooth time period	>	200000.00	us	and ECM has detected reference mark on the crankshaft and	=	FALSE	-	with 0.1 s rate whenever enable	
			Crankshaft tooth counts between detected gaps or	>	68.00	counts	basic enable conditions met:	=	see sheet enable tables	-	conditions are met	
			If gap not expected, ratio of current tooth time to previous tooth time (see Look-Up-Table #18) or	>	1.5 to 2	ratio						
			If gap expected, ratio of current tooth time to previous tooth time (see Look-Up-Table #17)	>	3.38 to 8	ratio						
			with increment	=	1.00	counts						
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	=	TRUE		fail conditions exists for 0.01 s test performed	А
							and basic enable conditions met:	=	see sheet enable tables	-	continuously 0.01 s rate	
	_					_				_		
Camshaft Position [CMP] Sensor Performance	P0341	Detects implausible camshaft sensor operation by detecting incorrect cam sensor patterns	number of camshaft edges	>	4	counts	ECM has detected reference mark on the crankshaft and	=	TRUE	-	fail conditions exists for	В
							basic enable conditions met:	=	see sheet enable tables	-	more than 6 events test performed continuously 0.01 s rate	

Component /	Fault	Monitor Strategy	Primary Malfunction	Threshold	Secondary	Enable	Time	MIL
System Glow Plug/Heater Indicator Control Circuit/Open	P0381	Description Diagnoses the Glow Lamp Circuit high side driver circuit for circuit faults.	Criteria Voltage high during driver off state (open circuit)	Logic and Value	and battery voltage for time and Basic enable conditions met:	Conditions	Required fail conditions exists for 0.2 s monitor runs with 0.01 s rate whenever enable conditions are met	Illum. B
		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	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	
		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:	= TRUE > 11.00 V > 3.00 sec = see sheet enable - tables	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.
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	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	controller deviation of the exhaust gas recirculation (EGR) - calculated out of desired and actual value	^	(a)*(b)	-	(fail conditions exists for 10 s monitor runs	В
		flowing.	with (a) Minimum Controller Deviation (see Look-Up-Table #12)	=	-1.2 to -0.56	g/rev	EGR controller is active and	=	TRUE		0.02 s rate whenever enable conditions	
			(b) Environmental Pressure correction factor (see Look-Up-Table #8)	=	0.71 to 1	factor	change of injection quantity between actual and last received value	<	40.00	(mm^3/rev) /sec	are met	
							for time and	=	0.25	sec		
							change of engine speed between actual and last received value	<	50.00	rpm/sec		
							for time and	=	0.50	sec		
							VGT offset learning is active	=	FALSE	-		
							maximum setpoint for air-mass flow (see Look-Up-Table #9) and	>	0.8 to 1.2	g/rev		
							Engine speed Engine speed	<= >=	1000.00 500.00	rpm rpm		
							and Torque generating commanded engine	<=	72.00	mm^3/rev		
						fuel injection quantity Torque generating commanded engine fuel injection quantity	>=	4.00	mm^3/rev			
						and setpoint valve position of exhaust-gas recirculation and	>	5.00	%			
							throttle position	<	5.00	%		
							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.
							NO Pending or Confirmed DTCs:	=	see sheet inhibit tables	-		
							for time	>=	5.00	sec		
Exhaust Gas Recirculation(EGR) Flow Excessive	P0402	Detects excessive EGR flow. Actual MAF readings are compared to desired MAF values as an indication	controller deviation of the exhaust gas recirculation (EGR) - calculated out of desired and actual value	>	(a)*(b)	-	(fail conditions exists for 8 s monitor runs	В
		of how much EGR is flowing.	with (a) Maximum Controller Deviation (see Look-Up-Table #10) (b) Environmental Pressure correction	=	0.4 to 0.6	g/rev factor	EGR controller is active and change of injection quantity between	=	TRUE 40.00	- (mm^3/rev)	0.02 s rate whenever enable conditions are met	
			factor	=	ı	iacioi	actual and last received value for time	=	0.25	/sec sec		
							and change of engine speed between actual and last received value for time	<	50.00 0.50	rpm/sec		
							and VGT offset learning is active	=	FALSE	sec -		
							maximum setpoint for EGR mass flow and Engine speed	<	1.00 1400.00	g/rev		
							Engine speed and	<= >=	1000.00	rpm rpm		
							Torque generating engine fuel injection quantity Torque generating engine fuel injection quantity	<= >=	200.00	mm^3/rev mm^3/rev		
							and basic enable conditions met:	=	see sheet enable tables	-		
							and NO Pending or Confirmed DTCs:	=	see sheet inhibit tables	-		
							for time	>=	1.00	sec		
Exhaust Gas Recirculation (EGR) Motor Control Circuit	P0403	Diagnoses the EGR Valve low side driver circuit for circuit faults.	Voltage low during driver off state (indicates short-to-ground)	=	Short to ground: ≤ 0.5 Ω impedance between signal and controller ground	-	EGR Solenoid Control Circuit	=	ACTIVE	-	fail conditions exists for 7 s monitor runs with 0.005 s rate whenever	В
							and offset learning for EGR valve is completed and battery voltage	= >	TRUE 11.00	- V	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.
				· ·	for time and starter is active cranking for time and starter and time and basic enable conditions met: and NO Pending or Confirmed DTCs:	> 3.00 = FALSE > 3.00 = see sheet enable tables = see sheet inhibit tables		
			The ECM detects that the commanded state of the driver and the actual state of the control circuit do not match.		and offset learning for EGR valve is completed and battery voltage for time and starter is active cranking for time and basic enable conditions met: and NO Pending or Confirmed DTCs:	= ACTIVE = TRUE > 11.00 > 3.00 = FALSE > 3.00 = see sheet enable tables = see sheet inhibit tables	fail conditions exists for 3 s monitor runs with 0.005 s rate whenever enable conditions are met	В
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		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

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 High Voltage	P0406	Detects high voltage readings on the EGR position circuit, indicating an OOR high condition on the EGR position circuit	raw voltage of EGR actuator position sensor same as EGR actuator position	>	4.80 127	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 0.005 s rate	A
						_				_		
Exhaust Gas Recirculation(EGR) Temperature Sensor A Circuit Low Voltage	P040C	Detects low voltage readings on the EGR cooler temperature circuit, indicating an OOR low condition on the EGR cooler temperature 2 circuit	EGR temperature sensor 2 voltage same as EGR sensor 2 temperature	>	220	V °C	time since engine start and engine coolant temperature and	> <	0.00 199.96	sec °C	fail conditions exists for 5 s monitor runs 0.05 s rate whenever enable conditions are met	В
							ambient temperature and	>	-60.04	°C		
							ambient pressure and	>	20.00	kPa		
							setpoint valve position of exhaust-gas recirculation and setpoint valve position of exhaust-gas recirculation	>	-100.00 200.00	%		
							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:	=	see sheet enable tables	-		
							and NO Pending or Confirmed DTCs:	=	see sheet inhibit tables	-		
Exhaust Gas	P040D	Detects high voltage	EGR temperature sensor 2 voltage	>	4.84	V	 /				fail	В
Exhaust Gas Recirculation(EGR) Temperature Sensor A Circuit High Voltage	F040D	Detects high voltage readings on the EGR temperature cooler circuit, indicating an OOR high condition on the EGR cooler temperature 2 circuit	EGN temperature sensor 2 voltage	>	4.04	V					conditions exists for 5 s monitor runs 0.05 s rate whenever enable	D

Component /	Fault	Monitor Strategy	Primary Malfunction	_	Threshold		Secondary		Enable		Time	MIL
System	Code	Description	Criteria		Logic and Value		Parameters		Conditions		Required	Illum.
·			same as EGR sensor 2 temperature	<	-50	°C	time since engine start and engine coolant temperature	>	0.00 -60.04	sec °C	conditions are met	
							and ambient temperature	>	-60.04	°C		
							and 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	-		
							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	-		
							and NO Pending or Confirmed DTCs:	=	see sheet inhibit tables	-		
Exhaust Gas Recirculation(EGR) Temperature Sensor Correlation (EGR 1/ EGR 2)	P040F	Detects biased EGR temperature sensors by comparing the two EGR cooler temp sensor after an engine off soak time	Path 1:				minimum engine-off time	>=	28800.00	sec	fail conditions exists for 0.1 s monitor runs	В
(LOIC II LOIC 2)		engine on soak time									with 0.1 s	
			(a) - (b) (see Look-Up-Table #4) with	>	100 to 999	°C	and ambient temperature	>	-60.04	°C	rate whenever	
	(a) captu tempera and with	(a) captured EGR sensor 2 temperature at start	=	measured parameter	-	and				enable conditions		
						Engine Running (see parameter definition)	=	TRUE	-	are met		
			(b) captured EGR sensor 1 temperature at start or	=	measured parameter	-	for time	>	0.00	sec		
			Path 2:				and engine post drive/ afterun	=	FALSE			
			((a) - (b) (see Look-Up-Table #4)	<=	100 to 999	°C	and diagnostic performed in current dc	=	FALSE			
			with (a) captured EGR sensor 2	=	measured		and basic enable conditions met:	=	see sheet enable	-		
			temperature at start and with		parameter		and		tables			

Component /	Fault	Monitor Strategy	Primary Malfunction Criteria		Threshold		Secondary		Enable Conditions		Time	MIL
System	Code	Description	(b) captured EGR sensor 1	=	Logic and Value measured	-	Parameters NO Pending or Confirmed DTCs:	=	Conditions see sheet inhibit	_	Required	Illum.
			temperature at start	=	parameter	-	NO Fending of Confinition DTCs.	_	tables	-		
			(a) - (b) (see Look-Up-Table #7) with	>	20 to 999	°C						
			(a) captured EGR sensor 2	=	measured	-						
			temperature at start		parameter							
			and with (b) captured EGR sensor 1	=	measured	_						
			temperature at start	-	parameter							
			and		·							
			t status of block heater (see parameter definition) or	=	FALSE	-						
			status of sun-load detection (see parameter definition)	=	FALSE	-						
)									
5.10	D0110		1500		2.42	.,				_		
Exhaust Gas Recirculation(EGR	P041C	Detects low voltage readings on the EGR cooler	voltage of EGR temperature sensor 1	<	0.46	V	(fail conditions	В
Temperature		temperature circuit,									exists for 5 s	
Sensor B Circuit		indicating an OOR low									monitor runs	
Low Voltage		condition on the EGR cooler temperature 1 circuit									0.05 s rate whenever	
			same as EGR sensor 1 temperature		220	°C	time since engine start and	>	0.00	sec	enable conditions	
			EGR Sensor i temperature	>	220	C	engine coolant temperature	<	199.96	°C	are met	
							ambient temperature and	>	-60.04	°C		
							ambient pressure	>	20.00	kPa		
							and (
							setpoint valve position of exhaust-gas recirculation	>	-100.00	%		
							and setpoint valve position of exhaust-gas recirculation	<	200.00	%		
) and					
							Engine Running (see parameter definition) and	=	TRUE	-		
							valve position of EGR cooler bypass and	>	-100.00	%		
							valve position of EGR cooler bypass)	<	200.00	%		
							and basic enable conditions met:	=	see sheet enable tables	-		
							NO Pending or Confirmed DTCs:	=	see sheet inhibit tables	-		

Component /	Fault	Monitor Strategy	Primary Malfunction		Threshold		Secondary		Enable		Time	MIL
System	Code	Description	Criteria		Logic and Va	lue	Parameters		Conditions		Required	Illum.
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 enable	В
			same as EGR sensor 1 temperature	<	-50	°C	time since engine start and engine coolant temperature and ambient temperature and ambient pressure and (setpoint valve position of exhaust-gas recirculation and setpoint valve position of exhaust-gas recirculation) and Engine Running (see parameter definition) and current injection quantity and (valve position of EGR cooler bypass and valve position of EGR cooler bypass)) for time and basic enable conditions met: and NO Pending or Confirmed DTCs:	> > > < = > > < = = = = = = = = = = = =	0.00 -60.04 -60.04 20.00 -100.00 200.00 TRUE 0.00 -100.00 200.00 0.00 see sheet enable tables see sheet inhibit tables	sec °C kPa % % - mm^3/rev % sec	enable conditions are met	
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	-	(Modeled HC mass converted in the oxidation catalyst since monitor start means	>	140.00	g	fail conditions exists for more than 0.1 seconds monitor runs once per driving cycle with 0.1 s rate whenever enable conditions are met	В

Component /	Fault	Monitor Strategy	Primary Malfunction	Threshold	Secondary		Enable		Time	MIL
System	Code	Description	Criteria	Logic and Value	Parameters Converted HC mass model uses		Conditions		Required	Illum.
					commanded fuel quantity, DOC temperature, and exhaust gas mass flow as inputs					
					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 and	>	0.00	kJ		
					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)) and	=	FALSE	-		
					there has been sufficient HC integrated in order to evaluate the monitor conversion efficiency. means	=	TRUE	-		
					particulate filter regeneration) land	=	TRUE	-		
					measured temperature upstream of the oxidation catalyst and	>	249.96	°C		
					engine speed and	>	700.00	rpm		
					engine speed) and	<	3400.00	rpm		
					diagnostic performed in current dc and reset condition	=	FALSE FALSE	-		
					which becomes False under following conditions					
					converted HC mass in the oxidation catalyst during monitoring calculated by integrating the amount of fuel injected by the HCI (Hydro-Carbon Injector)	<	140.00	g		

Component / System	Fault Code	Monitor Strategy Description	Primary Malfunction Criteria	ı	Threshold Logic and Value		Secondary Parameters		Enable Conditions		Time Required	MIL Illum.
							or particulate filter regeneration or regeneration was not aborted to assure that HC conversion was disturbed and NO Pending or Confirmed DTCs:) and basic enable conditions met:	= =	FALSE TRUE see sheet inhibit tables see sheet enable tables			
Primary Fuel Sensor Performance	P0461	Detects an error in the primary fuel tank sensor performance by comparing the decrease of the fuel level for a certain driven mileage to a threshold.	(a) - (b) with (a) total vehicle distance and with (b) change in mileage and (c) - (d) with (c) maximum volume of fuel reached in primary tank during driving cycle and with (d) minimum volume of fuel reached in primary tank during driving cycle	>= = < = =	measured parameter calculated parameter 4.00 measured parameter measured parameter	miles	Engine Running for time and fuel transfer pump active means (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) and filtered fuel volume in secondary tank for time and cumulative transfer pump on time in current ignition cycle) and fuel level zone 3 means (filtered fuel volume in primary tank and filtered fuel volume in secondary tank	= >= = >	0.00 TRUE 1638.35 0.00 TRUE 137.40 0.00	sec - I sec sec - I I	fail conditions exists for 0.02 s monitor runs 0.02 s rate whenever enable conditions are met	В

Component / System	Fault Code	Monitor Strategy Description	Primary Malfunction Criteria	Threshol Logic and V		Secondary Parameters		Enable Conditions		Time Required	MIL Illum.
Jysteili	Code	Description	Gineria	Logic and V	aa MC	fuel level zone 4 means (filtered fuel volume in primary tank and filtered fuel volume in secondary tank) and basic enable conditions met: and NO Pending or Confirmed DTCs:	= <= = =	TRUE 137.40 0.00 see sheet enable tables see sheet inhibit tables	- 1 1	regared	mun.
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	ignition on and basic enable conditions met:	=	TRUE see sheet enable tables		fail conditions exists for 24 s test performed continuously 0.1 s rate	В
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 and basic enable conditions met:	=	TRUE see sheet enable tables		fail conditions exists for 24 s test performed continuously 0.1 s rate	В
Exhaust Gas Recirculation (EGR) Position Sensor Performance	P046C	Detects in range EGR valve position errors by comparing desired EGR position to actual EGR valve position	controller deviation of EGR valve calculated out of difference between desired and actual value	5.00	%	offset learning of EGR actuator active	=	FALSE	-	fail conditions exists for 8 s monitor runs with 0.02 s rate	В

Component / System	Fault Code	Monitor Strategy Description	Primary Malfunction Criteria	Threshold Logic and Value		Secondary Parameters		Enable Conditions		Time Required	MIL Illum.
,			controller deviation of EGR valve calculated out of difference between desired and actual value	<= -5.00	%	offset learning in the previous driving cycle was complete	=	TRUE	-	whenever enable conditions	
						and Engine Running and	=	TRUE	-	are met	
						duty cycle of the Intake Air Heater output	<	5.00	%		
						and battery voltage and	>=	11.00	V		
						EGR Valve	=	ACTIVE	-		
						EGR Valve Jammed and	=	FALSE	-		
						NO Pending or Confirmed DTCs:		see sheet inhibit tables	-		
						basic enable conditions met:		see sheet enable tables	-		
0	D0 400	T1 '- 1' 1' 1 1 1	The FOM have death and			La transition of the same		44.00	.,,	6.2	
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	>	11.00	V	fail conditions exists for 3 s	В
						for time and	>	3.00	sec	test performed continuously	
						starter is active cranking for	=	FALSE	-	0.02 s rate	
						time and ignition on	> =	3.00 TRUE	sec -		
						and basic enable conditions met:	=	see sheet enable	-		
								tables			
		This diagnostic checks the	The ECM detects that the commanded			battery voltage	>	11.00	V	fail	
		circuit for electrical integrity during operation.	state of the driver and the actual state of the control circuit do not match.						-	conditions exists for 1 s	
						for time and	>	3.00	sec	test performed continuously	
						starter is active cranking for	=	FALSE	-	0.02 s rate	
						time and	>	3.00	sec		
	I	I	I			ignition on	=	TRUE	-		

Component / System	Fault Code	Monitor Strategy Description	Primary Malfunction Criteria		Threshold Logic and Value		Secondary Parameters		Enable Conditions		Time Required	MIL Illum.
							and basic enable conditions met:	=	see sheet enable tables	-		
Cooling Fan System Performance	P0483	Detects inability to control fan speed to desired RPM	fan speed difference between actual and commanded value	<=	-500.00	rpm	PWM of fan driver output	>=	28.00	%	fail conditions exists for	В
			or fan speed difference between actual and commanded value or fan speed difference between actual and	>=	500.00	rpm	and Commanded fan speed and	>=	999.00	rpm	120 s monitor runs with 0.1 s rate whenever	
			commanded value, unfiltered or fan speed difference between actual and commanded value, unfiltered	>=	500.00	rpm	fan input speed means	<	5320.00	rpm	enable conditions are met	
							Fan input speed is calculated by the engine speed * the pulley ratio and fan input speed means Fan input speed is calculated by the engine speed * the pulley ratio	>	400.00	rpm		
) and engine coolant temperature	>	69.96	°C		
							and fan drive speed rate of change and	<	2000.00	rpm		
							fan speed weight factor calculated out of ((a) * (b) * (c) * (d) with (a) factor based on input shaft stability	> =	0.59 0 to 1	factor		
							(see Look-Up-Table #32) and with (b) factor based on intake air temperature (see Look-Up-Table #35)	=	0 to 1	factor		
							and with (c) factor based on engine coolant temperature (see Look-Up-Table #34)	=	0 to 1	factor		
							and with (d) factor based on fan drive speed (see Look-Up-Table #33))	=	0 to 1	factor		
							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.
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:	> > =	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
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) for Error counter	>=	400 to 1500 800.00	rpm	fluid volume in Clutch (see Look-Up-Table #37) 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.	<	0.005 to 0.0115	ı	fail conditions exists for 0.02 s monitor runs with 0.1 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.
			equivalent to 80 sec				Maximum allowed clutch pump out time when { input fan speed means Fan input speed is calculated by the engine speed * the pulley ratio	>=	600 to 65534 1500.00	rpm		
							and (PWM of fan driver output and Commanded fan speed) and	<= <	45.00 600.00	% rpm		
							ambient pressure and intake air temperature and	> >	55.00 -40.04	kPa °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 threshold.	Path 1:				offset learning is active	=	TRUE	-	fail conditions exists for 0.005 s monitor runs with 0.005 s rate	В
		anconola.	(a) - (b) with (a) maximum learned offset value for EGR valve and with	> =	30.00 measured parameter	%	active under following conditions (engine coolant temperature and	>=	5.06	°C	whenever enable conditions are met	
		Only the closed position is learned.	(b) minimum learned offset value for EGR valve or	=	measured parameter	-	engine coolant temperature)	<=	130.06	°C		

omponent /	Fault	Monitor Strategy	Primary Malfunction		Threshold		Secondary		Enable		Time	
System	Code	Description	Criteria	L	ogic and Value		Parameters		Conditions		Required	
rstem	Code	Description 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. The maximum and minimum learned offset referrs to the maximum and minimum learned values of the 3 learns performed within total learn procedure.		> <	23.33 -23.33	%	parameters and (battery voltage and battery voltage) and 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	>= <= =	10.00 30.00 TRUE	V V	Required	
							complete. and engine post drive/ afterun and engine was running during last driving cycle means engine running during last driving cycle and	= =	TRUE TRUE TRUE	-		
							NO Pending or Confirmed DTCs: and basic enable conditions met:	=	see sheet inhibit tables see sheet enable tables			
		Detects a jammed EGR valve during opening or closing the valve.	Path 1:				Path 1:				fail conditions exists for	

Component /	Fault	Monitor Strategy	Primary Malfunction		Threshold		Secondary		Enable		Time	MIL
System	Code	Description	Criteria		Logic and Value		Parameters		Conditions		Required	Illum.
-5,5			means ((a) + (b) with (a) position of EGR valve and with (b) learned offset value of EGR valve	>= =	20.01 measured parameter measured	% -	or Path 2: EGR valve is closing and engine post drive/ afterun and offset learning active	= =	TRUE TRUE TRUE	-	monitor runs with 0.005 s rate whenever enable conditions are met	
			in the previous driving cycle or (a) - (c) with	<=	parameter 0.01	%	and basic enable conditions met:		see sheet enable tables	-		
			(a) position of EGR valve and with (c) position of EGR valve of previous	=	measured parameter measured	-						
			process cycle (refers to last measured valve position in the previous raster calculation)		parameter							
			for time or Path 2: EGR valve stuck during closing	>	5.00 TRUE	sec -						
			means (position of EGR valve with	= <=	(a) * (b)	-						
			(a) reference position of the EGR valve in open position and with (b) factor for EGR valve close	=	measured parameter 0.50	- factor						
			position or (c) - (d)	>	0.02	%						
			with (c) position of EGR valve and with	=	measured parameter	-						
			(d) 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						
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	=	TRUE	-	fail conditions exists for 20 s monitor runs	В
			with (a) minimum engine speed	=	300.00	rpm	and (with 0.1 s rate	

Component /	Fault	Monitor Strategy	Primary Malfunction		Threshold		Secondary		Enable		Time	MIL
System	Code	Description	Criteria		Logic and Value		Parameters		Conditions		Required	Illum.
			and with (b) minimum idle speed setpoint (see table #91 for commanded) minimum idle speed and with	=	calculated parameter	-	engine coolant temperature and engine coolant temperature	>	-7.04 129.96	°C	whenever enable conditions are met	
			(c) factor for calculation of engine speed interval	=	24.00	%	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 no other torque demanding function active means no torque demand based on accelerator pedal input	=	1.86 TRUE	mph -		
							and setpoint torque of the speed controller and	>	0	NM		
							measured engine speed and basic enable conditions met:	>	300.00	rpm		
							and	=	see sheet enable tables	-		
							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 with 0.1 s	В
			(a) maximum engine speed and with (b) minimum idle speed setpoint (see table #91 for commanded) minimum idle speed	=	2500.00 calculated parameter	rpm -	(engine coolant temperature and	>	-7.04	°C	rate whenever enable conditions	
			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	=	TRUE	-		

Component / System	Fault Code	Monitor Strategy Description	Primary Malfunction Criteria	L	Threshold ogic and Value		Secondary Parameters		Enable Conditions		Time Required	MIL Illum.
Speed Sensor							no torque demand based on accelerator pedal input and setpoint torque of the speed controller and measured engine speed and basic enable conditions met: and NO Pending or Confirmed DTCs:	> > =	0 300.00 see sheet enable tables see sheet inhibit tables	NM rpm - -		
Cooling Fan Speed Sensor Circuit	P0526	This diagnostic checks the circuit for electrical integrity during operation.	Path 1: period is too long to measure and (> =	0.21 TRUE 0.21 TRUE	sec -	engine speed and { (PWM of fan driver output and Commanded fan speed) for time or vehicle speed for time }	>= >= >= > < >	550.00 45.00 0.00 30.00 203.65 327.67	rpm % rpm sec mph sec	fail conditions exists for 3 s monitor runs with 0.020 s rate whenever enable conditions are met	В
Exhaust Gas	DOEAE	Detacts law relices	voltogo of the temperature concer		0.65		and basic enable conditions met: and NO Pending or Confirmed DTCs:	=	see sheet enable tables see sheet inhibit tables		fail	В
Exhaust Gas Temperature (EGT) Sensor 1 Circuit Low Voltage	P0545	Detects low voltage readings on the EGT 1 circuit, indicating an OOR low condition on the EGT circuit	voltage of the temperature sensor upstream of oxidation catalyst same as temperature upstream of oxidation catalyst	<	-50	v °C	NO Pending or Confirmed DTCs: for time and ignition on and basic enable conditions met:	> =	o.00 TRUE see sheet enable tables	sec	rail conditions exists for 3 s monitor runs 0.050 s rate whenever enable conditions are met	B

Component / System	Fault Code	Monitor Strategy Description	Primary Malfunction Criteria		Threshold Logic and Value		Secondary Parameters		Enable Conditions		Time Required	MIL Illum.
Exhaust Gas Temperature (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 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 quantity (map) factor for calculating the minimum threshold out of the reference map Neutral 46.0 to 161.6	ev	AND Vehicle speed AND Particulate filter regeneration AND Engine speed AND Engine speed AND Idle speed controller all for time 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) AND Basic enable conditions met	= <= = > = > <	unchanged 1.86 not active 1040.00 448.00 -20.04 active 5.00 16383.50 see sheet enable tables	rpm rpm °C - sec rpm	fail conditions exists for 15 s monitor runs 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.
	P054F	Quantity Threshold - Fuel Quantity Higher Than Expected	with Current gear and maximum expected injection quantity (see Look-Up-Table #50) and factor for calculating the maximum threshold out of the reference map)	∀ = =	maximum expected injection quantity (map) factor for calculating the maximum threshold out of the reference man Neutral 122.8 to 244.4	mm^3/r ev factor	Current gear AND Vehicle speed AND Particulate filter regeneration AND Engine speed AND Engine speed AND Engine speed AND Engine coolant temperature AND Idle speed controller all for time) 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) AND Basic enable conditions met	= <= > = > <	unchanged 1.86 not active 1040.00 448.00 -20.04 active 5.00 16383.50	- mph rpm rpm °C - sec rpm	fail conditions exists for 15 s monitor runs 0.2 s rate whenever enable conditions are met	В
Cruise Control Multi-Function Input "A" Circuit	P0564	Cruise switch status indicated not in "between range" for calibrated period of time.	Set Switch CAN message value "Between Ranges"	-	9		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 5 sec monitor runs with 0.005 s rate whenever enable conditions are met	Special C

Component / System	Fault Code	Monitor Strategy Description	Primary Malfunction Criteria	Threshold Logic and Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
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	Special C
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	Special C
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	Special C
Cruise Control "Cancel" Signal	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 -	ignition on and input circuit active and	= TRUE - = TRUE -	fail conditions exists for 20s monitor runs with 0.005 s rate whenever enable	Special C

Component /	Fault	Monitor Strategy	Primary Malfunction		Threshold		Secondary		Enable		Time	MIL
System	Code	Description	Criteria		Logic and Value	e	Parameters basic enable conditions met	=	Conditions see sheet enable	-	Required	Illum.
							and NO Pending or Confirmed DTCs:	=	tables see sheet inhibit tables	-	conditions are met	
									tablee			
Cruise Control Input Circuit	P0575	Cruise control CAN communication monitoring	amount of errors in consecutive frames	>=	3.00	counts	ignition on	=	TRUE	-	fail conditions	Special C
			with number of consecutive frames	=	10.00	counts	and input circuit active and	=	TRUE	-	exists for 0.005 s monitor runs	
							basic enable conditions met	=	see sheet enable tables	-	with 0.005 s rate	
							and NO Pending or Confirmed DTCs:	=	see sheet inhibit tables	-	whenever enable conditions are met	
					_	_		_		_		
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)	<=	0.40	factor	following conditions for time:	>	4	sec	monitor runs 0.02 s rate whenever enable conditions	А
			where (a) maximum analog brake sensor raw voltage during test (b) minimum analog brake sensor raw	=	calculated parameter calculated	V V	ignition on	=	TRUE	-	are met	
			voltage during test where difference of the brake sensor voltage corresponds to a corrected value of (see Look-Up-Table #14)	=	parameter 0 to 1	factor	starter is active cranking for	=	FALSE	-		
							time and	>	3.00	sec		
							battery voltage for	>	11.00	V		
							time) and	>	3.00	sec		
							gear has been in Park during this driving cycle	=	TRUE	-		
							full test has not been completed this driving cycle gear selector currently not in Park	=	TRUE TRUE	-		
							vehicle speed accelerator pedal position 1 and	= >= <	4.35 5.00	mph %		
							No Pending or Confirmed DTCs: and	=	see sheet inhibit tables	-		

Component / System	Fault Code	Monitor Strategy Description	Primary Malfunction Criteria	Threshold Logic and Value	Secondary Parameters	Enable Conditions	Time MIL Required Illum.
					basic enable conditions met:	= see sheet enable - tables	
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	fail A conditions exists for 0.5 s monitor runs 0.01 s rate whenever enable conditions are met
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	fail A conditions exists for 0.5 s monitor runs 0.01 s rate whenever enable conditions are met
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	fail conditions exists for 20s monitor runs with 0.005 s rate whenever enable conditions are met
Cruise Control Multi-Function Input "A" Circuit High	P0581	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	= TRUE - = TRUE -	fail Special C conditions exists for 2.5s monitor runs with 0.005 s rate

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	whenever enable conditions	
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	
Control Module Not Programmed	P0602	Detects if the ECM is programmed.	ECM not programmed	= TRUE -	ignition on and engine pre drive		TRUE -	conditions exists for	9

Component /	Fault	Monitor Strategy	Primary Malfunction		Threshold		Secondary		Enable		Time	MIL
System	Code	Description	Criteria		ogic and Value		Parameters		Conditions		Required	Illum
Control Module Internal Performance	P0606	Monitors and detects the improper operation of the ECM. This is accomplished by monitoring the output of various hardware modules within the ECM and by creating parallel redundant calculations of critical engine management system parameters. 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		ignition on and basic enable conditions met:	=	TRUE		fail conditions exists for 0.5 s test performed continuously with 0.01 s rate	A
					_	_			tables			
			faults detected in the SPI communication	>		ounts	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 monitor runs 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	>		V	ignition on and counter of reactivation attempt of power output stage and	>=	TRUE 2.00	counts	fail conditions exists for 0.08s	

Component / System	Fault Code	Monitor Strategy Description	Primary Malfunction Criteria		Threshold Logic and Valu	e	Secondary Parameters		Enable Conditions		Time Required	MII
-,							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	ma
			(a) - (b)	>	50.00	usec	programmed energizing time for fuel	=	TRUE		fail	
			with		30.00	usco	injection has been read back	_	THOL		conditions	
			(a) parallel redundant calculation of energizing time for fuel injection and with	=	calculated parameter	-	means programmed energizing time for fuel injection and	>=	0	-	exists for at least 0.05 s monitor runs with 0.01 s	
			(b) parallel redundant calculation of programmed energizing time for fuel injection	=	calculated parameter	-	measured energizing time for fuel injection has been read back	=	TRUE	-	rate whenever enable	
							means measured energizing time for fuel injection and	>=	0	-	conditions are met	
							engine speed and	>	1200.00	rpm		
							rail pressure	>	20000.00	kPa		
							and engine test active via diagnosis tester and	=	FALSE	-		
			Doth 1.				angina angad		1200.00	rin ma	foil	
			Path 1:				engine speed and	>	1200.00	rpm	fail conditions	
			parallel redundant calculation of angle for pilot injection 1 quantity or	<	-32.98	degrees	engine test active via diagnosis tester	=	FALSE	-	exists for at least 0.05 s monitor runs	
			parallel redundant calculation of angle for pilot injection 1 quantity) or Path 2:	>	102.99	degrees					with 0.01 s rate whenever enable conditions	
			(parallel redundant calculation of angle for main injection quantity	<	-32.98	degrees					are met	
			or parallel redundant calculation of angle for main injection quantity)	>	43.53	degrees						
			or Path 3:									
			parallel redundant calculation of angle for post injection quantity 1 or	<	-360.00	degrees						

Component /	Fault	Monitor Strategy	Primary Malfunction		Threshold		Secondary		Enable		Time	
System	Code	Description	Criteria		Logic and Valu	ıe	Parameters		Conditions		Required	
			parallel redundant calculation of angle for post injection quantity 1) or Path 4:	>	-67.00	degrees						
			(parallel redundant calculation of angle for post injection quantity 2 or	<	-83.00	degrees						
			or parallel redundant calculation of angle for post injection quantity 2) or	>	43.53	degrees						
			Path 5:									
			parallel redundant calculation of angle for post injection quantity 3	<	-83.00	degrees						
			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)	>	200 to 6000	us	fuel system is in fuel cut off (see parameter definition line #189)	=	TRUE	•	fail conditions exists for at least 0.8 s	

Component / System	Fault Code	Monitor Strategy Description	Primary Malfunction Criteria		Threshold Logic and Val	110	Secondary Parameters		Enable Conditions		Time Required	MI
System	Code	Description	and		Logic and Van	uc	for		Conditions		monitor runs	1110
			activation counter (intervention) of the surge damper	>=	74.00	counts		>	0.65	sec	with 0.04 s rate	
							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	engine test is active via diagnosis tester	=	FALSE	-	monitor runs with 0.04 s rate	
			parallel redundant calculation of averaged wave correction quantity for post injection 2 or	>=	7.50	mm^3					whenever enable conditions are met	

Component /	Fault	Monitor Strategy	Primary Malfunction		Threshold		Secondary		Enable		Time
System	Code	Description	Criteria		Logic and Valu		Parameters		Conditions		Required
			parallel redundant calculation of averaged wave correction quantity for post injection 3	>=	7.50	mm^3					
			(rail pressure	<=	16000.00	kPa	(parallel redundant calculation of voltage of rail pressure sensor	<	0.19	V	fail conditions exists for
			or rail pressure	>=	204000.00	kPa	or parallel redundant calculation of voltage of rail pressure sensor)	>	4.81	V	0.120 s 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
			or internal supply voltage	>	5.25	V					conditions exists for 0.05 s test performed continuously with 0.01 s rate
			WDA (watch dog) shut off due to	=	TRUE		shut off path test active	=	FALSE		fail
			undervoltage means				and			.,	conditions exists for
			internal supply voltage	<	4.2	V	battery voltage for time	>	8.00 0.10	V sec	0.01 s monitor runs with 0.01 s
							and WDA (watch daog) line active	=	TRUE		rate whenever enable conditions are met
			WDA (watch dog) shut off due to	=	TRUE		shut off path test active	=	FALSE		fail conditions
			overvoltage means				and				exists for

Component / System	Fault Code	Monitor Strategy Description	Primary Malfunction Criteria	Threshold Logic and Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,							monitor runs with 0.01 s rate 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	

Component / System	Fault Code	Monitor Strategy Description	Primary Malfunction Criteria		Threshold Logic and Value		Secondary Parameters		Enable Conditions	Time Required	MIL Illur
		2000,								conditions are met	
			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 and (voltage accelerator pedal 1 or voltage accelerator pedal 2)) or Path 2: [(maximum (a) (b)) - 2 * (maximum (c) (b))] with (a) voltage accelerator pedal 1 and with (a) voltage accelerator pedal 1 and with (b) lower limit for accelerator pedal voltage and with (c) voltage accelerator pedal 2 and (voltage accelerator pedal 1 or voltage accelerator pedal 2	> > >	0.29 0.95 1.45 1.45 0.41 0.95	v v v v v 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	
			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	

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

Component /	Fault	Monitor Strategy	Primary Malfunction	Threshold	Secondary	Enable	Time MII
System	Code	Description	Criteria	Logic and Value	Parameters	Conditions	Required Illui
			too few bytes received by monitoring module from CPU means bytes received by monitoring module from CPU as response	= TRUE - < 4 Bytes	ignition on	= TRUE -	
			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

Component / System	Fault Code	Monitor Strategy Description	Primary Malfunction Criteria		Threshold Logic and Value	9	Secondary Parameters		Enable Conditions		Time Required	MIL Illum.
			redundant filtered supply voltage to injector chip 1 or redundant filtered supply voltage to injector chip 1	>	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	
			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	

Component / System	Fault Code	Monitor Strategy Description	Primary Malfunction Criteria		Threshold Logic and Valu	e	Secondary Parameters		Enable Conditions	Time Required are met	MIL Illum.
			piezo injector actuator internal feedback voltage or piezo injector actuator internal feedback voltage	>	0.00 3.30	V	main injection	=	ACTIVE	- fail conditions exists for more than 0.1 s monitor runs with 0.01 s rate whenever enable conditions are met	
			Path 1: engine speed or Path 2: engine speed	>	1500.00 1600.00	rpm	injection cut off demand from ECM internal monitoring	=	TRUE	- fail conditions exists for 0.02 s test performed continuously with 0.02 s	
			security torque limitation request due to implausible air system control requests	=	TRUE		ignition on	=	TRUE	- fail conditions exists for more than 533 events test performed continuously with 0.01 s	
			security torque limitation request due to implausible rail pressure request	=	TRUE	•	ignition on	=	TRUE	- fail conditions exists for more than 533 events test performed continuously with 0.01 s	

Component / System	Fault Code	Monitor Strategy Description	Primary Malfunction Criteria	Thres Logic an		Secondary Parameters		Enable Conditions			MII
			security torque limitation request due to implausible quantity setpoint control requests	= TRI	JE -	ignition on	=	TRUE	conc exis more 533 e te perfo contir	fail ditions sts for e than events est ormed nuously 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) (d) = calcul param 11.72 to = calcul param = calcul param	ated - 99.61 % ated - eter ated - ated -	Engine Running and basic enable conditions met:	= =	TRUE see sheet enable tables	condexis - more 0.2 monit with ra whe	fail ditions sts for e than 28 s or runs 0.04 s atte enever able ditions e met	
			voltage of charging switch or voltage of charging switch if buffer of a bank is not charged completely, or not at all	> 210 > 100		ECM is in startup before injections are released	=	TRUE	conc exis more eve monit with ra whee	fail ditions sts for than 4 ents or runs 0.01 s ate mever able ditions e met	

Component / System	Fault Code	Monitor Strategy Description	Primary Malfunction Criteria		Threshold Logic and Value		Secondary Parameters		Enable Conditions		Time Required	MIL Illum.
			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	
			DC/DC converter cannot be switched off.	=	TRUE	-	ignition on	=	TRUE	·	conditions 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	=	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	>	4.73	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	> =	0.16 measured parameter	V	ignition on and (=	TRUE	-	fail conditions exists for at least 0.12 s	

Component / System	Fault Code	Monitor Strategy Description	Primary Malfunction Criteria		Threshold Logic and Value	9	Secondary Parameters		Enable Conditions		Time Required	MIL Illum.
- Cyclenii	Jour	Bookiption	and with (b) voltage accelerator pedal signal 2 at external ADC	=	measured parameter	V	counter for steady state detection of the internal AD converter means	>=	4.00	events	monitor runs with 0.01 s rate whenever	uiii.
			at oxional 7150		parameter		(a) - (b) with	<=	0.06	V	enable conditions	
							(a) voltage accelerator pedal signal 2 at internal ADC and with	=,	measured parameter	V	are met	
							(b) voltage of the accelerator pedal signal 2 at the external ADC	=	measured parameter	V		
							counter for steady state detection of the external AD converter means	>=	4.00	events		
							(c) - (d) with	<=	0.06	V		
							(c) voltage accelerator pedal signal 2 at external ADC and with	=	measured parameter	V		
							(d) voltage of the accelerator pedal signal 2 at the internal ADC	=	measured parameter	V		
									TRUE			
			(ratio metric correction factor or ratio metric correction factor)	>	0.62 0.74	factor	ignition on	=	INCE	-	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.	(a) - (b)	>=	400.00	rpm	redundant calculated engine speed	>=	600.00	rpm	fail conditions exists for more than 0.32 s monitor runs with 0.04 s	A
			with (a) redundant calculated engine speed	=	calculated parameter	-	and engine synchronization	=	TRUE	-	rate whenever	
			and with (b) engine speed	=	measured parameter	-	engine synchronization completed which means	=	TRUE	-	enable conditions are met	
					parametel		number of crankshaft revolutions and	>=	4.00	revs		
							crankshaft reference mark detected	=	TRUE	-		
							(reference mark is the 2 missing teeth in the 50-2 tooth-wheel configuration)					

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	and basic enable conditions met:	= see sheet enable tables	-	Required	mum.
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:)	= FALSE > 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
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: -	engine post drive/ afterun for time and battery voltage for time and (ignition on and basic enable conditions met:)	= FALSE > 1.00 > 11.00 > 3.00 = TRUE = see sheet enable tables	sec V sec	fail conditions exists for 1s monitor runs with 0.2 s rate whenever enable conditions are met	В
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	= FALSE		fail conditions exists for 2 s monitor runs with 0.2 s rate whenever enable	В

Component / System	Fault Code	Monitor Strategy Description	Primary Malfunction Criteria		hreshold ic and Value)	Secondary Parameters		Enable Conditions		Time Required	MIL Illum.
							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	conditions are met	
Control Module Long Term Memory Performance		Each data block of memory is read for a check sum error and flags if a fault is found.	EEPROM sector reports faults regarding: unable to erase or change whole EEPROM sector or read order is not successfully accomplished for more than amount of blocks or amount of write errors in current block	= =	TRUE 3 3	- counts	ignition on and basic enable conditions met:	=	TRUE see sheet enable tables		fail conditions exists for 0.01 s test performed continuously at the 0.01 s rate	A
5 Volt Reference 1 Circuit		Sensor supply voltage circuitry determines if faults related to maintaining the voltage level exist.	sensor supply voltage 1	<=	4.6	V	ignition on and basic enable conditions met:	=	TRUE see sheet enable tables		fail conditions exists for 0.1 s test performed continuously 0.01s rate	A
5 Volt Reference 2 Circuit		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

Component / System	Fault Code	Monitor Strategy Description	Primary Malfunction Criteria	Threshold Logic and Va		Secondary Parameters		Enable Conditions	Time Required	MIL Illum.
5 Volt Reference 3 Circuit	P0697	Sensor supply voltage circuitry determines if faults related to the voltage level present at the sensor supply voltage exist.	sensor supply voltage 3	<= 4.6	V	ignition on and basic enable conditions met:	=	TRUE see sheet enable tables	fail conditions exists for 0.1 s test performed continuously 0.01s rate	A
5 Volt Reference 4 Circuit	P06A3	Sensor supply voltage circuitry determines if faults related to the voltage level present at the sensor supply voltage exist.	sensor supply voltage 4	<= 4.6	V	ignition on and basic enable conditions met:	=	TRUE see sheet enable tables	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 enable tables	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 and load		circuit active at low current and ignition on and	=	TRUE	fail conditions exists for 2 s monitor runs with 0.01 s rate whenever enable conditions are met	B (No MIL)

Component /	Fault	Monitor Strategy	Primary Malfunction	Threshold	Secondary		Enable		Time	MIL
System	Code	Description	Criteria	Logic and Value	Parameters ECU Initialization tasks in progress	=	Conditions FALSE		Required	Illum.
					for time	>	1.00	sec		
					and			560		
					ECU Shutdown tasks in progress for	=	FALSE	-		
					time and	>	1.00	sec		
					Battery voltage	>	10.50	V		
					for time	>	3.00	sec		
					and basic enable conditions met:	=	see sheet enable	_		
							tables			
		Diagnoses the Malfunction	Voltage high during driver on state	= Short to power: - ≤ 0.5 Ω	lamp is commanded off	=	TRUE	-	fail conditions	B (No MIL)
		Indicator Lamp (MIL) low side driver circuit for circuit	(indicates short to power)	impedance					exists for 2 s	
		faults.		between signal and controller					monitor runs with 0.01 s	
				power					rate whenever	
					and		TRUE		enable	
					ignition on and	=		-	conditions are met	
					ECU Initialization tasks in progress for	=	FALSE	-		
					time and	>	1.00	sec		
					ECU Shutdown tasks in progress	=	FALSE	-		
					for time	>	1.00	sec		
					and Battery voltage	>	10.50	V		
					for time	>	3.00	sec		
					and basic enable conditions met:	=	see sheet enable			
					basic chabic conditions met.	_	tables			
		Diagnoses the Malfunction	Voltage low during driver off state	= Short to ground: -	circuit active at low current	=	TRUE	-	fail	B (No MIL)
		Indicator Lamp (MIL) low side driver circuit for circuit	(indicates short-to-ground)	≤ 0.5 Ω impedance					conditions exists for 3 s	
		faults.		between signal and controller					monitor runs with 0.01 s	
				ground					rate	
					and ignition on	=	TRUE	-	whenever enable	
					and ECU Initialization tasks in progress	=	FALSE	_	conditions are met	
					for time	>	1.00	sec	are met	
					and					
					ECU Shutdown tasks in progress for	=	FALSE	-		
				1	time	>	1.00	sec	I	

Component / System	Fault Code	Monitor Strategy Description	Primary Malfunction Criteria	Threshold Logic and Value	Secondary Parameters		Enable Conditions		Time Required	MIL Illum.
					and Battery voltage for time and basic enable conditions met:	>	3.00 see sheet enable tables	V sec		
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 -	for time and new message is received via CAN and basic enable conditions met and NO Pending or Confirmed DTCs:	> = =	O.25 TRUE see sheet enable tables see sheet inhibit tables	sec	fail conditions exists for 1 s test performed continuously 0.5 s rate	A (No MIL)
Park/Neutral Position (PNP) Switch Circuit Low Voltage	P0852	Detects low voltage condition on the PNP circuit by comparing the ECM sensed input to the broadcasted state from the TCM over GMLAN serial data	GMLAN Message for PNP position indicates park neutral and disagrees with ECM (on-board control unit) sensed position based on PNP switch inputs to ECM	= TRUE -	battery voltage and battery voltage) and engine speed and (selected gear position is park or selected gear position is neutral) and basic enable conditions met: and NO Pending or Confirmed DTCs:	>= <= = = =	11.00 655.34 7000.00 TRUE TRUE see sheet enable tables see sheet inhibit tables	V V rpm - -	fail conditions exist for more than 3000 events monitor runs with 0.01 s rate whenever enable conditions are met	В

Component /	Fault	Monitor Strategy	Primary Malfunction		Threshold		Secondary		Enable		Time	MIL
System	Code	Description	Criteria		Logic and Value		Parameters		Conditions		Required	Illum.
Traction Control Input Signal	P0856	Detects a failure when a certain number of Traction Control System torque request messages within a defined message group checksum or rolling count values are incorrect	Error counter for Traction Control torque request message group	>=	8.00	counts	Traction Control Torque Request CAN Message Received	=	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	=	TRUE	-		
							and basic enable conditions met:	=	see sheet enable tables	-		
							and NO Pending or Confirmed DTCs:	=	see sheet inhibit tables	-		
Reductant Pump	P1043	Diagnoses the Ruductant	Voltage low during driver on state	=	Short to ground:	-	ECU initialization tasks in progress	=	FALSE		fail	A
High Control Circuit Low Voltage		Pump Motor high side driver circuit for circuit faults.	(indicates short to ground)		≤ 0.5 Ω impedance between signal and controller ground						conditions exists for 3 s monitor runs with 10 msec rate	
							for time and	>	1.00	sec	whenever enable conditions	
							battery voltage	>	11.00	V	are met	
							for time	>	3.00	sec		
							and battery voltage for	<	655.34	٧		
							time and	>	3.00	sec		
							battery voltage correction factor (please see the parameter definition (please see the parameter definition and	>	0.00	factor		
							battery voltage correction factor (please see the parameter definition (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	-		

Component /	Fault	Monitor Strategy	Primary Malfunction	Threshold	Secondary		Enable		Time	MIL
System	Code	Description Discourse	Criteria	Logic and Value	Parameters COLUMN TO A COLUMN		Conditions		Required	Illum.
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	=	FALSE	-	fail conditions exists for 3 s monitor runs with 10 msec rate	A
					for time and	>	1.00	sec	whenever enable 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 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 High Control Circuit High Voltage	P1046	Diagnoses the Reductant Purge Valve high side driver circuit for circuit faults.	Voltage high during driver off state (indicates short to power)	= 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	
					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		
					for					

Component /	Fault	Monitor Strategy	Primary Malfunction		Threshold		Secondary		Enable		Time	MIL
System	Code	Description	Criteria		Logic and Value		Parameters		Conditions		Required	Illum.
							time and basic enable conditions met: and NO Pending or Confirmed DTCs:	=	3.00 see sheet enable tables see sheet inhibit tables	sec - -		
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 1.60	Amps	for time and battery voltage correction factor (please see the parameter definition and battery voltage correction factor (please see the parameter definition)) for time and basic enable conditions met: and NO Pending or Confirmed DTCs:		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 factor	fail conditions exists for 3 s monitor runs with 10 msec rate whenever enable conditions are met	A
Reductant Injector High Control Circuit High Voltage	P1049	Diagnoses the Reductant Injector high side driver circuit for circuit faults.	Voltage high during driver off state (indicates short to power) OR Output current to dosing valve	<	Short to power: ≤ 0.5 Ω impedance between signal and controller power 0.10	Amps	for time and battery voltage for time and battery voltage for time and battery to the for time and battery voltage for time and battery voltage for the fo	> > <	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 /	Fault	Monitor Strategy	Primary Malfunction	Threshold	Secondary		Enable		Time	MIL
System	Code	Description	Criteria	Logic and Value	Parameters		Conditions		Required	Illum.
					time and (battery voltage correction factor (please see the parameter definition and battery voltage correction factor (please see the parameter definition	>	3.00 0.00 4.00	factor factor		
					for 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:	= ^ =	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	for time and battery voltage for time and starter is active cranking for time and Diesel dosing valve: fuel injection and	> > = =	1.00 11.00 3.00 FALSE 3.00 ACTIVE	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

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	Citteria	Logic and value	basic enable conditions met:	=	see sheet enable tables	-	Required	mum.
Exhaust Aftertreatment Fuel Injector High Control Circuit Low Voltage	P10CD		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 and	>	1.00	sec	with 0.1 s	
				battery voltage for	>	11.00	V	whenever enable		
				time and	>	3.00	sec	conditions are met		
					starter is active cranking for	=	FALSE	-		
					time and basic enable conditions met:	>	3.00 see sheet enable	sec		
					basic enable conditions met.	=	tables	-		
Exhaust Aftertreatment Fuel Injector High Control Circuit High Voltage	Aftertreatment Fuel Injector High Control Circuit Aftertreatment high side drive circuit faults.	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		=	FALSE		fail conditions exists for more than 30 events monitor runs with 0.1 s	В
					for time	>	1.00	sec	rate whenever	
					and battery voltage for	>	11.00	V	enable conditions	
					time and	>	3.00	sec	are met	
					starter is active cranking for	=	FALSE	-		
					time and	>	3.00	sec		
					basic enable conditions met:	=	see sheet enable tables	-		
Charge Air Cooler	P10CF		Path 1:		minimum engine-off time	>=	28800.00	sec	fail	В
Temperature Sensor Performance		cooler temperature sensor downstream or charge air cooler temperature sensor upstream by comparing the respective values at startup.							conditions exists for 0.1 s monitor runs once per trip with 0.1 s	
			(a) - (b) (see Look-Up-Table #3) with	> 100 to 999 °C	and ambient temperature	>	-60.04	°C	rate whenever enable	

Component /	Fault	Monitor Strategy	Primary Malfunction		Threshold		Secondary		Enable		Time	MIL
System	Code	Description	Criteria		Logic and Value		Parameters		Conditions		Required	Illum.
			(a) captured charge air cooler downstream temperature at start and with (b) captured charge air cooler upstream temperature at start	=	measured parameter measured parameter	-	and engine speed (see Look-Up-Table #3) for time	>	530 to 870 0.00	rpm	conditions are met	
			or Path 2:				and engine post drive/ afterun and	=	FALSE	-		
			((a) - (b) (see Look-Up-Table #3)	<=	100 to 999	°C	diagnostic performed in current dc and	=	FALSE	-		
1			with (a) captured charge air cooler	=	measured	_	basic enable conditions met:	=	see sheet enable tables	-		
			downstream temperature at start and with		parameter		NO Pending or Confirmed DTCs:	=	see sheet inhibit tables	-		
			(b) captured charge air cooler upstream temperature at start and (a) - (b) (see Look-Up-Table #6)	=	measured parameter 27 to 999	- °C						
			with (a) captured charge air cooler downstream temperature at start	=	measured parameter	-						
			and with (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	-						
Reductant Injector Temperature - Exhaust Gas Temperature 2 Correlation	P10D0	Detects an implausible SCR dosing valve coil temperature by comparing the temperature with a reference temperature	(a) - (b) (see Look-Up-Table #90)	>	30 to 3276.7	°C	ignition on	=	TRUE	-	fail conditions exists for 0.1 s monitor with	В
			with (a) dosing valve coil temperature	=	calculated parameter	°C	and 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 and	=	FALSE	-		
							battery voltage	>	11.00	V		
							and ambient temperature and	>=	-60.04	°C		
							engine run time and	<	10.00	sec		

Component /	Fault	Monitor Strategy	Primary Malfunction		Threshold		Secondary		Enable		Time	MIL
System	Code	Description	Criteria		Logic and Value		Parameters		Conditions		Required	Illum.
							engine off time and	>	28800.00	sec		
							urea pump motor output duty cycle and	=	0.00	%		
							Max [(a), (b)] - Min [(a), (b)] where	<=	7.00	°C		
							(a) ambient temperature	=	measured parameter	-		
							(b) oxidation catalyst downstream temperature	=	measured parameter	-		
							and urea dosing valve output duty cycle and	>	3.00	%		
							coil current measurement is valid and	=	TRUE	-		
							basic enable conditions met:	=	see sheet enable tables	-		
							and NO Pending or Confirmed DTCs:	=	see sheet inhibit tables	-		
Fuel Temperature Sensor 1 Circuit High	P111F	Detects an error in the fuel pump temperature sensor performance by comparing start-up temperatures	Path 1:				minimum engine-off time	>=	28800.00	sec	fail conditions exists for 0.2 s	В
		between fuel pump temperature and fuel rail temperature	(a) - (b) (see Look-Up-Table #41) where	>	100 to 999	°C	and				monitor runs once per trip with 0.2 s rate	
			(a) captured fuel temperature 1 at start	=	measured parameter	-	ambient temperature and	>	-60.04	°C	whenever enable conditions	
			and with		parameter		engine speed (see Look-Up-Table #91)	>	600 to 850	rpm	are met	
			(b) captured fuel temperature 2 at start	=	measured parameter	-	for					
)		paramotor		time and	>	0.00	sec		
			or Path 2:				engine post drive/ afterun and	=	FALSE	-		
			(a) - (b) (see Look-Up-Table #41) with	<=	100 to 999	°C	diagnostic performed in current do and	=	FALSE	-		
			(a) captured fuel temperature 1 at start	=	measured parameter	-	basic enable conditions met:	=	see sheet enable tables	-		
			and with (b) captured fuel temperature 2 at start	=	measured parameter	-	and 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	-						

Component / System	Fault Code	Monitor Strategy Description	Primary Malfunction Criteria		Threshold Logic and Value		Secondary Parameters		Enable Conditions		Time Required	MIL Illum.
			(status of block heater (see parameter definition)	=	FALSE	-						
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)	=	measured parameter measured parameter	°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	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	=	Please see the general description for details of this calcaulted O2 concentration 0.04	factor	engine speed engine speed commanded fuel injection quantity commanded fuel injection quantity Air mass per cylinder	> <	1800 550 240.00 88.00 3.96	rpm rpm mm^3/rev mm^3/rev g/rev	fail conditions exists for more than 2 event monitor runs with 0.1 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.
- - - - - - - - - -	0000	2000ро	O MO M		209.0 4.14 74.40		Air mass per cylinder	>	1.98	g/rev	Hoquirou	
							Status of binary lambda signal valid (see		TRUE	9/10/		
							parameter definition at line #273)	=	INOL			
									0.50			
							for time	>	0.50	sec		
							oxidation catalyst upstream temperature	<	999.96	°C		
							oxidation catalyst upstream 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	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 steady state conditions are met	=	measure variable	factor		
							(b) tolerance range of calculated	=	0.02	factor		
							Oxygen concentration					
							for time	>	0.10	sec		
							Engine operation mode (Please see the definition)	=	normal operation	-		
							engine speed	<	4500.00	rpm		
									600.00			
							engine speed	>	122.96	rpm °C		
							ambient temperature	<		°C		
							ambient temperature	>	-45.04			
							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	-		
									tables			
	P11A9	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 1		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	=	Please see the	factor	commanded fuel injection quantity	<	240.00	mm^3/rev	rate	
			based on injection quantity, air mass	_	general	140101	sommandod raor injobiloti quantity		≥-10.00	5/100		
			and fuel density		description for						whenever	
			and rue defisity		details of this						enable conditions	
					calcaulted O2 concentration						are met	
			(b) Positive O2 concentration margin	=	0.04	factor	commanded fuel injection quantity	>	88.00	mm^3/rev		
			l				Air mass per cylinder	<	3.96	g/rev		
							Air mass per cylinder	>	1.98	g/rev	l	
							Status of binary lambda signal valid (see		TRUE	-		
							parameter definition at line #273)	=			l	
							for time	>	0.50	sec		
		•		li .			· · · · · · · · · · · · · · · · · · ·	-	2.00	- 30		l.

HO2S P11AF Compare the pressure compensated O2 concentration Specific Performance Signal High During Portions and service of Campare the pressure compensated O2 concentration Specific Performance Signal High During Portions and the concentration Signal Portion	Component /		nitor Strategy	Primary Malfunction		Threshold		Secondary		Enable		Time	MIL
P11AF Compare the pressure compensated O2 concentration and the pressure compensated O2 concentration and the second of the compensated O2 concentration an	System	ode [Description	Criteria		Logic and Value		Parameters		Conditions		Required	Illum.
integrated air mass since all other rolesse conditions are fulfilled for O2 plausibility and provided air mass since all other rolesses conditions are fulfilled for O2 plausibility and provided air mass since all other rolesses conditions are fulfilled for O2 plausibility and provided air fulfilled for O2 plausibility are fulfilled for O2 plausibility and provided air fulfilled for O2 plausibility and provided air fulfilled for O2 plausibility are fulfilled for O2 plausibility and provided air fulfilled for O2 plausibility and provided air fulfilled for O2 plausibility are fulfilled for O2 plausibility and provided air fulfilled for O2 plausibility and provided air fulfilled for O2 plausibility are fulfilled for O2 plausibility and provided air fulfilled for O2 plausibility are fulfilled for O2 plausibility and provided air fulfilled for O2 plausibility and provided air fulfilled for O2 plausibility are fulfilled for O2 plausibility and provided air fulfilled for O2 plausibility and provided air fulfilled for O2 plausibility are fulfilled for O2 plausibility and provided air fulfilled for O2 plausibility are fulfilled for O2 plausibility and provided fulfilled for O2 plausibility are fulfilled for O2 plausibility and provided fulfilled for O2 plausibility are fulfilled for O2 plausibility and provided fulfilled for O2 plausibility are fulfilled for O2 plausibility and provided fulfilled for O2 plausibility are fulfilled for O2 plausibility and provided fulfilled for O2 plausibility and provided fulfilled fulfilled fulfilled for O2 plausibility and provided fulfilled fulfi									<				
HCZS Plane Profressor 2 P11AF Compare the pressure compensated Q2 concentration Bank 1 Sensor 2 P10AF Compare the pressure (a) Flated calculated Q2 concentration Bank 1 Sensor 2 (b) Pesitive Q2 concentration margin (c) Pesitive Q2 concentration margin (d) Pesitive Q2 concentration margin (e) P10AF Compare the pressure (a) Flated calculated Q2 concentration period feeling of the calculated Q2 concentration and because of the calculated Q3 concentration and because of the calculated Q3 concentration to the calculated Q3 concentration period feeling of the calculated Q5 concentration period feeling of the calculated Q5 concentration and become feeling of the calculated Q5 concentration period feeling of the calculated Q5 concentration per								oxidation catalyst upstream temperature	>	99.96	°C		
HO2S PHAF Compare the pressure compensated Q2 concentration Signal High During Moderate Load Bank 1. Sensor 2 P1 AF Signal High During Moderate Load Bank 1. Sensor 2 P1 AF Signal High During Moderate Load Bank 1. Sensor 2 P1 AF Signal High During Moderate Load Bank 1. Sensor 2 P1 AF Signal High During Moderate Load Bank 1. Sensor 2 P1 AF Signal High During Moderate Load Bank 1. Sensor 2 P1 AF Signal High During Moderate Load Bank 1. Sensor 2 P1 AF Signal High During Moderate Load Bank 1. Sensor 2 P1 AF Signal High During Moderate Load Bank 1. Sensor 2 P1 AF Signal High During Moderate Load Bank 1. Sensor 2 P1 AF Signal High During Moderate Load Bank 1. Sensor 2 P1 AF Signal High During Moderate Load Bank 1. Sensor 2 P1 AF Signal High During Moderate Load Bank 1. Sensor 2 P1 AF Signal High During Moderate Load Bank 1. Sensor 2 P1 AF Signal High During Moderate Load Bank 1. Sensor 2 P1 AF Signal High During Moderate Load Bank 1. Sensor 2 P1 AF Signal High During Moderate Load Bank 1. Sensor 2 P1 AF Signal High During Moderate Load Bank 1. Sensor 2 P1 AF Signal High During Moderate Load Bank 1. Sensor 2 P1 AF Signal High During Moderate Load Bank 1. Sensor 2 P1 AF Signal High During Moderate Load Bank 1. Sensor 2 P1 AF Signal High During Moderate Load Bank 1. Sensor 2 P1 AF Signal High During Moderate Load Bank 1. Sensor 2 P1 AF Signal High During Moderate Load Bank 1. Sensor 2 P1 AF Signal High During Moderate Load Bank 1. Sensor 2 P1 AF Signal High During Moderate Load Bank 1. Sensor 2 P1 AF Signal High During Moderate Load Bank 1. Sensor 2 P1 AF Signal High During Moderate Load Bank 1. Sensor 2 P1 AF Signal High During Moderate Load Bank 1. Sensor 2 P1 AF Signal High During Moderate Load Bank 1. Sensor 2 P1 AF Signal High During Moderate Load Bank 1. Sensor 2 P1 AF Signal High During Moderate Load Bank 1. Sensor 2 P1 AF Signal High During Moderate Load Bank 1. Sensor 2 P1 A									>	2.5	g		
Following in tell tank Deceleration tup duri-off injection active								plausibility	>	11.00	V		
HO2S P11AF Compare the pressure compensated Q2 concentration performance signal with a threshold P11AF Compare the pressure compensated Q2 concentration based on injection quantity, air mass and fuel density P14AF Compare the pressure compensated Q2 concentration based on injection quantity, air mass and fuel density P15AF Compare the pressure compensated Q2 concentration to based on injection quantity, air mass and fuel density P15AF Compare the pressure compensated Q2 concentration to based on injection quantity, air mass and fuel density P15AF Compare the pressure compensated Q2 concentration to based on injection quantity, air mass and fuel density P15AF Compare the pressure compensated Q2 concentration to based on injection quantity, air mass and fuel density P15AF Compare the pressure compensated Q2 concentration to based on injection quantity, air mass and fuel density P15AF Compare the pressure compensated Q2 concentration to based on injection quantity, air mass and fuel density P15AF Compare the pressure compensated Q2 concentration to based on injection quantity, air mass and fuel density P15AF Compare the pressure compensated Q2 concentration to based on injection quantity, air mass and fuel density and fuel density are decisited on the calculated Q2 concentration and fuel density are specified factor density and fuel density are specified factor density and fuel injection quantity P15AF Compare the pressure compensated Q2 concentration and fuel density are specified factor density and fuel density are specified factor density and fuel density are specified factor density and fuel density and fuel density and fuel fuel injection quantity are specified factor commanded fuel injection quantity Air mass per cylinder Ai											-		
HO2S P11AF Compare the pressure compensated O2 concentration and fuel classification and fuel classification and fuel density HO2S P600 Concentration and fuel density P71AF Compare the pressure compensated O2 concentration based on injection quantity, air mass and fuel density P71AF Compare the pressure compensated O2 concentration based on injection quantity, air mass and fuel density P71AF Compare the pressure compensated O2 concentration based on injection quantity, air mass and fuel density P71AF Compare the pressure compensated O2 concentration based on injection quantity, air mass and fuel density P71AF Compare the pressure compensated O2 concentration based on injection quantity, air mass and fuel density P71AF Compare the pressure compensated O2 concentration based on injection quantity, air mass and fuel density P71AF Compare the pressure compensated O2 concentration based on injection quantity, air mass and fuel density P71AF Compare the pressure compensated O2 concentration based on injection quantity, air mass and fuel density P71AF Compare the pressure compensated O2 concentration based on injection quantity, air mass and fuel density P71AF Compare the pressure compensated O2 concentration based on injection quantity, air mass and fuel injection quantity P71AF Compare the pressure compensated O2 concentration based on injection quantity, air mass and fuel injection quantity P71AF Compare the pressure compensated O2 concentration based on injection quantity, air mass and fuel injection quantity P71AF Compare the pressure compensated O2 concentration based on injection quantity, air mass profinder Air mass per cylinder													
Concentration Concentratio											-		
Calculated oxygen concentration Security Calculated									<=		factor		
where (a) Oxygen concentration is captured at the moment when the above steady state conditions are met (b) tolerance range of calculated Organ concentration (c) tolerance range of calculated Organ concentration (d) tolerance range of calculated Organ concentration (e) tolerance range of calculated Organ cancel range and the range speed (c) tolerance range of calculated Organ concentration (e) tolerance range of calculated Organ organ and entire range range and entire range range and range range and range range range range range range range range r													
(a) Oxygen concentration is captured at the moment when the above steady state conditions are met (b) tolerance range of calculated Oxygen concentration for time above steady state conditions are met (b) tolerance range of calculated Oxygen concentration are met (c) tolerance range of calculated Oxygen concentration are met (c) tolerance range of calculated Oxygen concentration (c) tolerance range of calculated (c)										(a) (b)	idotoi		
HO2S Performance Performance or Compensated O2 concentration Signal High During Moderate Load Bank 1 Sensor 2 P11AF Compare the pressure compensated O2 concentration (b) Positive O2 concentration action Commanded fuel injection quantity Where (a) Filtered calculated O2 concentration Dased on injection quantity, air mass and fuel density Where (a) Filtered calculated O2 concentration Dased on injection quantity, air mass and fuel density Where (b) Positive O2 concentration margin (c) tolerance range of calculated Oxygen concentration Tor time > 0.10 > 0.10 > sec = normal operation > 4500.00 rpm ambient temperature > 4500.00 rpm A (800.00 rpm A (900.00 rpm A (90								(a) Oxygen concentration is captured at the moment when the above	=	measure variable	factor		
HO2S Performance - Signal High During Moderate Load Bank 1 Sensor 2 HO2S Performance - Signal High During Moderate Load Bank 1 Sensor 2 HO2S Performance - Signal High During Moderate Load Bank 1 Sensor 2 HO2S Performance - Signal High During Moderate Load Bank 1 Sensor 2 HO2S Performance - Signal High During Moderate Load Bank 1 Sensor 2 HO2S Performance - Signal High During Moderate Load Bank 1 Sensor 2 HO2S Performance - Signal High During Moderate Load Bank 1 Sensor 2 HO2S Performance - Signal High During Moderate Load Bank 1 Sensor 2 HO2S Performance - Signal High During Moderate Load Bank 1 Sensor 2 HO2S Performance - Signal High During Moderate Load Bank 1 Sensor 2 HO2S Performance - Signal High During Moderate Load Bank 1 Sensor 2 HO2S Performance - Signal High During Moderate Load Bank 1 Sensor 2 HO2S Performance - Signal High During Moderate Load Bank 1 Sensor 2 Where (a) Filtered calculated O2 concentration based on injection quantity, air mass and fuel density Where (b) Positive O2 concentration margin = Please see the description for details of this calcaulted O2 concentration Poderate O2 commanded fuel injection quantity National Poderate O2 Secure Poderate Poderate O2 Secure Poderate Poderate O2 Secure Poderate O2 Secure Poderate O2 Secure Poderate Poderate Poderate O2 Secure Poderate Pod								,					
HO2S Performance - Signal High During Moderate Load Bank 1 Sensor 2 P11AF Compare the pressure compensated O2 concentration based on injection quantity, air mass and fuel density Where (a) Filtered calculated O2 concentration based on injection quantity, air mass and fuel density (b) Positive O2 concentration margin Engine operation mode (Please see the definition) engine speed								Oxygen concentration					
HO2S HO2S AT Sensor 2 P11AF Compare the pressure compensated O2 concentration and the threshold P11AF Compare the pressure compensated O2 concentration and the threshold P11AF Compare the pressure compensated O2 concentration and the threshold P11AF Compare the pressure compensated O2 concentration (b) Positive O2 concentration and fuel density P11AF Compare the pressure compensated O2 concentration and the density P11AF Compare the pressure compensated O2 concentration and the density P11AF Compare the pressure compensated O2 concentration and the density P11AF Compare the pressure compensated O2 concentration and the pressure compensated O2 concentration and the density P11AF Compare the pressure compensated O2 concentration and the density P11AF Compare the pressure compensated O2 concentration and the density P11AF Compare the pressure compensated O2 concentration and the density P11AF Compare the pressure compensated O2 concentration and the density P11AF Compare the pressure compensated O2 concentration and the density P11AF Compare the pressure compensated O2 concentration and the density P11AF Compare the pressure compensated O2 concentration and the density P11AF Compare the pressure compensated O2 concentration and the density P11AF Compare the pressure compensated O2 concentration and the density P11AF Compare the pressure compensated O2 concentration and the density P11AF Compare the pressure conditions met: P11AF P10AF P10A													
HO2S P11AF Performance - Signal High During Moderate Load Bank 1 Sensor 2 P1 AF (a) Filtered calculated O2 concentration based on injection quantity, air mass and fuel density Where (a) Filtered calculated O2 concentration based on injection quantity, air mass and fuel density Where (b) Positive O2 concentration margin (b) Positive O2 concentration margin P1 AF RPa Pressure compensated O2 concentration ambient pressure compensated O2 concentration based on injection quantity, air mass and fuel density RPa P1 AF Performance - Signal High During Moderate Load Bank 1 Sensor 2 P1 AF Performance - Signal High During Moderate Load Bank 1 Sensor 2 P1 AF Performance - Signal High During Moderate Load Bank 1 Sensor 2 P1 AF Performance - Signal High During Moderate Load Bank 1 Sensor 2 P1 AF Performance - Signal High During Moderate Load Bank 1 Sensor 2 P1 AF Performance - Signal High During Moderate Load Bank 1 Sensor 2 P1 AF Compare the pressure compensated O2 concentration based on injection quantity, air mass and fuel density Where (a) Filtered calculated O2 concentration based on injection quantity, air mass and fuel density Where (b) Positive O2 concentration margin (b) Positive O2 concentration margin P1 AF Pressure compensated O2 concentration P1 AF Performance - Signal High During Moderate Load Bank 1 Sensor 2 P1 AF Pressure compensated O2 concentration P1 AF P1 AF Pressure compensated O2 concentration P1 AF P2 AF P3 Compare the pressure P1 AF P4 AB P5 AF P6 Compare the pressure P1 AF P6 AF P7 AB P6 AF P7 AB P6 AF P7 AB P6 AF P7 AB P6 AF									=		-		
## HO2S ## HO2													
HO2S Performance Signal High During Moderate Load Bank 1 Sensor 2 P11AF (a) Filtered calculated O2 concentration based on injection quantity, air mass and fuel density (b) Positive O2 concentration margin (b) Positive O2 concentration margin (c) Positive O2 concentration margin (d) Positive O2 concentration margin (e) Positive O2 concentration margin (e) Positive O2 concentration margin (f) Positive O2 concentration margin (h) Pressure conditions met: (a) Filtered calculated O2 concentration margin (b) Filtrat													
## Analysis pressure ambient pressure ambient pressure ambient pressure ambient pressure ambient pressure ambient pressure > 74.80 kPa 7													
HO2S Performance - Signal High During Moderate Load Bank 1 Sensor 2 P11AF (a) Figure 2 Where (a) Filtered calculated O2 concentration based on injection quantity, air mass and fuel density (b) Positive O2 concentration margin (b) Positive O2 concentration margin (b) Positive O2 concentration margin (c) Figure 2 Air mass per cylinder													
HO2S Performance - Signal High During Moderate Load Bank 1 Sensor 2 P11AF Compare the pressure compensated O2 concentration based on injection quantity, air mass and fuel density where (a) Filtered calculated O2 concentration based on injection quantity, air mass and fuel density (b) Positive O2 concentration margin (b) Positive O2 concentration margin (b) Positive O2 concentration and fuel density NO Pending or Confirmed DTCs: a see sheet inhibit - table engine speed (a) + (b) factor general description for details of this calculated O2 concentration based on injection quantity, air mass and fuel density (b) Positive O2 concentration margin (b) Positive O2 concentration margin (c) commanded fuel injection quantity Air mass per cylinder Air mas													
HO2S Performance - Signal High During Moderate Load Bank 1 Sensor 2 Where (a) Filtered calculated O2 concentration based on injection quantity, air mass and fuel density (b) Positive O2 concentration margin (b) Positive O2 concentration margin (c) Perssure compensated O2 concentration based on injection quantity (b) Positive O2 concentration margin (c) Perssure compensated O2 concentration (a) Filtered calculated O2 concentration based on injection quantity, air mass and fuel density (b) Positive O2 concentration margin (c) Positive O2 concentration margin (b) Positive O2 concentration margin (c) Positive O2 concentration margin (b) Positive O2 concentration margin (c) Positive O2 concentration margin (d) Positive O2 concentration margin (e) Positive O2 concentration margin (f) Positive O2 concentration margin (h) Positive O2 concentration (h) Positive O2 concentra											kPa		
HO2S Performance - Service the pressure compensated O2 concentration where (a) Filtered calculated O2 concentration based on injection quantity, air mass and fuel density Where (b) Positive O2 concentration margin basic enable conditions met:								NO Pending or Confirmed DTCs:	=		-		
HO2S Performance - Signal High During Moderate Load Bank 1 Sensor 2 Where (a) Filtered calculated O2 concentration based on injection quantity, air mass and fuel density (b) Positive O2 concentration margin (b) Positive O2 concentration margin (b) Positive O2 concentration margin (c) Compare the pressure compensated O2 concentration compensated O2 concentration based on injection quantity, air mass and fuel density (b) Positive O2 concentration margin (c) Compare the pressure compensated O2 concentration based O2 concentration based on injection quantity, air mass and fuel density (b) Positive O2 concentration margin (c) Compare the pressure compensated O2 concentration based O2 concentration based O2 concentration deatalls of this calcaulted O2 concentration factor (a) Filtered calculated O2 concentration factor details of this calcaulted O2 concentration details of this calcaulted O2 concentration details of this calcaulted O2 concentration factor (b) Positive O2 concentration margin (b) Positive O2 concentration margin (c) Compare the pressure compensated O2 concentration engine speed (a) Filtered calculated O2 concentration factor details of this calcaulted O2 concentration factor (b) Positive O2 concentration margin (b) Positive O2 concentration margin (c) Compare the pressure compensated O2 concentration engine speed (c) Compare the pressure compensated O2 concentration engine speed (c) Compare the pressure compensated O2 concentration engine speed (d) Filtered calculated O2 concentration engine speed (e) Filtered calculated O2 concentration engine speed (a) Filtered calculated O2 concentration factor (b) Positive O2 concentration margin (b) Positive O2 concentration margin (c) Compare the pressure compensated O2 concentration engine speed (e) Filtered calculated O2 concentration engine speed (c) Compare the pressure compensated O2 concentration engine speed (c) Compare the pressure compensated O2 concentration engine speed (c) Compare the pressure compensated O2 concentratio													
HO2S Performance - Signal High During Moderate Load Bank 1 Sensor 2 Where (a) Filtered calculated O2 concentration based on injection quantity, air mass and fuel density Where (b) Positive O2 concentration margin Where (b) Positive O2 concentration margin Fressure compensated O2 concentration Fressure compensate O2 concentratio								basic enable conditions met:	=		-		
Performance - Signal High During Moderate Load Bank 1 Sensor 2 where (a) Filtered calculated O2 concentration based on injection quantity, air mass and fuel density (b) Positive O2 concentration margin (b) Positive O2 concentration margin (b) Positive O2 concentration margin (c) Concentration based on injection quantity, air mass and fuel density (b) Positive O2 concentration margin (c) Explanation of Concentration and fuel injection quantity (c) Compensated O2 concentration and fuel injection quantity (d) Please see the factor general description for details of this calcaulted O2 concentration (b) Positive O2 concentration margin (b) Positive O2 concentration margin (c) Explanation of the provided fuel injection quantity (c) Commanded fuel injection quantity (c) Status of binary lambda signal valid (see (c) TRUE (c) Explanation of the provided fuel injection quantity (d) Filtered calculated O2 concentration and fuel injection quantity (d) Commanded fuel injection quantity (e) Commanded fuel injection quantity (f) Commanded fuel inject										tables			
Performance - Signal High During Moderate Load Bank 1 Sensor 2 where (a) Filtered calculated O2 concentration based on injection quantity, air mass and fuel density where (b) Positive O2 concentration margin (b) Positive O2 concentration margin where (a) Filtered calculated O2 concentration based on injection quantity, air mass and fuel density = Please see the factor general description for details of this calculated O2 concentration commanded fuel injection quantity commanded fuel injection quantity commanded fuel injection quantity commanded fuel injection quantity Air mass per cylinder Air mass per cylinder Air mass per cylinder Status of binary lambda signal valid (see TRUE commanded fuel injection quantity 7 88.00 mm^3/rev 88.00 mm^3/rev 88.00 mm^3/rev 88.00 mm^3/rev 88.00 mm/3/rev						_				_	-		-
where (a) Filtered calculated O2 concentration based on injection quantity, air mass and fuel density (b) Positive O2 concentration margin (b) Positive O2 concentration margin (b) Positive O2 concentration margin (c) Positive O2 concentration margin (b) Positive O2 concentration margin (c) Positive O2 concentration margin (d) Positive O2 concentration margin (engine speed commanded fuel injection quantity (c) Commanded fuel injection quantity (c) Commanded fuel injection quantity (d) Commanded fuel injection quantity (engine speed commanded fuel injection qu	rformance - nal High During derate Load	compens	sated O2 ation sensor signal	Pressure compensated O2 concentration	>	(a) + (b)	factor	engine speed	<	1800	rpm	fail conditions exists for more than 2 event	В
(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 = 0.05 factor O.05 factor Air mass per cylinder Air mass per cylinder Status of binary lambda signal valid (see TRUE - 240.00 mm/3/rev with a commanded fuel injection quantity or commanded fuel inject										550		monitor runs	
based on injection quantity, air mass and fuel density (b) Positive O2 concentration margin (b) Positive O2 concentration margin (b) Positive O2 concentration margin (c) Positive O2 concentration margin (b) Positive O2 concentration margin (c) Positive O2 concentration margin (description for details of this calcaulted O2 concentration (e) Commanded fuel injection quantity (f) Commanded fuel inje					_	Diagra con the	factor					with 0.1 s	
and fuel density description for details of this calcaulted O2 concentration (b) Positive O2 concentration margin = 0.05 factor Air mass per cylinder					_ =		iacioi	commanded ruer injection quantity	<	240.00	mm/3/rev	rate	
details of this calcaulted O2 concentration margin (b) Positive O2 concentration margin = 0.05 factor Air mass per cylinder												whenever	
(b) Positive O2 concentration margin (b) Positive O2 concentration margin (b) Positive O2 concentration margin (c) Positive O2 concentration margin (d) Positive O2 concentration margin (e) Positive O2 concentration margin (f) Positive O2 concentration ma				and ruel density								enable	
(b) Positive O2 concentration margin = 0.05 factor												conditions	
(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 > 1.98 g/rev Status of binary lambda signal valid (see TRUE -												are met	
Air mass per cylinder < 3.96 g/rev Air mass per cylinder > 1.98 g/rev Status of binary lambda signal valid (see TRUE -				(h) Positive O2 concentration margin	_		factor	commanded fuel injection quantity	_	88 00	mm/3/rav		
Air mass per cylinder > 1.98 g/rev Status of binary lambda signal valid (see TRUE -				(5) . SS.AVO OZ OSHOSHILAGON Margin	. –	0.00	.00101						
Status of binary lambda signal valid (see TRUE -													
											-		
parameter definition at time (LETO)									=	11102			
for time > 0.50 sec										0.50	sec		
SCR downstream temperature < 999.96 °C													
SCR downstream temperature > 99.96 °C													
integrated air mass since all other > 2.5 g													
release conditions are fulfilled for O2											Э		
plausibility													

Component /	Fault	Monitor Strategy	Primary Malfunction		Threshold		Secondary		Enable		Time	MIL
System	Code	Description	Criteria		Logic and Value		Parameters		Conditions		Required	Illum.
							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	>=	(a) - (b)	factor		
							where					
							(a) Oxygen concentration is captured	=	measure variable	factor		
							at the moment when the above					
							steady state conditions are met					
							(b) tolerance range of calculated	=	0.02	factor		
							Oxygen concentration					
							for time	>	0.10	sec		
							Engine operation mode (Please see the	=	normal operation	-		
							definition)		· ·			
		l					engine speed	<	4500.00	rpm		
							engine speed	>	600.00	rpm		
							ambient temperature	<	122.96	е́С		
		l					ambient temperature	>	-45.04	°C		
							ambient pressure	<	110.00	kPa		
							ambient pressure	>	74.80	kPa		
							NO Pending or Confirmed DTCs:	=	see sheet inhibit	-		
							l		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
IO2S		compensated O2									conditions	
erformance -		concentration sensor signal									exists for	
ignal Low During		with a threshold									more than 2	
loderate Load											event	
ank 1 Sensor 2											monitor runs	
			where				engine speed	_	550	rpm	with 0.1 s	
					DI 4			>				
			(a) Filtered calculated O2 concentration	=	Please see the	factor	commanded fuel injection quantity	<	240.00	mm^3/rev	rate	
			(a) Filtered calculated O2 concentration based on injection quantity, air mass	=	general	factor			240.00		rate whenever	
			(a) Filtered calculated O2 concentration	=	general description for	factor			240.00			
			(a) Filtered calculated O2 concentration based on injection quantity, air mass	=	general	factor			240.00		whenever	
			(a) Filtered calculated O2 concentration based on injection quantity, air mass	=	general description for details of this calcaulted O2	factor			240.00		whenever enable	
			(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			mm^3/rev	whenever enable conditions	
			(a) Filtered calculated O2 concentration based on injection quantity, air mass	=	general description for details of this calcaulted O2	factor	commanded fuel injection quantity commanded fuel injection quantity		88.00	mm^3/rev	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	<	88.00 3.96	mm^3/rev mm^3/rev g/rev	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	>	88.00 3.96 1.98	mm^3/rev	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	> <	88.00 3.96	mm^3/rev mm^3/rev g/rev	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	> <	88.00 3.96 1.98	mm^3/rev mm^3/rev g/rev	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	>	88.00 3.96 1.98 TRUE 0.50	mm^3/rev mm^3/rev g/rev g/rev - sec	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)	<	88.00 3.96 1.98 TRUE	mm^3/rev g/rev g/rev - sec °C	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		88.00 3.96 1.98 TRUE 0.50	mm^3/rev mm^3/rev g/rev g/rev - sec	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		88.00 3.96 1.98 TRUE 0.50 999.96	mm^3/rev g/rev g/rev - sec °C	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	<pre></pre>	88.00 3.96 1.98 TRUE 0.50 999.96 99.96	mm^3/rev mm^3/rev g/rev g/rev - sec °C °C	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	<pre></pre>	88.00 3.96 1.98 TRUE 0.50 999.96 99.96	mm^3/rev mm^3/rev g/rev g/rev - sec °C °C	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>	88.00 3.96 1.98 TRUE 0.50 999.96 99.96	mm^3/rev mm^3/rev g/rev g/rev - sec °C °C	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	<pre></pre>	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	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>	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	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 Fuel volume in fuel tank Deceleration fuel cut-off	<pre></pre>	88.00 3.96 1.98 TRUE 0.50 99.96 99.96 2.5	mm^3/rev mm^3/rev g/rev g/rev - sec °C °C g	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 Fuel volume in fuel tank Deceleration fuel cut-off Injection active	<pre></pre>	88.00 3.96 1.98 TRUE 0.50 999.96 99.96 2.5 11.00 -1638.40 FALSE TRUE	mm^3/rev g/rev g/rev g/rev - Sec °C °C g V I	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 Fuel volume in fuel tank Deceleration fuel cut-off	<pre></pre>	88.00 3.96 1.98 TRUE 0.50 99.96 99.96 2.5	mm^3/rev mm^3/rev g/rev g/rev - sec °C °C g	whenever enable conditions	

Component /	Fault	Monitor Strategy	Primary Malfunction	Threshold	Secondary		Enable		Time	MIL
System	Code	Description	Criteria	Logic and Value	Parameters (a) Oxygen concentration is captured at the moment when the above steady state conditions are met	=	Conditions measure variable	factor	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	factor 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 ratio = measured - parameter = calculated - parameter	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
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 ratio = measured - parameter = calculated - parameter	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.
NOx Sensor	P11CB	Detects a high deviation of	Filtered NOx concentration deviation	> 0.70 -	Status of NOx signal of upstream NOx	=	TRUE	-	fault exists	В
Performance -		the measured NOx sensor	from model		sensor (please see the definition)				for more	
Signal High Bank 1		concentration from the			"				than 1 event;	
Sensor 1		modeled Nox concentration							monitor runs	
									at 0.1 s once	
					Normal Mode (Particulate Filter	=	TRUE	-	per trip	
					Regeneration not active)				p 4p	
					for time	>=	15.00	sec		
					ambient pressure	>=	75.00	kPa		
					ambient pressure	<=	106.00	kPa		
					ambient temperature	>=	-7.04	°C		
					ambient temperature	<=	37.96	°C		
				((
				filtered modeled Nox concentration	<=	0.050048828125	%			
				percent positive deviation (always						
			1	enabled -> cal'd out)						
				filtered modeled Nox concentration	>=	0.050048828125	%			
		1		1	percent positive deviation (always					
					enabled -> cal'd out)					
)					
					())					
					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	>0	0 to 1	factor		
					Upstream Nox sensor (see Look-Up-					
					Table #81)					
					Fuel Injection pattern (see Look-Up-	=	0 to 58	pattern		
					Table #82)					
					,		24 = pilot 1 main			
							56 = pilot 2, pilot			
							1, main			
							58 = pilot 2, pilot			
							1, main, post 2			
							26 = pilot 1 main,			
							post 2			
							0 = all off			
							(overrun)			
					Ratio of transient factor	>	0.95	factor		
		1			for time	>	0.50	sec		
		1			Vehicle speed	>=	37.29	mph		
		1			for time	>	1.00	sec		
		1			relative humidity	<=	100.00	%		
		1								
		1			relative humidity	>=	0.00	%		
		1								
		1			Enable range for the plausibility check of	≠0	0 to 1	factor		
		1			Upstream Nox sensor (see Look-Up-					
		1			Table #74)					
		1		1	for time	>	0.00	sec		
		1		1	Air mass per cylinder	>=	0.00	g/rev		
		1		1	Air mass per cylinder	<=	6.00	g/rev		
		1			for time	>	5.00	sec		
		1		1	actual valve position of exhaust-gas	>=	0.00	%		
	l	I	I		recirculation					

Component /	Fault	Monitor Strategy	Primary Malfunction		Threshold		Secondary		Enable		Time	MIL
System	Code	Description	Criteria		Logic and Valu	е	Parameters		Conditions		Required	Illum.
							actual valve position of exhaust-gas	<=	100.00	%		
							recirculation					
							for time	>	0.50	sec		
							filtered modeled NOx-concentration	>=	0.00	ppm		
							upstream of the SCR filtered modeled NOx-concentration	<=	1650.00	nnm		
							upstream of the SCR	\ <u> </u>	1050.00	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			
											l	
NOx Sensor	P11CC	Detects a high deviation of	Filtered NOx concentration deviation	<	(a) * (b)	-	Status of NOx signal of upstream NOx	=	TRUE	-	fault exists	В
Performance -		the measured NOx sensor	from model				sensor (please see the definition)				for more	
Signal Low Bank 1		concentration from the									than 1 event;	
Sensor 1		modeled Nox concentration									monitor runs	
			(a) Table for the base value of the lower	=	-1 to -0.46	_	Normal Mode (Particulate Filter	=	TRUE	_	at 0.1 s once	
			plausibility limit (see Look-Up-Table #80)	=	-1 10 -0.46	-	Regeneration not active)	=	IRUE	-	per trip	
			plausibility littlit (see Look-op-Table #60)				regeneration not active)					
			(b) Factor correction based on	=	1	factor	for time		15.00	sec		
			Environmental Pressure									
							ambient pressure	>=	75.00	kPa		
							ambient pressure	<=	106.00	kPa		
							ambient temperature	>=	-7.04	°C		
							ambient temperature	<=	37.96	°C		
							((filtered modeled Nox concentration	<=	0.05	factor		
							percent positive deviation (always	\ <u> </u>	0.03	iacioi		
							enabled -> cal'd out)					
							filtered modeled Nox concentration	>=	0.05	factor		
							percent positive deviation (always					
							enabled -> cal'd out)					
)					
))		0.00			
							for time time since start	> >	2.00 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)		04 11-1-4 1			
									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)			
		1	1				Ratio of transient factor	>	0.95	factor	1	

0.1	Fault	Monitor Strategy	Primary Malfunction	Threshold	Secondary		Enable		Time	MIL
System	Code	Description	Criteria	Logic and Value	Parameters		Conditions		Required	Illum.
					for time	>	0.50	sec		
					Vehicle speed	>=	37.29	mph		
					for time	>	1.00	sec		
					relative humidity	<=	100.00	%		
					relative humidity	>=	0.00	%		
					Enable range for the plausibility check of Upstream Nox sensor (see Look-Up- Table #75)	≠0	0 to 1	factor		
					for time	>	0.00	sec		
					Air mass per cylinder	>=	0.00	g/rev		
					Air mass per cylinder	<=	6.00	g/rev		
					for time	>	5.00	sec		
					actual valve position of exhaust-gas	>=	0.00	%		
					recirculation					
					actual valve position of exhaust-gas recirculation	<=	100.00	%		
					for time	>	0.50	sec		
					filtered modeled NOx-concentration	>=	0.00	ppm		
					upstream of the SCR	•	2.00	rr		
					filtered modeled NOx-concentration	<=	1650.00	ppm		
					upstream of the SCR 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:		see sheet enable	-		
							tables			
Downstream NOx	P11D7	During the NOx sensor self-	number of self-diagnostic abortions of	> 0.00 counts	Global Release conditions:	-		_	fault exists	В
Downstream NOx lensor Self liagnostic Bank 1 Gensor 2	P11D7	During the NOx sensor self- diagnostic test, the number of aborted self-diagnostics is monitor. If the self- diagnostic is aborted, by	number of self-diagnostic abortions of downstream NOx sensor	> 0.00 counts	Global Release conditions:				fault exists for more than 3 events; monitor runs	В
ensor Self liagnostic Bank 1	P11D7	diagnostic test, the number of aborted self-diagnostics is monitor. If the self-		> 0.00 counts	Global Release conditions:				for more than 3 events;	В
ensor Self liagnostic Bank 1	P11D7	diagnostic test, the number of aborted self-diagnostics is monitor. If the self- diagnostic is aborted, by NOx sensor indication, a		> 0.00 counts					for more than 3 events; monitor runs at 0.1 s once	В
ensor Self liagnostic Bank 1	P11D7	diagnostic test, the number of aborted self-diagnostics is monitor. If the self-diagnostic is aborted, by NOx sensor indication, a calibrated number of times		> 0.00 counts	time interval between the runs of the	>	10.00	sec	for more than 3 events; monitor runs at 0.1 s once per trip	В
ensor Self iagnostic Bank 1	P11D7	diagnostic test, the number of aborted self-diagnostics is monitor. If the self-diagnostic is aborted, by NOx sensor indication, a calibrated number of times		> 0.00 counts	time interval between the runs of the diagnostic tests status of downstream NOx sensor	> =	10.00 TRUE	sec -	for more than 3 events; monitor runs at 0.1 s once per trip during the	В
ensor Self liagnostic Bank 1	P11D7	diagnostic test, the number of aborted self-diagnostics is monitor. If the self-diagnostic is aborted, by NOx sensor indication, a calibrated number of times		> 0.00 counts	time interval between the runs of the diagnostic tests status of downstream NOx sensor validity	=	TRUE	-	for more than 3 events; monitor runs at 0.1 s once per trip during the	В
ensor Self liagnostic Bank 1	P11D7	diagnostic test, the number of aborted self-diagnostics is monitor. If the self-diagnostic is aborted, by NOx sensor indication, a calibrated number of times		> 0.00 counts	time interval between the runs of the diagnostic tests status of downstream NOx sensor				for more than 3 events; monitor runs at 0.1 s once per trip during the	В
ensor Self liagnostic Bank 1	P11D7	diagnostic test, the number of aborted self-diagnostics is monitor. If the self-diagnostic is aborted, by NOx sensor indication, a calibrated number of times		> 0.00 counts	time interval between the runs of the diagnostic tests status of downstream NOx sensor validity SCR downstream temperature SCR downstream temperature status of current engine operation system	= >=	TRUE -7.04	- °C	for more than 3 events; monitor runs at 0.1 s once per trip during the	В
ensor Self iagnostic Bank 1	P11D7	diagnostic test, the number of aborted self-diagnostics is monitor. If the self-diagnostic is aborted, by NOx sensor indication, a calibrated number of times		> 0.00 counts	time interval between the runs of the diagnostic tests status of downstream NOx sensor validity SCR downstream temperature SCR downstream temperature status of current engine operation system ≠ Post Drive	= >= <= =	TRUE -7.04 399.96 TRUE	- °C °C -	for more than 3 events; monitor runs at 0.1 s once per trip during the	В
ensor Self liagnostic Bank 1	P11D7	diagnostic test, the number of aborted self-diagnostics is monitor. If the self-diagnostic is aborted, by NOx sensor indication, a calibrated number of times		> 0.00 counts	time interval between the runs of the diagnostic tests status of downstream NOx sensor validity SCR downstream temperature SCR downstream temperature status of current engine operation system	= >= <=	TRUE -7.04 399.96	- °C	for more than 3 events; monitor runs at 0.1 s once per trip during the	В
ensor Self agnostic Bank 1	P11D7	diagnostic test, the number of aborted self-diagnostics is monitor. If the self-diagnostic is aborted, by NOx sensor indication, a calibrated number of times		> 0.00 counts	time interval between the runs of the diagnostic tests status of downstream NOx sensor validity SCR downstream temperature SCR downstream temperature status of current engine operation system ≠ Post Drive	= >= <= =	TRUE -7.04 399.96 TRUE	- °C °C -	for more than 3 events; monitor runs at 0.1 s once per trip during the	В
ensor Self agnostic Bank 1	P11D7	diagnostic test, the number of aborted self-diagnostics is monitor. If the self-diagnostic is aborted, by NOx sensor indication, a calibrated number of times		> 0.00 counts	time interval between the runs of the diagnostic tests status of downstream NOx sensor validity SCR downstream temperature SCR downstream temperature status of current engine operation system # Post Drive Engine operation mode = normal mode engine speed	= >= <= =	TRUE -7.04 399.96 TRUE	- °C °C - rpm	for more than 3 events; monitor runs at 0.1 s once per trip during the	В
ensor Self agnostic Bank 1	P11D7	diagnostic test, the number of aborted self-diagnostics is monitor. If the self-diagnostic is aborted, by NOx sensor indication, a calibrated number of times		> 0.00 counts	time interval between the runs of the diagnostic tests status of downstream NOx sensor validity SCR downstream temperature SCR downstream temperature status of current engine operation system # Post Drive Engine operation mode = normal mode	= >= <= = =	TRUE -7.04 399.96 TRUE 1.00 1500.00	- ℃ ℃ -	for more than 3 events; monitor runs at 0.1 s once per trip during the	В
ensor Self agnostic Bank 1	P11D7	diagnostic test, the number of aborted self-diagnostics is monitor. If the self-diagnostic is aborted, by NOx sensor indication, a calibrated number of times		> 0.00 counts	time interval between the runs of the diagnostic tests status of downstream NOx sensor validity SCR downstream temperature SCR downstream temperature status of current engine operation system # Post Drive Engine operation mode = normal mode engine speed engine speed	= >= <= = =	TRUE -7.04 399.96 TRUE 1.00 1500.00 0.00	- °C °C - rpm rpm	for more than 3 events; monitor runs at 0.1 s once per trip during the	В

Component /	Fault	Monitor Strategy	Primary Malfunction	Threshold	Secondary		Enable		Time	MIL
System	Code	Description	Criteria	Logic and Value	Parameters		Conditions		Required	Illum.
- Cy Cross					Battery voltage	<=	6553.40	V		
					Battery voltage	>=	10.00	V		
					NO Pending or Confirmed DTCs:	=	see sheet	-		
							inhibit tables			
					status of heater temperature validity for	=	True	-		
					downstream Nox sensor					
					(
					engine speed	<	1200.00	rpm		
					virtual pedal angle	<	10.00	%		
					for time	<=	14400.00	sec		
					With					
					(((
					SCR downstream temperature	<=	129.96	°C		
					for time	>=	40.00	sec		
)					
					for time	>=	600.00	sec		
),					
					((24.00	meh		
					vehicle speed	<=	31.08	mph		
					for time	>=	40.00	sec		
) for time	>=	600.00	sec		
					ior time	>=	600.00	sec		
					"					
					(
					Status: DFP Regeneration active	=	FALSE	_		
					Or	_	IALOL			
					Status: DPF Regeneration not completed	=	FALSE	_		
					Status. Di i Regeneration not completed	_	TALOL			
)					
					l'					
					Rising edge of the following conditions:	=	TRUE	_		
					The state of the s					
					(
					Ìgnition key on	=	TRUE	-		
					Engine operation status	=	Running	-		
)		_			
					with					
					(
					Status: DPF Regeneration not completed	=	TRUE	-		
					Status: DFP Regeneration active	=	TRUE	-		
					Engine coolant temperature	<=	59.96	°C		
))					
					(TD. 15			
					Ignition key on	=	TRUE	-		
					Or		TDUE			
					status of over run condition	=	TRUE	-		
					for time	<=	12.00	sec		
					status of over run condition for time	=	False	-		
					tor ume	>	20.00	sec		
					ľ					
					(
					Estimated HC Load in SCP catalyat	<=	2.00	~		
					Estimated HC Load in SCR catalyst Or	<=	∠.00	g		
					()					
1				1	I/				1 1	

Component /	Fault	Monitor Strategy	Primary Malfunction	Threshold	Secondary		Enable		Time	MIL
System	Code	Description	Criteria	Logic and Value	Parameters		Conditions		Required	Illur
					change of estimated HC Load in SCR	>=	(a) * (b)	g		
					catalyst					
					within time	<	0.20	sec		
					(a) Estimated HC Load limit in SCR	=	-0.01	g/sec		
					catalyst					
					(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		
					((100.00	00		
					SCR downstream temperature	<=	199.96	°C		
					for time	>=	1.00	sec		
) for time (see Look-Up-Table #99)	>=	100 to 900	sec		
)	>=	100 10 900	260		
					'(
					((vehicle speed	<=	44.75	mph		
					for time	>=	1.00	sec		
)	-	1.00	500		
					for time (see Look-Up-Table #99)	>=	100 to 900	sec		
))		100 10 000	000		
					"					
					Additional release conditions:					
					vehicle speed	=	0	mph		
					number of possible test runs in after-	<	20.00	p		
					run		20.00			
					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		
					status of heater temperature validity for	=	TRUE	-		
					downstream Nox sensor					
					Status of downstream NOx sensor self-	=	2	_		
					diagnostic abortion (Bit1)		_			
					Afterrun Conditions:					
					NO Pending or Confirmed DTCs:	=	see sheet inhibit	-		
							tables			
					Engine operation status = Post Drive	=	TRUE	-		
					vehicle speed	=	0			
					measured downstream NOx	<=	160.00	ppm		
					concentration				l	
					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	-		
				1			tables			

Component / System	Fault Code	Monitor Strategy Description	Primary Malfunction Criteria		Threshold Logic and Valu	e	Secondary Parameters		Enable Conditions		Time Required	MIL Illum.
					_							
Nox Sensor Current Performance Bank 1 Sensor 1	P11DB	Detects a failure of the feedback performance of upstream NoX sensor	Ratio of invalid upstream Nox sensor status time count (invalid time / total time)	>	0.50	ratio	Sufficient number of valid and invalid NOx status time (sum of valid and invalid Nox status for diagnostic determination)	>=	18.00	sec	fail conditions exists for more than	В
							and Engine Running (see parameter definition)	=	TRUE	-	36 sec monitor runs with 0.02 s	
							for time (required for the NOx sensor to give valid response) and	>	20.00	sec	rate whenever	
							Upstream NoX sensor detects a lean A/F mixture and	=	TRUE	-	enable conditions are met	
							Valid NOx signal from CAN is received (no Nox sensor communication failures)	=	TRUE	-		
							or following conditions for time: battery voltage	> >= <=	45.00 11.00 655.34	sec V V		
							battery voltage SCR upstream temperature	<= >=	94.96	°C		
							SCR upstream temperature	<=	3003.56	°C		
							Engine Running (see parameter	=	TRUE	-		
							definition) for time (required for the NOx sensor to give valid response)	>	20.00	sec		
							and Lambda signal is in steady state condition (see Look-Up-Table #28)	<=	0.1 to 10	-		
							for time	>=	5.00	sec		
							Inhibit Status (no inhibiting faults) (No pending or stored DTC)	=	see sheet inhibit tables	-		
							basic enable conditions met:	=	see sheet enable tables	-		
Nox Sensor	P11DC	Detects a failure of the	Ratio of valid to invalid downstream Nox	>	0.50	ratio	Sufficient number of valid and invalid	>=	18.00	sec	fail	В
Current Performance Bank1 Sensor 2		feedback performance of downstream NoX sensor	sensor status time count				downstream NOx sensor status time (sum of valid and invalid Nox status for diagnostic determination) and				conditions exists for more than	
							Engine Running (see parameter definition)	=	TRUE	-	36 sec monitor runs with 0.02 s	
							for time (required for the NOx sensor to give valid response)	>	20.00	sec	rate whenever	
							and Downstream NoX sensor detects a lean A/F mixture	=	TRUE	-	enable conditions are met	
							and Valid NOx signal from CAN is received (no Nox sensor communication failures)	=	TRUE	-		
							or following conditions for time:	>	120.00	sec		

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	>= <=	11.00 655.34	V V		
					SCR downstream temperature	>=	94.96	°C		
					SCR downstream temperature	<=	3003.56	°C		
					Engine Running (see parameter definition)	=	TRUE	-		
					for time (required for the NOx sensor to give valid response) and	>	20.00	sec		
					Downstream Lambda signal is in steady state condition (measured lambda signal - filtered lambda signal) (see Look-Up-Table #27)	<=	0.2 to 3.2	-		
					for time	>=	5.00	sec		
					Inhibit Status (no inhibiting faults)	=	see sheet inhibit	-		
					(No pending or stored DTC)		tables			
					basic enable conditions met:	=	see sheet enable tables	-		
Injector 1 Control	P1224	Diagnoses the Injector	Voltage low during driver on state	= Short to ground: -	Engine Running (see parameter	=	TRUE		fail	A
Circuit Shorted		Cylinder #1 high side driver circuit for circuit faults.	(indicates short to ground)	≤ 0.5 Ω impedance between signal and controller ground	definition)				conditions exists for more than 0.04 s monitor runs with 0.01 s rate whenever enable conditions	
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	A

Component / System	Fault Code	Monitor Strategy Description	Primary Malfunction Criteria	Threshold Logic and Value	Secondary Parameters	Enable Conditions	R	Time Required are met	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.		for time 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	sec exi mc with sec	fail conditions ists for 3 sonitor runs th 0.005 s rate whenever enable conditions are met	В
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. 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 a 3rd time, and closed position is read for learn.	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 is driven to a mechanical stop and Engine Coolant Temperature	= FALSE = FALSE > 123.06	e e mo	fail conditions exists for 10.05 s onitor runs once per ivingcycle th 0.005 s rate whenever enable conditions are met	В

Component / System	Fault Code	Monitor Strategy Description	Primary Malfunction Criteria	1.0	Threshold ogic and Value		Secondary Parameters		Enable Conditions		Time Required	MIL Illum
Jystein	Code	The maximum and minimum learned offset referrs to the maximum and minimum learned values of the 3 learns performed within total learn procedure.	Gitteria		ogic and value		and		Conditions		Required	mum
		leam procedure.					offset learning for the throttle valve was successful in the previous driving cycle	=	TRUE	-		
							and engine post drive/ afterun and	=	TRUE	-		
							basic enable conditions met		see sheet enable tables	-		
							and NO Pending or Confirmed DTCs:	=	see sheet inhibit tables	-		
		Detects implausible learned offset values.	Path 1:			-	(fail conditions	
			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 or	>	20.00	%	and engine temperature	<=	130.06	°C	monitor runs once per drivingcycle with 0.005 s	
			Path 2: difference between the maximum and minimum positions learned at closed position	>	30.00	%	and (rate whenever enable conditions	
			or Path 3: difference between the maximum and minimum positions learned at open	>	30.00	%	battery voltage and	>=	8.00	V	are met	
			position				battery voltage) and Throttle Valve is not frozen	<=	30.00	٧		
							consisting of: (Engine Coolant Temperature or	>=	5.06	°C		
							if 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 basic enable conditions met	=	TRUE see sheet enable	-		

Component / System	Fault Code	Monitor Strategy Description	Primary Malfunction Criteria	Threshold Logic and Value	Secondary Parameters		able litions	Time Required	MIL Illum.
Intake Air Flow Valve Control Circuit 2 Low Voltage	P122E	Diagnoses the Throttle Valve high side driver circuit for circuit faults.	Voltage low during driver on state (indicates short to ground)	= Short to ground: - ≤ 0.5 Ω impedance between signal and controller ground	for time and and Throttle Valve Actuator Solenoid Control Circuit and Open Load Diagnosis active and basic enable conditions met	> 3. = AC = FA = see she	.00 V 00 sec FIVE - LSE - et enable - ples	fail conditions exists for 3 s monitor runs with 0.005 s rate whenever enable conditions are met	В
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	> 3. = AC = FA = see she	.00 V 00 sec FIVE - LSE - et enable - oles	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)	= TR	:UE -	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 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 with 0.01 s rate whenever enable conditions are met	A
Injector 6 Control Circuit Shorted	P1239	Diagnoses the Injector Cylinder #6 high side driver circuit for circuit faults.	Voltage low during driver on state (indicates short to ground)	= Short to ground: - ≤ 0.5 Ω impedance between signal and controller ground	Engine Running (see parameter definition)	= TRUE -	fail conditions exists for more than 0.04 s monitor runs with 0.01 s rate whenever enable conditions are met	A
Injector 7 Control Circuit Shorted	P1242	Diagnoses the Injector Cylinder #7 high side driver circuit for circuit faults.	Voltage low during driver on state (indicates short to ground)	= Short to ground: - ≤ 0.5 Ω impedance between signal and controller ground	Engine Running (see parameter definition)	= TRUE -	fail conditions exists for more than 0.04 s monitor runs with 0.01 s rate whenever enable conditions are met	A

Component / System	Fault Code	Monitor Strategy Description	Primary Malfunction Criteria	Threshold Logic and Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
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 whenever enable conditions are met	A
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	= 0 rpm = TRUE - = see sheet inhibit tables > 2.00 sec	fail conditions exists for 0.1 s monitor runs with 0.1s rate whenever enable conditions are met	В

Component / System	Fault Code	Monitor Strategy Description	Primary Malfunction Criteria		Threshold Logic and Value	,	Secondary Parameters		Enable Conditions		Time Required	MIL Illum.
System	Code	Description	Criteria		Logic and value	•	basic enable conditions met:	=	see sheet enable tables	-	Required	illum
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 basic enable conditions met: and NO Pending or Confirmed DTCs:	=	TRUE see sheet enable tables see sheet inhibit tables	-	fail conditions exists for 2 s monitor runs with 0.02 s rate whenever enable conditions are met	A
			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	
			rail pressure	>	215000.00	kPa	state machine rail pressure control equal to pressure control valve and	=	TRUE		are met	

Fault	Monitor Strategy	Primary Malfunction		Threshold		Secondary		Enable		Time	MIL
Code	Description	Criteria		Logic and Value		basic enable conditions met: and NO Pending or Confirmed DTCs:	=	see sheet enable tables see sheet inhibit tables	-	Required	Illum.
		rail pressure	>	215000.00	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			
	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 or	=	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 Path 4: Pilot Injection 2 is prohibited due to exceeding the allowed number of injections (see general description for details) or	=	TRUE	-						
	Code	P1400 Detects problems resulting in improper delivery of fuel for catalyst light off and aftertreatment system	P1400 Detects problems resulting in improper delivery of fuel for catalyst light off and aftertreatment system preparation 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 or Path 3: Injector circuit or activation errors (setpoint deviation) occurred when the injector was being energized for Pilot or Path 4: Pilot Injection 2 is prohibited due to exceeding the allowed number of injections (see general description for details)	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 or Path 3: Injector circuit or activation errors (setpoint deviation) occurred when the injector was being energized for Pilot or Path 4: Pilot Injection 2 is prohibited due to exceeding the allowed number of injections (see general description for details)	P1400 Detects problems resulting in improper delivery of tuel for catalyst light oft and aftertreatment system preparation 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 or Path 3: Injector circuit or activation errors (setpoint deviation) occurred when the injector was being energized for Pilot or Path 4: Pilot Injection 2 is prohibited due to exceeding the allowed number of injectors as being energized for Pilot or Path 4: Pilot Injection 2 is prohibited due to exceeding the allowed number of injections (see general description for details)	P1400 Detects problems resulting in improper delivery of fuel for catalyst light off and aftertreatment system preparation Plot 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 or Path 3: Injector circuit or activation errors (setpoint deviation) occurred when the injector was being energized for Pilot or exceeding the allowed number of injections (see general description or exceeding the allowed number of injections (see general description for details)	P1400 Detects problems resulting in improper delivery of fuel for catalyst light of and aftertreatment system preparation or Pliot Injection 1 is prohibited due to exceeding the allowed number of injections (see general description or Pliot Injection 2 (see general description or Pliot Injection 2 (see general description or Pliot Injection 2 (see general description or See general description for details) Path 3: Path 3: Path 3: Path 3: Path 3: Path 3: Path 3: Path 3: Path 3: Path 3: Path 3: Path 3: Path 3: Path 3: Path 3: Path 3: Path 3: Path 4: Path	Path 2: Path 2: Path 3:	Continue Parameters Conditions met:	Pit Delects problems resulting preparation Pot Injection 1 is prohibited due to exceeding the allowed number of details) Path 1: Pot Injection 2 is prohibited due to exceeding the allowed number of or details) Path 3: Path 3: Path 3: Path 3: Path 4: Pot Injection 2 is prohibited due to exceeding the allowed number of or engine coolent temperature TRUE Path 4: Path 4	Criteria Logic and Value Search Conditions Cond

Component / System	Fault Code	Monitor Strategy Description	Primary Malfunction Criteria		Threshold Logic and Value	ie	Secondary Parameters		Enable Conditions		Time Required	MIL Illum.
5,5.5			collision (overlap) with Pilot Injection 1 (see general description for details) or									
			Path 6: Injector circuit or activation errors (setpoint deviation) occurred when the injector was being energized for Pilot or	=	TRUE	-						
			Path 7: Injector circuit or activation errors (setpoint deviation) occurred when the injector was being energized for Main or	=	TRUE	-						
			Path 8: Post Injection 2 is prohibited due to exceeding the allowed number of injections (see general description for details) or	=	TRUE							
			Path 9: Post Injection 2 is prohibited due to collision (overlap) with Main Injection and Post Injection 1 (see general description 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	=	ACTIVE	-	fail conditions exists for 3 s monitor runs with 0.005 s rate	В
							battery voltage for time and starter is active cranking	> > =	11.00 3.00 FALSE	V sec	whenever enable conditions are met	

Component / System	Fault	Monitor Strategy Description	Primary Malfunction Criteria	Threshold	Secondary		Enable		Time	MIL
System	Code	Description	Grieria	Logic and Value	for time and basic enable conditions met:	> =	3.00 see sheet enable tables	sec -	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	> 0.32 g/rev	ambient pressure and engine coolant temperature and EGR control is in closed loop for time and EGR control is active for time and exhaust gas system regeneration mode for time and engine speed Engine speed and injection quantity injection quantity and desired delta air mass flow and difference of the air mass and NO Pending or Confirmed DTCs:	> = > = > = > = > = > = > = > = > = > =	74.80 69.96 TRUE 1.50 TRUE 0.00 FALSE 5.00 1000.00 2200.00 80.00 300.00 0.13 -0.02 0 see sheet inhibit tables 0.10 see sheet enable tables	kPa °C - sec - sec rpm rpm mm^3/rev mm^3/rev g/s g/s g/rev - sec -	fail conditions exists for 15 s monitor runs with 0.1s rate whenever enable conditions are met	В
Exhaust Gas Recirculation Slow Response- Decreasing Flow	P140C	Detects a positive slow response by comparing expected system dynamics with actual value	average positive gradient of the air mass - calculated by accumulating control deviation (deviation between desired and actual value) over a sampling time and dividing result by sampling time	>= -0.32 g/rev	ambient pressure and engine coolant temperature	> >	74.80 69.96	kPa °C	fail conditions exists for 15 s monitor runs with 0.1s 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.
					and EGR control is in closed loop for time and EGR control is active for time and exhaust gas system regeneration mode for time and Engine speed Engine speed Engine speed injection quantity 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:	=	TRUE 1.50 TRUE 0.00 FALSE 5.00 1450.00 2200.00 112.00 300.00 0.13 -0.02 0 see sheet inhibit tables 0.10 see sheet enable tables	sec sec rpm rpm mm^3/rev mm^3/rev g/s g/s g/rev - sec -	conditions are met	
Exhaust Gas Recirculation (EGR) Motor Control Circuit 2 Low Voltage		Diagnoses the EGR 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	and battery voltage for time and starter is active cranking for time and starter defined 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
Exhaust Gas Recirculation (EGR) Motor Control Circuit 2 High Voltage		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	EGR Solenoid Control Circuit	=	ACTIVE	·	fail conditions exists for 3 s monitor runs with 0.005 s rate	В

Component / System	Fault Code	Monitor Strategy Description	Primary Malfunction Criteria	Threshold Logic and Value	Secondary Parameters	Enable Conditions		Time Required	MIL Illum.
					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 -	whenever enable conditions are met	
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	and battery voltage for time and starter is active cranking for time and starter battery conditions met:	= ACTIVE > 11.00 > 3.00 = FALSE > 3.00 = see sheet enable tables	V sec - sec -	fail conditions exists for 2 s monitor runs with 0.005 s rate whenever enable conditions are met	В
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

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 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 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
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 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
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	> > =	11.00 3.00 FALSE 3.00	V sec	fail conditions exists for 2 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.
							and basic enable conditions met:	=	see sheet enable tables	-		
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 gas temperature.	and deviation from the temperature setpoint for inner control loop	>	maximum of (a) and (b)	-	and release of the exhaust gas temperature outer loop control monitoring	=	TRUE	-	conditions are met	
			(with (a) limitation of the temperature threshold and with (b) temperature threshold value for	=	100.00	°C	means (active operation mode of the inner control loop means (=	TRUE	-		
			maximum deviation				particulate filter regeneration	=	TRUE	-		
							and 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	=	TRUE	-		
							means vehicle speed	<=	124.30	mph		
							and Relative accelerator pedal position	>	3.00	%		
							for time	>	1.00	sec		
							and 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 Parameters Parameters		Conditions		Required	Illum.
Closed Loop Diesel Particulate Filter (DPF) Regeneration Control At Limit - Stage 1 Temperature Too	P144C	Detects excessive exhaust temperature. Actual inner controller ratio and temperature readings are compared to desired controller ratio and temperature values as an	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	В
High		indication of an excessive exhaust gas temperature.	and deviation from the temperature setpoint for inner control loop	<	minimum of (a) and (b)	-	and release of the exhaust gas temperature outer loop control monitoring means	=	TRUE	-	whenever enable conditions 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	-		
			minimum deviation				particulate filter regeneration and	=	TRUE	-		
							and 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	A

Component /	Fault	Monitor Strategy	Primary Malfunction		Threshold		Secondary		Enable		Time	MIL
System	Code	Description	Criteria		Logic and Value	•	Parameters		Conditions		Required	Illum.
			(number of messages with rolling count / protection value errors detected with number of consecutive frames	>=	7.00	-	and basic enable conditions met: and NO Pending or Confirmed DTCs:	=	see sheet enable tables see sheet inhibit tables	-	test performed continuously 0.01 s	
) or Path 2: (
			internal calculated checksum value for transmission is not equal the received value and number of fault results	= >	TRUE 15.00	-						
			Path 3:	,	15.00	-						
			time since last frame with valid protection value was received from transmission	>	0.08	sec						
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	=	TRUE	-	fail conditions exists for 15.5s monitor runs	Special C
							input circuit active and basic enable conditions met	=	TRUE see sheet enable		with 0.005 s rate whenever	
							and NO Pending or Confirmed DTCs:	=	tables see sheet inhibit tables	-	enable conditions are met	
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	>=	4.00	counts	ignition on	=	TRUE	-	Once the fault is reported there will be	Special C
			in the last number of messages (sliding window) received PTO frames	=	10.00	counts	for time	>=	3.00	sec	no debouncing of the DFC until ignition	
							and Bus off or error passive on CAN and	=	FALSE	-	key state changes from 0 to 1.	
							basic enable conditions met: and	=	see sheet enable tables	-	monitor runs with 0.005 s rate	
							NO Pending or Confirmed DTCs:	=	see sheet inhibit tables	-	whenever enable	

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	and basic enable conditions met and no sensor supply error and	= TRUE - = see sheet enable - tables = TRUE -	fail conditions exists for 5 s test performed continuously 0.005 s rate	В
					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
					and basic enable conditions met and no sensor supply error	= see sheet enable - tables = TRUE -		
					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 and basic enable conditions met	= TRUE - = see sheet enable - tables	fail conditions exists for 8 s test performed continuously	В
					and no sensor supply error and NO Pending or Confirmed DTCs:	= TRUE - = see sheet enable - tables	0.005 s rate	
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	= FALSE -	exists for 20 s monitor runs	

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	=	FALSE	-	with 0.005 s rate whenever	
							and basic enable conditions met	=	see sheet enable tables	-		
							NO Pending or Confirmed DTCs:	=	see sheet inhibit tables	-		
Particulate filter efficiency monitoring	P2002	Statistical evaluation of the present exhaust gas volume flow signal and particulate filter delta pressure signal to determine particulate filter efficiency	particulate filter efficiency factor	>	0.34	factor	Calculated exhaust-gas volume flow in the particulate filter	<	3000.00	m^3/h	fail conditions exists for 0.1s monitor runs with 0.1s rate whenever	В
							and Calculated exhaust-gas volume flow in the particulate filter	>	600.00	m^3/h	enable conditions are met	
							and Temperature upstream of the particulate filter and	<	799.96	°C		
							Temperature upstream of the particulate filter and	>	499.96	°C		
							Temperature downstream particulate filter and	<	799.96	°C		
							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	°C		
							Simulated surface temperature, particulate filter and	<	799.96	°C		
							Simulated surface temperature, particulate filter and	>	499.96	°C		
							Basic enable conditions met	=	see sheet enable tables	-		
							NO Pending or Confirmed DTCs	=	see sheet inhibit tables	-		
	Basser				40.00		5 ()		T0115		6 h 1	
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

Component /	Fault	Monitor Strategy	Primary Malfunction		Threshold		Secondary		Enable		Time	MIL
System	Code	Description	Criteria	Lo	gic and Value	Э	Parameters		Conditions		Required	Illum.
							Reductant Dosing System Metering control substate of Pressure control state (see definition)	=	TRUE	-	monitor runs with 100 ms rate	
							Calculated Reductant Injector coil temperature	>=	-6.64	°C	whenever enable	
							Calculated Reductant Injector coil temperature	<=	99.96	°C	conditions are met	
							(battery voltage battery voltage)	>= <=	11.00 655.34	V V		
							(Reductant Dosing System pump relative	>=	350.00	kPa		
							pressure Reductant Dosing System pump relative pressure)	<=	650.00	kPa		
							(ambient pressure ambient pressure	>= <=	0.00 130.00	kPa kPa		
							(NO Pending or Confirmed DTCs	=	see sheet inhibit tables	-		
							(ambient pressure ambient temperature	> >	0.00 -30.04	kPa °C		
							basic enable conditions met:	=	see sheet enable tables	-		
Exhaust Gas Temperature (EGT) Sensor 2 Circuit Low	P2032	Detects low voltage readings on the EGT 2 circuit, indicating an OOR low condition on the EGT 2	temperature sensor voltage downstream of oxidation catalyst	<	0.65	V	ignition on	=	TRUE	·	fail conditions exists for 3 s monitor runs	А
Voltage		circuit	same as temperature downstream of oxidation catalyst	<	- 50	°C	and basic enable conditions met:	=	see sheet enable tables	-	0.050 s rate whenever enable conditions are met	
Exhaust Gas Temperature (EGT) Sensor 2 Circuit High Voltage	P2033	Detects high voltage readings on the EGT 2 circuit, indicating an OOR high condition on the EGT 2 circuit	temperature sensor voltage downstream of oxidation catalyst	>	2.21	V	ignition on	=	TRUE		fail conditions exists for 3 s monitor runs 0.050 s rate	A
			same as				and				whenever	

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 basic enable conditions met:	=	see sheet enable tables	-	continuously 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 are met	
			(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	-		
			(measured tank level sensor 3 voltage after 1.5 ms since a test impulse was applied)	=	(0.0 to 1.7)	V						
			(measured tank level sensor 1 voltage after 1.5 ms since a test impulse was applied)	=	(1.71 to 3.56)	V						
			or ((measured tank level sensor 3	=	(0.0 to 1.7)	V						
			voltage after 1.5 ms since a test impulse was applied) (measured tank level sensor 2 voltage after 1.5 ms since a test impulse was applied)	=	1.71 to 3.56)	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 measured after a test impulse was	<	(0.17)	V	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	

Component / System	Fault Code	Monitor Strategy Description	Primary Malfunction Criteria	Threshold Logic and Value		Secondary Parameters		Enable Conditions		Time Required	MIL Illum.
- System		5300.piid.i		Togo and value		, u.u.i.o.oo		Communication		enable conditions are met	
Reductant Level Sensor 1 Circuit High	Path 1: CAN message: Discrete level sensor 1 open load error	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)	= 3 > (3.56) < (4.74)	V	ignition on battery voltage basic enable conditions met:	= > =	TRUE 8 see sheet enable tables	V	fail conditions exists for more than 3 sec. monitor runs with 1 s rate whenever enable conditions are met	A	
		Path 2: CAN message: Discrete level sensor 1 short to battery error	Reductant Tank Level 1 Error Status (measured tank level sensor 1 voltage after 1.5 ms since a test impulse was applied)	= 2 > (4.74)	V	ignition on battery voltage basic enable conditions met:	= > =	TRUE 8 see sheet enable tables	- V -		
Reductant 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 correction factor (please see the parameter definition and battery voltage correction factor (please see the parameter definition)	=	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 / 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 - -		
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	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 time and No Pending or confirmed DTCs and basic enable conditions met:	= > > < > > < > = = =	1.00 11.00 3.00 655.34 3.00 0.00 4.00 3.00 See sheet inhibit tables see sheet enable tables	sec V sec V sec factor factor	fail conditions exists for 2 s monitor runs with 10 msec rate whenever enable conditions are met	A
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	=	FALSE	·	fail conditions exists for 3 s monitor runs with 10 msec rate whenever enable	A

Component /	Fault	Monitor Strategy	Primary Malfunction		hreshold	Secondary		Enable		Time	MIL
System	Code	Description	Criteria	Log	ic and Value	Parameters		Conditions 1.00	200	Required	Illum.
						time and battery voltage	>	1.00	sec V	conditions are met	
						for time	>	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		
						and battery voltage correction factor (please see the parameter definition	<	4.00	factor		
						for time	>	3.00	sec		
						No Pending or confirmed DTCs	=	See sheet inhibit tables	-		
						and basic enable conditions met:	=	see sheet enable tables	-		
Reductant Pressure Sensor Circuit Range/Performanc e	P204B	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	=	No Pressure	_	with 0.01 s rate whenever	
						the definition) and		Control		enable conditions	
						State of the defrosting check of pressure line (please see the definition)	=	TRUE	-	are met	
						and ambient pressure	>	0.00	kPa		
						and ambient temperature and	>	-30.04	°C		
						NO Pending or Confirmed DTCs:	=	see shet inhibit tables	-		
						and basic enable conditions met:	=	see sheet enable tables	-		
Reductant Pump	P204C	Measured reductant pump	Reductant pump pressure sensor signal	<	0.41 V	ignition on	=	TRUE		fail	A
Pressure Sensor Circuit Low		pressure sensor signal low voltage								conditions exists for	

Component /	Fault	Monitor Strategy	Primary Malfunction		Threshold		Secondary		Enable		Time	MIL
System	Code	Description	Criteria same as: reductant pump pressure	<	Logic and Value	kPa	Parameters NO Pending or Confirmed DTCs: basic enable conditions met:	=	conditions see sheet inhibit tables see sheet enable tables		more than 0.4 sec. monitor runs with 0.01 s rate whenever enable	Illum.
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 Dwell time in ventilation 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	Criteria		Logic and Value		Parameters		Conditions		Required	Illum.
		The temperature difference between reductant tank temperature and diesel fuel temperature are compared to an upper threshold after sufficient engine-off duration	(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	11 11	measured parameter measured parameter	-	status of SCR control state (please see the definition) Engine off Time time since start Max [(a), (b), (c)] - Min [(a), (b), (c)] where (a) Oxidation Catalyst upstream temperature (b) fuel temperature (c) Particulate filter downstream temperature NO Pending or Confirmed DTCs: basic enable conditions met:	=	No Pressure control 28800.00 6.00 6.96 measured parameter measured parameter measured parameter see sheet inhibit tables see sheet enable tables	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) where (a) Reductant tank temperature	<	-35.04	°C	ignition on status of SCR control state (please see the definition) Engine off Time time since start	= = ^ ^	True No Pressure control 28800.00 6.00	sec sec	fail conditions exists for more than 0.5 sec monitor runs with 0.01 s rate whenever enable conditions are met	
			(b) fuel temperature	=	parameter measured parameter	-	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:	= = =	6.96 measured parameter measured parameter measured parameter see sheet inhibit tables see sheet enable tables	°C	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.
Reductant Tank Temperature Sensor Circuit Low	P205C	Detects an out of range low reading of the Reductant Tank Temperature Sensor via CAN Message	Raw value of the CAN message for the Reductant Tank Temperature Corresponds to a temperature of Corresponds to a resistance of Corresponds to a voltage of	< <= >= >=	-55.0 1200 5.0	°C kOhm	basic enable conditions met: and No rolling count or protection value errors. (sliding window errors) in the CAN frame	=	see sheet enable tables	-	fault exists for more than 3 sec; monitor runs at 1 s whenever enable conditions are met	A
Reductant Tank Temperature Sensor Circuit High	P205D	Detects an out of range high reading of the Reductant Tank Temperature Sensor via CAN Message or an invalid (initialization) value of the Reductant Tank Temperature CAN message	Raw value of the CAN message for the Reductant Tank Temperature Corresponds to a temperature of	>	0x3FE 1022 160.0	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 are met	В
		Corresponds to a resistance of Corresponds to a voltage of	<= <=	0.153	kOhm V	No rolling count or protection value errors. (sliding window errors) in the CAN frame	=	TRUE	-			
			Raw value of the CAN message for the Reductant Tank Temperature	=	0x3FF 1023	hex dec						
Secondary Fuel Sensor Performance	P2066	Detects an error in the secondary fuel tank sensor performance by comparing the decrease of the fuel level for a certain driven mileage to a threshold.	(a) - (b)	<	100.00	miles	Engine Running for	=	TRUE		fail conditions exists for 0.02 s monitor runs 0.02 s rate whenever	В
			(a) total vehicle distance and with (b) change in mileage	=	measured parameter measured	-	time and diagnosis tester	>=	60.00 FALSE	sec -	enable conditions are met	
		and (c) - (d) with (c) maximum volume of fuel reached in secondary tank during driving cycle and with	< =	4.00 measured parameter	l -	and fuel transfer pump active means (=	FALSE	-			

Component /	Fault	Monitor Strategy	Primary Malfunction		Threshold		Secondary		Enable		Time	MIL
System	Code	Description	Criteria		Logic and Value		Parameters		Conditions		Required	Illum.
			(d) minimum volume of fuel reached in secondary tank during driving cycle	=	measured parameter	-	filtered fuel volume in primary tank	>	1638.35	I		
			and filtered fuel volume in secondary tank	>	0.00	I	or filtered fuel volume in secondary tank for	<	0.00	I		
							time and	>	0.00	sec		
							cumulative transfer pump on time in current ignition cycle) and fuel level zone 1 means	>	0.00	sec		
							filtered fuel volume in primary tank and	>=	137.40	I		
							filtered fuel volume in secondary tank)	>=	0.00	1		
							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 secondary tank	P2067	Detects low voltage readings in the fuel level secondary tank sensor circuit, indicating an OOR low condition on the fuel	voltage of fuel level sensor 2	<	0.20	V	ignition on	=	TRUE	-	fail conditions exists for 24 s test	В
		level sensor circuit					and basic enable conditions met:	=	see sheet enable tables	-	performed continuously 0.2 s rate	
SRC high for fuel	P2068	Detects high voltage	voltage of fuel level sensor 2	>	4.80	V	ignition on	=	TRUE		fail	В
level sensor of secondary tank		readings in the fuel level secondary tank sensor circuit, indicating an OOR high condition on the fuel level sensor circuit					and basic enable conditions met:	=	see sheet enable tables	-	conditions exists for 24 s test performed continuously 0.2 ms rate	

Component /	Fault	Monitor Strategy	Primary Malfunction		Threshold		Secondary		Enable		Time	MIL
System	Code	Description	Criteria		Logic and Value		Parameters		Conditions		Required	Illum.
Exhaust Temperature Sensor 1 Performance	P2080	Detects a fault in the exhaust temperature sensor 1 performance by comparing the heat quantity	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	В
		on the sensor position to a threshold.	or integrated heat quantity of exhaust gas temperature sensor 1 with (a) exhaust gas mass flow and with (b) factor and with	> =	(a) / (b) * (c) / (d) * (e) * (g) calculated parameter 3.60	- g/sec	for time and time since start and (exhaust-gas temperature sensor 1	> >	1500.00 327.00 -60.04	sec sec	monitor runs with 0.1 s rate whenever enable conditions are met	
			(c) heat capacity	=	1050.00	J/Kg/°C	and					
	(d) factor and with (e) correction factor for heat flow quantity depending on exhaust g mass flow for temperature sense and with (f) minimum permissible tempera	and with	=	1000	kW/°C	and	<	1999.96	°C			
		(e) correction factor for heat flow quantity depending on exhaust gas mass flow for temperature sensor 1	=	1.00	factor	change in exhaust-gas temperature sensor 1 for	<	7.00	°C			
		(f) minimum permissible temperature deviation for exhaust gas temperature	=	-100.00	°C	time and	=	5.00	sec			
			and with (g) maximum permissible temperature deviation for exhaust gas temperature sensor 1	=	100.00	°C	engine operation point suitable for diagnostic (see Look-Up-Table #29) for	=255	0 to 255	-		
							time and	>=	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 kJ		
							heat quantity for exhaust gas 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 / 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	-		
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 or integrated heat quantity of exhaust gas temperature sensor 2 with (a) exhaust gas mass flow and with (b) factor and with (c) heat capacity and with (d) factor and with (e) correction factor for heat flow quantity depending on exhaust gas mass flow for temperature sensor 2 and with (f) minimum permissible temperature deviation for exhaust gas temperature sensor 2 and with	> = = = = =	(a) / (b) * (c) / (d) * (e) * (f) (a) / (b) * (c) / (d) * (e) * (g) calculated parameter 3.60 1050.00 1000 1.00		exhaust gas system regeneration mode for time and time since start and (exhaust-gas temperature sensor 2 and exhaust-gas temperature sensor 2	= > > < < = = =		sec sec °C °C °C °C	fail conditions exists for 5 times monitor runs with 0.1 s rate whenever enable conditions are met	В
			(g) maximum permissible temperature deviation for exhaust gas temperature sensor 2	=	100.00	°C	diagnostic (see Look-Up-Table #29) for time and change in modeled exhaust-gas temperature sensor 2 and (heat quantity for exhaust gas temperature sensor 2 and 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 evaluates multiple times	>= >>	0.05 4.00 10.00 12.00	sec °C kJ kJ		

Component /	Fault	Monitor Strategy	Primary Malfunction		Threshold		Secondary Parameters		Enable		Time	MIL Illum.
System	Code	Description	Criteria		Logic and Value		Parameters		Conditions		Required	mum.
							and engine has been in normal mode for time	>=	1.00	sec		
							or engine has been in exhaust warm-up mode for time	>=	1.00	sec		
							and basic enable conditions met:	=	see sheet enable tables	-		
							and NO Pending or Confirmed DTCs:	=	see sheet inhibit tables	-		
Exhaust Femperature 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 rate	В
			integrated heat quantity of exhaust gas temperature sensor 3 with	>	(a) / (b) * (c) / (d) * (e) * (g)	-	time	>	1500.00	sec	whenever enable conditions	
			(a) exhaust gas mass flow and with	=	calculated parameter	-	time since start	>	327.00	sec	are met	
			(b) factor and with (c) heat capacity	=	3.60 1050.00	g/sec J/Kg/°C	(exhaust-gas temperature sensor 3	>	-60.04	°C		
			and with (d) factor	=	1000	kW/°C		<	1999.96	°C		
			and with (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 3	<	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	=	100.00	°C	engine operation point suitable for diagnostic (see Look-Up-Table #29) for	=	0 to 255	-		
			temperature deviation for exhaust gas temperature sensor 3				time	>=	0.05	sec		
							and change in modeled exhaust-gas temperature sensor 3 and	>	4.00	°C		
							heat quantity for exhaust gas temperature sensor 3 and	>	10.00	kJ		
							heat quantity for exhaust gas temperature sensor 3	<	12.00	kJ		

Component / System	Fault Code	Monitor Strategy Description	Primary Malfunction Criteria		Threshold Logic and Value		Secondary Parameters		Enable Conditions		Time Required	MIL Illum.
							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)					
) 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 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 with	>	(a) / (b) * (c) / (d) * (e) * (g)	-	for time	>	1500.00	sec	rate whenever enable	
			(a) exhaust gas mass flow and with	=	calculated parameter	-	and time since start and	>	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 4 and	>	-60.04	°C		
			and with (d) factor and with	=	1000	kW/°C	and	<	1999.96	°C		
			(e) correction factor for heat flow quantity depending on exhaust gas mass flow for temperature sensor 3	=	1.00	factor	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		

Component /	Fault	Monitor Strategy	Primary Malfunction	Threshold	Secondary		Enable		Time	MIL
System	Code	Description	Criteria	Logic and Value	Parameters		Conditions		Required	Illum.
		·		-	change in modeled exhaust-gas temperature sensor 4 and	>	4.00	°C		
					(heat quantity for exhaust gas temperature sensor 4 and	>	10.00	kJ		
					heat quantity for exhaust gas temperature sensor 4 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 or	>=	1.00	sec		
					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	>	1.00	sec	enable conditions	
					and battery voltage	>	11.00	V	are met	
					for time	>	3.00	sec		
			and battery voltage	<	655.34	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		

Component /	Fault	Monitor Strategy	Primary Malfunction		Threshold		Secondary		Enable		Time	MIL
System	Code	Description	Criteria	Lo	gic and Value		Parameters for		Conditions		Required	Illum.
							time and basic enable conditions met:	> =	3.00 see sheet enable tables	sec -		
							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.				ECU Initialization task in progress	=	FALSE		fail conditions exists for 0.01 s	
							time and	>	1.00	sec	monitor runs with 0.01 sec	
							battery voltage for	>	11.00	V	rate whenever	
							time and	>	3.00	sec	enable conditions	
							battery voltage for	<	655.34	V	are met	
							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 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	=	TRUE	-		
							the definition) SCR Engine State (please see the definition) ((=	ON	-		

Component /	Fault	Monitor Strategy	Primary Malfunction	Threshold	Secondary		Enable		Time	MIL
System	Code	Description	Criteria	Logic and Value	Parameters		Conditions		Required	Illum.
					Remaining defrosting time of the tank Remaining defrosting time of the tank) OR	> <=	0 120.00	sec		
					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
					time and	>	1.00	sec	enable conditions are met	
					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) for	<	4.00	factor		
					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	=	FALSE		fail conditions exists for 3 s monitor runs with 10 msec	А

Component /	Fault	Monitor Strategy	Primary Malfunction	Threshold	Secondary		Enable		Time	MIL
System	Code	Description	Criteria	Logic and Value	Parameters for		Conditions		Required rate	Illum.
					time and	>	1.00	sec	whenever enable	
					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		
					for time and	>	3.00	sec		
					basic enable conditions met:	=	see sheet enable tables	-		
					NO Pending or Confirmed DTCs:	=	see sheet inhibit tables	-		
Reductant Purge Valve Performance	P20A1	This diagnostic checks the Reductant Purge valve performance during operation by detecting a lack of reduction of the reductant pressure	Difference between reductant pump pressure at beginning and end of pressure reduction state	< 50.00 kPa	Reductant Dosing System state pressure	=	TRUE	_	fault exists for more than 1 event monitor runs with 100 ms rate whenever	A
					reduction Reductant Dosing System pump relative	>=	350.00	kPa	enable conditions	
					pressure to initiate test) AND				are met	
					((Time attempting to reduce dosing pressure AND	>=	5.00	sec		
					Reductant Dosing System pump relative pressure after attempting to reduce pressure	>	50.00	kPa		
					OR Reductant Dosing System pump relative pressure after attempting to reduce pressure)	<=	50.00	kPa		
					(ambient pressure ambient temperature)	> >	0.00 -100.04	kPa °C		

Component / System	Fault Code	Monitor Strategy Description	Primary Malfunction Criteria	Threshold Logic and Value	Secondary Parameters		Enable Conditions		Time Required	MIL Illum.
		,,,,,			NO Pending or Confirmed DTCs basic enable conditions met:	=	see sheet inhibit tables see sheet enable tables	-	,	
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	=	FALSE		fail conditions exists for 2 s monitor runs with 10 msec rate whenever	А
					for time and battery voltage	> >	1.00 11.00	sec V	enable 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	-		
					and NO Pending or Confirmed DTCs:	=	see sheet inhibit tables	-		
Reductant Purge Valve Control Circuit High Voltage	P20A3	Diagnoses the Reductant Purge Valve low side driver circuit for circuit faults.	Voltage high during driver on state (indicates short to power)	= Short to power: - ≤ 0.5 Ω impedance between signal and controller power	ECU Initialization task in progress	Ξ	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		

Component /	Fault	Monitor Strategy	Primary Malfunction		Threshold		Secondary		Enable		Time	MIL
System	Code	Description	Criteria	Lo	gic and Val	ue	Parameters time and	>	Conditions 3.00	sec	Required	Illum.
							battery voltage correction factor (please see the parameter definition and battery voltage correction factor (please	>	0.00	factor		
							see the parameter definition) for		4.00	iacioi		
							time and	>	3.00	sec		
							basic enable conditions met: and	=	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 basic enable conditions met:	> =	3.00 see sheet enable	sec		
							and		tables			
							basic enable conditions met:	=	see sheet enable tables	-		
Exhaust	P20CC	Detects high exhaust	oxidation catalyst downstream	>	300	°C	7				fail	A
Aftertreatment Fuel Injector Performance	12000	temperatures in order to protect the engine	temperature - oxidation catalyst upstream temperature		300	O	(conditions exists for	
Performance			OR				oxidation catalyst upstream temperature change	<	50.00	°C	180 s test performed	
			particulate filter downstream temperature - SCR downstream temperature	>	300	°C	for time	>	10.00	sec	continuously 0.1 s rate	
) AND (
							time since last successful regeneration	>	900.00	sec		
							AND ((I

Component /	Fault	Monitor Strategy	Primary Malfunction	Threshold	Secondary		Enable		Time	MIL
Component / System	Fault	Monitor Strategy Description	Primary Malfunction Criteria	Threshold Logic and Value	Secondary Parameters Normal Mode (Particulate Filter Regeneration not active) OR Exhaust Gas Temperature (Active) Management Mode) for time) AND ((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 SCR Catalyst downstream temperature SCR Catalyst downstream temperature DOC Upstream Temperature Engine Speed Vehicle Speed Exhaust Mass Flow) AND basic enable conditions met: AND NO Pending or Confirmed DTCs:	= > > > > > = = = = = = = = = = = = = =	TRUE 300.00 TRUE 300.00 TRUE 300.00 TRUE 499.96 179.96 219.96 500 3.10 72.00 see sheet enable tables see sheet inhibit tables	sec sec C C C rpm mph g/sec -	Time Required	MIL Illum.
Exhaust Aftertreatment Fuel Injector Control Circuit Low Voltage	P20CD	Electronic out-put driver circuitry determines circuit integrity on the exhaust aftertreatment fuel injector control circuit.	The ECM detects that the commanded state of the driver and the actual state of the control circuit do not match.		engine pre drive for time battery voltage for time and starter is active cranking for time	= > > = >	1.00 11.00 3.00 FALSE 3.00	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

Component /	Fault	Monitor Strategy	Primary Malfunction	Threshold	Secondary		Enable		Time	MIL
System	Code	Description	Criteria	Logic and Value	and basic enable conditions met: and Diesel dosing valve: fuel injection and basic enable conditions met:	= =	see sheet enable tables INACTIVE see sheet enable tables		Required	Illum.
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	for time 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 see sheet enable tables	sec V sec - sec	fail conditions exists for more than 30 events monitor runs with 0.1 s rate whenever enable conditions are met	В
Exhaust Gas Temperature (EGT) Sensors 1-2 not plausible	P20E2	Detects biased exhaust temperature sensors by comparing the upstream and downstream oxidation catalyst temperature sensors after a calibrated engine off soak time	Path 1: (a) - (b) (see Look-Up-Table #30) with (a) captured oxidation catalyst downstream temperature at start and with (b) captured oxidation catalyst upstream temperature at start as reference temperature or Path 2: ((a) - (b) (see Look-Up-Table #30) with	= measured parameter = measured parameter	minimum engine-off time C and ambient temperature - and Engine Running (see parameter definition) - for time and engine post drive/ afterun C and diagnostic performed in current dc	>= > = = = = = = = = = = = = = = = = =	28800.00 -60.04 TRUE 0.00 FALSE FALSE	°C - sec	fail conditions exists for 0.050 s monitor runs with 0.050 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.
System	Code	Description	(a) captured oxidation catalyst downstream temperature at start and with	=	measured parameter	-	and basic enable conditions met:	=	see sheet enable tables	-	Required	mum.
			(b) captured oxidation catalyst upstream temperature at start as reference temperature and	=	measured parameter	-	and NO Pending or Confirmed DTCs:	=	see sheet inhibit	-		
			(a) - (b) (see Look-Up-Table #31) with (a) captured oxidation catalyst downstream temperature at start	> =	30 to 999 measured parameter	°C -			tables			
			and with (b) captured oxidation catalyst upstream temperature at start as reference temperature and	=	measured parameter	-						
			status of block heater	=	FALSE	-						
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	Reductant Pump Module Pressure	>	650.00	kPa	status of SCR control sub state (please see the definition)	=	Metering control		fail conditions exists for more than 10 s monitor runs with 0.1 s	A
		control					status byte in substate METERING CONTROL	=	Running	-	rate whenever enable conditions	

Component / System	Fault Code	Monitor Strategy Description	Primary Malfunction Criteria		Threshold Logic and Value	e	Secondary Parameters		Enable Conditions		Time Required	MIL Illum.
							Dwell time in Metering control substate ambient pressure ambient temperature NO Pending or Confirmed DTCs: basic enable conditions met:	> >= >= =	1.00 0.00 -30.04 see inhibit tables see sheet enable tables	sec kPa °C -	are met	
		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 conditions	
SCR Nox Catalyst Efficiency Below Threshold Bank 1	P20EE	Compare EWMA filtered NOx conversion efficiency of SCR catalyst with a threshold value	EWMA filtered delta SCR catalyst efficiency of (a) - (b)	<	0.00	factor	NO Pending or Confirmed DTCs:	=	see sheet inhibit tables	-	fail conditions exists for more than 1	A
		unestiola value	where (a) measured SCR catalyst efficiency	=	calculated	factor	for time	>	300.00	sec	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 enable	
			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 -	conditions are met	
			(d) correction map dependent on SCR catalyst temperature and upstream NOx mass flow		1.00	factor	for time	>	60.00	sec		
			(e) correction map dependent on SCR catalyst temperature and exhaust mass flow		1.00	factor						
			(f) Offset threshold (see Look-Up-Table #100)		-0.3 to -0.1	factor	(TOUE			
							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 metering strategy)		330.00 20.00	sec		
							Status for disabling SCR Efficiency monitoring following an SCR Adaptation completion (please see the definition)	=	FALSE	-		

Component /	Fault	Monitor Strategy	Primary Malfunction	Threshold	Secondary		Enable		Time	MIL
System	Code	Description	Criteria	Logic and Value	Parameters		Conditions		Required	Illun
, , , , ,		,			for time	>	(a) + (b)	sec		
					(a) Debounce time after pre controlled	>	0.50	sec		
				1	dosing over		0.00	550		
					(b) delay time the status of disabling	>	80.00	sec		
						_	60.00	Sec		
					SCR Efficiency monitoring					
					or					
					integrated upstream NOx	>=	3276.70	g		
)					
					(
					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		000.00	000		
				1						1
				1	or integrated upstream NOx	>=	3276.70	C		1
					integrated upstream NOX	>=	3270.70	g		
				1)					1
				1	.[1
					(5)					
					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			Ü		
					for time	>	0.50	sec		
					Monitor disable time based on average	>	0 to 120	sec		
					NOx mass flow and the time (see Look-		0 10 120	500		
					Up-Table #88)					
					Op-Table #66)					
					/					
					for a time of critical		F 00			
					for time with	>	5.00	sec		
					Delta SCR temperature (see Look-Up-	<	59.96 to 64.96	°C		
				1	Table #85)					1
				1	Delta SCR temperature (see Look-Up-	>	-50.04 to -0.04	°C		1
				1	Table #101)					
				1	Delta SCR temperature	<=	524.96	°C		
				1	Delta SCR temperature	>=	199.96	°C		1
					Initialization time of temperature gradient	>=	2.50	sec		
					calculation					
)					
				1	or					
				1	Delta SCR temperature	<	229.96	°C		
				1	or	`	220.00	3		
					Delta SCR temperature	>	499.96	°C		
				1	for time					
				1	for time	>	10.00	sec		
)					
				1	J					
				1	(a			
				1	normalized HC load in SCR catalyst	>	21.00	-		1
				1)					
				1	(1
				1	ambient pressure	>=	74.80	kPa		1
					ambient temperature		-7.04	°C		

Component /	Fault	Monitor Strategy	Primary Malfunction	Threshold	Secondary		Enable		Time	MIL
System	Code	Description	Criteria	Logic and Value	Parameters		Conditions		Required	Illum
)					
					(EALOE			
					Stuck reductant dosing valve fault was healed	=	FALSE	-		
					last particulate filter regeneration	=	TRUE	_		
					successful	_	INOL			
)					
					ί					
					State of the NH3 slip detection	=	FALSE	-		
					integrated upstream NOx during SCR	>=	20.00	g		
					adaptation plausibility check active					
					Status of the SCR adaptation plausibility	=	FALSE	-		
					check active (please see the definition)					
					for time	>	600.00	sec		
)		EALOE			
					SCR NOx Catalyst Efficiency Below	=	FALSE	-		
					Threshold Bank 1 was performed this					
					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)					
					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)	=	FALSE	-		
					trie definition)					
					(
					Disable after SCR adaptation	=	FALSE	-		
					for time	>	600.00	sec		
)					
					((
					(a) - (b)	<=	74.96	°C		
					for time	>	0.00	sec		
)					
					or					
					(-) (-)		14.06	°C		
					(a) - (b)	>=	14.96			
					for time (a) upstream SCR catalyst temperature	>	0.00	sec		
					(a) upstream SON catalyst temperature					
					(b) downstream SCR catalyst					
					temperature					
))					
					Integrated NOx mass upstream SCR	>	1.00	g		
					for time	>	0.00	sec		
					Average SCR Temperature	<=	399.96	°C		
					Average SCR Temperature	>=	-3549.94	°C	1	

Component /	Fault	Monitor Strategy	Primary Malfunction	Threshold	Secondary		Enable		Time	MIL
System	Code	Description	Criteria	Logic and Value	Parameters		Conditions		Required	Illum.
- ,		, , ,			Downstream SCR catalyst temperature	>=	3003.56	°C		
					Downstream SCR catalyst temperature	<=	-3549.94	°C		
					Filtered and delayed upstream NOx raw emission	>=	750.00	ppm		
					Filtered and delayed upstream NOx raw emission	<=	175.00	ppm		
					Filtered and delayed NOx raw emission mass flow upstream of SCR	<=	0.17	g/sec		
					Filtered and delayed NOx raw emission mass flow upstream of SCR	>=	0.01	g/sec		
					Filtered exhaust gas mass flow	<=	236.13	g/sec		
					Filtered exhaust gas mass flow	>=	-910.30	g/sec		
					MAP for valid engine operation points for SCR efficiency monitoring (see Look-Up-	=	0 to 1	-		
					Table #83)		0.00			
				1	for time	>	0.00	sec	[
					Inverse calculated accelerator pedal value	>	5.00	%		
					for time	>	0.00	sec		
					EWMA fast initialization mode:					
					filter coefficient for fast initialization	=	0.35	factor		
					number of SCR efficiency measurements for fast initialization mode	>=	3.00	count		
					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 general description for details)	<	-0.01	iacioi		
					offset-corrected modeled SCR catalyst efficiency (please see the general	>	0.00	factor		
					description for details) filter coefficient for Rapid Respond mode	=	0.16	factor		
					number of SCR efficiency measurements for Rapid Response mode	>=	6.00	count		
					EWMA filtered value too small in Fast Init. And Rapid Response modes:					
					EWMA filtered delta SCR catalyst efficiency of (a) - (b) (a) measured SCR catalyst efficiency (b) offset-corrected modeled SCR catalyst efficiency (please see the general description for details)	<	0.00	factor		
					EWMA stabilized mode: filter coefficient for stabilized mode number of SCR efficiency measurements for stabilized mode	= =	0.04 1	factor count		

Component / System	Fault Code	Monitor Strategy Description	Primary Malfunction Criteria	L	Threshold ogic and Value		Secondary Parameters		Enable Conditions		Time Required	MIL Illum.
							not disabled during following conditions	=	see sheet enable tables	-		
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	<= <=	-13.9	V %	ignition on and basic enable conditions met: and NO Pending or Confirmed DTCs:	=	TRUE see sheet enable tables see sheet inhibit tables		fail conditions exists for 0.19 s monitor runs with 0.01 s rate whenever enable conditions are met	А

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	>=	2.32 115.1	V %	and basic enable conditions met: and NO Pending or Confirmed DTCs:	0 0	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	А

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 -	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.
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) and fuel system status	= TRUE -	fail conditions exists for more than 0.04 s monitor runs with 0.01 s rate whenever enable conditions are met	A

Component /	Fault	Monitor Strategy	Primary Malfunction	Threshold	Secondary		Enable		Time	MIL
System	Code	Description	Criteria	Logic and Value	Parameters		Conditions		Required	Illum.
Injector Positive Voltage Control Circuit Group 4	P2155	ECM Electronic out-put driver circuitry determines if faults (open/short/no load) exist on injector charging bank #4.	Voltage high during driver off state (indicates short to power, short to ground, or open circuit)	= Short to power: ≤ 0.5 Ω impedance between signal and controller power Open Circuit: ≥ 200 K Ω impedance between ECU 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	-	fail conditions exists for more than 0.04 s monitor runs with 0.01 s rate whenever enable conditions are met	A
Reductant tank heater short circuit	P214F	Compare the maximum measured conductance of a tank heater against the threshold	maximum conductance of tank heater (a) upper threshold (b) factor for tolerances	with = 0.98	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 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 more per trip with 0.001 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.
Intake Air Temp Sensor 1 / 2 Correlation	P2199	Detects biased Humidity Temperature Sensor (IAT #1) or MAF Intake Air Temperature Sensor (IAT #2) by comparing the measured temperatures at start.	Path 1:	>	100 to 999	°C	minimum engine-off time	>=	28800.00	sec	fail conditions exists for 0.1 s monitor runs once per trip with 0.1 s rate	В
			where (a) captured intake air temperature at start	=	measured parameter	-	ambient air temperature and	>	-60.04	°C	whenever enable conditions	
			and (b) captured humidity temperature at start	=	measured parameter	-	Engine Running (see parameter definition) for	=	TRUE	-	are met	
			or Path 2:				time and engine post drive/ afterun	> =	0.00 FALSE	sec -		
			((a) - (b) (see Look-Up-Table #2)	<=	100 to 999	°C	and diagnostic performed in current dc	=	FALSE	-		
			where (a) captured intake air temperature at start and	=	measured parameter	-	and basic enable conditions met:	=	see sheet enable tables	-		
			(b) captured humidity temperature at start and	=	measured parameter	-	NO Pending or Confirmed DTCs:	=	see sheet inhibit tables	-		
			(a) - (b) (see Look-Up-Table #5) where (a) captured intake air temperature at	> =	20 to 999 measured	°C						
			start and (b) captured humidity temperature at start	=	parameter measured parameter	-						
			and (status of block heater (see parameter	=	FALSE	_						
			definition) or status of sun-load detection (see	=	FALSE	-						
			parameter definition)))									
Reductant Level Sensor 2 Circuit	P21AA	CAN message: Discrete level sensor level 2 short to	Reductant Tank Level 2 Error Status	=	1	-	ignition on	=	TRUE	-	fail conditions	Α
Low		ground error	(tank level sensor 2 voltage directly measured after a test impulse was	<	(0.17)	V	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	P21AB	Path 1:									are met	
Sensor 2 Circuit High	FZIAD	raui i.										

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	-		
		enor	(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		
			аруной у				basic enable conditions met:	=	see sheet enable tables	-		
Reductant Level Sensor 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	<	(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	
Reductant Level Sensor 3 Circuit	P21B0	Path 1:									conditions 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	>	(3.56)	V	battery voltage	>	8	V		
			applied) (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	ic and Valu	ie	Parameters		Conditions		Required	Illum.
eductant tank eater 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	0.92 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: 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	0.001 s monitor runs once per trip with 0.001 s rate whenever enable conditions are met	
IOx Sensor Circuit Bank 1 Jensor 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 see sheet enable 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	

omponent /	Fault	Monitor Strategy	Primary Malfunction	Threshold	Secondary		Enable		Time	M
System	Code	Description	Criteria	Logic and Value	Parameters		Conditions	90	Required	III
					SCR upstream temperature SCR upstream temperature	>= <=	94.96 3003.56	°C	enable	
					Engine Running	=	TRUE	-	conditions	
					for time		20.00		are met	
					Can Bus Initialized (CAN Bus is Active	>=	Z0.00 TRUE	sec		
					Can bus milialized (CAN bus is active	=	IKUE	-		
)	l				
					consisting of:	l	TDUE			
					ignition on	=	TRUE	-		
					for time	>=	3	sec		
					battery voltage	>	9.8	V		
					battery voltage	<	655.34	V		
					Upstream NOx sensor dewpoint	=	TRUE	-		
					achieved (please see the definition)	l				
					no pending or confirmed faults	=	see sheet inhibit	-		
						l	tables			
					basic enable conditions met:	=	see sheet enable	-		
						l	tables			
						l				
									4.11	
		Detects a failure when open	Open circuit linear lambda signal error	= TRUE -	following conditions for time	>	0.50	sec	fail	
		circuit status message from				l			conditions	
		linear lambda signal from				l			exists for	
		the NOx sensor is received				l			more than	
		continuously for a time				l			13 sec.	
		period				l			monitor runs	
						l			with 0.01 s	
					battery voltage	>=	11.00	V	rate	
					battery voltage	<=	655.34	V	whenever	
					SCR upstream temperature	>=	94.96	°C	enable	
					SCR upstream temperature	<=	3003.56	°C	conditions	
					Engine Running	=	TRUE	-	are met	
					for time	>=	20.00	sec	are met	
					Can Bus Initialized (CAN Bus is Active	=	TRUE			
)	l				
					consisting of:	l				
					ignition on	=	TRUE	_		
					for time	>=	3	sec		
					battery voltage	>	9.8	V		
					battery voltage	<	655.34	V		
					Upstream NOx sensor dewpoint	=	TRUE	-		
					achieved (please see the definition)	_				
					no pending or confirmed faults	=	see sheet inhibit	_		
					perioring or committee reality	-	tables			
					basic enable conditions met:	=	see sheet enable	_		
					badie dilabie dellamente men		tables			
			Short Circuit Nox signal error	= TRUE -	following conditions for time	>	0.50	sec	fail	
		circuit status message from				l			conditions	
		NOx sensor is received			1	l			exists for	
		continuously for a time				l			more than	
		period				l			13 sec.	
					battery voltage	>=	11.00	V	monitor runs	
					battery voltage	<=	655.34	V	with 0.01 s	
					SCR upstream temperature	>=	94.96	°C	rate	
		I	l		SCR upstream temperature	<=	3003.56	°C	whenever	
					Engine Running	=	TRUE		enable	

Component / System	Fault Code	Monitor Strategy Description	Primary Malfunction Criteria	Threshold Logic and Value	Secondary Parameters	Enable Conditions		Time Required	MI IIIu
-,500			SHORE		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			
		Detects a failure when short circuit status message from binary lambda signal form the NOx sensor is received continuously for a time period	Short Circuit binary lambda signal error	= TRUE -	following conditions for time	> 0.50	sec	fail conditions exists for more than 13 sec. monitor runs	
					battery voltage 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 inhibi	sec V V		
					basic enable conditions met:	tables = see sheet enable tables			
		Detects a failure when short circuit status message from linear lambda signal from the NOx sensor is received continuously for a time period	Short Circuit linear lambda signal error	= TRUE -	following conditions for time	> 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	>= 11.00 <= 655.34 >= 94.96 <= 3003.56 = TRUE >= 20.00	V V °C °C - sec	with 0.01 s rate whenever enable conditions are met	

Component /	Fault	Monitor Strategy	Primary Malfunction		Threshold		Secondary		Enable		Time	MIL
System	Code	Description	Criteria	L	ogic and Value	•	Parameters Can Bus Initialized (CAN Bus is Active		Conditions TRUE	_	Required	Illum.
							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 -		
N0x Sensor Circuit	P2203	Detects an out of range high	Nox sensor signal (raw information	>	2500.00	ppm	Nox sensor 1 ready status (see	=	TRUE		fault exists	В
High Bank 1 Sensor 1		fault of the upstream NoX Sensor	received via CAN from Nox sensor)				parameter definition) Valid NOx signal from CAN is received (no Nox sensor communication failures)	=	TRUE	-	for more than 10 sec; monitor runs at 0.1 s	
							Engine Running (see parameter definition)	=	TRUE	-	when enable conditions	
N0x Sensor Circuit	P2202	Detects an out of range low	Nox sensor signal (raw information	<	-90.00	ppm	for time and	>	20.00	sec	are met	
Low Bank 1 Sensor 1		fault of the upstream NoX Sensor	received via CAN from Nox sensor)				Injection Quantity	>	8.00	mm^3/rev		
							or Upstream NOx sensor dewpoint	=	TRUE	-		
							achieved (please see the definition) for time	>	600.00	sec		
Nox Sensor	P2205	Detects a failure when open	Open Circuit Nox Heater signal error	=	TRUE		following conditions for time	>	0.50	sec	fail	A
Heater Control Circuit Bank 1 Sensor 1		circuit status message from NOx sensor heater is received continuously for a time period									conditions exists for more than 13 sec.	
1							battery voltage	>=	11.00	V V	monitor runs with 0.01 s	
							hattery voltage		655 34			
							battery voltage SCR upstream temperature	<= >=	655.34 94.96	°C	rate whenever	
							SCR upstream temperature SCR upstream temperature	>= <=	94.96 3003.56	°C	whenever enable	
							SCR upstream temperature SCR upstream temperature Engine Running	>= <= =	94.96 3003.56 TRUE	°C °C -	whenever enable conditions	
							SCR upstream temperature SCR upstream temperature	>= <=	94.96 3003.56	°C	whenever enable	
							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 -	whenever enable conditions	
							SCR upstream temperature SCR upstream temperature Engine Running for time Can Bus Initialized (CAN Bus is Active) consisting of: ignition on	>= <= = >= =	94.96 3003.56 TRUE 20.00 TRUE	°C °C - sec -	whenever enable conditions	
							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	>= <= = >= = >= >	94.96 3003.56 TRUE 20.00 TRUE TRUE 3 9.8	°C °C - sec - sec V	whenever enable conditions	
							SCR upstream temperature SCR upstream temperature Engine Running for time Can Bus Initialized (CAN Bus is Active) consisting of: ignition on for time	>= <= = >= = = >=	94.96 3003.56 TRUE 20.00 TRUE TRUE 3	°C °C - sec - - sec	whenever enable conditions	

Component / System	Fault Code	Monitor Strategy Description	Primary Malfunction Criteria	Threshold Logic and Value	Secondary Parameters		Enable Conditions		Time Required	MIL Illum.
					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 battery voltage battery voltage SCR upstream temperature SCR upstream temperature Engine Running	> >= <= >= = =	0.50 11.00 655.34 94.96 3003.56 TRUE	sec	fail conditions exists for more than 13 sec. monitor runs with 0.01 s rate whenever enable	
					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:	= = > < = = =	TRUE 3 9.8 655.34 TRUE see sheet inhibit tables see sheet enable tables	sec - sec V V	conditions are met	
NOx Heater Performance Bank Sensor 1	P2209	Monitoring of the upstream NOx sensor signal readiness	Upstream NOx sensor heater temperature has reached setpoint	= FALSE -	battery voltage and battery voltage and Oxidation Catalyst upstream temperature and Oxidation Catalyst upstream temperature and	>= <= >= <=	11.00 655.34 94.96 3003.56	V V °C °C	fault exists for more than 1 event when dewpoint end is reached; monitor runs at 0.02 s when enable conditions are met	В
					Engine running for time and Upstream NOx sensor dewpoint end is reached (please see parameter definition)) for time and	= > = >	TRUE 20.00 TRUE	sec -		

Component /	Fault	Monitor Strategy	Primary Malfunction		Threshold		Secondary		Enable		Time	MIL
System	Code	Description	Criteria		Logic and Value	Э	Parameters		Conditions		Required	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	=	0.92 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	===	(a) * (b) with 0.12 1.00	1/Ohm 1/Ohm factor	and	= >= <= >= = =	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	1/Ohm	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 /	Fault	Monitor Strategy	Primary Malfunction	Threshold		Secondary		Enable		Time	MIL
System	Code	Description	Criteria	Logic and Va	lue	Parameters 4 the same tends in a start in		Conditions		Required	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	Detects a supply module heater short circuit by detecting high conductance in the heater	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		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	<= 1.97 <= 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 / System	Fault Code	Monitor Strategy Description	Primary Malfunction Criteria		Threshold Logic and Value		Secondary Parameters		Enable Conditions		Time Required	MIL 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	А
			same as ambient pressure	>=	115.00	kPa	and NO Pending or Confirmed DTCs: and basic enable conditions met:	=	see sheet inhib tables see sheet enab tables		whenever enable conditions are met	
Turbo Boost System Performance	P2263	Detects if the Turbocharger is severely over or under boosting based on control deviation	Path 1				(fail conditions exists for 15	A
		deviation	control deviation of the boost pressure calculated out of difference between desired and actual value with	>	(g*h) 42.5 to 45.0	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	=	FALSE	-	s monitor runs with 0.01 s rate 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 - in order to prevent soot accumulation e.g. in a long idle operation under cold engine condition on the turbine the desired value of the boost pressure actuator position governor is assigned from the set-point value	=	FALSE	-		
							and injection quantity is stable means increase of injection quantity	= <	TRUE 80.00	- (mm^3/rev) /sec		
							and engine speed is stable means	=	TRUE	-		
							increase of engine speed and injection Quantity injection Quantity and	< >= <=	80.00 480.00	rpm/sec mm^3/rev mm^3/rev		
							engine Speed engine Speed	>= <=	1200.00 3400.00	rpm rpm		l

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		and working range of boost pressure is in closed-loop means	=	TRUE	-	Kequirea	illum.
						(engine speed and	>	1200.00	rpm		
						injection quantity	>	20.00	mm^3/rev		
						NO Pending or Confirmed DTCs:	=	see sheet inhibit tables			
						for time and	>	2.00	sec		
						basic enable conditions met:	=	see sheet enable tables			
			Path 2 control deviation of the boost pressure calculated out of difference between	< (i*j)	-	(VNT turbocharger offset adaptation active	=	FALSE	-	fail conditions exists for 15	
			desired and actual value with (i) the upper limit (see Look-Up-Table	= -80 to -40	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				s monitor runs with 0.01 s rate whenever enable conditions are met	
			#63) (j) correction factor	= 1.00	factor	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	=	FALSE	-		
						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	>= <=	1200.00 3400.00	rpm rpm		
						and working range of boost pressure is in closed-loop means	=	TRUE	-		

Component / System	Fault Code	Monitor Strategy Description	Primary Malfunction Criteria	Threshold Logic and Value	Secondary Parameters	Enable Conditions		Time Required	MIL Illum.
					(engine speed and injection quantity) NO Pending or Confirmed DTCs: for time and Basic enable conditions met:	> 1200.00 > 20.00 = see sheet inhibit tables > 2.00 = see sheet enable tables	sec		
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	-	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		for time and NO Pending or Confirmed DTCs: and ignition on and basic enable conditions met:	> 11.00 > 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 Condition	ns	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:	> 11.00 > 3.00 = see sheet in tables = TRUE = see sheet en tables	-	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:	> 11.00 > 3.00 = see sheet in tables = TRUE = see sheet en tables	-	fail conditions exists for 0.5 s monitor runs with 0.01 s rate whenever enable conditions are met	A
NOx Sensor Circuit Bank 1 Sensor 2	P229E	Detects a failure when open circuit status message from downstream NOx sensor is received continuously for a time period	Open circuit downstream NOx signal error	= TRUE -	following conditions for time battery voltage battery voltage SCR downstream temperature SCR downstream temperature Engine Running for time	> 0.50 >= 11.00 <= 655.34 >= 94.96 <= 3003.56 = TRUE >= 20.00	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 / System	Fault Code	Monitor Strategy Description	Primary Malfunction Criteria	Threshold Logic and Value	Secondary Parameters	Enable Conditions		Time Required	MIL Illum
					Can Bus Initialized (CAN Bus is Active) consisting of: ignition on for time battery voltage battery voltage Downstream NOx sensor dewpoint achieved (please see the definition) no pending or confirmed faults basic enable conditions met:	= TRUE = TRUE >= 3 > 9.8 < 655.34 = TRUE = see sheet inhibit tables = see sheet enable tables	- sec V V -		
		Open circuit error of the binary lambda signal of Downstream NOx sensor via the CAN message	Open circuit lambda binary error of downstream NOx sensor via CAN message	= TRUE -	following conditions for time battery voltage battery voltage SCR downstream temperature SCR downstream temperature Engine Running for time	> 0.50 >= 11.00 <= 655.34 >= 94.96 <= 3003.56 = TRUE >= 20.00	sec V V °C °C - sec	fail conditions exists for more than 13 s monitor runs with 0.1 s rate whenever enable	
					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	= TRUE = TRUE >= 3 > 9.8 < 655.34 = TRUE = see sheet inhibit	sec V V	conditions are met	
					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	
					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	>= 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	
					for time battery voltage battery voltage	>= 3 > 9.8 < 655.34	sec V V		

mponent /	Fault	Monitor Strategy	Primary Malfunction	Threshold	Secondary		Enable		Time	
System	Code	Description	Criteria	Logic and Value	Parameters		Conditions		Required	
					Downstream NOx sensor dewpoint achieved (please see the definition) no pending or confirmed faults basic enable conditions met:	= =	TRUE see sheet inhibit tables see sheet enable tables	-		
		Downstream NOx sensor short circuit error via the CAN message	Short circuit NOx signal error of downstream NOx sensor via CAN message	= TRUE -	following conditions for time battery voltage battery voltage SCR downstream temperature SCR downstream temperature Engine Running for time Can Bus Initialized (CAN Bus is Active) consisting of: ignition on 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	fail conditions exists for more than 13 s monitor runs with 0.1 s rate whenever enable conditions are met	
		Short circuit error of binary lambda signal of Downstream NOx sensor via the CAN message	Short circuit lambda binary error of downstream NOx sensor via CAN message	= TRUE -	following conditions for time battery voltage battery voltage SCR downstream temperature SCR downstream temperature Engine Running for time Can Bus Initialized (CAN Bus is Active) consisting of: ignition on for time battery voltage battery voltage 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	

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

Component /	Fault	Monitor Strategy	Primary Malfunction	Threshold	Secondary		Enable		Time	MIL
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 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	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 I 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 / System	Fault Code	Monitor Strategy Description	Primary Malfunction Criteria	Threshold Logic and Value		Secondary Parameters		Enable Conditions		Time Required	MIL Illum.
				3		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 Or measured upstream NOx response time from the initial NOx value to 40% of the initial value.	> 2.30	sec	global enable conditions: upstream NOx readiness Engine operation mode ≠ DPF Regeneration no post injection No Pending or Confirmed DTC basic enable conditions met: state machine: inactive the following conditions moves the state machine from inactive state to steady- state operating point state: (engine speed injection quantity for combustion upstream NOx concentration) state-machine: Check-Operating point the following conditions moves the state machine from steady-state operating point state to wait-for-overrun: (engine speed	= = = >= >= >= >=	TRUE TRUE TRUE See sheet inhibit tables see sheet enable tables 1200.00 120.00 100.00	- - - - - rpm mm^3/rev ppm	fail conditions exist for 1 event, test is performed in the 0.01 ms rate when enable conditions are met	В
						upstream NOx concentration injection quantity for combustion injection quantity for combustion with (a) Reference injection quantity picked in Check-operating point state (b) Maximum deviation of injection quantity for time	>= <= >= =	100.00 (a) + (b) (a) - (b) measured parameter 40.00 2.00	ppm mm^3/rev mm^3/rev mm^3/rev mm^3/rev sec		
						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 /	Fault	Monitor Strategy	Primary Malfunction		Threshold		Secondary		Enable		Time	MIL
System	Code	Description	Criteria	L	ogic and Value		Parameters		Conditions		Required	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 sec		
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- diagnostic result	<	62.00	%	diagnostic tests status of downstream NOx sensor validity	=	True	-		
			ulagriostic result				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		
							for time	>=	5.00	rpm sec		
1							Modeled downstream NOx concentration	<	160.00	ppm		
1							Battery voltage	<=	6553.40	V		
							Battery voltage NO Pending or Confirmed DTCs:	>=	10.00 see sheet	V -		
							status of heater temperature validity for downstream Nox sensor	=	inhibit tables TRUE	-		
							(engine speed virtual pedal angle	<	1200.00 10.00	rpm %		
							for time With	< <=	14400.00	sec		
							(((SCR downstream temperature for time	<= >=	129.96 40.00	°C sec		

Total	Component /	Fault	Monitor Strategy	Primary Malfunction	Threshold	Secondary		Enable		Time	MIL
Vehicle speed	System	Code	Description	Criteria	Logic and Value	Parameters		Conditions		Required	Illum.
True Status: DPF Regeneration active Status: DPF Regeneration ract completed FALSE Status: DPF Regeneration ract completed FALSE Status: DPF Regeneration ract completed FALSE Status: DPF Regeneration ract completed TRUE Status: DPF Regeneration ract complete TRUE Status:) for time	>=	600.00	sec		
True Status: DPF Regeneration active Status: DPF Regeneration ract completed FALSE Status: DPF Regeneration ract completed FALSE Status: DPF Regeneration ract completed FALSE Status: DPF Regeneration ract completed TRUE Status: DPF Regeneration ract complete TRUE Status:) ((04.00	1		
Status: DPP Regeneration actors FALSE -											
Status: DPF Regeneration not completed FALSE -						for time	>=	600.00	sec		
Status: DPF Regeneration not completed = FALSE -						(Status: DFP Regeneration active	=	FALSE	-		
Ignition key of Engine operation satus						Or Status: DPF Regeneration not completed	=	FALSE	-		
Ignition key of Engine operation satus)					
Engine operation status						Rising edge of the following conditions:	=	TRUE	-		
Status: DPF Regeneration not completed = TRUE -						(Ignition key on Engine operation status					
Status: DFP Regeneration active)					
Engine coolant temperature						Status: DPF Regeneration not completed	=	TRUE	-		
Ignition key on Or Status of over run condition						Status: DFP Regeneration active					
Status of over run condition						Engine coolant temperature))	<=	59.96	°C		
Status of over run condition							=	TRUE	-		
Status of over run condition = FALSE						status of over run condition					
Estimated HC Load in SCR catalyst Change of estimated HC Load in SCR SCR Catalyst Within time Catalyst Cata									sec -		
Change of estimated HC Load in SCR catalyst within time (a) Estimated HC Load limit in SCR catalyst (b) time factor (b) time factor (c)									sec		
Catalyst within time							<=	2.00	g		
Within time Co.20 sec							>=	(a) * (b)	g		
Catalyst						within time	<				
))) 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						catalyst			_		
engine speed <=))		0.20	260		
engine speed <=						(Estimated HC Load in SCR catalyst	>=	32.00	g		
SCR downstream temperature <= 199.96 °C SCR downstream temperature >= -40.04 °C						engine speed	<=	4000.00	rpm		
SCR downstream temperature >= -40.04 °C											
						SCR downstream temperature					

System Code Description Criteria Logic and Value Parameters Code 159.95 Code To time Code To time Code To time Code To time Code	Component /	Fault	Monitor Strategy	Primary Malfunction		Threshold		Secondary		Enable		Time	MIL
SR doverstream temperature: (199.95 °C) for time (are Look-Lip-Table #89)					L		9						
True California Californi	,		·						<=		°C		
For time (pred Lock-Up Table 1985)													
vehicle speed for time in the control of the contro)					
vehicle speed for time in the control of the contro								for time (see Look-Up-Table #99)	>=	100 to 900	sec		
Additional release conditions:)					
Additional release conditions:								ά					
Additional release conditions:								vehicle speed	<=	44.75	mph		
Additional release conditions:													
Additional release conditions release conditions and provided speak for the properties of the provided speak for t													
Additional release conditions release conditions and provided speak for the properties of the provided speak for t								for time (see Look-Up-Table #99)	>=	100 to 900	sec		
Vehicle speed number of possible sets runs in affer-run 20.00 counts))					
Vehicle speed number of possible sets runs in affer-run 20.00 counts													
rumber of possible test runs in affer-un < 2,000 counts								Additional release conditions:					
Engine operation status = Post Drive for time in ECL different in 2 = 100.00 sec to time in ECL different in 2 = 100.00 sec to time in ECL different in 2 = 100.00 sec to time in ECL different in 2 = 100.00 sec to time in ECL different in 2 = 100.00 sec to time in ECL different in 2 = 100.00 sec to time in ECL different in 2 = 100.00 sec to time in ECL different in 2 = 100.00 sec to time in ECL different in 2 = 100.00 sec to time in ECL different in 2 = 100.00 sec to time in ECL different in 2 = 100.00 sec to time in ECL different in 2 = 100.00 sec to time in ECL different in EC								vehicle speed	=	0	mph		
Engine operation status = Post Drive for time in ECL different in 2 = 100.00 sec to time in ECL different in 2 = 100.00 sec to time in ECL different in 2 = 100.00 sec to time in ECL different in 2 = 100.00 sec to time in ECL different in 2 = 100.00 sec to time in ECL different in 2 = 100.00 sec to time in ECL different in 2 = 100.00 sec to time in ECL different in 2 = 100.00 sec to time in ECL different in 2 = 100.00 sec to time in ECL different in 2 = 100.00 sec to time in ECL different in 2 = 100.00 sec to time in ECL different in 2 = 100.00 sec to time in ECL different in EC								number of possible test runs in after-run	<	20.00	counts		
Tor time in ECM alterum conditions in ECM al								·					
Tor time in ECM alterum conditions in ECM al								Engine operation status = Post Drive	=	True	-		
Tortime in ECM afterrun -									>=		sec		
True - status of heater temperature validity of the status of downstream NOx sensor self disprosis (Biz) for the status of heater temperature allowed the status of downstream NOx sensor self disprosis (Biz) for the status of heater temperature and with status of downstream NOx sensor self disprosis (Biz) to the status of heater temperature and with status of heater temperature status of heater tem													
status of heater temperature validity for worstream Nox sensor number of tests for averaging test result can be considered in the consider									<=		sec		
downstream Nox sensor self all diagnosis (BIZ) count status of downstream Nox sensor self diagnosis (BIZ) for time and the self-diagnosis (BIZ) for time and time													
number of tests for averaging test result <= 1.00 count Status of downstream NOx sensor self diagnosis (Bit2) for time >= 1 sec Afterrun Conditions: NO Pending or Confirmed DTCs: Engine operation status = Post Drive vehicle spend measured downstream NOx <= 160.00 ppm conditions: DFF regeneration active = FALSE - 00 ppm engine speed <= 1500.00 ppm engine speed <=													
Status of downstream Nox sensor self diagnosis (Bit2) for time >= 1 sec Afterrun Conditions: NO Pending or Confirmed DTCs: = see sheet inhibit - tables Engine operation status = Post Drive whickle speed messured downstream Nox = 160.00 ppm conditions PALSE - 160.00 ppm conditions PALS									<=	1.00	count		
Afterrun Conditions:													
Afterrun Conditions:								Status of downstream NOx sensor self	=	4	decimal		
P2428 Detects implausible temperatures in order to protect the engine P2428 Conditions in order to protect the engine P2428 Condition order to protect the engine													
P2428 P2428 P2428 Exhaust Gas High remperature P2428									>=	1	sec		
P2428 P2428 P2428 Exhaust Gas High remperature P2428													
P2428 P2428 P2428 Exhaust Gas High remperature P2428								Afterrun Conditions:					
Exhaust Gas High Temperature Exhaust Gas High Temperature Exhaust Gas High (a) oxidation catalyst upstream temperature and with (b) oxidation catalyst upstream (c) oxidation catalyst upstream (c) oxidation catalyst downstream (c) oxidation ca									=	see sheet inhibit	-		
Exhaust Gas High P2428 Eetects implausible temperature Any two of the following four conditions: (a) and (b)) or ((a) and (c)) or ((b) and (d)) or ((c) and (d)) with (a) oxidation catalyst upstream temperature and with (b) oxidation catalyst downstream temperature and with Engine operation status = Post Drive P40													
wehicle speed measured downstream NOX concentration DPF regnerator active engine speed engine sp								Engine operation status = Post Drive	=		-		
measured downstream NOx concentration DPF regeneration active engine speed engine													
Concentration DPF regeneration active engine speed engine speed PNOx sensor signal is valid (e.g. No CAN error of NOx CAN messages) Maximum duration in after un minimum duration to start self-diagnostic Exhaust Gas High P2428 Exhaust Gas High P2428 The preformation of the following four conditions: Itemperature Any two of the following four conditions: ((a) and (b)) or ((a) and (c)) or ((b) and (d)) or ((c) a											mag		
DPF regeneration active engine speed engine speed cengine speed engine speed engine speed cengine sp													
engine speed engin									=	FALSE	-		
exhaust Gas High remperature P2428 Detects implausible temperatures in order to protect the engine (a) and (b)) or ((a) and (c)) or ((b) and (d)) or ((b) and (d)) with (a) avidation catalyst upstream and with (b) oxidation catalyst downstream and with (b) oxidation catalyst downstream and with (c) AN error of NOx CAN messages) (maximum duration in afterrun (c) CAN error of NOx CAN messages) (maximum duration in afterrun (c) CAN error of NOx CAN messages) (maximum duration in afterrun (c) CAN error of NOx CAN messages) (maximum duration in afterrun (c) CAN error of NOx CAN messages) (maximum duration in afterrun (c) CAN error of NOx CAN messages) (maximum duration in afterrun (c) CAN error of NOx CAN messages) (maximum duration in afterrun (c) CAN error of NOx CAN messages) (maximum duration in afterrun (c) CAN error of NOx CAN messages) (maximum duration in afterrun (c) CAN error of NOx CAN messages) (maximum duration in afterrun (c) CAN error of NOx CAN messages) (maximum duration in afterrun (c) CAN error of NOx CAN messages) (maximum duration in afterrun (c) CAN error of NOx CAN messages) (c) CAN error of NOx CAN messages) (c) CAN error of NOx CAN messages) (c) Can duration in afterrun (d) or (b) and (c) or ((a) and (b) or ((a) and error of NOx each remainder of the following four conditions: (d) and (d) or ((b) and (d)) or ((a) and error of NO enditions met: (d) and (d) or ((b) and (d)) or ((a) and error of NO enditions met: (e) See sheet enable (a) and (b) or ((a) and (c)) or ((b) and (d)) or ((b) and											man		
Nox sensor signal is valid (e.g. No CAN error of NOx CAN messages) Maximum duration in afterrun minimum duration in afterrun minimum duration in start self-diagnostic expensive expen									<=				
Exhaust Gas High P2428 Detects implausible temperatures in order to protect the engine (a) oxidation catalyst downstream temperature and with (b) oxidation catalyst downstream temperature and with (b) oxidation catalyst downstream and with (c) and (d) or (d) an									=				
maximum duration in afterrun minimum duration to start self-diagnostic attempts basic enable conditions met: Exhaust Gas High Femperature P2428 Detects implausible temperatures in order to protect the engine (d) or ((a) and (b)) or ((a) and (c)) or ((b) and (c)) or ((c) and (c)) or ((b) and (c)) or ((c) and (c)) or ((c) and (c)) or ((c) and (c)) or ((b) and (CAN error of NOx CAN messages)					
Exhaust Gas High Temperature P248 Detects implausible temperatures in order to protect the engine Any two of the following four conditions: ((a) and (b)) or ((a) and (c)) or ((a) and (d)) or ((b) and (d)) o									<=	300.00	sec		
number of self-diagnostic attempts basic enable conditions met: P2428 Detects implausible temperatures in order to protect the engine P2428 Conditions met: Exhaust Gas High Temperature P2428 Detects implausible temperatures in order to protect the engine P2428 P2428 Detects implausible temperatures in order to protect the engine P2428 P2428 Detects implausible temperatures in order to protect the engine P2428 P2													
Exhaust Gas High Temperature P2428 Detects implausible temperatures in order to protect the engine Any two of the following four conditions: ((a) and (b)) or ((a) and (c)) or ((b) and (c)) or ((b) and (d)) or ((c) and (d)) or ((b) and (d)) or ((b) and (d)) or ((c) and (d)) or ((b) and (d)) or ((b) and (d)) or ((b) and (d)) or ((b) and (d)) or ((c) and (d)) or ((b) and (d)) or ((b) and (d)) or ((c) and (d)) or ((b) and (d)) or ((b) and (d)) or ((b) and (d)) or ((c) and (d)) or ((b) and (d)) or ((c) and (d)) or ((b) and (d)) or ((c) and (d)) or ((b) and (d)) or ((b) and (d)) or ((b) and (d)) or ((c) and (d)) or ((b) and (d)) or ((c) and (d)) or ((b) and (d)) or ((b) and (d)) or ((c) and (d)) or ((b) and (d)) or ((b) and (d)) or ((c) and (d)) or ((b) and (d)) or ((b) and (d)) or ((c) and (d)) or ((c) and (d)) or ((b) and (d)) or ((c) and (d)) or ((b) and (d)) or ((c) and (d)) or ((c) and (d)) or ((b) and (d)) or ((c) and (d)) or ((c) and (d)) or ((b) and (d)) or ((c) and (d)) or ((c) and (d)) or ((b) and (d)) or ((c) and (d)) or ((c) and (d)) or ((b) and (d)) or ((b) and (d)) or ((c) and (d)) or ((c) and (d)) or ((b) and (d)) or ((b) and (d)) or ((c) and (d)) or ((c) and (d)) or ((c) and (d)) or ((b) and (d)) or ((c) and (d)) o]					
Exhaust Gas High Temperature P2428 Detects implausible temperatures in order to protect the engine Any two of the following four conditions: ((a) and (b)) or ((a) and (c)) or ((b) and (c)) or ((b) and (d)) or ((c) and (d)) or ((b) and (d)) or ((b) and (d)) or ((c) and (d)) or ((b) and (d)) or ((b) and (d)) or ((b) and (d)) or ((b) and (d)) or ((c) and (d)) or ((b) and (d)) or ((b) and (d)) or ((c) and (d)) or ((b) and (d)) or ((b) and (d)) or ((b) and (d)) or ((c) and (d)) or ((b) and (d)) or ((c) and (d)) or ((b) and (d)) or ((c) and (d)) or ((b) and (d)) or ((b) and (d)) or ((b) and (d)) or ((c) and (d)) or ((b) and (d)) or ((c) and (d)) or ((b) and (d)) or ((b) and (d)) or ((c) and (d)) or ((b) and (d)) or ((b) and (d)) or ((c) and (d)) or ((b) and (d)) or ((b) and (d)) or ((c) and (d)) or ((c) and (d)) or ((b) and (d)) or ((c) and (d)) or ((b) and (d)) or ((c) and (d)) or ((c) and (d)) or ((b) and (d)) or ((c) and (d)) or ((c) and (d)) or ((b) and (d)) or ((c) and (d)) or ((c) and (d)) or ((b) and (d)) or ((c) and (d)) or ((c) and (d)) or ((b) and (d)) or ((b) and (d)) or ((c) and (d)) or ((c) and (d)) or ((b) and (d)) or ((b) and (d)) or ((c) and (d)) or ((c) and (d)) or ((c) and (d)) or ((b) and (d)) or ((c) and (d)) o													
Exhaust Gas High Temperature P2428 Detects implausible temperatures in order to protect the engine Any two of the following four conditions: ((a) and (b)) or ((a) and (c)) or ((b) and (c)) or ((b) and (d)) or ((c) and (d)) or ((b) and (d)) or ((b) and (d)) or ((c) and (d)) or ((b) and (d)) or ((b) and (d)) or ((b) and (d)) or ((b) and (d)) or ((c) and (d)) or ((b) and (d)) or ((b) and (d)) or ((c) and (d)) or ((b) and (d)) or ((b) and (d)) or ((b) and (d)) or ((c) and (d)) or ((b) and (d)) or ((c) and (d)) or ((b) and (d)) or ((c) and (d)) or ((b) and (d)) or ((b) and (d)) or ((b) and (d)) or ((c) and (d)) or ((b) and (d)) or ((c) and (d)) or ((b) and (d)) or ((b) and (d)) or ((c) and (d)) or ((b) and (d)) or ((b) and (d)) or ((c) and (d)) or ((b) and (d)) or ((b) and (d)) or ((c) and (d)) or ((c) and (d)) or ((b) and (d)) or ((c) and (d)) or ((b) and (d)) or ((c) and (d)) or ((c) and (d)) or ((b) and (d)) or ((c) and (d)) or ((c) and (d)) or ((b) and (d)) or ((c) and (d)) or ((c) and (d)) or ((b) and (d)) or ((c) and (d)) or ((c) and (d)) or ((b) and (d)) or ((b) and (d)) or ((c) and (d)) or ((c) and (d)) or ((b) and (d)) or ((b) and (d)) or ((c) and (d)) or ((c) and (d)) or ((c) and (d)) or ((b) and (d)) or ((c) and (d)) o								number of self-diagnostic attempts	<	20.00	count		
Detects implausible temperatures in order to protect the engine Any two of the following four conditions: ((a) and (b)) or ((a) and (c)) or ((a) and (d)) or ((b) and (d)) or (basic enable conditions met:	=	see sheet enable	-		
temperature in order to protect the engine temperature in order to protect the engine ((a) and (b)) or ((b) and (c)) or ((b) and (d)) or ((c) and (d)) or ((c) and (d)) or ((b) and (d)) or ((c) and (d)) or ((c) and (d)) or ((c) and (d)) or ((b) and (d)) or ((c) and (d)) or ((c) and (d)) or ((c) and (d)) or ((b) and (d)) or ((c) and (d)) or ((c) and (d)) or ((c) and (d)) or ((b) and (d)) or ((c)												<u> </u>	
temperature in order to protect the engine temperature in order to protect the engine ((a) and (b)) or ((b) and (c)) or ((b) and (d)) or ((c) and (d)) or ((c) and (d)) or ((b) and (d)) or ((c) and (d)) or ((c) and (d)) or ((c) and (d)) or ((b) and (d)) or ((c) and (d)) or ((c) and (d)) or ((c) and (d)) or ((b) and (d)) or ((c) and (d)) or ((c) and (d)) or ((c) and (d)) or ((b) and (d)) or ((c)													
protect the engine (d)) or ((b) and (c)) or ((b) and (d)) or ((c) and (d)) or ((c) and (d)) or ((c) and (d)) or ((d) and (d)) or ((e) and (e)	Exhaust Gas High	P2428	Detects implausible					basic enable conditions met:	=	see sheet enable	-	fail	Α
and (d)) with (a) oxidation catalyst upstream temperature and with (b) oxidation catalyst downstream temperature and with (b) oxidation catalyst downstream and with (c) oxidation catalyst downstream and with (d) oxidation catalyst downstream and with (e) oxidation catalyst downstream and with (f) oxidation catalyst downstream and with (f) oxidation catalyst downstream and with (f) oxidation catalyst downstream	Temperature		temperatures in order to	((a) and (b)) or ((a) and (c)) or ((a) and						tables		conditions	
and (d)) with (a) oxidation catalyst upstream temperature and with (b) oxidation catalyst downstream temperature and with (b) oxidation catalyst downstream and with (c) oxidation catalyst downstream and with (d) oxidation catalyst downstream and with (e) oxidation catalyst downstream and with (f) oxidation catalyst downstream and with (f) oxidation catalyst downstream and with (f) oxidation catalyst downstream			protect the engine									exists for 6 s	
(a) oxidation catalyst upstream > 799.96 °C NO Pending or Confirmed DTCs: = see sheet inhibit - continuously temperature and with (b) oxidation catalyst downstream > 799.96 °C temperature and with				and (d))								test	
temperature and with (b) oxidation catalyst downstream > 799.96 °C temperature and with													
temperature and with (b) oxidation catalyst downstream > 799.96 °C temperature and with				(a) oxidation catalyst upstream	>	799.96	°C	NO Pending or Confirmed DTCs:	=	see sheet inhibit	-		
and with (b) oxidation catalyst downstream > 799.96 °C temperature and with										tables			
temperature and with													
and with				(b) oxidation catalyst downstream	>	799.96	°C						
(c) SCR downstream temperature > 799.96 °C													
				(c) SCR downstream temperature	>	799.96	°C					ı l	

Component / System	Fault Code	Monitor Strategy Description	Primary Malfunction Criteria		Threshold Logic and Value		Secondary Parameters	Enabl Condition		Time Required	MIL Illum.
бузісні	Ouc	Description	and with (d) particulate filter downstream temperature	>	799.96	°C	r ai alligitets	Condition		required	mam.
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 ℃	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:	<= 6000.0 >= 0.00 <= 800.00 >= 0.00 > -50.00 > 0.00 > 0.00 > -45.02 > 0.00 = see she inhibit tat = see sheet e tables	mm^3/rev 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><= 6000.0 >= 0.00 <= 800.00 >= 0.00 > -50.04 > 0.00 > 0.00 > -45.04 > 0.00 = see she inhibit tat = see sheet 6 tables</pre>	mm^3/rev 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
renormance			or change in differential pressure	>	1.00	kPa/s	change in exhaust gas volume flow or	>	375.00	m^3/h/s	performed continuously	
							change in exhaust gas volume flow)	<	-375.00	m^3/h/s	0.1 s rate	
							and current exhaust gas volume flow and	>	375.00	m^3/h		
							basic enable conditions met:	=	see sheet enable tables	-		
							and NO Pending or Confirmed DTCs:	=	see sheet inhibit tables	-		
			Port 4				E. d. Out		A(D		6.9	
			Path 1: differential pressure sensor	>	3.20	kPa	Engine State for time and	>	After Run 35.00	sec	fail conditions exists for 0.5	
							basic enable conditions met:	=	see sheet enable tables	-	s monitor runs	
							and NO Pending or Confirmed DTCs:	=	see sheet inhibit tables	-	with 0.1 s rate	
									tables		whenever enable conditions are met	
Diesel Particulate	P2454	Detects low voltage	voltage of differential pressure sensor	<	0.83	V	ignition on	=	TRUE	-	fail	В
Filter Differential Pressure Sensor Circuit Low Voltage		readings on the DPF differential pressure sensor circuit, indicating an OOR low condition on the circuit									conditions exists for 3 s test performed continuously	
			same as differential pressure	<	-4.20	kPa	and basic enable conditions met:	=	see sheet enable	-	0.020 s rate	
							and NO Pending or Confirmed DTCs:	=	tables see sheet inhibit	_		
							NO Fending of Committee DTCs.	_	tables			
Diesel Particulate	P2455	Detects high voltage	voltage of differential pressure sensor	>	4.67	V	ignition on	=	TRUE		fail	
Filter Differential Pressure Sensor Circuit High		readings on the DPF differential pressure sensor circuit, indicating an OOR									conditions exists for 3 s test	
Voltage		high condition on the circuit									performed continuously	
i l		l	same as	I			and	l			0.020 s rate	

Component / System	Fault Code	Monitor Strategy Description	Primary Malfunction Criteria	Threshold Logic and Value	Secondary Parameters		Enable Conditions		Time Required	MIL Illum.
ŕ			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	< 0.45 -	following conditions for time (engine speed and engine speed)) and (injection quantity and injection quantity) and injection quantity) and (recirculated exhaust-gas mass flow downstream of the EGR cooler and recirculated exhaust-gas mass flow downstream of the EGR cooler and EGR controller is active and ((a) - (b) with (a) filtered temperature upstream of EGR-cooler and with (b) engine temperature upstream of EGR-cooler and with (a) filtered temperature upstream of EGR-cooler and with (b) engine temperature upstream of EGR-cooler and with (b) engine temperature upstream of EGR-cooler and with (b) engine temperature upstream of EGR-cooler and with (a) filtered temperature upstream of EGR-cooler and with (b) engine temperature upstream of EGR-cooler and with (b) engine temperature upstream of engine coolant temperature	>=	120.00 1400.00 2800.00 20.00 320.00 12.50 32.72 TRUE 210.00 3276.70	sec rpm rpm mm^3/rev mm^3/rev g/sec g/sec - °C	fail conditions exists for 120 s monitor runs with 0.1 s rate whenever enable conditions are met	В
					and engine coolant temperature and	<=	129.96	°C		

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	<=	5.00	%		
							control value provided for EGR cooling bypass and	>=	-400.00	%		
							control value provided for EGR cooling bypass for	<=	5.00	%		
							time)	>	10.00	sec		
							and 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	-	land 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 549	g	basic enable conditions met:	=	see sheet enable tables	-		
			and with (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		Enable Conditions		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:2 - 200 K Ω impedance between ECU pin and load	battery voltage 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:	> = > = =	3.00 FALSE 3.00 ACTIVE 3.00 see sheet inhibit tables see sheet enable tables	v 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	> = > =	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	

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)	=	see sheet inhibit tables	-		
					and basic enable conditions met:	=	see sheet enable tables	-		
Exhaust Gas Recirculation (EGR) Motor Control Circuit 1	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	battery voltage	>	11.00	V	fail conditions exists for 3 s monitor runs	В
Low Voltage				and controller ground	for time and starter is active cranking	> =	3.00 FALSE	sec -	with 0.005 s rate whenever enable conditions are met	
	for time >				time	>	3.00	sec		
		ACTIVE	-							
					(NO Pending or Confirmed DTCs	=	see sheet inhibit tables	-		
					and basic enable conditions met:	=	see sheet enable tables	-		
Exhaust Gas Recirculation (EGR) Motor Control Circuit 1 High Voltage	P245D	Diagnoses the EGR Cooler Bypass low side driver circuit for circuit faults.	Voltage high during driver on state (indicates short to power)	= Short to power: ≤ 0.5 Ω impedance between signal and controller power	battery voltage	>	11.00	V	fail conditions exists for 3 s monitor runs with 0.005 s rate whenever	В
					for time	>	3.00	sec	enable conditions	
					and starter is active cranking for	=	FALSE	-	are met	
					time and	>	3.00	sec		
					EGR Cooling Bypass Solenoid Control Circuit and	=	ACTIVE	-		

Component / System	Fault Code	Monitor Strategy Description	Primary Malfunction Criteria	L	Threshold ogic 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	°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 %	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.
					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 factor	long term adaption triggered NO Pending or Confirmed DTCs basic enable conditions met:	= TRUE - = see sheet inhibit - tables = see sheet enable - tables	fault exists for more than 0.1 s; monitor runs at 0.1 s whenever enable conditions are met	В
Closed loop Reductant Injection Control at Limit-Flow too low	P249E	Detects an out of range low of the long term Reductant quantity adaption factor	long term adaptation factor of Reductant quantity	< 0.41 factor	long term adaption triggered 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.	commanded control value of the HCI temperature controller and deviation from the temperature setpoint for HCI control loop with (a) temperature threshold value and with (b) temperature value for threshold of	>= 0.00 - > maximum of (a) and (b+c) = 100.00 °C = 0.00 °C	current engine operating point is suitable for monitoring deviation of exhaust gas temperature control - depending on engine speed and injection quantity (see Look-Up-Table #25) for time and (exhaust gas temperature control is active means	= 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 /	Fault	Monitor Strategy	Primary Malfunction		Threshold		Secondary		Enable		Time	MIL
System	Code	Description	Criteria and with		Logic and Value		Parameters (Conditions		Required	Illum.
			(c) basic temperature threshold value for monitoring	=	100.00	°C	temperature upstream of the oxidation catalyst and	>	224.96	°C		
							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 and	<=	124.30	mph		
							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	-		
Closed Loop Particulate Filter Regeneration Control At Limit - Temperature Too High	P24A1	Detects excessive HCI temperature. Actual HCI controller ratio and temperature readings are compared to desired HCI controller ratio and temperature values as an indication of an excessive exhaust gas temperature.	commanded control value of the HCI temperature controller	<=	0.99		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 #26)	=	0 to 1		fail conditions exists for 300 s monitor runs with 0.1 s rate whenever enable	В
			and deviation from the temperature setpoint for HCI control loop with (a)	=	minimum of (a) and (b+c-(d-e)) -75.00	°C	for time and (>	30.00	sec	conditions are met	
			and with (b) temperature value for threshold of monitoring with (c) basic temperature threshold value	=	0.00	°C	exhaust gas temperature control is active means	=	TRUE	-		
			for monitoring and with				temperature upstream of the oxidation catalyst	>	224.96	°C		
			(d) temperature setpoint for exhaust gas system control loop and with	=	calculated parameter	-	and (

Component /	Fault	Monitor Strategy	Primary Malfunction		Threshold		Secondary		Enable		Time	MIL
System	Code	Description	Criteria		ogic and Value		Parameters particulate filter temperature		Conditions	°C	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:				and (
			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	%	battery voltage	>=	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 / System	Fault Code	Monitor Strategy Description	Primary Malfunction Criteria		Threshold Logic and Value		Secondary Parameters		Enable Conditions		Time Required	MIL Illum.
							and (
							engine coolant temperature	>=	5.06	°C		
							engine coolant temperature	<=	130.06	°C		
)					
							or offset learning active	=	TRUE	-		
							or diagnosis tester present	=	FALSE	_		
) and		. 7.202			
							completion of offset learning	=	TRUE	-		
							and basic enable conditions met:	=	see sheet enable	-		
							and		tables			
							NO Pending or Confirmed DTCs:	=	see sheet inhibit tables	-		
									tables			
		Detects a jammed EGR	Path 1:				EGR cooler bypass valve is opening	=	TRUE		fail	
		cooling bypass valve during opening or closing the valve.									conditions exists for 5 s	
		opening or electing the valve.	EGR cooler bypass valve stuck during	=	TRUE	_	or				monitor runs	
			opening	=	TRUE	-					with 0.01 s rate	
			which means (EGR cooler bypass valve is closing and	=	TRUE	-	whenever enable	
			(a) + (b) with	>=	75.01	%	(conditions are met	
			(a) position of the EGR cooling bypass valve				active cleaning mode of EGR cooler bypass valve - no movement in EGR	=	FALSE	-	uro mot	
							cooling bypass valve					
			and with (b) learned offset value of EGR cooler	=	calculated	-	and engine post drive/ afterun	=	TRUE	-		
			bypass valve in the previous driving cycle		parameter							
			and (a) - (b)	>=	0.99	%	and (
			with (a) position of the EGR cooling bypass	,	0.00	-	battery voltage and	>=	10.00	V		
			valve			-						
			and with (b) position of the EGR cooling bypass	=	calculated	-	battery voltage)	<=	30.00	V		
			valve of the previous process cycle		parameter							
) for time		E 00	000	and					
				>	5.00	sec	engine coolant temperature	>=	5.06	°C		
			or Path 2:				and engine coolant temperature	<=	130.06	°C		
			EGR cooler bypass valve stuck during closing	=	TRUE	-)					
			which means)					

Component /	Fault	Monitor Strategy	Primary Malfunction		Threshold		Secondary		Enable		Time	MIL
System	Code	Description	Criteria		Logic and Value	Э	Parameters		Conditions		Required	Illum.
			position of the EGR cooling bypass valve with (a) reference position of the EGR cooling bypass valve in open position	=	(a) * (b) calculated parameter	-	offset learning active or diagnosis tester present	=	TRUE FALSE	-		
			and with (b) calibrateable factor of the EGR cooling bypass valve close position and (a) - (b) with (a) position of the EGR cooling bypass	= <=	0.15	factor	and completion of offset learning and basic enable conditions met:	= =	TRUE see sheet enable tables	-		
			valve 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						
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 and engine pre drive and Basic enable conditions met:	= =	TRUE TRUE see sheet enable conditions		fail conditions exists for 0.02 s monitor runs once per driving cycle during predrive with 0.02 s rate whenever enable conditions	В
		Detection of main relay that is stuck and not opened when commanded by ECM	Time after request to open the main relay	۸	1.40	sec	ignition on and engine pre drive and Basic enable conditions met: and NO Pending or Confirmed DTCs:	= =	FALSE FALSE see sheet enable conditions see sheet inhibit tables		fail conditions exists for 0.02 s monitor runs once per driving cycle during predrive with 0.02 s rate whenever enable conditions	В
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		Required 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	=	TRUE	-						
			and 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	А
			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	
							No Pending or Confirmed DTCs:	=	see sheet inhibit tables	-		
Turbocharger Boost Control Position Sensor "A" Circuit	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	В
Range/Performanc e - Stuck Low							and adaption not active and	=	FALSE	-	monitor runs with 0.02 s rate whenever enable	

Component /	Fault	Monitor Strategy	Primary Malfunction		Threshold		Secondary		Enable		Time	MIL
System	Code	Description	Criteria		ogic and Value	0/	Parameters		Conditions		Required	Illum.
Turbocharger Boost Control Position Sensor "A" Circuit Range/Performanc e - Stuck High	P2599		turbo charger control deviation calculated out of difference between desired and actual value	<	-15.00	%	offset learned since last clearing of fault code memory	=	TRUE	-	conditions 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) and	<	199.86	°C		
							basic enable conditions met:	=	see sheet enable tables	-		
							and 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.			time since engine post drive/ afterun	<	20.00	sec	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	< (100% - ((a) - 7.5%)) > (100% + ((a) - 7.5%))	and engine post drive/ afterun and basic enable conditions met:	=	TRUE see sheet enable tables	-		
			(where (a) Tolerance threshold for diagnosis of stop counter	= 17.19 %						
		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:	=	TRUE see sheet enable tables	-	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)	·	= TRUE -	ignition on and basic enable conditions met:	=	TRUE see sheet enable tables	-	fail conditions exists for more than 1 event monitor runs once per driving cycle with 0.01 s rate	

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 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:2 - 200 K Ω impedance between ECU pin and load	ignition on and basic enable conditions met:	= TRUE - = see sheet enable - tables	fail conditions exists for 3 s monitor runs 0.02 s rate whenever enable conditions are met	В
Fuel Transfer Pump Relay Control Circuit Low	P2633		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 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 and change in fuel volume in secondary tank	<	0.80 0.00 0.80 0.00 0.80	1 1 1	Engine Running and fuel transfer pump active means (= = < > > = = = > =	TRUE TRUE 1638.30 0.00 32767.00 137.40 0.00 0.00 see sheet inhibit tables 327.67 see sheet enable tables	- I sec I mph - sec -	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	P268C	Detects a miss match in IQA values between ECM	IQA (injection quantity adjustment) value of injector 1 transmitted via CAN from	= FALSE -	transmitted IQA data from GPCM (glow plug module) for cylinder 1 are valid	= TRUE -	fail conditions	A
(IQA)		and GPCM	GPCM (glow plug module) match with the stored ECM value		and basic enable conditions met: and NO Pending or Confirmed DTCs:	= see sheet enable - tables = see sheet inhibit - tables	exist for 1 s test performed continuously with 1 s rate	
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	А
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	А

Component / System	Fault Code	Monitor Strategy Description	Primary Malfunction Criteria	Threshold Logic and Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
		3 con participation	5	Logic and take	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	Α
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	Α
Cylinder 8 Injector Data Incorrect (IQA)	P2693	Detects a miss match in IQA values between ECM and GPCM	IQA (injection quantity adjustment) value of injector 8 transmitted via CAN from GPCM (glow plug module) match with the stored ECM value	= FALSE -	transmitted IQA data from GPCM (glow plug module) for cylinder 8 are valid and basic enable conditions met: and NO Pending or Confirmed DTCs:	= TRUE - = see sheet enable - tables = see sheet inhibit - tables	fail conditions exist for 1 s test performed continuously with 1 s rate	A

Component / System	Fault Code	Monitor Strategy Description	Primary Malfunction Criteria		Threshold Logic and Value	.	Secondary Parameters		Enable Conditions		Time Required	MIL Illum.
4WD Switch Circuit	P2771	Checks plausibility of the 4WD-Low switch with 4WD state based on 4WD state from transmission turbine speed, transmission output shaft speed, and transmission gear ratio.	Debounced value of 4WD-Lo switch	=	FALSE	-	Current Transmission Gear	≠	Park/Neutral	-	fail conditions exists for 0.05 s test performed continuously 0.02 s rate	В
			and 4WD-Lo active based on transmission turbine speed, output shaft speed, and gear ratio	=	TRUE	-	land Current Transmission Gear	≠	Reverse	-		
							and Torque converter clutch open and	=	FALSE	-		
							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 engine speed	< >	6000.00 1000.00	rpm		
							and basic enable conditions met:	=	see sheet enable	rpm -		
							and		tables			
							NO Pending or Confirmed DTCs:	=	see sheet inhibit tables	-		
Exhaust Nox Concentration	P2BAD	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	А
High - Unknown Reason		SCR catalyst with a threshold value									exists for more than 1	
			where (a) measured SCR catalyst efficiency	=	calculated	factor	for time	>	300.00	sec	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 enable	
			where				for time Status of NOx signal of downstream NOx sensor (please see the definition)	> =	60.00 True	sec -	conditions are met	
			(c) SCR modeled NOx conversion efficiency	=	calculated parameter	factor	for time	>	60.00	sec		
			(d) correction map dependent on SCR catalyst temperature and upstream NOx mass flow	=	1.00	factor						
			(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	-		
i	I						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		000.00	000		
					(b) Turn on delay time 2 of status		20.00	sec		
					metering strategy		20.00	300		
					metering strategy					
					1					
					l l					
					(
					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	•	0.00	000		
							90.00			
					(b) delay time the status of disabling	>	80.00	sec		
					SCR Efficiency monitoring					
					or					
					integrated upstream NOx	>=	3276.70	g		
					[)					
					1					
					d d					
					Status of pre controlled dosing (please	=	FALSE	-		
					see the definition)		TALOL			
							(a) , (b)			
					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		
)			3		
					1					
					Decrease of Reductant load level	=	FALSE	_		
						=	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		
							0 10 120	300		
					NOx mass flow and the time (see Look-					
					Up-Table #88)					
					for time with	>	5.00	sec		
					((
					Delta SCR temperature (see Look-Up-	<	59.96 to 64.96	°C		
					Table #85)					
					Delta SCR temperature (see Look-Up-	>	-50.04 to -0.04	°C		
					Table #101)		00.0-10-0.04	J		
							E24 06	۰.		
					Delta SCR temperature	<=	524.96	°C		
					Delta SCR temperature	>=	199.96	°C		
					Initialization time of temperature gradient	>=	2.50	sec		
					calculation					
](
					or					
					Delta SCR temperature	<	229.96	°C		
					or	`	220.00	J		
							400.06	°C		
	l	ı		1	Delta SCR temperature	>	499.96	C	1 1	

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		
					1					
					ambient pressure	>=	74.80	kPa		
					ambient temperature	>=	-7.04	°C		
					1					
					Stuck reductant dosing valve fault was	=	FALSE	-		
					healed		TDUE			
					last particulate filter regeneration successful	=	TRUE	-		
)					
					(E41.0E			
					Status of the SCR adaptation plausibility check active (please see the definition)	=	FALSE	-		
					check active (picase see the definition)					
					for time	>	600.00	sec		
) Reductant Delivery performance	=	FALSE	_		
					completed this drive cycle	_	TALOL			
					(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)		0.4- 0.0	_		
					SCR estimated current Reductant load (see Look-Up-Table #76)	<=	2 to 2.2	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-		0.10 to 0.20	9		
					Table #78)		E41.0E			
					SCR in Pre-Control State (please see the definition)	=	FALSE	-		
					(
					Disable after SCR adaptation for time	= >	FALSE 600.00	-		
					for time	>	600.00	sec		
					1					
					(()	_	74.06	°C		
					(a) - (b) for time	<= >	74.96 0.00	sec		
)	•				
					or /					
					(a) - (b)	>=	14.96	°C		
					for time	>	0.00	sec		
					(a) upstream SCR catalyst temperature					
					(b) downstream SCR catalyst					
					temperature					
	l))				1	

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		
					Average SCR Temperature	<=	399.96	°C		
					Average SCR Temperature	>=	-3549.94	°Č		
					Downstream SCR catalyst temperature	<=	3003.56	°C		
					Downstream SCR catalyst temperature	>=	241.96	°C		
					Filtered and delayed upstream NOx raw	<=	750.00	ppm		
					emission					
					Filtered and delayed upstream NOx raw emission	>=	175.00	ppm		
					Filtered and delayed NOx raw emission mass flow upstream of SCR	<=	0.17	g/sec		
					Filtered and delayed NOx raw emission	>=	0.01	g/sec		
					mass flow upstream of SCR Filtered exhaust gas mass flow	<=	236.13	g/sec		
					Filtered exhaust gas mass flow	>=	-910.29	g/sec		
					MAP for valid engine operation points for	=	0 to 1	factor		
					SCR efficiency monitoring (see Look-Up-	_	0.01	140101		
					Table #84)					
					for time		0.00	sec		
						>				
					Inverse calculated accelerator pedal	>	5.00	%		
					value for time	>	0.00	sec		
							0.00	000		
					EWMA fast initialization mode:					
					filter coefficient for fast initialization	=	0.35	factor		
					number of SCR efficiency measurements for fast initialization mode	>=	2.00	count		
					EWMA Rapid Response mode:					
					EWMA filtered delta SCR catalyst efficiency	>	0.12	factor		
					(a) - (b)	<	-0.01	factor		
					(a) measured SCR catalyst efficiency	•	0.01	idoto.		
					(b) offset-corrected modeled SCR					
					catalyst efficiency (please see the					
					general description for details) offset-corrected modeled SCR catalyst	>	0.00	factor		
					efficiency (please see the general		0.00	lactor		
					description for details)					
					filter coefficient for Rapid Respond mode	=	0.08	factor		
					number of SCR efficiency measurements	>=	6.00	count		
					for Rapid Response mode	>=	0.00	Courit		
					EWMA filtered value too small in Fast					
					Init. And Rapid Respond modes:					
					EWMA filtered delta SCR catalyst	<	0.00	factor		
					efficiency of (a) - (b)					
					(a) measured SCR catalyst efficiency					
				I	(b) offset-corrected modeled SCR					
					catalyst efficiency (please see the general description for details)					

Component / System	Fault Code	Monitor Strategy Description	Primary Malfunction Criteria	Thresho Logic and		Secondary Parameters		Enable Conditions		Time Required	MIL Illum.
				v		EWMA stabilized mode: 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		
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 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

Component /	Fault	Monitor Strategy	Primary Malfunction		Threshold		Secondary		Enable		Time	MIL
System	Code	Description	Criteria		Logic and Valu		Parameters		Conditions		Required	Illun
low Plug iagnostic Status rame	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 and	=	TRUE	-	test performed continuously at 0.02 s	В
							Bus off or error passive on CAN and	=	FALSE	-	rate whenever	
							Frame enabled. The EMC is authorized to read the frame and	=	TRUE	-	enable conditions	
							basic enable conditions met:	=	see sheet enable tables	-	are met	
est ommunication th Reductant ontrol 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	=	TRUE		fail conditions exists for more than 5	A
							Can Bus Initialized (CAN Bus is Active)				sec monitor runs	
							consisting of: ignition for	=	TRUE	-	with 0.1 s rate	
							time battery voltage	> <	5.00 6553.40	sec V		
							battery voltage	>	9.00	V		
		CAN frame rolling counter and protection value verification using a sliding window evaluation	DLS1 Sliding Window error counter	>=	8.00		CAN Bus is Active	=	TRUE	-	monitor runs 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	>	5.00	sec		
							battery voltage battery voltage	< >	6553.40 9.00	V V		
		CAN frame rolling counter and protection value verification using a sliding	DLS2 Sliding Window error counter	>=	8.00	counts	CAN Bus is Active	=	TRUE		monitor runs with 1 s rate	
		window evaluation Check of temperature sensor	within a number of message frames	=	9.00	counts	Can Bus Initialized (CAN Bus is Active)					
							consisting of: ignition for	=	TRUE	-		
							time	>	5.00	sec		
							battery voltage battery voltage	< >	6553.40 9.00	V V		
		CAN frame rolling counter and protection value verification using a sliding	DLS3 Sliding Window error counter	>=	8.00	counts	CAN Bus is Active	=	TRUE		monitor runs with 1 s rate	
		window evaluation Check of error states	within a number of message frames	=	9.00	counts	Can Bus Initialized (CAN Bus is Active)					
							consisting of:					

Component / System	Fault Code	Monitor Strategy Description	Primary Malfunction Criteria		Threshold gic and Value		Secondary Parameters		Enable Conditions		Time Required	MIL Illum.
oystelli	Code	Description	Grieffa	LOQ	gic and Value		ignition for time battery voltage battery voltage	= > < >	5.00 6553.40 9.00	sec V V	Required	mum.
Lost Communications with Auxiliary Heater Control Module	U0166	Detects loss of communication between ECM (on-board control unit) and Auxiliary Heater Control Module	time since last message from auxiliary heater control module was received	>	2.50	sec	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 12 s test performed continuously 0.01 s rate	Special (
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) consisting of: ignition for time battery voltage	= = > <	TRUE TRUE 5.00 6553.40	- sec V	fail conditions exists for more than 20 sec monitor runs with 0.005 s rate	A
		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	counts	battery voltage CAN Bus is Active Can Bus Initialized (CAN Bus is Active) consisting of: ignition for time battery voltage battery voltage battery voltage	= = > < >	9.00 TRUE TRUE 5.00 6553.40 9.00	- sec V	monitor runs whenever enable conditions are met	
		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) consisting of: ignition for	=	TRUE	-	monitor runs whenever enable conditions are met	

Component / System	Fault Code	Monitor Strategy Description	Primary Malfunction Criteria		Threshold		Secondary Parameters		Enable Conditions		Time Required
Эуэсен	Code	Description	GILETIA		ogic aliu Value		time battery voltage battery voltage No pending or confirmed DTCs	> < > =	5.00 6553.40 9.00 see sheet inhibit tables	sec V V	Required
Engine 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 Can Bus Initialized (CAN Bus is Active) consisting of:	=	TRUE	-	fail conditions exists for more than 20 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 engine out NOx ser	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 -	
Engine 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	= > <	TRUE 5.00 6553.40	sec V	with 0.005 s rate
						_	battery voltage	>	9.00	V	
		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		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 / System	Fault Code	Monitor Strategy Description	Primary Malfunction Criteria		Threshold Logic and Valu	ie	Secondary Parameters		Enable Conditions		Time Required	MII IIIu
·							No pending or confirmed DTCs	=	see sheet inhibit tables	-		
Engine 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	
							consisting of: ignition for time battery voltage	= > <	TRUE 5.00 6553.40	sec V	monitor runs with 0.02 s rate	
							battery voltage	>	9.00	V		
		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	=	TRUE	-		
							time	>	5.00	sec V		
							battery voltage battery voltage	< >	6553.40 9.00	V		
							No pending or confirmed DTCs	=	see sheet inhibit tables	-		
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	=	TRUE		fail conditions exists for more than	
							Can Bus Initialized (CAN Bus is Active) consisting of: ignition for	=	TRUE	-	20 sec monitor runs with 0.1 s rate	
							time	>	5.00	sec		
							battery voltage battery voltage	< >	6553.40 9.00	V V		
ost Catalyst NOx Sensor CAN Message #1	U029E	Post catalyst NOx sensor CAN message #1 frame not received after a calibrated	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	A
		number of times					Can Bus Initialized (CAN Bus is Active) consisting of:				more than 21 sec monitor runs with 0.005 s	
							ignition	=	TRUE	-	rate	
							for time	>	5.00	sec		
							battery voltage	<	6553.40	V		
							battery voltage	>	9.00	V		ı

Component /	Fault	Monitor Strategy	Primary Malfunction		Threshold		Secondary		Enable		Time	MIL
System	Code	Description	Criteria		Logic and Valu	е	Parameters		Conditions		Required	Illum
		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	>=	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		
		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		
st 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)	=	TRUE		fail conditions exists for more than 21 sec monitor runs	
							consisting of: ignition for time battery voltage	= > <	TRUE 5.00 6553.40	- sec V	with 0.005 s rate	
							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 s	Sliding window error counter	>=	8.00		CAN Bus is Active Can Bus Initialized (CAN Bus is Active)	=	TRUE	·	monitor runs whenever enable conditions are met	
					3.30	554.16	consisting of: ignition for time battery voltage	= > <	TRUE 5.00 6553.40	sec V	are met	
							battery voltage No pending or confirmed DTCs	> =	9.00 see sheet inhibit tables	- -		

Component /	Fault	Monitor Strategy	Primary Malfunction		Threshold		Secondary		Enable		Time	MI
System	Code	Description	Criteria		Logic and Valu		Parameters		Conditions		Required	Illu
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	=	TRUE	-	with 0.005 s	
							time battery voltage battery voltage	> < >	5.00 6553.40 9.00	sec V V		
							battery voltage		3.00			
		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	
		Check of post catalyst NOX s	within a number of message frames	=	10.00	counts	Can Bus Initialized (CAN Bus is Active) consisting of: ignition	=	TRUE	_	are met	
							for time battery voltage	> <	5.00 6553.40	sec V		
							battery voltage No pending or confirmed DTCs	> =	9.00 see sheet inhibit tables	V -		
ost 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 Can Bus Initialized (CAN Bus is Active)	=	TRUE		fail conditions exists for more than 21 sec	
							consisting of: ignition for	=	TRUE	-	monitor runs with 0.02 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	Sliding window error counter	>=	8.00	counts	CAN Bus is Active Can Bus Initialized (CAN Bus is Active)	=	TRUE	-	monitor runs whenever enable conditions	
		Check of post catalyst NOX s	within a number of message frames	=	9.00	Courits	consisting of: ignition	=	TRUE	_	are met	
							for time	>	5.00	sec		
							battery voltage battery voltage No pending or confirmed DTCs	< > =	6553.40 9.00 see sheet inhibit tables	V V -		
ost 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	=	TRUE		fail conditions exists for more than	

Component /	Fault	Monitor Strategy	Primary Malfunction	Threshold	Secondary		Enable		Time	MIL
System	Code	Description	Criteria	Logic and Value	Parameters		Conditions		Required	Illum.
					Can Bus Initialized (CAN Bus is Active) consisting of: ignition for time battery voltage battery voltage	= > < >	TRUE 5.00 6553.40 9.00	sec V V	21 sec monitor runs with 0.1 s rate	

End of Table

15 OBDG12 ECM Diagnostic Parameter Definition Table

Component /	State or Status	Description of State or Status	Defined by:	Enable	Enable	Enable
System	Sub-Grouping	found in 15OBDG12-HD		Logic	Values	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	>	500	rpm
			for time and	>	60	sec
			(a) - (b) with	>	1.8	°C
			(a) reference temperature (engine coolant temperature) captured during start and with	=	measured parameter	-
			(b) engine coolant temperature		measured parameter	-
			,			
		status of Block Heater monitor time	active under following conditions			
			engine speed	>	500	rpm
			for time		60	sec
		Status of Sun Load Detection	active under following condition			
		(high thermal input from the sun which influences system behavior)	(Vehicle speed for		14.92	mph
			time		300	sec
			and engine speed (see Look-Up-Table #14)	>	600 to 850	rpm
			for time	>	600	sec
			and (a) - (b)		4.5	°C

15 OBDG12 ECM Diagnostic Parameter Definition Table

Component /	State or Status	Description of State or Status	Defined by:	Enable	Enable	Enable
System	Sub-Grouping	found in 15OBDG12-HD		Logic	Values	Units
			with (a) intake at temperature at start and with		measured parameter	-
			(b) minimum intake air temperature value for the comparison with the reference temperature during driving cycle)		measured parameter	-
		Status of Sun Load Detection time	active under following condition			
		Status of Gail Edge Detection time	(Vehicle speed	>	14.92	mph
			time		300	sec
			and engine speed (see Look-Up-Table #14)	>	600 to 850	rpm
			for time		600	sec
			,			
ECM Operating States		Engine Pre-Drive	processor operating normally ignition		TRUE OFF	:
			processor powerup boot initialization or	=	complete	-
			key off bookkeeping cleanup (accessory, post-wake-up, pre-sleep)		complete	-
		Engine Running	ignition	=	ON	-
		(see Look-Up table #70)	engine speed engine speed was at start	>=	100 850	rpm rpm
		Engine Post-Drive/ Afterun	processor operating normally	=	TRUE	
		also includes "engine stopping" during engine spin down	ignition key off bookkeeping cleanup	=	OFF in process	-

Component / System	State or Status Sub-Grouping	Description of State or Status found in 150BDG12-HD	Defined by:	Enable Logic	Enable Values	Enable Units
Engine Operating Modes	Exhaust Operating Mode focus	Normal Mode				
		Particulate Filter Regeneration Mode				
		Particulate Filter Regen Service Mode				
		Exhaust Gas Temperature (Active) Management Mode also known as Engine Operating Mode		=	Warm Up or Maintain Temperature Exhaust Warm- up	
Exhaust Gas Recirculation (EGR)		Exhaust Gas Recirculation (EGR)	EGR controller is active			
		Control is enabled	continuously with exceptions for failures detected EGR controller is active Overrun Long Idle Transmission Gear Shift Cold Start extreme temperature or pressure Critical Regeneration Modes Overrun Gear Shifting Overlong Idle permanent control deviation Demand of the drift compensation System error Error exhaust gas recirculation valve Error throttle valve			
			Engine Brake Status			

Component /	State or Status	Description of State or Status	Defined by:	Enable	Enable	Enable
System	Sub-Grouping	found in 15OBDG12-HD		Logic	Values	Units
			Atmospheric pressure too low			
			Battery voltage too low			
			Switch-off coordinator			
			Environmental temperature too low			
			Environmental temperature too high			
			Engine temperature too low			
			Engine temperature too high			
			Cold start			
			Injection quantity too large			
			Operating-mode coordinator			
			Rich Idle			
			External control intervention			
			Rich Idle Regen			
			Environmental Temperature too low in Regeneration			
			EGR Stroking			
			EGR controller is active in Overrun (warm exhaust system)			
			EGR controller is active in Overrun (Cold exhaust system)			
			AFS Faults			
			Request via SCR monitoring (NOx sensor plausibility check)			
			Atmospheric Pressure too low in Regeneration			
			Engine Temperature too low in Regeneration			
l .	I	I				

Component /	State or Status	Description of State or Status	Defined by:	Enable	Enable	Enable
System	Sub-Grouping	found in 15OBDG12-HD		Logic	Values	Units
			Engine Temperature too high in Regeneration			
					_	-
Engine Position Management		Engine Position Sync Complete	synchronization completed consisting of: crankshaft sensor pulses received camshaft sensor pulse received and aligned properly or sync via crank only invoked then crankshaft rotations	>=	4	counts
Fuel System		Fuel System is in Fuel Shut Off also known as Decel Fuel Shut Off or Over-Run	engine running required actual engine torque -		TRUE 1 -	- Nm -
		Status of Diesel Fuel Refill Detection	((Filtered total fuel volume available (a) Amount of fuel volume change that indicates a refueling event occurred (b) captured remaining diesel fuel volume under the following conditions	=	(a) + (b) 25.26 measured parameter	- % -
			(Vehicle speed time) and		1.24 4	mph sec
			(Vehicle speed time))	<= >	1.24 30	mph sec
			or at initialization of Diesel fuel level	=	TRUE	
Idle Speed Control		Idle Speed Controller Active "normal" low idle speed governor	no overrides for: Gear-Shift Harmonization Intrusive Diagnosis Action			

Component /	State or Status	Description of State or Status	Defined by:	Enable	Enable	Enable
System	Sub-Grouping	found in 15OBDG12-HD		Logic	Values	Units
			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:	>	30	sec
			Integrated heat quantity (see Look-Up-Table #1)	>=	375 to 500	kJ
			NOx status signal received via CAN message (Please see the definition)		TRUE	-
			for time		0.5	sec
			calculated lambda value based on air mass flow and injection quantity		0.9	-
			for time engine speed		0.5 100	sec
			for time		20	rpm sec
			NO Pending or Confirmed DTCs:		see sheet inhibit tables	-
		Upstream Nox Sensor Signal Ready	following condition met for time:	>	30	sec
		or 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			_	

Component /	State or Status	Description of State or Status	Defined by:	Enable	Enable	Enable
System	Sub-Grouping	found in 15OBDG12-HD	Defined by.	Logic	Values	Units
			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) for time		TRUE 0.5	- sec
			calculated lambda value based on air mass flow and injection quantity	>	0.9	-
			for time engine speed for time	> > >	0.5 100 20	sec rpm sec
			NO Pending or Confirmed DTCs:	=	see sheet inhibit tables	-
		Upstream Nox Sensor Signal Ready or	following condition met for time:	>	30	sec
		Upstream Nox SensorDewpoint Reached or	Integrated heat quantity (see Look-Up-Table #2)	>=	0 to 350	kJ
		Lambda signal from NOx sensor ready				
		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	۸ ۸ گ
			and Integrated heat quantity (see Look-Up-Table #2)		0 to 350	kJ
			for time	>	30	sec
			and for time	>	1	sec

Component /	State or Status	Description of State or Status	Defined by	Enable	Enable	Enable
System	Sub-Grouping	found in 15OBDG12-HD	Defined by:	Logic	Values	Units
			NO Pending or Confirmed DTCs:	=	see sheet inhibit tables	,
		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 ∨ ∨
			and Integrated heat quantity (see Look-Up-Table #1)		375 to 500	kJ
			for time) and		30	sec
			for time NO Pending or Confirmed DTCs:	>	1 see sheet inhibit tables	sec -
Rail Pressure Control System Operating States		Rail Control at ECM Start	reset condition or	=	TRUE	-
			NO Pending or Confirmed DTCs:	=	see sheet inhibit tables	-
		Rail Pre-Control (Just after start)	Rail Control at ECU Start and		TRUE	-
			engine speed and (<=	300	rpm
			rail pressure or		15000	kPa
			(a) - (b) (a)Fuel Rail Pressure Setpoint	< =	5000 measured paramter	kPa -

Component /	State or Status	Description of State or Status	Defined by:	Enable	Enable	Enable
System	Sub-Grouping	found in 150BDG12-HD		Logic	Values	Units
			(b)Maximum Rail Pressure for last 10ms	=	measured paramter	-
		Rail Control - PCV Closed Loop Control Only			TOUE	
		PCV = Pressure Control Valve	Rail Pressure Precontrol (Just after start) and	=	TRUE	-
			Number of Crankshaft revolutions since entering Rail Pressure Precontrol)		10	revs
			or (state machine rail pressure control transitioning	=	TRUE	-
			pressure control valve mode and setpoint volume flow of the metering unit out of rail pressure control (see Look-Up-Table #6)	>	60000 to 224000	mm^3/rev
			or (
			Fuel system pressure and high pressure pump outlet and	<	0	kPa
			engine status)	=	RUNNING	-
		Rail Control - Metering Unit Closed Loop Control	state machine rail pressure control equal transitioning to metering unit pressure control mode	=	TRUE	-
			and Controller for PCV not wound-up (large corrective control)	=	TRUE	-
		Rail Control - Metering Unit + PCV Closed Loop Control	state machine rail pressure control transitioning to coupled pressure control mode (rail pressure is controlled by metering unit and pressure control valve)		TRUE	-

Component /	State or Status	Description of State or Status	Defined by:	Enable	Enable	Enable
System	Sub-Grouping	found in 15OBDG12-HD		Logic	Values	Units
			and (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	-
			(b)Non-Torque generating fuel injection quantity		parametet 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 (ii ii iibit tables	
			state machine rail pressure control equal to metering unit control mode or			

Component /	State or Status	Description of State or Status	Defined b	Enable	Enable	Enable
System	Sub-Grouping	found in 15OBDG12-HD	Defined by:	Logic	Values	Units
			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 and	<	0	kPa
			engine status)	=	RUNNING	-
) and NO Pending or Confirmed DTCs:)	=	see sheet inhibit tables	-
			,			_
		Switchover between PCV or Metering Unit closed loop control to Metering Unit + PCV Closed Loop Control	(
		2006	state machine rail pressure control equal to pressure control valve or		TRUE	-
			state machine rail pressure control equal coupled pressure control (rail pressure is controlled by metering unit and pressure control valve)		TRUE	-
			or state machine rail pressure control transitioning pressure control valve mode or	=	TRUE	-
			state machine rail pressure control equal transitioning to metering unit pressure control mode	=	TRUE	-
			and (
			exhaust gas system regeneration mode)	!=	REGEN	-

Component /	State or Status	Description of State or Status	Defined by:	Enable	Enable	Enable
System	Sub-Grouping	found in 150BDG12-HD		Logic	Values	Units
			and NO Pending or Confirmed DTCs:	=	see sheet inhibit tables	-
		Switchover Between Metering Unit +				
		PCV Closed Loop Control to PCV Closed Loop Control only	state machine rail pressure control equals coupled pressure control (rail pressure is controlled by metering unit and pressure control valve)	=	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	-
Regeneration of the Diesel		Status thermal regeneration active				
Regeneration of the Diesel Particulate Filter		Status thermal regeneration active	Reduced particle mass flow in simulation by thermal regeneration (a) * (b) * (c) (a) Correction factor for thermal soot burn-out dependent on lambda and oxygen mass flow (see Look-Up-Table #4) (b) Effect of temperature on regenerated particle mass (see Look-Up-Table #5) (c) Basis value of produced soot mass flow dependent on actual soot mass (see Look-Up-Table #3)		0 0 to 4.0 0 to 2.97 0.02 to 0.29	- factor - g/sec

Component /	State or Status	Description of State or Status	Defined by:	Enable	Enable	Enable Units
System	Sub-Grouping	found in 15OBDG12-HD	2002 27:	Logic	Values	Units
					_	
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 Deactivation of dosing to execute the NOx Offset test (Please see the definition) since start for time gradient of exhaust gas temperature since start for time Average temperature inside the SCR catalyst: SCR catalyst wall temperature Vehicle speed engine speed NO Pending or Confirmed DTCs:	>= <= >= > >	Metering Control TRUE FALSE 0.02 300 0.01 179.96 89.96 -0.62 400 see sheet inhibit tables	- sec °C/sec sec °C °C mph rpm -
	NOx Control System Reductant Dosing Pressure Control System States	State of Reductant Pressure Control System: Standby	ignition Dwell time in the state of standby NO Pending or Confirmed DTCs:	= <	on 5 see sheet inhibit tables	- sec -
		State of Reductant Pressure Control System: No Pressure control	Old SCR control state (please see the definition) ignition Dwell time in the state of standby Dwell time in the state of no pressure control NO Pending or Confirmed DTCs:		Stand by on 5 2 see sheet inhibit tables	- sec sec -
		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	>	NO Pressure Control on 550 2	rpm sec

Component /	State or Status	Description of State or Status	Defined how	Enable	Enable	Enable
System	Sub-Grouping	found in 15OBDG12-HD	Defined by:	Logic	Values	Units
			exhaust gas temperature Upstream SCR	>=	169.96	°C
			(Reductant Defrost check (please see the definition)		TRUE	-
			or The component protection release of the heater control (please see the definition)	=	TRUE	-
			or Preliminary release of the heater control for the main state machine (please see the definition)	=	TRUE	-
) NO Pending or Confirmed DTCs:	=	see sheet inhibit tables	-
		State of Reductant Pressure Control System: Refilling Reductant in pressure line (substate of Pressure control)	SCR control state (please see the definition)	=	Pressure Control	-
) Reductant filling state in the pressure line and		50	%
			Reductant Pump Module Pressure		200	kPa
) Set-point duty cycle for Reductant dosing valve	=	100	%
			Set-point duty cycle for the Reductant Pump	=	40.00	%
			pressure Motor actuator NO Pending or Confirmed DTCs:		see sheet inhibit tables	-
		State of Reductant Pressure Control System: Pressure build up (substate of Pressure control)	SCR control state (please see the definition)	=	Pressure Control	-
			Reductant filling state in the pressure line or	>=	50	%
			Reductant Pump Module Pressure	>=	200	kPa
			for time	>	0.5	sec
			Reductant Pump Module Pressure	<	350	kPa

Component /	State or Status	Description of State or Status	Defined by:	Enable	Enable	Enable
System	Sub-Grouping	found in 15OBDG12-HD	Defined by:	Logic	Values	Units
			Set-point duty cycle for Reductant dosing valve Set-point duty cycle for the Reductant Pump pressure Motor actuator NO Pending or Confirmed DTCs:		0% 80.00 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 Dwell time in Pressure Build up substate system pressurizes in pressure buildup and ventilation states Set-point duty cycle for Reductant dosing valve Set-point duty cycle for the Reductant Pump pressure Motor actuator	> <	350 10 10 10 80.00	kPa sec counts % %
			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) Reductant Pump Module Pressure Set-point duty cycle for Reductant dosing valve NO Pending or Confirmed DTCs:		Pressure Control 350 0 see sheet inhibit tables	- kPa % -
		State of Reductant Pressure Control System: Pressure reduction	ignition dwell time in the state of pressure reduction 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:	=	off 5 On 0 15.00 see sheet inhibit tables	- sec - % % -

Component /	State or Status	Description of State or Status	Defined by:	Enable	Enable	Enable Units
System	Sub-Grouping	found in 15OBDG12-HD		Logic	Values	
	SCR Engine State required for operation	SCR Engine State	Ignition on		TRUE	
			engine speed	>	550	rpm
	Reductant Dosing Strategy based on DPF Fload	Status fill level decrease (please see the definition)				
			Particulate Filter Regeneration demand on	=	TRUE	-
			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	>=	0	-
			(b) Estimated current Reductant load (c) Reductant Dosing quantity limitation		100	factor
			or SCR catalyst temperature too high to convert Reductant under Particle filter Regeneration request			
			Average temperature inside the SCR catalyst:		999.96	°C
	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)		TRUE	-
			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		-4.04	°C

Component /	State or Status	Description of State or Status	Deffered how	Enable	Enable	Enable
System	Sub-Grouping	found in 15OBDG12-HD	Defined by:	Logic	Values	Units
			Release heater pressure line and duration, for which the conditions for a hydraulic release reset of apply module bestes circuit are	= <=	FALSE 1200	- sec
			release reset of supply module heater circuit are satisfied ambient temperature Release heater supply module)	> =	-4.04 FALSE	°C -
		Status of reductant tank heater temperature	status of reductant tank heater temperature (please see the definition) Reductant tank heat temperature at Standby state	>	-0.04	°C
			or Engine off Time Reductant tank heat temperature at Standby state	< >	2147483647 -9.04	sec °C
		State of the defrosting check of pressure	State of the defrosting check of pressure line			
		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
			or ignition engine speed (= >	on 550	sec rpm
			Pressure line defrost check in last driving cycle status of SCR control state (please see the definition)		TRUE No Pressure Control	-
			Engine off Time NO Pending or Confirmed DTCs:	^ 	0 TRUE	sec -
		State of the defrosting check of supply module	State of the defrosting check of supply module (please see the definition)			

Component /	State or Status	Description of State or Status	Defined by:	Enable	Enable	Enable
System	Sub-Grouping	found in 15OBDG12-HD	Defined by:	Logic	Values	Units
			time since supply module heating on under supply module defrost mode or		0 to 3276.7	sec
			status of SCR control state (please see the definition)		No Pressure Control	-
			Supply module defrost timer or	=	0	sec
			ignition engine speed	= >	on 550	sec rpm
			Pressure line defrost check in last driving cycle	=	TRUE	-
			status of SCR control state (please see the definition)		No Pressure Control	-
			Engine off Time NO Pending or Confirmed DTCs:		0 TRUE	sec -
		The common and must estimate uple consections	Course at time of an hooting / not hooting of hooting		0.45.200	
		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
			status of reductant tank heater defrost status of reductant tank heater temperature	=	FALSE FALSE	-
			(please see the definition)			-
			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 (
			ignition engine speed		on 550	sec
			Engine speed Engine off Time		0	rpm sec

Component /	State or Status	Description of State or Status	Defined by	Enable	Enable	Enable
System	Sub-Grouping	found in 15OBDG12-HD	Defined by:	Logic	Values	Units
			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 driving cycle	=	TRUE	-
			ignition engine speed Engine off Time State of the defrosting check of pressure line (please see the definition) State of the defrosting check of supply module (please see the definition)))	= > <= = =	on 550 0 TRUE TRUE	sec rpm sec - -
		Release of tank heater circuit				
		Release of tank heater circuit	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
			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)) and	>=	0 to 3277	sec
			Requested defrosting time for pressure line heater (see Look-Up-Table #18) or	>=	0 to 3276.7	sec
			Requested heating time for pressure line heater (see Look-Up-Table #20)	>=	0 to 3276.7	sec

Component /	State or Status	Description of State or Status	5 ()	Enable	Enable	Enable
System	Sub-Grouping	found in 15OBDG12-HD	Defined by:	Logic	Values	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
			and (
			Requested defrosting time for supply module heater (see Look-Up-Table #19) or	>=	0 to 3276.7	sec
			Requested heating time for supply module heater (see Look-Up-Table #21)	>=	0 to 3276.7	sec
			or			
			Requested defrosting time for Reductant tank heater (see Look-Up-Table #16)	>=	0 to 14400	sec
			Requested heating time for Reductant tank heater (see Look-Up-Table #17)	>=	0 to 3277	sec
			and			
			Requested defrosting time for pressure line heater (see Look-Up-Table #18) or	>=	0 to 3276.7	sec
			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:	=	TRUE	-

Component /	State or Status	Description of State or Status	Defined by:	Enable	Enable	Enable Units
System	Sub-Grouping	found in 15OBDG12-HD		Logic	Values	00
		Release of pressure line heater circuit			0.4.0070.7	
			Requested defrosting time for pressure line heater (see Look-Up-Table #18) or		0 to 3276.7	sec
			Requested heating time for pressure line heater (see Look-Up-Table #20))		0 to 3276.7	sec
			or ((
			Requested defrosting time for pressure line heater (see Look-Up-Table #18) or	>=	0 to 3276.7	sec
			Requested heating time for pressure line heater (see Look-Up-Table #20)		0 to 3276.7	sec
			and (
			Requested defrosting time for supply module heater (see Look-Up-Table #19) 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	-
		Release of tank heater circuit	(
			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 (()			

System Sub-Grouping found in 150BDG12-HD Requested defrosting time for Reductant tank heater (see Look-Up-Table #16) or Requested heating time for Reductant tank heater (see Look-Up-Table #17) and (Requested defrosting time for supply module heater (see Look-Up-Table #19) or Requested heating time for supply module heater (see Look-Up-Table #19) or Requested heating time for supply module heater (see Look-Up-Table #19) or Requested defrosting time for pressure line heater (see Look-Up-Table #18) or Requested heating time for pressure line heater (see Look-Up-Table #18) or Requested heating time for pressure line heater (see Look-Up-Table #18) or Requested heating time for pressure line heater (see Look-Up-Table #20) and (Requested defrosting time for supply module >= 0 to 3276.7 (see Look-Up-Table #20) and (Requested defrosting time for supply module >= 0 to 3276.7 (see Look-Up-Table #19) and (Requested defrosting time for supply module >= 0 to 3276.7 (see Look-Up-Table #19) and (Requested defrosting time for supply module >= 0 to 3276.7 (see Look-Up-Table #19) and (Requested defrosting time for supply module >= 0 to 3276.7 (see Look-Up-Table #19) and (Requested defrosting time for supply module >= 0 to 3276.7 (see Look-Up-Table #19) and (Requested defrosting time for supply module >= 0 to 3276.7 (see Look-Up-Table #19) and (Requested defrosting time for supply module >= 0 to 3276.7 (see Look-Up-Table #19) and (Requested defrosting time for supply module >= 0 to 3276.7 (see Look-Up-Table #19) and (Requested defrosting time for supply module >= 0 to 3276.7 (see Look-Up-Table #19) and (Requested defrosting time for supply module >= 0 to 3276.7 (see Look-Up-Table #19) and (Requested defrosting time for supply module >= 0 to 3276.7 (see Look-Up-Table #19) and (Requested defrosting time for supply module >= 0 to 3276.7 (see Look-Up-Table #19) and (Requested defrosting time for supply module >= 0 to 3276.7 (see Look-Up-Table #19) and (Requested defrosting time for supply module >= 0 to 3276.7 (see Look-Up-Table #19)	sec sec sec
heater (see Look-Up-Table #16) or Requested heating time for Reductant tank heater (see Look-Up-Table #17) and Requested defrosting time for supply module heater (see Look-Up-Table #19) or Requested heating time for supply module heater (see Look-Up-Table #21) Requested heating time for pressure line heater (see Look-Up-Table #18) or Requested defrosting time for pressure line heater (see Look-Up-Table #18) or Requested heating time for pressure line heater (see Look-Up-Table #18) or Requested heating time for pressure line heater (see Look-Up-Table #20) Requested defrosting time for pressure line heater (see Look-Up-Table #20) Requested defrosting time for supply module >= 0 to 3276.7	sec
(see Look-Up-Table #17) and Requested defrosting time for supply module heater (see Look-Up-Table #19) or Requested heating time for supply module heater (see Look-Up-Table #21))) or Requested defrosting time for pressure line heater (see Look-Up-Table #18) or Requested heating time for pressure line heater (see Look-Up-Table #18) or Requested heating time for pressure line heater (see Look-Up-Table #20)) and (Requested defrosting time for supply module heater (see Look-Up-Table #19)	sec
Requested defrosting time for supply module heater (see Look-Up-Table #19) or Requested heating time for supply module heater (see Look-Up-Table #21) or Requested defrosting time for pressure line heater (see Look-Up-Table #18) or Requested heating time for pressure line heater (see Look-Up-Table #18) or Requested heating time for pressure line heater (see Look-Up-Table #20) and Requested defrosting time for supply module heater (see Look-Up-Table #19)	
Requested heating time for supply module heater (see Look-Up-Table #21) or (((Requested defrosting time for pressure line heater (see Look-Up-Table #18) or Requested heating time for pressure line heater (see Look-Up-Table #20) Requested heating time for pressure line heater (see Look-Up-Table #20) and Requested defrosting time for supply module heater (see Look-Up-Table #19)	sec
Requested defrosting time for pressure line heater (see Look-Up-Table #18) or Requested heating time for pressure line heater (see Look-Up-Table #20)) and (Requested defrosting time for supply module heater (see Look-Up-Table #19)	
(see Look-Up-Table #18) or Requested heating time for pressure line heater (see Look-Up-Table #20)) and (Requested defrosting time for supply module heater (see Look-Up-Table #19)	
Requested heating time for pressure line heater (see Look-Up-Table #20) and (Requested defrosting time for supply module heater (see Look-Up-Table #19)	sec
Requested defrosting time for supply module >= 0 to 3276.7 heater (see Look-Up-Table #19)	sec
or l	sec
Requested heating time for supply module heater >= 0 to 3276.7 (see Look-Up-Table #21))) or	sec
Requested defrosting time for Reductant tank >= 0 to 14400 heater (see Look-Up-Table #16)	sec
Requested heating time for Reductant tank heater >= 0 to 3277 (see Look-Up-Table #17)	sec
and ((Requested defrosting time for pressure line heater >= 0 to 3276.7 (see Look-Up-Table #18)	sec

Component /	State or Status	Description of State or Status	Defined by:	Enable	Enable	Enable
System	Sub-Grouping	found in 15OBDG12-HD		Logic	Values	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)	= >	TRUE 0	- sec

Component /	State or Status	Description of State or Status	Define II	Enable	Enable	Enable
System	Sub-Grouping	found in 15OBDG12-HD	Defined by:	Logic	Values	Units
			or (/			
			() Waiting time before tank heater released	<	32767	sec
			started with		EAL 05	
			status of reductant tank heater temperature (please see the definition)	=	FALSE	-
			and (
			status of reductant tank heater temperature	=	TRUE	-
			(please see the definition) Waiting time after tank heater release expired	>	0	sec
))			
			or			
			((00707	
			Waiting time before tank heater released started with	>	32767	sec
			status of reductant tank heater temperature	=	FALSE	-
			(please see the definition)			
			and			
) status of reductant tank heater temperature	=	TRUE	-
			(please see the definition)		•	
			Waiting time after tank heater release expired))	>	0	sec
			"			
	Reductant Tank Level	status of Reductant tank level	Tank level > full (100%)	=	Full	-
	System States and Status		Warning (66.67%) < tank level < full (100%)		OK	-
			Restriction (33.33%) < tank level < Warning		Warning	-
			(66.67%) Empty < tank level < Restriction (33.33%)	=	Restriction	-
			Tank level < = 0.1%	=	Empty	-
		Ctatus of Dadustont tools lavely was t	,			
		Status of Reductant tank level reset when refilling is detected (please see the	(
		definition)				

System Sub-Grouping Found in 150BDG12-HD time since potential Reductant refill detection is set >= 12 ecc	Component /	State or Status	Description of State or Status	Defined by	Enable	Enable	Enable
and with Derivation of the PT1 filtered level signal (DT1) privation of the PT1 filtered level signal (DT1) filter release for Reductant rank level calculation at ignition on on (Please see the definition) privation of the PT1 filtered level signal (DT1) filter release for Reductant tank level calculation at ignition on on (Please see the definition) and with Prozen state is active during a centain warning level (Please see the definition) Reductant tank Temperature privation of the PT1 filtered level speak (Interval and with ignition on on (Please see the definition) Reductant tank Temperature privation of the PT1 filtered tank Temperature privation of the PT1 filtered level speak (Interval and with ignition on on (Please see the definition) Reductant lank Temperature privation of the PT1 filtered level speak (Interval and with ignition on on (Please see the definition) Reductant tank Temperature privation of the PT1 filtered level speak (Interval and with ignition on on (Please see the definition) Reductant tank Temperature privation of the PT1 filtered level signal (DT1) Reductant tank Temperature privation of the PT1 filtered level signal (DT1) privatio	System	Sub-Grouping	found in 15OBDG12-HD	Defined by:	Logic		Units
Derivation of the PT1 filtered level signal (DT1) >= 1.00 %/sec ignition on engine speed 550 yrm 5				time since potential Reductant refill detection is set	>=	12	sec
Ignition on sending speed S50 cpm				and with			
Ignition on sending speed S50 cpm				(Derivation of the PT1 filtered level signal (DT1)	\ _	1.00	%/sac
Vehicle speed time since engine started (a) Time period for a positive slope to detect (a) Time period for a positive slope to detect refueling (b) Factor for the extension of the detection time refueling since the following conditions met: TRUE - Falling edge of ignition or Reductant Refill enabling conditions reset timers TRUE - TRUE							-
time since engine started (a) Time period for a positive slope to detect refueling (b) Factor for the extension of the detection time for refueling since the following conditions met: Falling edge of ignition or reset timers Reductant Refill enabling conditions reset timers TRUE - Reductant Refill enabling conditions reset timers TRUE - TRUE							
(a) Time period for a positive slope to detect refueling (b) Factor for the extension of the detection time for refueling since the following conditions met: refueling since the following conditions met: = TRUE - Falling edge of ignition or reduced for refueling since the following conditions met: = TRUE - Falling edge of ignition or reduced for refueling for refueling since the following conditions met: = TRUE - Falling edge of ignition or reduced for refueling for reduced for red							mph
(b) Factor for the extension of the detection time for refueling since the following conditions met: Falling edge of ignition or reducing or reducing the following conditions reset times: Reductant Refill enabling conditions reset times: TRUE - Reductant Refill enabling conditions reset times: TRUE - Reductant tank level calculation at ignition on on (Please see the definition) and with (Frozen state is active during a certain warning level (please see the definition) and with (Reductant tank Temperature - Reductant low warning level (Please see the - TRUE - Reductant tank Temperature - Reductant low warning level (Please see the - TRUE -				(a) Time period for a positive slope to detect	=	12	sec
since the following conditions met: Falling edge of ignition or Reductant Refill enabling conditions reset timers = TRUE - Reductant Refill enabling conditions reset timers = TRUE - (time since potential Reductant refill detection is set >= 8 sec and with Derivation of the PT1 filtered level signal (DT1)				(b) Factor for the extension of the detection time		20	factor
Reductant Refill enabling conditions reset timers = TRUE - (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) and with Frozen state is active during a certain warning level (please see the definition) and with Reductant tank Temperature >= -100.04 °C Reductant low warning level (Please see the >= 0 level definition)					=	TRUE	-
Reductant Refill enabling conditions reset timers = TRUE - 100					=	TRUE	-
time since potential Reductant refill detection is set					=	TRUE	-
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) and with Frozen state is active during a certain warning level (please see the definition) and with Reductant tank Temperature or Reductant low warning level (Please see the definition) >= 0 level definition))))			
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) and with Frozen state is active during a certain warning level (please see the definition) and with Reductant tank Temperature or Reductant low warning level (Please see the definition) >= 0 level definition)							
and with Derivation of the PT1 filtered level signal (DT1) filter release for Reductant tank level calculation at ignition on on (Please see the definition) and with Frozen state is active during a certain warning level (please see the definition) and with Reductant tank Temperature >= -100.04 °C or Reductant low warning level (Please see the definition) >= 0 level							
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) and with (Frozen state is active during a certain warning level (please see the definition) and with (Reductant tank Temperature >= -100.04 °C or Reductant low warning level (Please see the definition) >= 0 level				time since potential Reductant refill detection is set	>=	8	sec
filter release for Reductant tank level calculation at ignition on on (Please see the definition) and with Frozen state is active during a certain warning level (please see the definition) and with (Reductant tank Temperature or Reductant low warning level (Please see the definition) Reductant low warning level (Please see the definition)				and with			
ignition on on (Please see the definition) and with (Frozen state is active during a certain warning level (please see the definition) and with (Reductant tank Temperature or Reductant low warning level (Please see the definition) Reductant low warning level (Please see the definition)							%/sec
level (please see the definition) and with (Reductant tank Temperature >= -100.04 °C or Reductant low warning level (Please see the definition)				ignition on on (Please see the definition)		TRUE	-
or Reductant low warning level (Please see the >= 0 level definition)				level (please see the definition)	=	TRUE	-
Reductant low warning level (Please see the >= 0 level definition)				(Reductant tank Temperature	>=	-100.04	°C
				Reductant low warning level (Please see the definition)	>=	0	level
)))			

Component /	State or Status	Description of State or Status	Defined by	Enable	Enable	Enable
System	Sub-Grouping	found in 15OBDG12-HD	Defined by:	Logic	Values	Units
		Status of Reductant Tank Level Release	status of reductant tank level release (please see the definition) Status of Filter release for reductant tank level calculation (please see the definition) and	=	TRUE	-
			() ambient temperature (/)	>=	-100.04	°C
			status of reductant tank heater temperature (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) or	>	0	sec
			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)) or	>=	0	sec
			Frozen state is active during a certain warning level (please see the definition)	=	TRUE	-
			Vehicle speed)	>=	6.22	mph
			or filter release for Reductant tank level calculation at ignition on on (Please see the definition)	=	TRUE	-
		Status of Filter release for reductant tank level calculation				
			Reductant tank Temperature or	>=	-100.04	°C
			Reductant low warning level (Please see the definition)	>=	0	-

Component /	State or Status	Description of State or Status	5.6.11	Enable	Enable	Enable
System	Sub-Grouping	found in 15OBDG12-HD	Defined by:	Logic	Values	Units
			NO Pending or Confirmed DTCs:	=	TRUE	-
			or Frozen state is active during a certain warning level (please see the definition)	=	TRUE	-
					_	
		Filter release for Reductant tank level calculation at Ignition on	ignition	=	on	-
			Engine on timer is expired (please see the 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)	=	2614	g
			in [g] (b) Tank level threshold range below Restriction threshold for ignition on refill detection release)	=	1015	g
			or Raw Reductant tank level and with	>=	66.7	%
			Remaining Reductant quantity (a) - (b): (a) Tank level for reserve mode (Warning level) in	< =	(a) - (b) 5279	g
			(b) Tank level threshold range below WARNING threshold for ignition on refill detection release	=	1617	g
			or Raw Reductant tank level and with	>=	100	%
			(Remaining Reductant quantity (a) - (b): (a) Tank level for reserve mode (Warning level) in [g]	>= =	(a) - (b) 5279	g

Component /	State or Status	Description of State or Status	Defined by:	Enable	Enable	Enable
System	Sub-Grouping	found in 15OBDG12-HD	Defined by:	Logic	Values	Units
			(b) Tank level threshold range below WARNING threshold for ignition on refill detection release	=	1617	g
			(inesticia for ignition on refin detection release			
		Status of Refill detection of Reductant tank	Status of Refill detection of Reductant tank (please see the definition)			
		tank	Reductant tank level changed	=	TRUE	-
			Captured Reductant tank level at last tank level change or	=	Empty	-
			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 definition)	=	OK	-
			or status of Reductant tank level (please see the definition)))	=	Full	-
			or			
			((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			

Component / System	State or Status Sub-Grouping	Description of State or Status found in 150BDG12-HD	Defined by:	Enable Logic	Enable Values	Enable Units
	. 5		(Captured Reductant tank level at last tank level change status of Reductant tank level (please see the	=	OK Full	-
			definition)		FUII	-
		Engine on timer is expired	time since engine started		(a) * (b) 12 20	sec sec
			(((ignition engine speed Vehicle speed) or	= > >=	on 550 6.22	sec rpm mph
			(Vehicle speed NO Pending or Confirmed DTCs: for time))	>= = >	6.22 TRUE 1	mph sec
			and with timer reset conditions (Falling edge of ignition or Reductant Refill enabling conditions reset timers	=	TRUE TRUE	-
)			
	Reducant Tank Level Low Warning States	Normal_Operation_OK: 0 decimal, normal operation	Reductant tank level and with		Full	-
			Warning level or (49	-
			Previous warning level vehicle speed		49 98.75	- mph

Component /	State or Status	Description of State or Status	Defined by:	Enable	Enable	Enable
System	Sub-Grouping	found in 15OBDG12-HD	Definied by.	Logic	Values	Units
)) or Reductant Quality state	>	0	-
		Warning_Leve1: 1 decimal, Warning	Reductant tank level	<	Full	-
		level 1	Remaining mileage and with	>	1558.75	miles
			(Warning level or	<=	49	Warning level
			(Previous warning level	>	49	Warning level
			vehicle speed))		98.75	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 or	<=	49	Warning level
			Previous warning level	>	49	Warning level
			vehicle speed v	<=	98.75	mph
)) and with Reductant Quality state	=	0	-

Component /	State or Status	Description of State or Status	Defined has	Enable	Enable	Enable
System	Sub-Grouping	found in 15OBDG12-HD	Defined by:	Logic	Values	Units
		Warning_Level3: 16 decimal, Warning	Reductant tank level	<	Full	-
		level 3	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		TRUE	-
			active Reductant Quality state	=	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
			vehicle speed	<=	98.75	mph
			and with		0	
			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

Component /	State or Status	Description of State or Status	Defined by:	Enable	Enable	Enable Units
System	Sub-Grouping	found in 15OBDG12-HD		Logic	Values	Units
			or (
			Previous warning level	>	49	Warning level
			vehicle speed)))) or	<=	98.75	mph
			Warning level	=	48	Warning
			initialization phase after Reductant refill event is active))	=	TRUE	level -
			and with Reductant Quality state	=	0	-
		Warning_Level6: 49 decimal, Warning level 6	((
		icvoi o	Warning level	=	49	Warning
			initialization phase after Reductant refill event is active	=	TRUE	level -
			or			
			(Warning level	<	49	Warning
			Failed Reductant system pressure build up	=	1	level -
			and with Reductant Quality state	=	0	-
		Warning_Level8: 80 decimal, Vehicle speed restriction mild	Warning level	=	80	Warning level
		apoca restriction mila	initialization phase after Reductant refill event is active	=	TRUE	16761
			and with Reductant Quality state	=	0	

Component / System	State or Status Sub-Grouping	Description of State or Status found in 150BDG12-HD	Defined by:	Enable Logic	Enable Values	Enable Units
		Warning_Level10: 112 decimal,Vehicle speed restriction aggressive	Warning level initialization phase after Reductant refill event is active and with Reductant Quality state	= =	112 TRUE 0	Warning level - -
		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
		Status of Reductant tank as frozen	(Engine off Time Reductant tank Temperature		14400 -11.04	sec °C

Component /	State or Status	Description of State or Status	Defined by:	Enable	Enable	Enable Units
System	Sub-Grouping	found in 15OBDG12-HD		Logic	Values	Ointo
			or (Engine off Time time since the following conditions are met (status of reductant tank heater defrost Vehicle speed Status of urea tank as frozen (please see the definition)))	<= <= = > =	7200 7200 On or Defrost 6.22 TRUE	sec sec - mph -
	SCR System Pressure State	Status of Low Reductant Pump Pressure - Under Reductant warning level 3 - Main state 0x30	Reductant low warning level (Please see the definition) number of pressure build-up attempts and (status of SCR control sub state (please see the definition) Reductant Pump Module Pressure Dwell time in Pressure Build up substate system pressurizes in pressure buildup and ventilation states Reductant Defrost check (please see the definition)	\" \" \" \" \" \" \" \" \" \" \" \" \" \	64 2 Pressure Build up 350 10 10	counts - kPa sec counts
	SCR System Long Term Adaptation Release States	Long-term Adaption Triggered	underdosing detected (please see the definition) OR overdosing detected (please see the definition)		TRUE TRUE	-

Component /	State or Status	Description of State or Status	Defined by:	Enable	Enable	Enable Units
System	Sub-Grouping	found in 15OBDG12-HD	·	Logic	Values	Office
		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
			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	(Status of NOx signal of downstream NOx sensor	=	TRUE	
			(please see the definition)		-	
			NOx concentration downstream SCR catalyst for time	> >	15 3	ppm sec
			Estimated SCR catalyst efficiency for time		0.3 3	factor sec

Component /	State or Status	Description of State or Status	5 ())	Enable	Enable	Enable
System	Sub-Grouping	found in 15OBDG12-HD	Defined by:	Logic	Values	Units
			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) and with (a) Filtered Upstream NOx mass flow	>= <=	0 500	mg/sec mg/sec
			(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 overall aging factor of the SCR catalyst	<= >=	10 0	factor factor
			for time	>	1	sec

Component /	State or Status	Description of State or Status	Defined by:	Enable	Enable	Enable
System	Sub-Grouping	found in 15OBDG12-HD	Defined by:	Logic	Values	Units
			Temperature gradient of SCR Temperature gradient of SCR for time	>= <= >	-1 1 18	°C/sec °C/sec sec
			Integrated NOx mass flow after engine start Release of Reductant dosing		5 active	g -
			engine operating condition based on engine speed and injection quantity (see Look-Up-Table #10)		0 to 1	factor
			(Difference between nominal and estimated Reductant Reductant mass flow (see Look-Up-Table #8) Elapsed time of the fill level timer)	>	-0.05 0 to 0.04 20	g g sec
		Chata of the NILIO (Americania) alim				
		State of the NH3 (Ammonia) slip detection	Reductant concentration downstream SCR and (a) - (b) (a) Filtered NOx mass flow downstream SCR measured by the sensor (b) Filtered and delayed NOx raw emission mass flow upstream of SCR	< = =	0 measured parameter measured parameter	ppm g/sec - -
		Deactivation of dosing to execute the NOx Offset test	SCR catalyst temperature SCR catalyst temperature time	<	400.06 999.96 60	°C °C sec
			and Currently dosed Reductant mass flow time and		0.005 30	g/sec sec

Component /	State or Status	Description of State or Status	Defined by:	Enable	Enable	Enable
System	Sub-Grouping	found in 15OBDG12-HD		Logic	Values	Units
			Feed ratio $ (a \) \ / \ ((\ b) \ ^* \ (\ c)) $ (a) Currently dosed Reductant mass flow	<= =	0.1 measured parameter	ratio -
			(b) NOx raw emission mass flow	=	measured parameter	-
			(c) Stoichiometric conversion factor NOx to Reductant		calculated parameter	-
			time and	>	10	sec
			Estimated current Reductant load time	<= >	0.3 10	g sec
					_	
		Release plausibility of Reductant Load				
			Release plausibility timer active or	>=	600	sec
			Release plausibility timer active Integrated NOx raw emission since fill level adaptation and plausibility have been locked)	>= >=	50 2	sec g
		Status for disabling the SCR Efficiency monitor following an SCR Adaptation cycle completion				
		Cycle completion	Maximum dosing quantity	<	0.6	g/sec
			or (a) - (b) (a) Reductant Dosing quantity	> =	0 measured	- -
			(b) Maximum Reductant Dosing quantity	=	parameter calculated parameter	-
			or (a) - (b) (a) Reductant Desired value		0 calculated parameter	-

Component /	State or Status	Description of State or Status	Defined by:	Enable	Enable	Enable
System	Sub-Grouping	found in 15OBDG12-HD	Defined by.	Logic	Values	Units
			(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) * (b)	- f- stan
			(a) Correction factor for the upper hysteresis threshold for filtered exhaust-gas mass flow, dependent on HC- contamination SCR (b) Upper hysteresis threshold for filtered exhaust-	=	1 0.25	factor
			gas 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
			(b) Offset for lower hysteresis switch on threshold for engine temperature	=	50	K
			Engine coolant temperature	>	108.06	°C
			and ambient pressure	>	(a) + (b)	-
			(a) Upper hysteresis threshold for environment pressure	=	74.5	kPa
			(b) Offset for upper hysteresis switch on threshold for environment pressure	=	65.0	kPa
			or ambient pressure	<	74.0	kPa
			and Intake air temperature	>	(a) + (b)	-

Component /	State or Status	Description of State or Status	Defined by	Enable	Enable	Enable
System	Sub-Grouping	found in 15OBDG12-HD	Defined by:	Logic	Values	Units
			(a) Lower hysteresis switch on threshold for inlet	=	-6.54	°C
			air temperature (b) Offset for upper hysteresis switch on threshold for inlet air temperature	=	49.5	°C
			or Intake air temperature	<	-8.04	°C
) and			
			(ambient temperature ambient pressure	>= >=	-7.04 74.8	°C kPa
			Selected temperature used for locking pre controlled mode	>=	209.96	°C
			Selected temperature used for locking pre controlled mode	<=	309.96	°C
			engine operation in normal mode	=	TRUE	-
			SCR Nox Catalyst Efficiency check was performed this drive cycle	=	FALSE	-
			Incorrect Reductant Composition check was performed this drive cycle	=	FALSE	-
			NO Pending or Confirmed DTCs:	=	TRUE	-
			(k) + (l) + (m)	>	75	
			(k) = (a) * (b) (a) entry condition for pre controlled dosing at sea level (see Look-Up-Table #13)	=	0 to 100	-
			(b) Altitude multiplier factor for sea level	=	measured paramter	-
			(I) = (c) * (d) * (e) (c) entry condition for online dosing at Mid level (see Look-Up-Table #12)	=	0 to 100	-
			(d) Multiplier to Mid Level enable speed load map	=	1	factor
			(e) Altitude multiplier factor for medium altitude	=	measured paramter	-

Component /	State or Status	Description of State or Status	Deffered by	Enable	Enable	Enable
System	Sub-Grouping	found in 15OBDG12-HD	Defined by:	Logic	Values	Units
			$(m) = (\ f)\ ^*\ (g)\ ^*\ (h)$ (f) Entry condition for online dosing at Hi level (see Look-Up-Table #11)	=	0 to 100	-
			(g) Multiplier to Hi Level enable speed load map	=	1	factor
			(h) Altitude multiplier factor for high altitude	=	measured paramter	-
			, and Low pass filtered rNOxNSCDs signal)	>	2000	-
	Reductant Tank Heater Performance Diagnosis Status	start temperature is captured in EERPOM if monitoring is active over several driving cycles	continuation of previously started tank temperature performance monitoring cycle (see definition)	=	1.56	°C
		or				
		start temperature is captured in EERPOM if monitoring is not active over several driving cycles	continuation of previously started tank temperature performance monitoring cycle (see definition)		FALSE	-
			ignition on for time or	> =	60 TRUE	sec
			ice detection by tank temperature difference: (a) - (b)	<=	-0.14	°C
			(a) filtered current tank temperature	=	measured	-
			(b) tank temperature captured at the beginning of current monitoring cycle))	=	paramter measured paramter	-
			or (a) - (b)	<=	-0.14	°C
			(a) filtered current tank temperature	=	measured	-
			(b) tank temperature captured at the beginning of current monitoring cycle	=	paramter measured paramter	-
			monitoring was performed in previous driving cycle			

Component /	State or Status	Description of State or Status	Defined by:	Enable	Enable	Enable
System	Sub-Grouping	found in 15OBDG12-HD	Defined by:	Logic	Values	Units
		continuation of previously started tank temperature performance monitoring cycle	temperature difference: (a) - (b)	<=	1.56	°C
		Cycle	(a) filtered current tank temperature	=	measured paramter	-
			(b) tank temperature of the previous driving cycle		measured paramter	-
			temperature difference: (a) - (b)		0	°C
			(a) tank temperature of the previous driving cycle	=	measured paramter	-
			(b) filtered current tank temperature		measured 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) Engine off Time		paramter 2000	sec
			This monitor was complete in the last driving cycle		FALSE	260
			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 current monitoring cycle		measured paramter	-
		State of Reductant injection valve Component Protection	(()		Matarias	
			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

Component /	State or Status	Description of State or Status	Defined by	Enable	Enable	Enable
System	Sub-Grouping	found in 15OBDG12-HD	Defined by:	Logic	Values	Units
			or (PM Filter Regeneration Reluctant dosing valve modeled temperature)) or		active 19.96	°C
			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)) or	>	not active 100.96 to 114.96	°C
			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: 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	rpm mm3/rev	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	rpm mph % sec	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, P0489, P140D, P1407, P0406, P0405, P2229, P2228, P2453, P2263, P0106, P0108, P0107, P0098, P0097, P007C, P02E0, P02EB, P02E3, P122F, P02E2, P122E, P122C, P02E9, P02E8, P0048, P0047, P2565, P2564		Engine off timer	P02610
		Error exhaust gas recirculation valve	DTC Pending or Confirmed	=	P0406, P0405	-		
		Engine Brake Status	DFCO Active Vehicle Speed	e = l >	TRUE 12.42	- mph	Transmission output speed sensor	P0722, P0721
		Atmospheric pressure too low	Barometric Pressure	<	72	kPa	Barometric Pressure	P2228, P2229, P0106
		Battery voltage too low Switch-off coordinator	Not Used on our application will remove for future	<	8	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	°C	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	- sec	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	P2122, P2123, P2138, P2127, P2128 P0335,P0336, P0016 P007D, P007C, P111C
		Environmental Temperature too low in Regeneration	Calibrated out on our application Intake Air Temperature	. <	-60	°C	Intake Air Temperature 2	P0097, P0098, P111C
		ECB Stroking	·			°C		
I	ı	EGR Stroking	DFCO Active	=	TRUE	-	Engine off timer	P02610

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 Brake	=	Not Active			
		EGR controller is active in Overrun	DFCO Active	=	TRUE	-		
		(warm exhaust system)	Regeneration Mode	=	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	_	Active			
		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 States	Closed Loop	Command Fuel Quantity	injection quantity	<u>></u>	8	mm^3/rev	Pedal Position 1 & 2	P2122, P2123, P2138, P2127, P2128
Tuel Balance Gondon States	Olosed Edop		injection quantity (see Look-Up-Table #31)	<u> </u>	200 to 380	mm^3/rev	Pedal Position 1 & 2	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)-	rpm	Crank Position	P0335,P0336, P0016
					250 to (Look-Up-Table #91) - 150			
			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, P1239, P122A			
	InActive	Command Fuel Quantity	injection quantity Range 1 or	<	6		Pedal Position 1 & 2	P2122, P2123, P2138, P2127, P2128
			injection quantity Range 2	>	(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	rpm	Crank Position	P0335,P0336, P0016
			or Engine Speed Range 2	>	2850	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
		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, P122A			
HCI Loop	Closed Loop	Regen demand	time distance fuel soot	A	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	S 2 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	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 for time	; <u><=</u>	230 0.5	C s	EGT 1	P0545, P0546, P20E2, P2080
		DPF inlet temperature	DPF upstream temperature or DPF upstream temperature for time	<u>>=</u>	750 230 0.5	C C s	EGT 3	P242D, P242C, P242D, P113A, P242B, P2428 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	<u>≥</u>	13.89	g/sec	Mass Air Flow Sensor	P0101, P0102, P0103
Intake Manifold Pressure	Intake Manifold Pressure Control is enabled	Manifold Pressure controller is active 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			
	1							

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	= = > <	Not Active R, 1, 2 -20 130	- - °C °C	Transmission Range Switch Engine Coolant Temperature Sensor	P0706, P0708 P0128, P0117, P0118, P008F
			Pressure Ratio (Manifold Pressure / Barometric Pressure) Modelled Exhaust Gas Pressure / Manifold Pressure Air Mass Engine Speed Gradient Engine Torque Demand Gradient	>	1.85 0.65 333.33 500 -720	ratio ratio g/sec rpm / sec Nm / sec	Barometric Pressure Manifold Absolute Pressure Sensor Mass Air Flow Sensor Crank Position Pedal Position 1 & 2	P2228, P2229, P0106 P0107, P0108, P0106 P0102, P0103, P0101 P0303, P0303, P0036, 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	N N N N	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	AI AI AI	70,200 802 325 44	s miles liters grams	Delta Pressure Sensor	P2459, P2463 P2459, P2463 P2459, P2463 P2453, P2454, P2455

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
		DOC inlet temperature	upstream DOC temperature upstream DOC temperature for time	<u>X</u> ≡ <u>V</u> ≡ ∧	650 100 0.5	C C s	EGT 1 EGT 1	P0545, P0546, P20E2, P2080, P2428 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 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:	= < = =	Pressure Control 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

State of Reductant Pressure Control System: Pressure Control System: Pressure Control State of Reductant Pump Module Pressure Set-point duty cycle for Reductant Pump Module Pressure Set-point duty cycle for Reductant Pump Module Pressure Set-point duty cycle for Reductant Pump Pressure Sensor NO Pending or Continued DTO: Pressure Control State of Reductant Pump Pressure Sensor Set Set Inhibit SCR control state (please see the definition) System: Ventilation (substate of Pressure Control System: Ventilation (substate of Pressure Dutilot pand ventilation Set-point duty cycle for the Reductant Pump Module Pressure Dwell time in Pressure Build up substate Set-point duty cycle for the Reductant Pump Module Pressure Dwell time in Pressure Build up substate Set-point duty cycle for the Reductant Pump Pressure Sensor Set-point duty cycle for the Reductant Pump Module Pressure Dwell time in the sub state ventilation Set-point duty cycle for the Reductant Pump pressure Set-point duty cycle for the Reductant Pump pressure Set-point duty cycle for the Reductant Pump Pressure Sensor Pressure Control Scr control Scr control State (please see the definition) Pressure Control Scr control state (please see the definition) Pressure Control Scr control state (please see the definition) Pressure Control Pr	98A, P208D
Reductant Pump Module Pressure for time Reductant Pump Module Pressure Reductant Pump Module Pressure Reductant Pump Pressure Sensor P204C, P204D, P204B Pressure Control Sensor Reductant Pump Pressure Sensor P204C, P204D, P204B Pressure Control Reductant Pump Pressure Sensor P204C, P204D, P204B Pressure Control Reductant Pump Pressure Sensor P204C, P204D, P204B Pressure Control Reductant Pump Pressure Sensor P204C, P204D, P204B Pressure Control Reductant Pump Pressure Sensor P204C, P204D, P204B Pressure Control Reductant Pump Pressure Sensor P204C, P204D, P204B P204C, P204D, P204B Reductant Pump Pressure Sensor P204C, P204D, P204B P204C, P204D, P204B Reductant Pump Pressure Sensor P204C, P204D, P204B, P20	98A, P208D
Reductant Pump Module Pressure Set-point duty cycle for Reductant dosing valve Set-point duty cycle for Reductant Pump pressure No Pending or Confirmed DTCs: State of Reductant Pressure Control System: Ventilation (substate of Pressure control) Reductant Pump Module Pressure Set-point duty cycle for Reductant (please see the definition) Reductant Pump Module Pressure Dwell time in Pressure Buildup and ventilation states Set-point duty cycle for Reductant dosing valve Set-point duty cycle for Reductant Opening or Confirmed DTCs: State of Reductant Pressure Control Set-point duty cycle for Reductant Opening valve Set-point duty cycle for Reductant dosing valve Set-point duty cycle for Reductant Opening valve Set-	98A, P208D
Set-point duty cycle for Reductant dosing valve Set-point duty cycle for Reductant Pump pressure Motor actuator NO Pending or Confirmed DTCs: State of Reductant Pressure Control System: Ventiliation (substate of Pressure control) Reductant Pump Module Pressure Control System publicly and ventilation states system pressure suildup and ventilation states Set-point duty cycle for Reductant dosing valve Set-point duty cycle for Reductant dosing valve Set-point duty cycle for Reductant dosing valve Set-point duty cycle for Reductant Dump pressure Set at set set set inhibit states Set-point duty cycle for Reductant dosing valve Set-point duty cycle for Reductant dosing valve Set-point duty cycle for Reductant Dump pressure Set at set set set inhibit states Set-point duty cycle for Reductant dosing valve Set-point duty cycle for Reductant Dump pressure Set at set inhibit states Set-point duty cycle for Reductant Dump pressure Set inhibit states Set-point duty cycle for Reductant Dump pressure Set inhibit states Set-point duty cycle for Reductant Dump pressure Set inhibit states Set-point duty cycle for Reductant Dump pressure Set inhibit states Set-point duty cycle for Reductant Dump pressure Set inhibit states Set-point duty cycle for Reductant Dump pressure Set inhibit states Set point duty cycle for Reductant Dump pressure Set inhibit states Set point duty cycle for Reductant Dump pressure Set inhibit states Set point duty cycle for Reductant Dump pressure Set inhibit states Set point duty cycle for Reductant Dump pressure Set inhibit states Set point duty cycle for Reductant Dump pressure Set inhibit states Set point duty cycle for Reductant Dump pressure Set inhibit states Set point duty cycle for Reductant Dump pressure Set inhibit states Set point duty cycle for Reductant Dump Pump Pump Pump Pump Pump Pump Pump P	98A, P208D
State of Reductant Pressure Control System: Ventilation (substate of Pressure control) Reductant Pump Module Pressure Dwell time in Pressure Build up substate system pressure Unit duty cycle for Reductant dosing valve Set-point duty cycle for Reductant Pump pressure Motor actuator Dwell time in the sub state ventilation NO Pending or Confirmed DTCs: State of Reductant Pressure Control State of Reductant Pressure Control Reductant Pump Module Pressure Control - 350	
System: Ventilation (substate of Pressure Control) Reductant Pump Module Pressure Dwell time in Pressure Build up substate > 10 sec system pressurizes in pressure buildup and ventilation states Set-point duty cycle for Reductant Pump pressure = 100 % Reductant Injector P1048, P2048, P1049, P204 P1043, P1044, P2088, P208 P1044, P2088, P208 P1045, P208 P1046, P208 P1046, P208 P1046, P208 P1047, P208 P1048, P208 P1048, P208 P1049, P208	
Reductant Pump Module Pressure Dwell time in Pressure Build up substate system pressure Juildup and ventilation states Set-point duty cycle for Reductant dosing valve Set-point duty cycle for Reductant Dump pressure Motor actuator Dwell time in the sub state ventilation NO Pending or Confirmed DTCs: State of Reductant Pressure Control System: Metering control (substate of	
Set-point duty cycle for Reductant dosing valve Set-point duty cycle for the Reductant Pump pressure Motor actuator Dwell time in the sub state ventilation NO Pending or Confirmed DTCs: State of Reductant Pressure Control System: Metering control (substate of	
NO Pending or Confirmed DTCs: = see sheet inhibit - tables State of Reductant Pressure Control System: Metering control (substate of	
System: Metering control (substate of	
System: Metering control (substate of	
Reductant Pump Module Pressure >= 350 kPa Reductant Pump Pressure Sensor P204C, P204D, P204B P1048, P204B, P1049, P204B P1048, P204B, P1049, P204B P1048, P204B, P1049, P204B P104B, P204B, P104B, P10	49, P2047, P202E
State of Reductant Pressure Control System: Pressure reduction dwell time in the state of pressure reduction < 5 sec	
Activation state of Reductant reverting valve power stage = On - Reductant Pump Reverting Valve P20A2, P1046, P20A3, P20A)A0, P20A1
Set-point duty cycle for Reductant dosing valve = 0 % Reductant Injector P1048, P2048, P1049, P204 Set-point duty cycle for the Reductant Pump pressure = 15.00 % Reductant Pump P1043, P1044, P208B, P208	
Motor actuator NO Pending or Confirmed DTCs: see sheet inhibit - tables	
SCR Engine State required SCR Engine State Ignition on = TRUE -	
for operation Schedule Schedu	
Reductant Heater and Defrost System Control States and Status	
Reductant Defrost check status of reductant tank heater temperature (please see = TRUE - the definition)	
State of the defrosting check of pressure line (please see = TRUE - the definition)	
State of the defrosting check of supply module (please = TRUE - see the definition)	
duration, for which the conditions for a hydraulic release <= 1200 sec reset of pressure line heater circuit are satisfied	

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
			ambient temperature Release heater pressure line	> =	-4.04 FALSE	°C -	Intake Air Temperature 2	P0097, P0098, P111C
			and 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	Intake Air Temperature 2	P0097, P0098, P111C
)					
		Status of reductant tank heater	status of reductant tank heater temperature (please					
		temperature	see the definition) Reductant tank heat temperature at Standby state or	>	-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	State of the defrosting check of pressure line (please					
		line	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)	=	TRUE No Pressure Control	-		
			Engine off Time NO Pending or Confirmed DTCs:		0 TRUE	sec -		
		Chate of the defending shoot of supply						
		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	= =	No Pressure Control	- sec		
			or 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)	= =	TRUE No Pressure Control	-		
			Engine off Time NO Pending or Confirmed DTCs:	<	0 TRUE	sec -		
		The component protection release of the heater control	Current time for heating / not heating of heater circuit 1 (tank)	>=	0 to 299	sec		
		Todas somo	Reductant Defrost check (please see the definition)	=	FALSE	-		
		Preliminary release of the heater control	Preliminary release of the heater control for the					
		for the main state machine	main state machine (please see the definition) (Current time for heating / not heating of heater circuit 1	>=	0 to 3276	sec		
			(tank) status of reductant tank heater defrost	=	FALSE	-		
			status of reductant tank heater temperature (please see the definition)	=	FALSE	-		
			State of the defrosting check of pressure line (please see the definition) State of the defrosting check of supply module (please	=	TRUE	-		
1	I		state of the defrosting check of supply module (please see the definition)		INUE	-		

Service of the demoting device of presents from the control of the demoting device of presents from the control of the demoting device of presents from the control of the demoting device of presents from the control of the demoting device of presents from the control of the demoting device of presents from the control of the demoting device of presents from the control of the demoting device of presents from the control of the demoting device of the demoting device of presents from the control of the demoting device of the device of the demoting device of the dev	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
Since of the definition of the service seed in the plane of the definition of the de) or					
State of the Administry of thesis of pressures in the planes are t				:	_	02	600		
State of the advicating area of all processors are presented in the company of th						550		Crank Position	P0335.P0336. P0016
Since of the authorising check of seeph seed of the deficiency of the total process of seeph see				Engine off Time	<=	0	sec		,,
Billion of the definition of dark of supply hydroxic contains a large of pressure of the control				State of the defrosting check of pressure line (please see	=	TRUE	-		
If the bolicuting conditions sure met in processor conditions conditions are conditions and the definition of the defini				State of the defrosting check of supply module (please	=	TRUE	-		
graphe grosses and section of the carborating shock of procession of the carborating shock of section sho				and					
register of the property of th					=	TRUE	-		
State of the deficiency check of pressure the following time for Reductions that however (now however form the following time for Reductions that however (now however form the following time for Reductions that however				(_	on	sec		
State of the deficiency check of pressure line in planes are set as a control deficiency of the plane of the deficiency of the plane of the deficiency of the plane of the planes of the				engine speed	>	550		Crank Position	P0335,P0336, P0016
Rapused defrosting time for Reduction tank header (see Local Lip Table 817) Requested defrosting time for Reduction tank header (see Local Lip Table 817) Requested defrosting time for Reduction tank header (see Local Lip Table 817) Requested defrosting time for Reduction tank header (see Local Lip Table 817) Requested defrosting time for Reduction tank header (see Local Lip Table 817) Requested heading time for Reduction tank header (see Local Lip Table 817) Requested heading time for Reduction tank header (see Local Lip Table 817) Requested definising time for pressure line header (see Local Lip Table 817) Requested definising time for pressure line header (see Local Lip Table 817) Requested definising time for pressure line header (see Local Lip Table 817) Requested definising time for pressure line header (see Local Lip Table 817) Requested definising time for pressure line header (see Local Lip Table 817) Requested definising time for pressure line header (see Local Lip Table 817) Requested definising time for pressure line header (see Local Lip Table 817) Requested definising time for finishcation tank header (see Local Lip Table 817) Requested definising time for finishcation tank header (see Local Lip Table 817) Requested definising time for finishcation tank header (see Local Lip Table 817) Requested definising time for finishcation tank header (see Local Lip Table 817) Requested definising time for for for for finishcation tank header (see Local Lip Table 817) Requested definising time for for for for for for finishcation tank header (see Local Lip Table 817) Requested definising time for for for for for for finishcation tank header (see Local Lip Table 817) Requested definising time for				Engine off Time	<=				
State of the defrooting direct of supply mode (places of tank hoster circuit) Requested defrooting time for Reductant tank hoster (page 1.55 keV 1					=	TRUE	-		
Respected defrosting time for Reduction town heador (see Lock-Up-Table et 10) Respected Presting time for Reduction town heador (see Lock-Up-Table et 10) Respected Respected Resting time for Reduction town heador (see Lock-Up-Table et 17) Respected Respected Resting time for Reduction town heador (see Lock-Up-Table et 17) Respected Respected Resting time for Reduction town heador (see Lock-Up-Table et 17) Respected Respected Resting time for Reduction town heador (see Lock-Up-Table et 17) Respected Respected Resting time for Reduction town heador (see Lock-Up-Table et 17) Respected Respected Resting time for Reduction town heador (see Lock-Up-Table et 17) Respected Resting time for Reduction town heador (see Lock-Up-Table et 17) Respected Resting time for Reduction town heador (see Lock-Up-Table et 17) Respected Resting time for Reduction town heador (see Lock-Up-Table et 17) Respected Resting time for Reduction town heador (see Lock-Up-Table et 17) Respected Resting time for Reduction town heador (see Lock-Up-Table et 17) Respected Resting time for supply module became (see Lock-Up-Table et 17) Respected Resting time for Reduction town heador (see Lock-Up-Table et 17) Respected Resting time for Reduction town heador (see Lock-Up-Table et 17) Respected Resting time for Reduction town heador (see Lock-Up-Table et 17) Respected Resting time for Reduction town heador (see Lock-Up-Table et 17) Respected Resting time for Reduction town heador (see Lock-Up-Table et 17) Respected Resting time for Reduction town heador (see Lock-Up-Table et 17) Respected Resting time for Reduction town heador (see Lock-Up-Table et 17) Respected Resting time for Reduction town heador (see Lock-Up-Table et 17) Respected Resting time for Reduction town heador (see Lock-Up-Table et 17) Respected Resting time for Reduction town heador (see Lock-Up-Table et 17) Respected Resting time for Reduction town heador (see Lock-Up-Table et 17) Respected Resting time for Reduction town heador (see Lock-Up-Table et 17) Respect				State of the defrosting check of supply module (please	=	TRUE	-		
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NO Perecting or Continued DTCs = TRUE - Respected restrict given for pressure line heater (see Local-Lip-Table #18) Requested heating given for pressure line heater (see Local-Lip-Table #18) Requested defending line for pressure line heater (see Local-Lip-Table #18) Requested defending line for pressure line heater (see Local-Lip-Table #18) Requested defending line for pressure line heater (see Local-Lip-Table #18) Requested defending line for septym module heater (see Local-Lip-Table #18) Requested heating line for septym module heater (see Local-Lip-Table #18) Requested heating line for septym module heater (see Local-Lip-Table #18) Requested heating line for septym module heater (see Local-Lip-Table #18) Requested heating line for septym module heater (see Local-Lip-Table #18) Requested heating line for septym module heater (see Local-Lip-Table #18) Requested heating line for septym module heater (see Local-Lip-Table #18) Requested heating line for septym module heater (see Local-Lip-Table #18) Requested heating line for septym module heater (see Local-Lip-Table #18) Requested heating line for septym module heater (see Local-Lip-Table #18) Requested heating line for septym module heater (see Local-Lip-Table #18) Requested heating line for septym module heater (see Local-Lip-Table #18) Requested heating line for septym module heater (see Local-Lip-Table #18) Requested heating line for septym module heater (see Local-Lip-Table #18) Requested heating line for septym module heater (see Local-Lip-Table #18) Requested heating line for septym module heater (see Local-Lip-Table #18) Requested heating line for septym module heater (see Local-Lip-Table #18) Requested heating line for septym module heater (see Local-Lip-Table #18) Requested heating line for septym module heater (see Local-Lip-Table #18) Requested heating line for septym module heater (see Local-Lip-Table #18) Requested heating line for septym module heater (see Local-Lip-Table #18) Requested heating line for septym module heater (see Local-Lip-Table #					>=	0 to 3276.7	sec		
Requested inference of pressure line header circuit. Requested definiting time for pressure line header (early Lock-Up-Table RT) Requested definiting time for pressure line header (early Lock-Up-Table RT) Requested dealing time for pressure line header (early Lock-Up-Table RT) Requested dealing time for pressure line header (early Lock-Up-Table RT) Requested dealing time for pressure line header (early Lock-Up-Table RT) Requested dealing time for pressure line header (early Lock-Up-Table RT) Requested dealing time for supply-module header (early Lock-Up-Table RT) Requested dealing time for supply-module header (early Lock-Up-Table RT) Requested dealing time for supply-module header (early Lock-Up-Table RT) Requested definising time for supply-module header (early Lock-Up-Table RT) Requested definising time for supply-module header (early Lock-Up-Table RT) Requested definising time for supply-module header (early Lock-Up-Table RT) Requested definising time for supply-module header (early Lock-Up-Table RT) Requested definising time for supply-module header (early Lock-Up-Table RT) Requested definising time for supply-module header (early Lock-Up-Table RT) Requested definising time for supply-module header (early Lock-Up-Table RT) Requested definising time for supply-module header (early Lock-Up-Table RT) Requested definising time for supply-module header (early Lock-Up-Table RT) Requested definising time for supply-module header (early Lock-Up-Table RT) Requested definising time for supply-module header (early Lock-Up-Table RT) Requested definising time for supply-module header (early Lock-Up-Table RT) Requested definising time for supply-module header (early Lock-Up-Table RT) Requested definising time for supply-module header (early Lock-Up-Table RT) Requested definising time for supply-module header (early Lock-Up-Table RT) Requested definising time for supply-module header (early Lock-Up-Table RT) Requested definising time for supply-module header (early Lock-Up-Table RT) Requested d				or Requested heating time for supply module heater (see Look-Up-Table #21)	>=	0 to 3276.7	sec		
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Leok-Lip-Table 870			Troiceast of process and measure crosses.	Requested defrosting time for pressure line heater (see Look-Up-Table #18)	>=	0 to 3276.7	sec		
Look-Up-Table #150 Requested heating time for pressure limited heating from the processure limited in the processor of				Requested heating time for pressure line heater (see Look-Up-Table #20)	>=	0 to 3276.7	sec		
Look-Up-Table #150 Requested heating time for pressure limited heating from the processure limited in the processor of				or					
Look-Up-Table #70 Requested defrosting time for supply module heater (see Look-Up-Table #10 Refease of tank heater circuit Requested heating time for supply module heater (see Look-Up-Table #10 Requested defrosting time for supply module heater (see Look-Up-Table #10 Requested heating time for supply module heater (see Look-Up-Table #10 Requested defrosting time for supply module heater (see Look-Up-Table #10 Requested heating time for supply module heater (see Look-Up-Table #10 Requested defrosting time for supply module heater (see Look-Up-Table #10 Requested defrosting time for supply module heater (see Look-Up-Table #10 Requested defrosting time for Reductant tank heater (see Look-Up-Table #10 Requested defrosting time for Reductant tank heater (see Look-Up-Table #10 Requested defrosting time for Reductant tank heater (see Look-Up-Table #10 Requested defrosting time for Reductant tank heater (see Look-Up-Table #10 Requested defrosting time for Reductant tank heater (see Look-Up-Table #10 Requested defrosting time for supply module heater (see Look-Up-Table #10 Requested defrosting time for supply module heater (see Look-Up-Table #10 Requested defrosting time for supply module heater (see Look-Up-Table #10 Requested defrosting time for supply module heater (see Look-Up-Table #10 Requested defrosting time for supply module heater (see Look-Up-Table #10 Requested heating time for supply module heater (see Look-Up-Table #10 Requested heating time for supply module heater (see Look-Up-Table #10 Requested heating time for supply module heater (see Look-Up-Table #10 Requested heating time for supply module heater (see Look-Up-Table #10 Requested heating time for supply module heater (see Look-Up-Table #10 Requested heating time for supply module heater (see Look-Up-Table #10 Requested heating time for supply module heater (see Look-Up-Table #10 Requested heating time for supply module heater (see Look-Up-Table #10 Requested defros					>=	0 to 3276.7	sec		
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Release of tank heater circuit Requested defrosting time for supply module heater (see Look-Up-Table #19) Requested heating time for supply module heater (see Look-Up-Table #21) Requested defrosting time for Reductant tank heater (see Look-Up-Table #21) Requested defrosting time for Reductant tank heater (see Look-Up-Table #19) Requested heating time for Reductant tank heater (see Look-Up-Table #19) Requested heating time for Reductant tank heater (see Look-Up-Table #17) And Requested defrosting time for supply module heater (see Look-Up-Table #17) And Requested defrosting time for supply module heater (see Look-Up-Table #19) Requested heating time for supply module heater (see Look-Up-Table #19) Requested heating time for supply module heater (see Look-Up-Table #19) Requested heating time for supply module heater (see Look-Up-Table #19) Requested heating time for supply module heater (see Look-Up-Table #19) Requested heating time for supply module heater (see Look-Up-Table #19) Requested heating time for supply module heater (see Look-Up-Table #19) Requested heating time for supply module heater (see Look-Up-Table #19) Requested heating time for supply module heater (see Look-Up-Table #19) Requested heating time for supply module heater (see Look-Up-Table #19)				or Requested heating time for supply module heater (see Look-Up-Table #21)	>=	0 to 3276.7	sec		
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Look-Up-Table #21) or ((Requested defrosting time for Reductant tank heater (see Look-Up-Table #16) or Requested heating time for Reductant tank heater (see Look-Up-Table #17) and (Requested defrosting time for supply module heater (see Look-Up-Table #19) or Requested heating time for supply module heater (see Look-Up-Table #19) or Requested heating time for supply module heater (see Look-Up-Table #19) or Requested heating time for supply module heater (see Look-Up-Table #19) or Requested heating time for supply module heater (see Look-Up-Table #19) or Requested heating time for supply module heater (see Look-Up-Table #19) or Requested heating time for supply module heater (see Look-Up-Table #19) or Requested heating time for supply module heater (see Look-Up-Table #19)					>=	0 to 3276.7	sec		
Look-Up-Table #16) Requested heating time for Reductant tank heater (see Look-Up-Table #17) and (Requested defrosting time for supply module heater (see Look-Up-Table #19) Requested heating time for supply module heater (see Look-Up-Table #19) Requested heating time for supply module heater (see >= 0 to 3276.7 sec				Requested heating time for supply module heater (see Look-Up-Table #21)	>=	0 to 3276.7	sec		
Look-Up-Table #16) Requested heating time for Reductant tank heater (see Look-Up-Table #17) and (Requested defrosting time for supply module heater (see Look-Up-Table #19) Requested heating time for supply module heater (see Look-Up-Table #19) Requested heating time for supply module heater (see Look-Up-Table #19) Requested heating time for supply module heater (see See Note 20 to 3276.7 sec				or ((Requested defrosting time for Reductant tank heater (see	>=	0 to 14400	SAC		
Look-Up-Table #17) and (Requested defrosting time for supply module heater (see 0 to 3276.7 sec Look-Up-Table #19) or Requested heating time for supply module heater (see >= 0 to 3276.7 sec Sec >= 0 to 3276.7 sec Sec >= 0 to 3276.7 sec				Look-Up-Table #16) or					
Requested defrosting time for supply module heater (see >= 0 to 3276.7 sec Look-Up-Table #19) or Requested heating time for supply module heater (see >= 0 to 3276.7 sec				Look-Up-Table #17))	>=	0 10 32//	sec		
				(Requested defrosting time for supply module heater (see		0 to 3276.7	sec		
				or Requested heating time for supply module heater (see	1	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
			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) and	>=	0 to 3276.7	sec		
			(Requested defrosting time for supply module heater (see Look-Up-Table #19)	>=	0 to 3276.7	sec		
			Requested heating time for supply module heater (see Look-Up-Table #21))) 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)) and	>=	0 to 3277	sec		
			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 Requested heating time for supply module heater (see	>=	0 to 3276.7 0 to 3276.7	sec		
			Requested neating time for supply module neater (see Look-Up-Table #21) and	>=	0 10 3276.7	sec		
			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	Closed Loop System Details found in 150BDG09	Defined by:	Enable Logic	Enable Values	Enable Units	Sensor Used	Sensor DTCs
			Waiting time before tank heater released	<	32767	sec		
			started with 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		
			((Waiting time before tank heater released	>	32767	sec		
			started with status of reductant tank heater temperature (please see the definition)	=	FALSE	-		
			and		TOUE			
			status of reductant tank heater temperature (please see the definition) Waiting time after tank heater release expired	= >	TRUE 0	- sec		
))		Ü	300		
	Reductant Tank Level	status of Reductant tank level	Tank level > full (100%)	_	Full	_		
	System States and Status		Warning (66.67%) < tank level < full (100%)	=	OK	-		
			Restriction (33.33%) < tank level < Warning (66.67%) Empty < tank level < Restriction (33.33%)	= =	Warning Restriction	-		
			Tank level < = 0.1%	=	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	>=	12	sec		
			Derivation of the PT1 filtered level signal (DT1) ignition on	>= =	1.00 TRUE	%/sec		
			engine speed	>	550	rpm	Crank Position	P0335,P0336, P0016
			Vehicle speed time since engine started		6.22 (a) * (b)	mph	Transmission output speed sensor	P0722, P0721
			 (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	_				
			or Reductant Refill enabling conditions reset timers))) or	=	TRUE	-		
			or	=	TRUE	- sec		
			or Reductant Refill enabling conditions reset timers)))) or ((time since potential Reductant refill detection is set	=				
			or Reductant Refill enabling conditions reset timers)))) or ((time since potential Reductant refill detection is set and with Derivation of the PT1 filtered level signal (DT1) filter release for Reductant tank level calculation at ignition on on (Please see the definition)	= >= = =	8	sec		
			Reductant Refill enabling conditions reset timers ()))) or time since potential Reductant refill detection is set and with Derivation of the PT1 filtered level signal (DT1) filter release for Reductant tank level calculation at ignition on on (Please see the definition) and with Frozen state is active during a certain warning level (please see the definition)	= >= = =	8 1.00 TRUE	sec %/sec -	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 Level Release	etative of radiustant tank loval release /-l					
		Status of Reductant Lank 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)	=	TRUE	-		
			and ((
			ambient temperature	>=	-100.04	°C	Intake Air Temperature 2	P0097, P0098, P111C
			status of reductant tank heater temperature (please see the definition)	=	FALSE	-		
			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	=	FALSE	_		
			the definition) Waiting time before tank heater released	>=	32767	sec		
			and			-		
			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	=	TRUE	_		
			(please see the definition)					
			Vehicle speed	>=	6.22	mph	Transmission output speed sensor	P0722, P0721
) or					
			filter release for Reductant tank level calculation at ignition on on (Please see the definition)	=	TRUE	-		
		Status of Filter release for reductant tank						
		level calculation	Reductant tank Temperature	>=	-100.04	°C	Reductant Tank Temperature Sensor	P205D, P205C, P205B
			or Reductant low warning level (Please see the definition)	>=	0			
					TRUE			
			NO Pending or Confirmed DTCs:	=		-		
			Frozen state is active during a certain warning level (please see the definition)	=	TRUE	-		
		Filter release for Reductant tank level	ignition	=	on			
		calculation at Ignition on	Engine on timer is expired (please see the definition)	=	FALSE			
			Vehicle speed Reductant low warning level (Please see the definition)	>= >=	0.62 49	mph level	Transmission output speed sensor	P0722, P0721
				>=	49	ievei		
			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 threshold	=	2614 1015	g		
			for ignition on refill detection release	=	1013	g		
)					
			or Raw Reductant tank level	>=	66.7	%		
			and with (

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
			Remaining Reductant quantity (a) - (b): (a) Tank level for reserve mode (Warning level) in [g] (b) Tank level threshold range below WARNING threshold for ignition on refill detection release)	< = =	(a) - (b) 5279 1617	g g		
			or Raw Reductant tank level and with	>=	100	%		
			Remaining Reductant quantity (a) - (b): (a) Tank level for reserve mode (Warning level) in [g] (b) Tank level threshold range below WARNING threshold for ignition on refill detection release))	>= = =	(a) - (b) 5279 1617	g g		
		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 definition)	=	OK	-		
			or status of Reductant tank level (please see the definition)	=	Full	-		
)) ((Captured Reductant tank level at last tank level change	=	Warning	-		
			or Captured Reductant tank level at last tank level change	=	ОК	-		
			and (status of Reductant tank level (please see the definition)	=	Full	_		
) or		. 011			
			(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		
			and with ((ignition	=	on	sec		
			engine speed Vehicle speed (> >=	550 6.22	rpm mph	Crank Position Transmission output speed sensor	P0335,P0336, P0016 P0722, P0721
			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
			Vehicle speed NO Pending or Confirmed DTCs:	>= =	6.22 TRUE	mph	Transmission output speed sensor	P0722, P0721
			for time	>	1	sec		
))					
			and with timer reset conditions (
			Falling edge of ignition or	=	TRUE	-		
			Reductant Refill enabling conditions reset timers	=	TRUE	-		
			(
	Deducest Teels Level Leve	Normal_Operation_OK: 0 decimal,	Darkettesk land		E.dl			
	Reducant Tank Level Low Warning States	normal_operation_ok: 0 decimal,	Reductant tank level	=	Full	-		
			and with (
			Warning level or	<=	49	-		
) Previous warning level	>	49			
			vehicle speed))	<=	98.75	mph	Transmission output speed sensor	P0722, P0721
			,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,					
			Reductant Quality state	>	0	-		
		Warning_Leve1: 1 decimal, Warning	Reductant tank level	<	Full	-		
		level 1	Remaining mileage	>	1558.75	miles		
			and with (
			Warning level	<=	49	Warning level		
			or (
			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		
			vvarning level	<=	49	level		
			or (
			Previous warning level	>	49	Warning level		
			vehicle speed))	<=	98.75	mph	Transmission output speed sensor	P0722, P0721
			and with Reductant Quality state	=	0	_		
			. roddodin godiny state		ŭ			
		Warning Lovel2: 46 desired Wards	Darkinstank and the old		F			
		Warning_Level3: 16 decimal, Warning level 3	Reductant tank level	<	Full	-		
			Remaining mileage and with	>	855	miles		
			(Warning level	=	2	Warning		
			Or			level		
			Warning level	=	16	Warning level		
1	I	!	ı	ı		ievei	1	1

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
) 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		855	miles		
			and with					
			Warning level	<=	49	Warning level		
			Previous warning level	>	49	Warning		
			vehicle speed	<=	98.75	level mph	Transmission output speed sensor	P0722, P0721
			and with Reductant Quality state	=	0	-		
		Warning Loyals: 49 desired Warning						
		Warning_Level5: 48 decimal, Warning level 5	(\) Reductant tank level	<	Full	_		
			Remaining mileage and with	<=	628.75	miles		
			Warning level	<=	49	Warning level		
) Previous warning level	>	49	Warning		
			vehicle speed)))	<=	98.75	level mph	Transmission output speed sensor	P0722, P0721
			or) Warning level	=	48	Warning		
			initialization phase after Reductant refill event is active		TRUE	level -		
			and with Reductant Quality state	=	0	-		
		Warriage Laurice 40 desired Warriage						
		Warning_Level6: 49 decimal, Warning level 6	() Warning level	=	49	Warning		
			initialization phase after Reductant refill event is active		TRUE	level		
) or	_	INOL			
			Warning level	<	49	Warning level		
			Failed Reductant system pressure build up	=	1	-		
			and with Reductant Quality state	=	0	-		
		Warning_Level8: 80 decimal,Vehicle speed restriction mild	Warning level	=	80	Warning level		
			initialization phase after Reductant refill event is active and with		TRUE			
			Reductant Quality state	=	0			
	1							

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
		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 speed restriction severe	Warning level	=	144	Warning level		
			initialization phase after Reductant refill event is active and with		TRUE	-		
			Reductant Quality state	=	0	-		
		Warning_Level14: 176 decimal, Vehicle	Warning level	=	176	Warning		
		speed restriction final	initialization phase after Reductant refill event is active	=	TRUE	level -		
			and with Reductant Quality state	=	0	-		
	Reductant frozen System	Frozen state is active during a certain	ignition	=	On	-		
	States	warning level	for time Reductant tank Temperature	> <=	5 -9.04	sec °C	Reductant Tank Temperature Sensor	P205D, P205C, P205B
			Reductant low warning level (Please see the definition)	>=	2	level	reductant rank remperature densor	1 2005, 1 2005, 1 2005
		Status of Reductant tank as frozen						
			Engine off Time Reductant tank Temperature	> <	14400 -11.04	sec °C	Reductant Tank Temperature Sensor	P205D, P205C, P205B
							Reductant Tank Temperature Sensor	P205D, P205C, P205B
			Reductant tank Temperature)) (Engine off Time	<=	-11.04 7200	°C sec	Reductant Tank Temperature Sensor	P205D, P205C, P205B
			Reductant tank Temperature) ori (< <= <=	-11.04	°C	Reductant Tank Temperature Sensor	P205D, P205C, P205B
			Reductant tank Temperature) o(Engine off Time time since the following conditions are met	<= <= = >	-11.04 7200 7200	°C sec sec	Reductant Tank Temperature Sensor Transmission output speed sensor	P205D, P205C, P205B
			Reductant tank Temperature) Engine off Time time since the following conditions are met status of reductant tank heater defrosi Vehicle speed	<= <= = >	-11.04 7200 7200 On or Defrost 6.22	°C sec sec		
			Reductant tank Temperature) Engine off Time time since the following conditions are met status of reductant tank heater defrosi Vehicle speed	<= <= = >	-11.04 7200 7200 On or Defrost 6.22	°C sec sec		
	SCR System Pressure State	Status of Low Reductant Pump Pressure - Under Reductant warning level 3 -	Reductant tank Temperature) Engine off Time time since the following conditions are met status of reductant tank heater defrosi Vehicle speed	<= <= = >	-11.04 7200 7200 On or Defrost 6.22	°C sec sec		
	SCR System Pressure State	Status of Low Reductant Pump Pressure	Reductant tank Temperature) Engine off Time time since the following conditions are met status of reductant tank heater defrosi Vehicle speed	<= <= = >	-11.04 7200 7200 On or Defrost 6.22	°C sec sec		
	SCR System Pressure State	Status of Low Reductant Pump Pressure - Under Reductant warning level 3 -	Reductant tank Temperature) ((Engine off Time time since the following conditions are met (status of reductant tank heater defrost Vehicle speed Status of urea tank as frozen (please see the definition)))	< <= <= > = > =	-11.04 7200 7200 On or Defrost 6.22 TRUE	°C sec sec - mph -		
	SCR System Pressure State	Status of Low Reductant Pump Pressure - Under Reductant warning level 3 -	Reductant tank Temperature Composition	< <= <= > = > =	-11.04 7200 7200 On or Defrost 6.22 TRUE	°C sec sec - mph -		
	SCR System Pressure State	Status of Low Reductant Pump Pressure - Under Reductant warning level 3 -	Reductant tank Temperature Composition Composition	<= <= >= >= >= = <	-11.04 7200 7200 On or Defrost 6.22 TRUE 64 2 Pressure Build up	°C sec sec - mph - counts - kPa		
	SCR System Pressure State	Status of Low Reductant Pump Pressure - Under Reductant warning level 3 -	Reductant tank Temperature Comparison Engine off Time time since the following conditions are met status of reductant tank heater defrost Vehicle speed Status of urea tank as frozen (please see the definition) Property of the prope	<= <= >= >= >= == == == == == == == == == ==	-11.04 7200 7200 On or Defrost 6.22 TRUE 64 2 Pressure Build up	°C sec sec - mph - counts	Transmission output speed sensor	P0722, P0721
	SCR System Pressure State	Status of Low Reductant Pump Pressure - Under Reductant warning level 3 -	Reductant tank Temperature () () () () () () () () () (<pre>< = <= >= >= >= >= = < > >= </pre>	-11.04 7200 7200 On or Defrost 6.22 TRUE 64 2 Pressure Build up 350 10	eC sec sec mph counts kPa sec	Transmission output speed sensor	P0722, P0721

able no.	Fault Codes	Label (Internal Manufacturer Reference)
1	P0101	AFS_rAirThresCor_CUR
	Intake Air Temperature (°C)	-100.04 -0.04 0.96 38.96 39.96 125.86
	Correction Factor (factor)	0.05 0.05 0 0 0
2	P2199	Air_tDiffMaxHiTAFS_CUR
	Engine Off Time (sec)	600 700 800 900 1000 2000 3000 4000 5000 8000 17999 18000 28799 28800 30000 32000
	Delta Temperature (°C)	999 999 999 999 999 999 999 999 999 999 999 999 999 999 999 100 100
3	P10CF	Air_tDiffMaxHiTCACDs_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
4	P040F	Air_tDiffMaxHiTEGRCIr2Ds_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
5	P2199	Air_tDiffMaxLoTAFS_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
6	P10CF	Air_tDiffMaxLoTCACDs_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_tDiffMaxLoTEGRCIr2Ds_CUR
	Engine Off Time (sec)	600 700 800 900 1000 2000 3000 4000 5000 8000 17999 18000 28799 28800 30000 32000
	Delta Temperature (°C)	999 999 999 999 999 999 999 999 999 999 999 999 999 999 20 20 20
8	P0401	AirCtl_facEnvPresMinDvt_CUR
	Ambient Pressure (kPa)	65 70 75 80 85 90 95 110
	Correction Factor (-)	0.71 0.71 0.85 0.85 0.92 1 1
9	P0401	AirCtl_mEGRMinDvtLim_CUR
	Ambient Pressure (kPa)	67 70 73 76 79 82 85 88 91 94 97 100
	Air Mass Flow (g/rev)	0.8 0.8 0.8 0.8 0.8 0.9 0.95 1 1.05 1.1 1.15 1.2

Table no. Fault Codes Label (Internal Manufacturer Reference) P0402 AirCtl_mMaxDvt_MAP Injection Qty (mm^3/rev) / Engine Speed (rpm) 1300 3000 550 1000 1200 1400 1500 2000 0.5 20 0.6 0.5 0.4 0.4 0.4 0.6 0.6 40 0.6 0.5 0.5 0.4 0.4 0.4 0.6 0.6 60 0.6 0.5 0.5 0.4 0.4 0.4 0.6 0.6 80 0.6 0.5 0.5 0.4 0.4 0.4 0.6 0.6 100 0.6 0.5 0.5 0.4 0.4 0.4 0.6 0.6 120 0.6 0.6 0.5 0.5 0.5 0.6 0.6 0.5 160 0.6 0.6 0.6 0.6 0.6 0.6 0.6 0.6 200 0.6 0.6 0.6 0.6 0.6 0.6 0.6 P0400 AirCtl_mMaxDvtPwr_MAP 11 Injection Qty (mm^3/rev) / Engine Speed (rpm) 500 1000 1500 2000 2500 3000 3750 2 2 20 40 60 80 1.8 1.8 1.8 160 1.8 1.6 1.6 1.6 1.6 320 2 1.8 1.6 1.6 2 380 2 2 2 12 P0401 AirCtl_mMinDvt_MAP Injection Qty (mm^3/rev) / Engine Speed (rpm) 550 1000 1400 1800 2200 2600 3000 3750 -0.56 -1.2 20 -1 -1.2 -1.2 -0.56 -0.56 40 -1 -1.2 -1.2 -0.56 -0.5660 -0.56 -0.56-1.2 80 -0.56 -0.56-1 -1.2 100 -0.9 -0.9 -0.9 -0.9 -0.9 -0.9 -1.2 120 -1 -1.2 -1.2 150 -1.2 13 P2138 APP_uSync_CUR Accel Pedal Voltage (V) 0.18 Pedal Deviation (V) 0.18 14 P057B Brk_facEWMASlowTest_CUR Brake Position Sensor Voltage (V) 0.04 0.045 0.051 0.0512 factor (-) 15 P008F CEngDsT_tDiffMaxHi_CUR Engine Off Time (sec) 700 800 900 1000 2000 3000 4000 5000 8000 17999 18000 28799 28800 30000 32767 Delta Temperature (°C) 999 999 999 999 999 999 999 999 999 999 999 999 999 100 100

CEngDsT_tDiffMaxLo_CUR

16

P008F

	- 1.0.1		1.1.7														
able no.	Fault Codes	Label (Inte				1000	2222	0000	1000	=000	0000	17000	10000	00700	00000	00000	
	Engine Off Time (sec)	99		800 999	900 999	1000	2000 999	3000	4000	5000 999	8000 999	17999	18000	28799	28800	30000	32767
	Delta Temperature (°C)	99	9 999	999	999	999	999	999	999	999	999	999	999	999	20	20	20
17	P0336	EpmCrS_fa	cGapPlaus	High_CA													
	-		8 5.8125	3.375	3.375												
18	P0336	EpmCrS_fa	cIncPlausH	igh_CA													
	-		2 1.8125	1.5	1.5												
	P02CD, P02CF, P02D1, P02D3, P02D5, P02D7, P02D9, P02DB	ETClb_pRa	ilSet_CA														
	Rail Pressure Setpoint (kPa)	3000	0 70000	90000													
	P02CD, P02CF, P02D1, P02D3, P02D5, P02D7, P02D9, P02DB	ETClb_tiET	_MAX_CA														
	Injector Energizing Time (usec)	670.	8 384.4	353.2													
	P01CD, P01CF, P01D1, P01D3, P01D5, P01D7, P01D9, P01DB	ETClb_tiET	FbOfsMax_	.CA													
	Injector Energizing Time (usec)	1	6 12	10													
	P01CD, P01CF, P01D1, P01D3, P01D5, P01D7, P01D9, P01DB	ETClb_tiET	FbOfsMin_0	CA													
	Injector Energizing Time (usec)	1	6 12	10													
23	P144B	ETCtl_stPC	pCtVILopM	lax_MAP													
	Injection Qty (mm^3/rev) / Engine Speed (rpm)		0 900 0 1 0 1	2250 1 1	3000 0												
	200 240	0	0 1	1 0	0												
24	P144C	ETCtl_stPC	pCtVILopM	lin_MAP													
	Injection Qty (mm^3/rev) / Engine Speed (rpm)		0 1	2250 1	3000												
	40	ni	0 1	1	0												

ibie no.	Fault Codes	Lab	el (Interna	Manufa	cturer Re	eference)													
25	P24A0	FTC	tlHCl_stPC	nCtVHC	II opMaxl	niMs MAI	P												
23	12400	LIC	/III 101_3II C	ростіс	льорічахі	rijivi3_ivi	ı												
	Injection Qty (mm^3/rev) / Engine Speed (rpm)		700	900	2250	3000													
		0	0	1	1	1													
		40 160	0	1	1	1													
		200	0	1	1	1													
26	P24A1	EIC	tlHCI_stPC	pCtVHC	ILopMinir	njMs_MAF	,												
	Injection Qty (mm^3/rev) / Engine Speed (rpm)		700	900	2250	3000													
	my and a process (ip.ii)	0	0	1	1	1													
		40	0	1	1	1													
		160	0	1	1	1													
		200	0	1	1	1													
27	P11DC	Exh	_facLamSta	atNoCat2	Ds_CUR														
			41	ol.	٥.	41		ol.	71	ol.	٥١	40	44	40	40	4.4	45	40	
	-		0.2	0.4	0.6	0.8	5 1	1.2	1.4	1.6	9 1.8	10	2.2	12 2.4	13 2.6	14 2.8	15 3	16 3.2	
			0.2	0.4	0.0	0.0	.,	1.2	,	1.0	1.0		2.2	2.1	2.0	2.0	<u> </u>	0.2	
28	P11DB	Exh _.	_facLamSta	atNSCDs	_CUR														
	-		0	3	4	5	6	7	8	9	10	15	16						
	-		0.1	3 0.1	4 1.25	5 1.5	6 3.848	7 3.889	8	9 6.484	10 10	15 10	16 10						
	-												16 10						
29	P2080, P2084, P242B, P246F	Exh	0.1	0.1	1.25	1.5							16 10						
29	P2080, P2084, P242B, P246F	Exh		0.1	1.25	1.5							16 10						
29	P2080, P2084, P242B, P246F Injection Qty (mm^3/rev) / Engine Speed (rpm)		0.1 _stPOpMoo	0.1 IPlausTN 1000	1.25 Mon_MAP	2000	3.848	3.889					16 10						
29		0	0.1 _stPOpMod 700 0	0.1 HPlausTN 1000 0	1.25 Mon_MAP 1500	2000	3.848	3.889					16 10						
29		0 20	0.1 _stPOpMod 700 0 255	0.1 IPlausTN 1000 0 255	1.25 Mon_MAP 1500 0 255	2000 0 255	3.848 3000 0 255	3300 0 0					16 10						
29		0 20 40	0.1 _stPOpMod 700 0 255 255	0.1 PlausTN 1000 0 255 255	1.25 Mon_MAP 1500 0 255 255	2000 0 255 255	3.848 3000 0 255 255	3300 0 0					16 10						
29		0 20	0.1 _stPOpMod 700 0 255	0.1 IPlausTN 1000 0 255	1.25 Mon_MAP 1500 0 255	2000 0 255	3.848 3000 0 255	3300 0 0					16 10						
29		0 20 40 100	0.1 stPOpMod 700 0 255 255 255	0.1 IPlausTN 1000 0 255 255 255	1.25 Mon_MAP 1500 0 255 255 255	2000 0 255 255 255	3.848 3000 0 255 255 255	3300 0 0 0					16 10						
29		0 20 40 100 200	0.1 stPOpMod 700 0 255 255 255	0.1 IPlausTN 1000 0 255 255 255 255	1.25 Mon_MAP 1500 0 255 255 255	2000 0 255 255 255 255	3.848 3000 0 255 255 255 255	3300 0 0 0 0					16 10						
	Injection Qty (mm^3/rev) / Engine Speed (rpm)	0 20 40 100 200 320	0.1 stPOpMoc 700 0 255 255 255 0 0	0.1 IPlausTN 1000 0 255 255 255 0	1.25 Mon_MAP 1500 0 255 255 255 0	2000 0 255 255 255 255	3.848 3000 0 255 255 255 255	3300 0 0 0 0					16 10						
29		0 20 40 100 200 320	0.1 stPOpMod 700 0 255 255 255	0.1 IPlausTN 1000 0 255 255 255 0	1.25 Mon_MAP 1500 0 255 255 255 0	2000 0 255 255 255 255	3.848 3000 0 255 255 255 255	3300 0 0 0 0					16 10						
	Injection Qty (mm^3/rev) / Engine Speed (rpm) P20E2 Engine Off Time (sec)	0 20 40 100 200 320	0.1	0.1 IPlausTN 1000 0 255 255 255 0 TOxiCat	1.25 //on_MAP 1500 0 255 255 255 255 0 Ds_CUR	2000 0 255 255 255 255 0	3.848 3000 0 255 255 255 0	3300 0 0 0 0 0	3000	6.484	5000	8000	17999	18000[28799]	28800		32000	
	Injection Qty (mm^3/rev) / Engine Speed (rpm) P20E2	0 20 40 100 200 320	0.1	0.1 #PlausTN 1000 0 255 255 255 0 TOxiCat	1.25 Mon_MAP 1500 0 255 255 255 0 Ds_CUR	2000 0 255 255 255 255 0	3.848 3000 0 255 255 255 255 0	3300 0 0 0 0 0	4	6.484	10	10	10	18000 999	28799 999	28800 100	30000 100	32000 100	
	Injection Qty (mm^3/rev) / Engine Speed (rpm) P20E2 Engine Off Time (sec)	0 20 40 100 200 320	0.1	0.1 IPlausTN 1000 0 255 255 255 0 TOxiCat	1.25 //on_MAP 1500 0 255 255 255 255 0 Ds_CUR	2000 0 255 255 255 255 0	3.848 3000 0 255 255 255 0	3300 0 0 0 0 0	3000	6.484	5000	8000	17999						
	Injection Qty (mm^3/rev) / Engine Speed (rpm) P20E2 Engine Off Time (sec)	0 20 40 100 200 320	0.1	0.1 IPlausTN 1000 0 255 255 255 0 TOxiCat 700 999	1.25 //on_MAP 1500 0 255 255 255 0 Ds_CUR 800 999	2000 0 255 255 255 255 0	3.848 3000 0 255 255 255 0	3300 0 0 0 0 0	3000	6.484	5000	8000	17999						
30	P20E2 Engine Off Time (sec) Delta Temperature (°C)	0 20 40 100 200 320	0.1 stPOpMoc 700 0 255 255 0 0 tDiffMaxHo 600 999	0.1 IPlausTN 1000 0 255 255 255 255 0 TOxiCat 700 999	1.25 Mon_MAP 1500 0 255 255 255 255 0 Ds_CUR 800 999	2000 0 255 255 255 255 0 900 999	3.848 3000 0 255 255 255 255 0 1000 999	3300 0 0 0 0 0 0	3000 999	4000	5000 999	8000 999	17999 999	999	999	100	100	100	
30	P20E2 Engine Off Time (sec) Delta Temperature (°C) Engine Off Time (sec)	0 20 40 100 200 320	0.1 stPOpMoc 700 0 255 255 255 0 0 tDiffMaxHc 600 999	0.1 IPlausTN 1000 0 255 255 255 255 0 TOxiCat 700 999 DTOxiCa	1.25 Mon_MAP 1500 0 255 255 255 255 0 Ds_CUR 800 999	2000 0 255 255 255 255 0 900 999	3.848 3000 0 255 255 255 255 0 1000 999	3300 0 0 0 0 0 0	3000 999 3000	4000 999	5000 999	8000 999	17999 999	999	999 28799	100 28800	30000	32000	
30	P20E2 Engine Off Time (sec) Delta Temperature (°C)	0 20 40 100 200 320	0.1 stPOpMoc 700 0 255 255 0 0 tDiffMaxHo 600 999	0.1 IPlausTN 1000 0 255 255 255 255 0 TOxiCat 700 999	1.25 Mon_MAP 1500 0 255 255 255 255 0 Ds_CUR 800 999	2000 0 255 255 255 255 0 900 999	3.848 3000 0 255 255 255 255 0 1000 999	3300 0 0 0 0 0 0	3000 999	4000	5000 999	8000 999	17999 999	999	999	100	100	100	
30	P20E2 Engine Off Time (sec) Delta Temperature (°C) Engine Off Time (sec)	0 20 40 100 200 320	0.1 stPOpMoo 700 0 255 255 255 0 0 tDiffMaxHe 600 999	0.1 IPlausTN 1000 0 255 255 255 255 0 TOxiCat 700 999 DTOxiCa	1.25 Mon_MAP 1500 0 255 255 255 255 0 Ds_CUR 800 999	2000 0 255 255 255 255 0 900 999	3.848 3000 0 255 255 255 255 0 1000 999	3300 0 0 0 0 0 0	3000 999 3000	4000 999	5000 999	8000 999	17999 999	999	999 28799	100 28800	30000	32000	
30	P20E2 Engine Off Time (sec) Delta Temperature (°C) Engine Off Time (sec)	0 20 40 100 200 320 Exh	0.1 stPOpMoo 700 0 255 255 255 0 0 tDiffMaxHe 600 999	0.1 IPlausTN 1000 0 255 255 255 255 0 TOxiCat 700 999 DTOxiCa 700 999	1.25 Mon_MAP 1500 0 255 255 255 255 0 Ds_CUR 800 999 DS_CUR 800 999	2000 0 255 255 255 255 0 900 999	3.848 3000 0 255 255 255 255 0 1000 999	3300 0 0 0 0 0 0	3000 999 3000	4000 999	5000 999	8000 999	17999 999	999	999 28799	100 28800	30000	32000	
30	P20E2 Engine Off Time (sec) Delta Temperature (°C) Pequestrate (°C) Polita Temperature (°C) Polita Temperature (°C)	0 20 40 100 200 320 Exh	0.1 stPOpMod 700 0 255 255 0 0	0.1 IPlausTN 1000 0 255 255 255 255 0 TOxiCat 700 999 DTOxiCa 700 999	1.25 Mon_MAP 1500 0 255 255 255 0 Ds_CUR 800 999 EDs_CUR	2000 0 255 255 255 255 255 0 900 999	3.848 3000 0 255 255 255 255 0 1000 999	3300 0 0 0 0 0 0 0 0 0 2000 999	3000 999 3000 999	4000 999 4000 999	5000 999 5000 999	8000 999 8000 999	17999 999 17999 999	999 18000 999	999 28799 999	28800 30	30000 30	32000 30	
30	P20E2 Engine Off Time (sec) Delta Temperature (°C) Engine Off Time (sec) Delta Temperature (°C)	0 20 40 100 200 320 Exh	0.1 stPOpMoc 700 0 255 255 255 0 0 LtDiffMaxH 600 999 LtDiffMaxL 600 999	0.1 IPlausTN 1000 0 255 255 255 255 0 TOxiCat 700 999 DTOxiCa 700 999	1.25 Mon_MAP 1500 0 255 255 255 255 0 Ds_CUR 800 999 DS_CUR 800 999	2000 0 255 255 255 255 0 900 999	3.848 3000 0 255 255 255 255 0 1000 999	3300 0 0 0 0 0 0	3000 999 3000	4000 999	5000 999	8000 999	17999 999	999	999 28799	100 28800	30000	32000	680

Table no.	Fault Codes	Label (Internal Manufacturer Reference)
33	P0483 Fan Speed (rpm)	FanCtl_facDiaDrvStab_CUR
	factor (-)	0 0 0.6 1 1 1 0.6 0 0
34	P0483	FanCtl_facDiaECT_CUR
	Engine Coolant Temperature (°C)	-20.04 -7.04 19.96 68.96 69.96 79.96 99.96 104.96 124.96
	factor (-)	0 0 0 0 0.6 0.95 1 0.95 0.9
35	P0483	FanCtl_facDiaIAT_CUR
	Intake Air Temperature (°C)	-8.04 -7.04 -0.04 9.96 14.96 19.96 44.96 69.96 99.96 0 0.6 0.62 0.7 0.8 1 1 1 0.9
36	Factor (-) P0495	0 0.6 0.62 0.7 0.8 1 1 1 0.9 FanCtl_nDiaHiSpd_CUR
	Fan Drive Speed (rpm)	400 1200 1500 1600 1800 2000 2400 2800 3200 3600 4000 4400 4800 5200 5600 6000 6800
	Fan Speed (rpm)	400 1200 1450 1500 1500 1500 1500 1500 1500 1500 1500 1500 1500 1500 1500 1500 1500 1500 1500 1500 1500 1500 1500 1500 1500 1500 1500 1500 1500 1500 1500 1500 1500 1500 1500 1500 1500 1500 1500 1500 1500 1500 1500 1500 1500 1500 1500 1500 1500 1500 1500 1500 1500 1500 1500 1500 1500 1500 1500 1500 1500 1500 1500 1500 1500 1500 1500 1500 1500 1500 1500 1500 1500 1500 1500 1500 1500 1500 1500 1500 1500 1500 1500 1500 1500 1500 1500 1500 1500 1500 1500 1500 1500 1500 1500 1500 1500 1500 1500 1500 1500 1500 1500 1500 1500 1500 1500 1500 1500 1500 1500 1500 1500 1500 1500 1500 1500 1500 1500 1500 1500 1500 1500 1500 1500 1500 1500 1500 1500 1500 1500 1500 1500 1500 1500 1500 1500 1500 1500 1500 1500 1500 1500 1500 1500 1500 1500 1500 1500 1500 1500 1500 1500 1500 1500 1500 1500 1500 1500 1500 1500 1500 1500 1500 1500 1500 1500 1500 1500 1500 1500 1500 1500 1500 1500 1500 1500 1500 1500 1500 1500 1500 1500 1500 1500 1500 1500 1500 1500 1500 1500 1500 1500 1500 1500 1500 1500 1500 1500 1500 1500 1500 1500 1500 1500 1500 1500 1500 1500 1500 1500 1500 1500 1500 1500 1500 1500 1500 1500 1500 1500 1500 1500 1500 1500 1500 1500 1500 1500 1500 1500 1500 1500 1500 1500 1500 1500 1500 1500 1500 1500 1500 1500 1500 1500 1500 1500 1500 1500 1500 1500 1500 1500 1500 1500 1500 1500 1500 1500 1500 1500 1500 1500 1500 1500 1500 1500 1500 1500 1500 1500 1500 1500 1500 1500 1500 1500 1500 1500 1500 1500 1500 1500 1500 1500 1500 1500 1500 1500 1500 1500 1500 150
37	P0495	FanCtl_volClthDia_CUR
	Fan Drive Speed (rpm)	400 600 800 1000 1200 1400 1600 1800 2000 2200 2400 2600 2800 3000 3200 3400 3600
	Clutch Fluid Vol (L)	0.005 0.005 0.006 0.011 0.011 0.011 0.011 0.011 0.011 0.011 0.011 0.010 0.0105 0.0105 0.0105 0.0105 0.0115 0.011 0.011 0.010 0.0105

38 P0263, P0266, P0269, P0272, P0275, P0278, P0281, P0284 FBC_qLimNeg_MAP

ECT (°C) / Inj. Qty (mm^3/rev)	0	8	52	76	448	464	472	480
-40.04	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

39 P0263, P0266, P0269, P0272, P0275, P0278, P0281, P0284 FBC_qLimPos_MAP

ECT (°C) / Inj. Qty (mm^3/rev)		0	8	52	76	448	464	472	480
	-40.04	0	0	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	6
	106.96	0	0	48	68	68	68	68	6
	107.96	0	0	48	68	68	68	68	6
	109.96	0	0	48	68	68	68	68	6
	134.96	0	0	48	68	68	68	68	6

Table no. Fault Codes

Label (Internal Manufacturer Reference)

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	1	1	1	1	1	1	1
28	0	1	1	1	1	1	1	1
280	0	1	1	1	1	1	1	1
300	0	0	0	1	1	1	1	1
320	0	0	0	1	1	1	0	0
340	0	0	0	1	1	1	0	0
360	0	0	0	0	1	1	0	0
380	0	0	0	0	0	0	0	0

44 P026D

FMO_qFlSysThresMax_MAP

Injection Qty (mm^3/rev) / Engine Speed (rpm)	400	450	500	550	700	750	800	850
	12 19.6	19.6	19.6	19.6	22.4	22.4	25.6	24
	16 16	19.2	19.2	19.2	23.2	23.2	26	24
	24 23.2	23.2	25.2	25.2	25.2	25.2	26	28
	40 23.2	23.2	25.2	25.2	25.2	25.2	26	28
	23.2	23.2	25.2	25.2	25.2	25.2	26	28
	72 23.2	23.2	25.2	25.2	25.2	25.2	26	28
	34.8	34.8	34.8	34.8	34.8	34.8	34.8	34.8
1	34.8	34.8	34.8	34.8	34.8	34.8	34.8	34.8

45 P026C

FMO_qFlSysThresMin_MAP

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

Table no. Fault Codes Label (Internal Manufacturer Reference)

46 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
3	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	71.32	79.24	87.2	91.16	95.12	99.08	103.04	126.84
24	77.64	85.56	93.48	97.44	101.4	105.36	109.32	133.12
28	109.12	117.04	125	128.96	132.92	136.88	140.84	164.64

47 P0171

FMO_qOBDMin_MAP

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

48 P0171, P0172, P026C, P026D

FMO_stOutObsvr_MAP

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

49 P11B4, P11B5

Hegn_facLamDiaFdbk_CUR

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

	Fault Codes		abel (Interna	l Manufa	cturer R	eference)								
50	P054F		njCtl_qDesGe				,								
			,		_										
	ECT (°C) / Engine Speed (rpm)		0	400	600	800	1000								
		-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							
		19.96	160	160	160 136	160 136	160 136	160 136							
		39.96 69.96	136 122.8	136 122.8	122.8	128.8	128.8								
		09.90	122.0	122.0	122.0	120.0	120.0	120.0							
54	P0606	Ι.	/loFCoOfs_rTi	raPtdOfs	MAP										
	Engine Speed (rpm) / Torque (%)			10.156	19.922	30.078	39.844	50	60.156	69.922					
	Linguic opecu (ipini) / Torque (70)	840		99.609	99.609	99.609	99.609		99.609	99.609					
		880		11.719	11.719	11.719	11.719	11.719	11.719	11.719					
		2000		11.719	11.719	11.719	11.719		11.719	11.719					
		3000	11.71875	11.719	11.719	11.719	11.719			11.719					
		4000		11.719	11.719	11.719	11.719								
		5000		11.719	11.719	11.719	11.719	11.719	11.719	11.719					
		6000			11.719		11.719								
		7000	11.71875	11.719	11.719	11.719	11.719	11.719	11.719	11.719					
			nor my cont_tize	FCETMax	x_CUR										
	Rail Pressure (kPa) Energizing Time (us)		20000	30400 500	70400 300	90400 256	120000	120800							
EG	Energizing Time (us)		20000	30400 500	70400										
56	Energizing Time (us) P0606	N	20000 500 MoFInjQnt_tiZf	30400 500 FCETMin	70400 300 CUR	256	50	50							
56	P0606 Rail Pressure (kPa)	N	20000 500 MoFInjQnt_tiZF	30400 500 FCETMin	70400 300 CUR	256 90400	50 120000	120800							
56	Energizing Time (us) P0606	N	20000 500 MoFInjQnt_tiZf	30400 500 FCETMin	70400 300 CUR	256	50	120800							
56 57	P0606 Rail Pressure (kPa)		20000 500 MoFInjQnt_tiZF	30400 500 FCETMin 30400 -500	70400 300 CUR 70400 -300	256 90400	50 120000	120800							
	Energizing Time (us) P0606 Rail Pressure (kPa) Energizing Time (us)		20000 500 MoFInjQnt_tiZF 20000 -500	30400 500 FCETMin 30400 -500	70400 300 CUR 70400 -300	256 90400	50 120000	120800	29.6	40					
	P0606 Rail Pressure (kPa) Energizing Time (us) P0606		20000 500 500 600 600 600 600 600 600 600 600 600 600 600 600 600 600 600 600 600 600 600 600 600 600 600 600 600 600 600 600 600 600 600 600 600 600 600 600 600 600 600 600 600 600 600 600 600 600 600 600 600 600 600 600 600 600 600 600 600 600 600 600 600 600 600 600 600 600 600 600 600 600 600 600 600 600 600 600 600 600 600 600 600 600 600 600 600 600 600 600 600 600 600 600 600 600 600 600 600 600 600 600 600 600 600 600 600 600 600 600 600 600 600 600 600 600 600 600 600 600 600 600 600 600 600 600 600 600 600 600 600 600 600 600 600 600 600 600 600 600 600 600 600 600 600 600 600 600 600 600 600 600 600 600 600 600 600 600 600 600 600 600 600 600 600 600 600 600 600 600 600 600 600 600 600 600 600 600 600 600 600 600 600 600 600 600 600 600 600 600 600 600 600 600 600 600 600 600 600 600 600 600 600 600 600 600 600 600 600 600 600 600 600 600 600 600 600 600 600 600 600 600 600 600 600 600 600 600 600 600 600 600 600 600 600 600 600 600 600 600 600 600 600 600 600 600 600 600 600 600 600 600 600 600 600 600 600 600 600 600 600 600 600 600 600 600 600 600 600 600 600 600 600 600 600 600 600 600 600 600 600 600 600 600 600 600 600 600 600 600 600 600 600 600 600 600 600 600 600 600 600 600 600 600 600 600 600 600 600 600 600 600 600 600 600 600 600 600 600 600 600 600 600 600 600 600 600 600 600 600 600 600 600 600 600 600 600 600 600 600	30400 500 FCETMin 30400 -500	70400 300 300 -CUR 70400 -300 s_CUR	90400 -256	120000 -50	120800 -50	29.6 920	40 840					
	Energizing Time (us) P0606 Rail Pressure (kPa) Energizing Time (us) P0606 ECT (°C)	N	20000 500 MoFInjQnt_tiZf 20000 -500 MoFOvR_nEng	30400 500 FCETMin 30400 -500 gStrtThre -30.4 1040	70400 300 2CUR 70400 -300 s_CUR -16 960	90400 -256	120000 -50 9.6	120800 -50							
57	Energizing Time (us) P0606 Rail Pressure (kPa) Energizing Time (us) P0606 ECT (°C) Engine Speed (rpm) P0606 Engine Speed (rpm)	N	20000 500 MoFInjQnt_tiZf 20000 -500 MoFOvR_nEng -40 1080 MoFOvR_tiLim	30400 500 500 500 500 500 500 500 500 500 500 500 500 500 500 500 500 500 500 500 500 500 500 500 500 500 500 500 500 500 500 500 500 500 500 500 500 500 500 500 500 500 500 500 500 500 500 500 500 500 500 500 500 500 500 500 500 500 500 500 500 500 500 500 500 500 500 500 500 500 500 500 500 500 500 500 500 500 500 500 500 500 500 500 500 500 500 500 500 500 500 500 500 500 500 500 500 500 500 500 500 500 500 500 500 500 500 500 500 500 500 500 500 500 500 500 500 500 500 500 500 500 500 500 500 500 500 500 500 500 500 500 500 500 500 500 500 500 500 500 500 500 500 500 500 500 500 500 500 500 500 500 500 500 500 500 500 500 500 500 500 500 500 500 500 500 500 500 500 500 500 500 500 500 500 500 500 500 500 500 500 500 500 500 500 500 500 500 500 500 500 500 500 500 500 500 500 500 500 500 500 500 500 500 500 500 500 500 500 500 500 500 500 500 500 500 500 500 500 500 500 500 500 500 500 500 500 500 500 500 500 500 500 500 500 500 500 500 500 500 500 500 500 500 500 500 500 500 500 500 500 500 500 500 500 500 500 500 500 500 500 500 500 500 500 500 500 500 500 500 500 500 500 500 500 500 500 500 500 500 500 500 500 500 500 500 500 500 500 500 500 500 500 500 500 500 500 500 500 500 500 500 500 500 500 500 500 500 500 500 500 500 500 500 500 500 500 500 500 500 500 500 500 500 500 500 500 500 500 500 500 500 500 500 500 500 500 500 500 500 500	70400 300 CUR 70400 -300 s_CUR -16 960	90400 -256 -10.4 960	120000 -50 9.6	120800 -50							
57	Energizing Time (us) P0606 Rail Pressure (kPa) Energizing Time (us) P0606 ECT (°C) Engine Speed (rpm) P0606	N	20000 500 MoFInjQnt_tiZf 20000 -500 MoFOvR_nEng -40 1080	30400 500 FCETMin 30400 -500 GStrtThre -30.4 1040 GET_CUR	70400 300 —CUR 70400 —300 s_CUR —16 960	90400 -256 -10.4 960	120000 -50 9.6	120800 -50							
57	Energizing Time (us) P0606 Rail Pressure (kPa) Energizing Time (us) P0606 ECT (°C) Engine Speed (rpm) P0606 Engine Speed (rpm)	N.	20000 500 MoFInjQnt_tiZf 20000 -500 MoFOvR_nEng -40 1080 MoFOvR_tiLim	30400 500 500 500 500 500 500 500 500 500 500 500 500 500 500 500 500 500 500 500 500 500 500 500 500 500 500 500 500 500 500 500 500 500 500 500 500 500 500 500 500 500 500 500 500 500 500 500 500 500 500 500 500 500 500 500 500 500 500 500 500 500 500 500 500 500 500 500 500 500 500 500 500 500 500 500 500 500 500 500 500 500 500 500 500 500 500 500 500 500 500 500 500 500 500 500 500 500 500 500 500 500 500 500 500 500 500 500 500 500 500 500 500 500 500 500 500 500 500 500 500 500 500 500 500 500 500 500 500 500 500 500 500 500 500 500 500 500 500 500 500 500 500 500 500 500 500 500 500 500 500 500 500 500 500 500 500 500 500 500 500 500 500 500 500 500 500 500 500 500 500 500 500 500 500 500 500 500 500 500 500 500 500 500 500 500 500 500 500 500 500 500 500 500 500 500 500 500 500 500 500 500 500 500 500 500 500 500 500 500 500 500 500 500 500 500 500 500 500 500 500 500 500 500 500 500 500 500 500 500 500 500 500 500 500 500 500 500 500 500 500 500 500 500 500 500 500 500 500 500 500 500 500 500 500 500 500 500 500 500 500 500 500 500 500 500 500 500 500 500 500 500 500 500 500 500 500 500 500 500 500 500 500 500 500 500 500 500 500 500 500 500 500 500 500 500 500 500 500 500 500 500 500 500 500 500 500 500 500 500 500 500 500 500 500 500 500 500 500 500 500 500 500 500 500 500 500 500 500 500 500 500 500 500 500 500 500 500 500 500 500	70400 300 -CUR 70400 -300 s_CUR -16 960	90400 -256 -10.4 960	120000 -50 9.6	120800 -50							
57 58	Energizing Time (us) P0606 Rail Pressure (kPa) Energizing Time (us) P0606 ECT (°C) Engine Speed (rpm) P0606 Engine Speed (rpm) Energizing Time (us)	N.	20000 500 MoFInjQnt_tiZf 20000 -500 MoFOvR_nEng -40 1080 MoFOvR_tiLim 0 6000	30400 500 500 500 500 500 500 500 500 500 500 500 500 500 500 500 500 500 500 500 500 500 500 500 500 500 500 500 500 500 500 500 500 500 500 500 500 500 500 500 500 500 500 500 500 500 500 500 500 500 500 500 500 500 500 500 500 500 500 500 500 500 500 500 500 500 500 500 500 500 500 500 500 500 500 500 500 500 500 500 500 500 500 500 500 500 500 500 500 500 500 500 500 500 500 500 500 500 500 500 500 500 500 500 500 500 500 500 500 500 500 500 500 500 500 500 500 500 500 500 500 500 500 500 500 500 500 500 500 500 500 500 500 500 500 500 500 500 500 500 500 500 500 500 500 500 500 500 500 500 500 500 500 500 500 500 500 500 500 500 500 500 500 500 500 500 500 500 500 500 500 500 500 500 500 500 500 500 500 500 500 500 500 500 500 500 500 500 500 500 500 500 500 500 500 500 500 500 500 500 500 500 500 500 500 500 500 500 500 500 500 500 500 500 500 500 500 500 500 500 500 500 500 500 500 500 500 500 500 500 500 500 500 500 500 500 500 500 500 500 500 500 500 500 500 500 500 500 500 500 500 500 500 500 500 500 500 500 500 500 500 500 500 500 500 500 500 500 500 500 500 500 500 500 500 500 500 500 500 500 500 500 500 500 500 500 500 500 500 500 500 500 500 500 500 500 500 500 500 500 500 500 500 500 500 500 500 500 500 500 500 500 500 500 500 500 500 500 500 500 500 500 500 500 500 500 500 500 500 500 500 500 500 500 500 500 500 500 500 500 500	70400 300 -CUR 70400 -300 s_CUR -16 960	90400 -256 -10.4 960	120000 -50 9.6	120800 -50 20 960		840					

Table no.	Fault Codes		Label (Interna	al Manufa	acturer R	eference	e)			
60	P0234		PCR_facPresI							
	Francisco contail Processor (IvPa)	-	50	75	00	0.5	00	07.5	400.4	405
	Environmental Pressure (kPa) factor (-)		50 0.800049	75 0.7	80 0.7	85 0.75	90 0.8	97.5	106.4	125 1
	identify ()		0.000010	0.7	0.1	0.10	0.0	.,		
61	P0299		PCR_pMaxDv	t_MAP						
	Injection Qty (mm^3/rev) / Engine Speed (rpm)		0	1300	1500	1600	1800	2000	2500	3000
		140	21	21	19	19	20	25	25	25
		160	24	24	22	22	22.5	25	25	25
		200 240	27 30	27 30	25 28	25 25	22.5 25	25 27.5	25 27.5	25 27.5
		280	33	33	31	31	27.5	28	28	27.3
		320	36	36	34	34	30	30	30	30
		360	36	36	35	35	35	35	35	35
		400	40	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
		140	-10	-10	-10	-10	-10	-11.7	-27	-31.5
		160	-10	-10	-10	-10	-10	-12.5	-27	-31.5
		200 240	-10 -12.5	-10 -12.5	-10 -12.5	-10 -12.5	-14.5 -20	-16 -25.2	-27 -27	-31.5 -31.5
		280	-15.3	-15.3	-12.5	-22.5	-22.5	-25.2	-27	-31.5
		320	-17.6	-17.6	-22.1	-27.5	-27.5	-27.5	-30	-31.5
		360	-19.8	-19.8	-24.3	-30	-30	-30	-30	-31.5
		400	-22.1	-22.1	-25.2	-30	-30	-30	-30	-31.5
63	P2263		PCR_pOvrBst					0.500		0=00
	Injection Qty (mm^3/rev) / Engine Speed (rpm)		500	750	1000	1500	2000	2500	3000	3500
		0 60	-80 -80	-80 -80	-80 -80	-80 -80	-80 -80	-60 -60	-40 -40	-40 -40
		120	-80	-80	-80	-80	-80	-60	-40	-40
		180	-80	-80	-80	-80	-80	-60	-40	-40
		240	-65	-65	-65	-65	-65	-55	-45	-45
		300	-50	-50	-50	-50	-50	-50	-50	-50
		360	-50	-50	-50	-50	-50	-50	-50	-50
		480	-50	-50	-50	-50	-50	-50	-50	-50
64	P2263		PCR_pUndrBs							
	Injection Qty (mm^3/rev) / Engine Speed (rpm)		500	750	1000	1500	2000	2500	3000	3500
		0 60	45 45	45	45	45 45	45	45	45 45	45 45
		120	45	45 45	45 45	45 45	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

Table no.	Fault Codes	Label (Internal Manufacturer Reference)
65	P2459	PFlt_mSotThresRgnFreq_CUR
	g Soot Mass (g)	0 5 10 20 30 45 0 61 122 244 366 549
	Soot Mass (g)	0 01 122 244 300 349
67	P128E	Rail_pCPCFItMin_CUR
	Engine Speed (rpm)	580 630
	Rail Pressure (kPa)	0 15000
68	P0087	Rail_pMeUnDvtMax_CUR
	Engine Speed (rpm)	580 630
	Rail Pressure (kPa)	80000 11000
69	P0088	Rail_pMeUnDvtMin_CUR
	Engine Speed (rpm)	580 630
	Rail Pressure (kPa)	-80000 -18000
70	P128E	Rail_pMeUnFltMin_CUR
	Engine Speed (rpm)	580 630
	Rail Pressure (kPa)	36U 53U 0 15000
	ram rossars (m a)	<u> </u>
71	P0087	Rail_pPCVDvtMax_CUR
	Engine Speed (rpm)	580 630
	Rail Pressure (kPa)	80000 11000
72	P128E	Rail_pPCVFltMin_CUR
		700
	Engine Speed (rpm) Rail Pressure (kPa)	580 630 0 15000
	rdii Fiessule (KFd)	0 13000
74	P11CB	SCRChk_idcPOpMaxNOxUsPlaus_GMAP
	Injection Qty (mm^3/rev) / Engine Speed (rpm)	500 600 700 800 900 1000 1100 1200 1400 1600 1800 2000 2001 2500 2600 3000
	40	
	60	
	80	0 0 0 0 0 0 0 0 1 1 1 1 1 0 0 0 0
	120	
	160	
	200.4	
	200.4	
	240	
	260	

001 2500 2600 3 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 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 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 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 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 0
0 0 0
0 0 0

P11CB, P11CC SCRChk_stExhTempRlsUsPlaus_CUR

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

Table no. Fault Codes Label (Internal Manufacturer Reference)

82 P11CB, P11CC

SCRChk_stlnjCharNOxUsPlaus_CA

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

83 P20EE

SCRChk_stPOpSelEta1_MAP

Filtered Exh Mass Flow (g/s) / SCR Upstream Temp (°C)	219.96	239.96	244.96	249.96	254.96	259.96	264.96	269.96	274.96	279.96	284.96	289.96	294.96	299.96	314.96	329.96
	219.90	239.90	244.90		254.96	259.90	204.90			279.90	204.90	209.90	294.90	299.90	314.90	329.90
61.11	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
69.44	0	0	0	0	1	1	1	1	1	0	0	0	0	0	0	0
80.56	0	0	0	0	1	1	1	1	1	0	0	0	0	0	0	0
83.33	0	0	0	1	1	1	1	1	1	0	0	0	0	0	0	0
97.22	0	0	0	1	1	1	1	1	1	0	0	0	0	0	0	0
102.78	0	0	0	1	1	1	1	1	1	1	0	0	0	0	0	0
111.11	0	0	0	1	1	1	1	1	1	1	1	0	0	0	0	0
119.44	0	0	0	1	1	1	1	1	1	1	1	1	0	0	0	0
127.78	0	0	0	1	1	1	1	1	1	1	1	1	0	0	0	0
136.11	0	0	0	1	1	1	1	1	1	1	1	1	0	0	0	0
144.44	0	0	0	1	1	1	1	1	1	1	1	1	0	0	0	0
152.78	0	0	0	1	1	1	1	1	1	1	1	1	0	0	0	0
161.11	0	0	0	0	0	0	0	0	1	1	1	1	0	0	0	0
169.44	0	0	0	0	0	0	0	0	0	1	1	1	0	0	0	0
177.78	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
186.11	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

84 P2BAD

SCRChk_stPOpSelEta2_MAP

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

5 P20EE, PBAD

SCRChk_tDeltaTempSCRMax_CUR

Filtered SCR Temp (°C)	249.96	259.96	269.96	279.96	289.96	299.96	309.96	319.96
Delta SCR Temp (°C)	59.96	59.96	59.96	59.96	64.96	64.96	64.96	64.96

ble no.	Fault Codes					eference)								 	
88	P20EE, P2BAD	SC	RChk_tiAdo	Disbl_M	\P											
	Nox Peak Duration (s) / Nox Mass Flow (g/s)		0.05	0.1	0.15	0.2	0.25	0.3	0.35	0.4						
		0	0	0	0	0	0.1	0.2	0.3	0.4						
		3	0.3	0.3	0.3	0.3	0.5	1 2	1.5	2						
		4	1	0.5	0.5	1	2	4	6	8						
		6	1.5	1.5	1.5	1.5	3	6	9	12						
		10	2.5	2.5	2.5	2.5	5	10	15	20						
		20	5	5	5	5	10	20	30	40						
		60	5	5	5	15	30	60	90	120						
90	P10D0	SC	RPOD_tMa	xDiff_CU	R											
	Engine Off Time (sec)		0	299	300	28799	28800	32000	32500	32767						
	Delta Temperature (°C)		3276.7	3276.7	3276.7	3276.7	30	30	30	30						
91	Engine Running	StS	Sys_nStrtCu	ıtOut MA	Þ											
	gg	310	., 5													
	BARO Pressure (kPa) / ECT at Start (°C)		-40.04	-30.04	-16.04	-10.04	9.96	19.96	29.96	39.96						
		65	850	800	735	735	735	735	675	600						
		70	850	800	735	735	735	735	675	600						
		75 80	850 850	800	735 735	735 735	735 735	735 735	675 675	600 600						
								7331	0/0	000						
				800						600						
		85	850	800	735	735	735	735	675	600 600						
										600 600						
		85 90	850 834	800 790	735 720	735 720	735 720	735 720	675 660	600						
		85 90 95	850 834 834	800 790 790	735 720 720	735 720 720	735 720 720	735 720 720	675 660 660	600 600						
92	P2598, P2599	85 90 95 100	850 834 834	800 790 790 790	735 720 720 720 720	735 720 720	735 720 720	735 720 720	675 660 660	600 600						
92		85 90 95 100	850 834 834 834 Ch_tiDiaEn	800 790 790 790 790	735 720 720 720 720	735 720 720 720 720	735 720 720 720 720	735 720 720 720	675 660 660 660	600 600 600						
92	P2598, P2599 ECT (°C) Delay Time (sec)	85 90 95 100	850 834 834 834	800 790 790 790	735 720 720 720 720	735 720 720	735 720 720	735 720 720	675 660 660	600 600						
92	ECT (°C)	85 90 95 100	850 834 834 834 Ch_tiDiaEn	800 790 790 790 790 hblDly_CU	735 720 720 720 720	735 720 720 720 720	735 720 720 720 720	735 720 720 720 720	675 660 660 660 59.96	600 600 600 79.96						
	ECT (°C) Delay Time (sec)	85 90 95 100	850 834 834 834 Ch_tiDiaEn -30.04 327.67	800 790 790 790 790 hblDly_CU -20.04 210	735 720 720 720 720	735 720 720 720 720	735 720 720 720 720	735 720 720 720 720	675 660 660 660 59.96	600 600 600 79.96						
92	ECT (°C) Delay Time (sec) P01CB, P01CD, P01D7, P01D9, P01D1, P01D3, P01D	85 90 95 100 Trb	850 834 834 834 Ch_tiDiaEn	800 790 790 790 790 hblDly_CU -20.04 210	735 720 720 720 720	735 720 720 720 720	735 720 720 720 720	735 720 720 720 720	675 660 660 660 59.96	600 600 600 79.96						
	ECT (°C) Delay Time (sec) P01CB, P01CD, P01D7, P01D9, P01D1, P01D3, P01D P01CF, P01CC, P01CE, P01D8, P01DA, P01D2, P01D	85 90 95 100 Trb	850 834 834 834 Ch_tiDiaEn -30.04 327.67	800 790 790 790 790 hblDly_CU -20.04 210	735 720 720 720 720	735 720 720 720 720	735 720 720 720 720	735 720 720 720 720	675 660 660 660 59.96	600 600 600 79.96						
	ECT (°C) Delay Time (sec) P01CB, P01CD, P01D7, P01D9, P01D1, P01D3, P01D	85 90 95 100 Trb	850 834 834 834 Ch_tiDiaEn -30.04 327.67	800 790 790 790 790 hblDly_CU -20.04 210	735 720 720 720 720	735 720 720 720 720	735 720 720 720 720	735 720 720 720 720	675 660 660 660 59.96	600 600 600 79.96						
	ECT (°C) Delay Time (sec) P01CB, P01CD, P01D7, P01D9, P01D1, P01D3, P01D P01CF, P01CC, P01CE, P01D8, P01DA, P01D2, P01D	85 90 95 100 Trb	850 834 834 834 Ch_tiDiaEn -30.04 327.67 C_stGearRI	800 790 790 790 790 3biDly_CU -20.04 210	735 720 720 720 720 R -0.04 120	735 720 720 720 720 720	735 720 720 720 720 720	735 720 720 720 720 39.96 50	675 660 660 660 59.96 30	79.96 30	8					
	ECT (°C) Delay Time (sec) P01CB, P01CD, P01D7, P01D9, P01D1, P01D3, P01D P01CF, P01CC, P01CE, P01D8, P01DA, P01D2, P01D P01D6, P01D0	85 90 95 100 Trb	850 834 834 834 Ch_tiDiaEn -30.04 327.67	800 790 790 790 790 hblDly_CL -20.04 210	735 720 720 720 720 720 R -0.04 120	735 720 720 720 720 720	735 720 720 720 720 720	735 720 720 720 720 39.96 50	675 660 660 660 59.96 30	600 600 600 79.96 30	8 0					
	ECT (°C) Delay Time (sec) P01CB, P01CD, P01D7, P01D9, P01D1, P01D3, P01D P01CF, P01CC, P01CE, P01D8, P01DA, P01D2, P01D P01D6, P01D0	85 90 95 100 Trb	850 834 834 834 Ch_tiDiaEn -30.04 327.67 C_stGearRI	800 790 790 790 790 3biDly_CU -20.04 210	735 720 720 720 720 R -0.04 120	735 720 720 720 720 720	735 720 720 720 720 720	735 720 720 720 720 39.96 50	675 660 660 660 59.96 30	79.96 30						
	ECT (°C) Delay Time (sec) P01CB, P01CD, P01D7, P01D9, P01D1, P01D3, P01D P01CF, P01CC, P01CE, P01D8, P01DA, P01D2, P01D P01D6, P01D0 Gear (-)	85 90 95 100 Trb	850 834 834 834 Ch_tiDiaEn -30.04 327.67 C_stGearRI	800 790 790 790 790 sibiDiy_CU -20.04 210	735 720 720 720 720 R -0.04 120	735 720 720 720 720 720	735 720 720 720 720 720	735 720 720 720 720 39.96 50	675 660 660 660 59.96 30	79.96 30						
93	ECT (°C) Delay Time (sec) P01CB, P01CD, P01D7, P01D9, P01D1, P01D3, P01D P01CF, P01CC, P01CE, P01D8, P01DA, P01D2, P01D P01D6, P01D0 Gear (-)	85 90 95 100 Trb	850 834 834 834 Ch_tiDiaEn -30.04 327.67 C_stGearRI	800 790 790 790 790 sibiDiy_CU -20.04 210	735 720 720 720 720 R -0.04 120	735 720 720 720 720 720	735 720 720 720 720 720	735 720 720 720 720 39.96 50	675 660 660 660 59.96 30	79.96 30						
93	ECT (°C) Delay Time (sec) P01CB, P01CD, P01D7, P01D9, P01D1, P01D3, P01D P01CF, P01CC, P01CE, P01D8, P01DA, P01D2, P01D P01D6, P01D0 Gear (-) P01CB, P01CD, P01D7, P01D9, P01D1, P01D3, P01D	85 90 95 100 Trb	850 834 834 834 Ch_tiDiaEn -30.04 327.67 C_stGearRI	800 790 790 790 790 sibiDiy_CU -20.04 210	735 720 720 720 720 R -0.04 120	735 720 720 720 720 720	735 720 720 720 720 720	735 720 720 720 720 39.96 50	675 660 660 660 59.96 30	79.96 30						
93	ECT (°C) Delay Time (sec) P01CB, P01CD, P01D7, P01D9, P01D1, P01D3, P01D P01CF, P01CC, P01CE, P01D8, P01DA, P01D2, P01D Gear (-) - P01CB, P01CD, P01D7, P01D9, P01D1, P01D3, P01D P01CF, P01CC, P01CE, P01D8, P01DA, P01D2, P01D P01D6, P01D0	85 90 95 100 Trb	850 834 834 834 Ch_tiDiaEn -30.04 327.67 C_stGearRI	800 790 790 790 790 hblDly_CU -20.04 210 s_CA	735 720 720 720 720 R -0.04 120	735 720 720 720 720 720 9.96 100	735 720 720 720 720 19.96 60	735 720 720 720 720 39.96 50	675 660 660 660 59.96 30	79.96 30	0	00.52				
93	ECT (°C) Delay Time (sec) P01CB, P01CD, P01D7, P01D9, P01D1, P01D3, P01D P01CF, P01CC, P01CE, P01D8, P01DA, P01D2, P01D P01D6, P01D0 Gear (-) - P01CB, P01CD, P01D7, P01D9, P01D1, P01D3, P01D P01CF, P01CC, P01CE, P01D8, P01DA, P01D2, P01D P01D6, P01D0 ECT (°C)	85 90 95 100 Trb	850 834 834 834 Ch_tiDiaEn -30.04 327.67 C_stGearRI	800 790 790 790 790 bblDly_CU -20.04 210 s_CA	735 720 720 720 720 R -0.04 120	735 720 720 720 720 9.96 100	735 720 720 720 720 19.96 60	735 720 720 720 720 39.96 50	675 660 660 660 59.96 30	79.96 30 66.86	76.86	86.86		106.86		
93	ECT (°C) Delay Time (sec) P01CB, P01CD, P01D7, P01D9, P01D1, P01D3, P01D P01CF, P01CC, P01CE, P01D8, P01DA, P01D2, P01D Gear (-) - P01CB, P01CD, P01D7, P01D9, P01D1, P01D3, P01D P01CF, P01CC, P01CE, P01D8, P01DA, P01D2, P01D P01D6, P01D0	85 90 95 100 Trb	850 834 834 834 Ch_tiDiaEn -30.04 327.67 C_stGearRI	800 790 790 790 790 hblDly_CU -20.04 210 s_CA	735 720 720 720 720 R -0.04 120	735 720 720 720 720 720 9.96 100	735 720 720 720 720 19.96 60	735 720 720 720 720 39.96 50	675 660 660 660 59.96 30	79.96 30	0	86.86	96.86	106.86		
93 94	ECT (°C) Delay Time (sec) P01CB, P01CD, P01D7, P01D9, P01D1, P01D3, P01D P01CF, P01CC, P01CE, P01D8, P01DA, P01D2, P01D Gear (-) - P01CB, P01CD, P01D7, P01D9, P01D1, P01D3, P01D P01CF, P01CC, P01CE, P01D8, P01DA, P01D2, P01D P01D6, P01D0 ECT (°C) Time (sec)	85 90 95 100 Trb	850 834 834 834 Ch_tiDiaEn -30.04 327.67 C_stGearRI	800 790 790 790 790 bblDly_CU -20.04 210 s_CA	735 720 720 720 720 R -0.04 120	735 720 720 720 720 9.96 100	735 720 720 720 720 19.96 60	735 720 720 720 720 39.96 50	675 660 660 660 59.96 30	79.96 30 66.86	76.86					
93	ECT (°C) Delay Time (sec) P01CB, P01CD, P01D7, P01D9, P01D1, P01D3, P01D P01CF, P01CC, P01CE, P01D8, P01DA, P01D2, P01D P01D6, P01D0 Gear (-) - P01CB, P01CD, P01D7, P01D9, P01D1, P01D3, P01D P01CF, P01CC, P01CE, P01D8, P01DA, P01D2, P01D P01D6, P01D0 ECT (°C)	85 90 95 100 Trb	850 834 834 834 Ch_tiDiaEn -30.04 327.67 C_stGearRI	800 790 790 790 790 bblDly_CU -20.04 210 s_CA	735 720 720 720 720 R -0.04 120	735 720 720 720 720 9.96 100	735 720 720 720 720 19.96 60	735 720 720 720 720 39.96 50	675 660 660 660 59.96 30	79.96 30 66.86	76.86					
93	ECT (°C) Delay Time (sec) P01CB, P01CD, P01D7, P01D9, P01D1, P01D3, P01D P01CF, P01CC, P01CE, P01D8, P01DA, P01D2, P01D Gear (-) - P01CB, P01CD, P01D7, P01D9, P01D1, P01D3, P01D P01CF, P01CC, P01CE, P01D8, P01DA, P01D2, P01D P01D6, P01D0 ECT (°C) Time (sec)	85 90 95 100 Trb	850 834 834 834 Ch_tiDiaEn -30.04 327.67 C_stGearRI	800 790 790 790 790 bblDly_CU -20.04 210 s_CA	735 720 720 720 720 R -0.04 120	735 720 720 720 720 9.96 100	735 720 720 720 720 19.96 60 4 0	735 720 720 720 720 39.96 50	675 660 660 660 59.96 30	79.96 30 66.86	76.86					

Table no. Fault Codes Label (Internal Manufacturer Reference)

96 P054E

InjCtl_qDesGearMonMin_MAP

ECT (°C) / Engine Speed (rpm	0	400	600	800	1000	5000
-20.04	161.6	161.6	161.6	161.6	161.6	161.6
-10.04	134.8	134.8	134.8	134.8	134.8	134.8
-0.04	108	108	108	108	108	108
19.96	77.2	77.2	77.2	77.2	77.2	77.2
39.96	53.2	53.2	53.2	53.2	53.2	53.2
69.96	40	40	40	46	46	46

97 P0299

PCR_facPresDvtCorMax_CUR

Environmental Pressure (kPa)	50	59.4	68.8	75	82.5	97.5	101.5	103
factor (-)	1.099976	1.1	1.1	1.1	1.1	1	1	1

99 P11D7, P22FE

Hegn_VdSlfDiagB1S2.tiDlyHCUnLd_CUR

HC Loading Time (sec)	0	1	2	3	4	5	10	20	50	100	300	600	900	1800	3600	7200
Diagnostic Delay Time (sec)	100.00	100.00	100	100	100	100	100	100	100	100	100	100	150	300	600	900

100 P20EE

SCRChk_facEtaEstOfs1_MAP

Exhaust Mass Flow (g/sec) / SCR Temperature (°C)	239.96	249.96	259.96	269.96	279.96	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

SCRChk_tDeltaTempSCRMin_CUR

Filtered SCR Temp (°C)	249.96	259.96	269.96	279.96	289.96	299.96	304.96	319.96
Delta SCR Temp (°C)	-50.04	-50.04	-25.04	-25.04	-5.04	-5.04	-0.04	-0.04

102 P2BAD

SCRChk_facEtaEstOfs2_MAP

Exhaust Mass Flow (g/sec) / SCR Temperature (°C)	239.96	249.96	259.96	269.96	279.96	289.96	299.96	309.96
61.11	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
69.44	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
77.78	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
86.11	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
94.44	0.125	0.125	0.125	0.125	0.125	0.125	0.125	0.125
102.78	0.125	0.125	0.125	0.125	0.125	0.125	0.125	0.125
111.11	0.125	0.125	0.125	0.125	0.125	0.125	0.125	0.125
119.44	0.125	0.125	0.125	0.125	0.125	0.125	0.125	0.125

15 OBDG12 ECM Diagnostic Calibration Status and State Tables

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
ECT at Start (C)7 Modeled Exhaust Wall Temp (C)	-40.14	-30.04	-20.04	-10.04	-0.04	19.90	39.90	59.90	09.90	109.90
-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

able no.	Status or State	Label (Interna	al Manuf	acturer R	eference												
5	Status thermal regeneration active	PFltLd_facTer	mpSimRg	n_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				
6	Rail Control - PCV Closed Loop Control Only	Rail_dvolMeU	nCtlUpLiı														
6	Rail Control - PCV Closed Loop Control Only Engine Speed (rpm)	Rail_dvolMeU	nCtlUpLii 480	m_CUR 2250	5000	5005	5010	5015	5020	5025	5030	5035	5040	5045	5050	5055	5060

7 Rail Control - Metering Unit + PCV Closed Loop Control Rail_qMeUnCtlType_CUR

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

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	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	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

Table no. Status or State

Label (Internal Manufacturer Reference)

11 Request for pre controlled dosing

SCRFFC_stNQntCurrHi_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

ole no.	Status or State	La	abel (Interna	al Manufa	cturer R	eference)				
14	Engine Running		:Sys_nStrtCu							
	BARO Pressure (kPa) / ECT at Start (°C)		-40.04	-20.04	-10.04	-0.04	9.96	19.96	34.96	59.9
	BARO Pressure (KPA) / ECT at Start (C)	65	850	770	755	755	755	680	600	59.9
		70	850	770	755	755	755	680	600	60
		75	850	770	755	755	755	680	600	60
		80	850	770	755	755	755	680	600	60
		85	850	770	755	755	755	680	600	60
		90	850	770	755	755	755	680	600	60
		95	834	740	720	720	720	650	600	60
		100	834	740	720	720	720	650	600	60
15	State of Reductant injection valve Component Pr	otection UI								
	Vehicle Speed (mph) / SCR Upstream Temp (°C)		99.96	199.96	299.96	399.96	499.96	599.96		
		0	104.96	104.96	104.96	104.96	95.46	89.96		
		20	109.96	109.96	109.96	107.96	100.26	94.96		
		50	109.96	109.96	109.96	108.96	107.96	103.96		
		60	109.96	109.96	109.96	109.96	109.96	105.96		
		100 150	109.96 109.96	109.96 109.96	109.96 109.96	109.96 109.96	109.96 109.96	107.96 109.96		
16	Release of tank heater circuit	Uŀ	HC_tiC1Dfrs	t_CUR						
	Reductant Tank Temp. (°C)		-30.04	-18.04	-15.04	-11.04	-8.04	-0.04	4.96	5.06
	Reductant Heater Time (sec)		3277	3277	3277	3277	300	300	300	(
17	Release of tank heater circuit	Uŀ	HC_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	Uŀ	HC_tiDfrstC2	2_CUR						
	Reductant Tank Temp. (°C)		-35.04	-25.04	-18.04	-10.04	-8.04	-5.04	-0.14	-0.0
	Reductant Heater Time (sec)		3276.7	3276.7	3000	600	300	300	200	
19	Release of tank heater circuit	Uŀ	HC_tiDfrstC3	3_CUR						
	Reductant Tank Temp. (°C)		-35.04	-25.04	-18.04	-10.04	-8.04	-5.04	-0.14	-0.0
	Reductant Heater Time (sec)		3276.7	3276.7	3000	600	300	300	200	
20	Release of tank heater circuit	Uŀ	HC_tiOnC2_	CUR						
20	Release of tank heater circuit Reductant Tank Temp. (°C)	Uł	-30.04	CUR -18.04	-15.04	-11.04	-7.04	-0.04	4.96	5.0

Table no.	Status or State	L	abel (Interna	I Manufa	acturer R	eference)				
24	Deleges of tout bester singuit		III.C #:O=C2 (CLID						
21	Release of tank heater circuit	· ·	JHC_tiOnC3_0	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 OBDG12 ECM Closed Loop Enable Conditions Calibration Tables

able no.	Olerad Law Evalua Candidan Barrantan Communica	l = - / (M		·													
	Closed Loop Enable Condition Parameter Summary	Label (Interna	Manutad	turer Ke	rerence)													
22	EGR Closed Loop - Overlong Idle Time Delay	AirCtl_tiDbShC	ffExtdIdl_	MAP														
	EGR Cooler Efficiency / Upstream EGR Temperature	79.96	129.96	139.96	149.96	169.96	199.96	249.96	299.96									
	0.30	79.90	0	40	50	60	70	80	135									
	0.40	0	0	40	50	60	70	80	135									
	0.50	0	0	40	50	60	70	80	135									
	0.60	0	0	40	60	70	80	90	145									
	0.70	0	0	40	60	70	80	90	145									
	0.80	0	0	50	65	75	85	95	150									
	0.90	0	0	50	65	75	85	95	150									
	1.00	0	0	50	65	75	85	95	150									
23	EGR Closed Loop - Injection Quantity too Large	AirCtl_q2HiEOl	M_MAP															
	CAC Downstream Temperature / Engine Speed	600	1000	1200	1400	1800	2200	2600	2800	3000	3200	3400	3600					
	-40.04	220	1000 220	1200 340	340	380	380	380	380	380	340	3400	400					
	-20.04	220	220	320	320	380	380	380	380	380	340	340	400					
	-0.04	220	220	320	320	380	380	380	380	380	340	340	400					
	19.96	220	220	300	300	340	340	340	300	300	280	280	400					
	39.96	220	220	300	300	300	340	340	300	300	280	220	400					
	49.96	220	220	220	220	260	300	300	260	260	220	220	400					
							000	000										
24	Intaka Manifold Pressura Cold Start	DCD tiCldStrt		-			0001	000										
24	Intake Manifold Pressure Cold Start	PCR_tiCldStrt_					0001	000					<u> </u>					
24		PCR_tiCldStrt_		-40.14	-35.14	-30.14	-25.14	-20.14	-15.14	-10.14	-5.14	-0.14	4.86	9.86	14.86	19.86	24.86	29.86
24	Intake Manifold Pressure Cold Start Coolant Temperature (°C) Engine Run Time (sec)		CUR			,		,	-15.14 110	,			4.86 45	9.86 35	14.86 25	19.86 15	24.86	Ę
24	Coolant Temperature (°C)	-50.14	-45.14	-40.14	-35.14	-30.14 150 34.86	-25.14 145 39.86	-20.14 120 44.86	-15.14 110 49.86	-10.14 100 54.86	-5.14 90 59.86	-0.14 75 64.86	45 69.86	35 74.86	25 79.86	15 84.86	5 89.86	94.86
24	Coolant Temperature (°C)	-50.14	-45.14	-40.14	-35.14	-30.14 150	-25.14 145	-20.14 120	-15.14 110	-10.14 100	-5.14 90	-0.14 75	45	35	25	15	5	94.86
	Coolant Temperature (°C) Engine Run Time (sec)	-50.14 300	-45.14 250	-40.14 200	-35.14	-30.14 150 34.86	-25.14 145 39.86	-20.14 120 44.86	-15.14 110 49.86	-10.14 100 54.86	-5.14 90 59.86	-0.14 75 64.86	45 69.86	35 74.86	25 79.86	15 84.86	5 89.86	94.86
24	Coolant Temperature (°C)	-50.14 300	-45.14 250	-40.14 200	-35.14	-30.14 150 34.86	-25.14 145 39.86	-20.14 120 44.86	-15.14 110 49.86	-10.14 100 54.86	-5.14 90 59.86	-0.14 75 64.86	45 69.86	35 74.86	25 79.86	15 84.86	5 89.86	94.86
	Coolant Temperature (°C) Engine Run Time (sec)	-50.14 300	-45.14 250	-40.14 200	-35.14	-30.14 150 34.86	-25.14 145 39.86	-20.14 120 44.86	-15.14 110 49.86	-10.14 100 54.86	-5.14 90 59.86	-0.14 75 64.86	45 69.86	35 74.86	25 79.86	15 84.86	5 89.86	94.86
	Coolant Temperature (°C) Engine Run Time (sec) Intake Manifold Closed Loop EGR Contol OFF High Altitude	-50.14 300 PCR_GovOnE	-45.14 250 GROffHi_	-40.14 200	-35.14 180	-30.14 150 34.86 5	-25.14 145 39.86 5	-20.14 120 44.86 5	-15.14 110 49.86 5	-10.14 100 54.86 5	-5.14 90 59.86 5	-0.14 75 64.86 5	45 69.86 5 2400 100	35 74.86 5 2600 100	25 79.86 5 2800 80	15 84.86 5 3000 80	5 89.86 5 3200 80	94.86 94.86 5 3400 80
	Coolant Temperature (°C) Engine Run Time (sec) Intake Manifold Closed Loop EGR Contol OFF High Altitude Engine RPM (RPM)	-50.14 300 PCR_GovOnE	-45.14 250 GROffHi_	-40.14 200 CUR	-35.14 180	-30.14 150 34.86 5	-25.14 145 39.86 5	-20.14 120 44.86 5	-15.14 110 49.86 5	-10.14 100 54.86 5	-5.14 90 59.86 5 2000 120 3600	-0.14 75 64.86 5 2200 100 3800	45 69.86 5 2400 100 4000	35 74.86 5 2600 100 4200	25 79.86 5 2800 80 4400	15 84.86 5 3000 80 4600	5 89.86 5 3200 80 4800	3400 80 5000
	Coolant Temperature (°C) Engine Run Time (sec) Intake Manifold Closed Loop EGR Contol OFF High Altitude Engine RPM (RPM)	-50.14 300 PCR_GovOnE	-45.14 250 GROffHi_	-40.14 200 CUR	-35.14 180	-30.14 150 34.86 5	-25.14 145 39.86 5	-20.14 120 44.86 5	-15.14 110 49.86 5	-10.14 100 54.86 5	-5.14 90 59.86 5	-0.14 75 64.86 5	45 69.86 5 2400 100	35 74.86 5 2600 100	25 79.86 5 2800 80	15 84.86 5 3000 80	5 89.86 5 3200 80	3400 80 5000
25	Coolant Temperature (°C) Engine Run Time (sec) Intake Manifold Closed Loop EGR Contol OFF High Altitude Engine RPM (RPM) Commanded Fuel (mm3/rev)	-50.14 300 PCR_GovOnE 200 340	-45.14 250 GROffHi_ 400 340	-40.14 200 CUR 600 340	-35.14 180	-30.14 150 34.86 5	-25.14 145 39.86 5	-20.14 120 44.86 5	-15.14 110 49.86 5	-10.14 100 54.86 5	-5.14 90 59.86 5 2000 120 3600	-0.14 75 64.86 5 2200 100 3800	45 69.86 5 2400 100 4000	35 74.86 5 2600 100 4200	25 79.86 5 2800 80 4400	15 84.86 5 3000 80 4600	5 89.86 5 3200 80 4800	3400 80 5000
	Coolant Temperature (°C) Engine Run Time (sec) Intake Manifold Closed Loop EGR Contol OFF High Altitude Engine RPM (RPM)	-50.14 300 PCR_GovOnE 200 340	-45.14 250 GROffHi_ 400 340	-40.14 200 CUR 600 340	-35.14 180	-30.14 150 34.86 5	-25.14 145 39.86 5	-20.14 120 44.86 5	-15.14 110 49.86 5	-10.14 100 54.86 5	-5.14 90 59.86 5 2000 120 3600	-0.14 75 64.86 5 2200 100 3800	45 69.86 5 2400 100 4000	35 74.86 5 2600 100 4200	25 79.86 5 2800 80 4400	15 84.86 5 3000 80 4600	5 89.86 5 3200 80 4800	3400 80 5000
25	Coolant Temperature (°C) Engine Run Time (sec) Intake Manifold Closed Loop EGR Contol OFF High Altitude Engine RPM (RPM) Commanded Fuel (mm3/rev) Intake Manifold Closed Loop EGR Contol OFF Medium Altit	-50.14 300 PCR_GovOnEr 200 340 PCR_GovOnEr	CUR -45.14 250 GROffHi_ 400 340 GROffMed	-40.14 200 CUR 600 340	-35.14 180 800 280	-30.14 150 34.86 5	-25.14 145 39.86 5 1200 180	-20.14 120 44.86 5	-15.14 110 49.86 5	-10.14 100 54.86 5	-5.14 90 59.86 5 2000 120 3600 80	-0.14 75 64.86 5 2200 100 3800 80	45 69.86 5 2400 100 4000 80	35 74.86 5 2600 100 4200 80	25 79.86 5 2800 80 4400 80	15 84.86 5 3000 80 4600 80	\$ 89.86 \$ 5 \$ 3200 \$ 80 \$ 4800 \$ 80	94.86 94.86 5 3400 80 5000 80
25	Coolant Temperature (°C) Engine Run Time (sec) Intake Manifold Closed Loop EGR Contol OFF High Altitude Engine RPM (RPM) Commanded Fuel (mm3/rev) Intake Manifold Closed Loop EGR Contol OFF Medium Altit Engine RPM (RPM)	-50.14 300 PCR_GovOnE 200 340	-45.14 250 GROffHi_ 400 340	-40.14 200 CUR 600 340	-35.14 180 800 280	-30.14 150 34.86 5 1000 200	-25.14 145 39.86 5 1200 180	-20.14 120 44.86 5	-15.14 110 49.86 5 1600 140	-10.14 100 54.86 5	-5.14 90 59.86 5 2000 120 3600 80	-0.14 75 64.86 5 2200 100 3800 80	45 69.86 5 5 2400 100 4000 80	35 74.86 5 2600 100 4200 80	25 79.86 5 2800 80 4400 80	3000 80 4600 80 3000	\$ 89.86 \$ 5 \$ 3200 80 4800 80	3400 80 5000 80 3400
25	Coolant Temperature (°C) Engine Run Time (sec) Intake Manifold Closed Loop EGR Contol OFF High Altitude Engine RPM (RPM) Commanded Fuel (mm3/rev) Intake Manifold Closed Loop EGR Contol OFF Medium Altit	-50.14 300 PCR_GovOnE 200 340 PCR_GovOnE	GROffMed	-40.14 200 CUR 600 340	-35.14 180 800 280	-30.14 150 34.86 5	-25.14 145 39.86 5 1200 180	-20.14 120 44.86 5 1400 180	-15.14 110 49.86 5	-10.14 100 54.86 5 1800 120	-5.14 90 59.86 5 2000 120 3600 80	-0.14 75 64.86 5 2200 100 3800 80	45 69.86 5 2400 100 4000 80	35 74.86 5 2600 100 4200 80	25 79.86 5 2800 80 4400 80	15 84.86 5 3000 80 4600 80	\$ 89.86 \$ 5 \$ 3200 \$ 80 \$ 4800 \$ 80	3400 80 3400 80 3400 80
25	Coolant Temperature (°C) Engine Run Time (sec) Intake Manifold Closed Loop EGR Contol OFF High Altitude Engine RPM (RPM) Commanded Fuel (mm3/rev) Intake Manifold Closed Loop EGR Contol OFF Medium Altit Engine RPM (RPM)	-50.14 300 PCR_GovOnE 200 340 PCR_GovOnE	GROffMed	-40.14 200 CUR 600 340	-35.14 180 800 280	-30.14 150 34.86 5 1000 200	-25.14 145 39.86 5 1200 180	-20.14 120 44.86 5 1400 180	-15.14 110 49.86 5 1600 140	-10.14 100 54.86 5 1800 120	-5.14 90 59.86 5 2000 120 3600 80	-0.14 75 64.86 5 2200 100 3800 80	45 69.86 5 2400 100 4000 80 2400 100	35 74.86 5 2600 100 4200 80 2600 100	25 79.86 5 2800 80 4400 80	3000 80 4600 80 3000 80	3200 80 4800 80 3200 80	3400 80 5000 80 3400 80 5000
25	Coolant Temperature (°C) Engine Run Time (sec) Intake Manifold Closed Loop EGR Contol OFF High Altitude Engine RPM (RPM) Commanded Fuel (mm3/rev) Intake Manifold Closed Loop EGR Contol OFF Medium Altit Engine RPM (RPM)	-50.14 300 PCR_GovOnE 200 340 PCR_GovOnE 200 340	GROffMed 400 340 GROffMed 400 340	-40.14 200 CUR 600 340 340	-35.14 180 800 280	-30.14 150 34.86 5 1000 200	-25.14 145 39.86 5 1200 180	-20.14 120 44.86 5 1400 180	-15.14 110 49.86 5 1600 140	-10.14 100 54.86 5 1800 120	-5.14 90 59.86 5 2000 120 3600 80 2000 120 3600	-0.14 75 64.86 5 2200 100 3800 80 2200 120 3800	2400 100 4000 80 2400 100 4000 4000	35 74.86 5 2600 100 4200 80 2600 100 4200	25 79.86 5 2800 80 4400 80 2800 100 4400	3000 80 4600 80 3000 80 4600	3200 80 4800 80 3200 80 4800 80	3400 80 5000 80 3400 80 5000
25	Coolant Temperature (°C) Engine Run Time (sec) Intake Manifold Closed Loop EGR Contol OFF High Altitude Engine RPM (RPM) Commanded Fuel (mm3/rev) Intake Manifold Closed Loop EGR Contol OFF Medium Altit Engine RPM (RPM) Commanded Fuel (mm3/rev) Intake Manifold Closed Loop EGR Contol OFF Low Altitude	-50.14 300 PCR_GovOnE(200 340 PCR_GovOnE(200 340	CUR -45.14 250 GROffHi_ 400 340 GROffMed 400 340 GROffSea	-40.14 200 CUR 600 340 GCUR	-35.14 180 800 280 800 340	-30.14 150 34.86 5 1000 200	-25.14 145 39.86 5 1200 180	-20.14 120 44.86 5 1400 180	-15.14 110 49.86 5 1600 140	-10.14 100 54.86 5 1800 120	-5.14 90 59.86 5 2000 120 3600 80 2000 120 3600 80	-0.14 75 64.86 5 2200 100 3800 80 2200 120 3800 80	2400 100 4000 80 2400 100 4000 80	35 74.86 5 2600 100 4200 80 2600 100 4200 80	25 79.86 5 2800 80 4400 80 2800 100 4400 80	3000 80 4600 80 3000 80 4600 80	3200 80 4800 80 3200 80 4800 80 80	3400 80 5000 80 3400 80 80
25	Coolant Temperature (°C) Engine Run Time (sec) Intake Manifold Closed Loop EGR Contol OFF High Altitude Engine RPM (RPM) Commanded Fuel (mm3/rev) Intake Manifold Closed Loop EGR Contol OFF Medium Altit Engine RPM (RPM) Commanded Fuel (mm3/rev) Intake Manifold Closed Loop EGR Contol OFF Low Altitude Engine RPM (RPM)	-50.14 300 PCR_GovOnEr 200 340 PCR_GovOnEr 200 340	GROffMed 400 340 GROffSea 400 400 400 400 400 400 400 400 400	-40.14 200 CUR 600 340 CUR 600 340 CUR 600 600	-35.14 180 800 280 800 340	-30.14 150 34.86 5 1000 200	-25.14 145 39.86 5 1200 180	-20.14 120 44.86 5 1400 180	-15.14 110 49.86 5 1600 140	-10.14 100 54.86 5 1800 120 1800 140	-5.14 90 59.86 5 2000 120 3600 80 2000 120 3600 80	-0.14 75 64.86 5 2200 100 3800 80 2200 120 3800 80	45 69.86 5 2400 100 4000 80 2400 100 4000 80	35 74.86 5 2600 100 4200 80 2600 100 4200 80	25 79.86 5 2800 80 4400 80 2800 100 4400 80	3000 80 4600 80 3000 80 4600 80 3000 80	3200 80 4800 80 3200 80 4800 80 3200 80	3400 80 5000 80 3400 80 3400 80
25	Coolant Temperature (°C) Engine Run Time (sec) Intake Manifold Closed Loop EGR Contol OFF High Altitude Engine RPM (RPM) Commanded Fuel (mm3/rev) Intake Manifold Closed Loop EGR Contol OFF Medium Altit Engine RPM (RPM) Commanded Fuel (mm3/rev) Intake Manifold Closed Loop EGR Contol OFF Low Altitude	-50.14 300 PCR_GovOnE(200 340 PCR_GovOnE(200 340	CUR -45.14 250 GROffHi_ 400 340 GROffMed 400 340 GROffSea	-40.14 200 CUR 600 340 GCUR	-35.14 180 800 280 800 340	-30.14 150 34.86 5 1000 200	-25.14 145 39.86 5 1200 180	-20.14 120 44.86 5 1400 180	-15.14 110 49.86 5 1600 140	-10.14 100 54.86 5 1800 120	-5.14 90 59.86 5 2000 120 3600 80 2000 120 3600 80	-0.14 75 64.86 5 2200 100 3800 80 2200 120 3800 80	2400 100 4000 80 2400 100 4000 80	35 74.86 5 2600 100 4200 80 2600 100 4200 80	25 79.86 5 2800 80 4400 80 2800 100 4400 80	3000 80 4600 80 3000 80 4600 80	3200 80 4800 80 3200 80 4800 80 80	29.86 94.86 5 94.86 5 3400 80 5000 80 3400 80 5000 80 5000 80 5000 80 5000 80 5000 80 5000 80 5000 80 5000 80 5000 80 5000 80 6000 8000 8000 8000 8000 8000 8000 8000 8000 8000 8000 8000 8000 8000 8000 8000 8000 8000 8000 8000 8000 8000 8000 8000 8000 8000 8000 8000 8000 8000 8000 8000 8000 8000 8000 8000 8000 8000 8000 8000 8000 8000 8000 8000 8000 8000 8000 8000 8000 8000 8000 8000 8000 8000 8000 8000 8000 8000 8000 8000 8000 8000 8000 8000 8000 8000 8000 8000 8000 8000 8000 8000 8000 8000 8000 8000 8000 8000 8000 8000 8000 8000 8000 8000 8000 8000 8000 8000 8000 8000 8000 8000 8000 8000 8000 8000 8000 8000 8000 8000 8000 8000 8000 8000 8000 8000 8000 8000 8000 8000 8000 8000 8000 8000 8000 8000 8000 8000 8000 8000 8000 8000 8000 8000 8000 8000 8000 8000 8000 8000 8000 8000 8000 8000 8000 8000 8000 8000 8000 8000 8000 8000 8000 8000 8000 8000 8000 8000 8000 8000 8000 8000 8000 8000 8000 8000 8000 8000 8000 8000 8000 8000 8000 8000 8000 8000 8000 8000 8000 8000 8000 8000 8000 8000 8000 8000 8000 8000 8000 8000 8000 8000 8000 8000 8000 8000 8000 8000 8000 8000 8000 8000 8000 8000 8000 8000 8000 8000 8000 8000 8000 8000 8000 8000 8000 8000 8000 8000 8000 8000 8000 8000 8000 8000 8000 8000 8000 8000 8000 8000 8000 8000 8000 8000 8000 8000 8000 8000 8000 8000 8000 8000 8000 8000 8000 8000 8000 8000 8000 8000 8000 8000 8000 8000 8000 8000 8000 8000 8000 8000 8000 8000 8000 8000 8000 8000 8000 8000 8000 8000 8000 8000 8000 8000 8000 8000 8000 8000 8000 8000 8000 8000 8000 8000 8000 8000 8000 8000 8000 8000 8000 8000 8000 8000 8000 8000 8000 8000 8000 8000 8000 8000 8000 8000 8000 8000 8000 8000 8000 8000 8000 8000 8000 8000 8000 8000 8000 8000 8000 8000 8000 8000 8000 8000 8000

15 OBDG12 ECM Closed Loop Enable Conditions Calibration Tables

Table no.	Closed Loop Enable Condition Parameter Summary	Label (Internal	Manufac	turer Ref	erence)													
28	Intake Manifold Closed Loop High Altitude	PCR_GovOnHi_	CUR		,													
	Engine RPM (RPM)	200	400	600	800	1000	1200	1400	1600	1800	2000	2200	2400	2600	2800	3000	3200	3400
	Commanded Fuel (mm3/rev)	340	340	340	340	280	200	180	180	140	120	120	100	100	100	80	80	80
										L	3600	3800	4000	4200	4400	4600	4800	5000
										L	80	80	80	80	80	80	80	80
29	Intake Manifold Closed Loop Medium Altitude	PCR GovOnMe	4 CLIB															
23	make Manifold Closed Loop Medium Attitude	1 CIV_GOVOIIME	u_con															
	Engine RPM (RPM)	200	400	600	800	1000	1200	1400	1600	1800	2000	2200	2400	2600	2800	3000	3200	3400
	Commanded Fuel (mm3/rev)	340	340	340	340	280	200	180	180	140	120	120	100	100	100	80	80	80
											3600	3800	4000	4200	4400	4600	4800	5000
										L	80	80	80	80	80	80	80	80
30	Intake Manifold Closed Loop Low Altitude	PCR_GovOnSea	a_CUR															
	Engine RPM (RPM)	200	400	600	800	1000	1200	1400	1600	1800	2000	2200	2400	2600	2800	3000	3200	3400
	Commanded Fuel (mm3/rev)	340	340	340	340	280	200	180	180	140	120	120	100	100	100	80	80	80
		<u>'</u>									3600	3800	4000	4200	4400	4600	4800	5000
											80	80	80	80	80	80	80	80
31	FBC Closed Loop Fuel Quantity	FBC_qGvrnThresN	1ax_CUR															
	Engine Speed (rpm)	800	1500	2000	2700													
	Fuel Quantity (mm3/rev)	200	380	380	200													
	T dot &dditity (IIIII0/101)	200	000	000	200													

P0016 - Crankshaft to Camshaft	P0191 - Fuel Rail Pressure Sensor	P0315 - Crankshaft Position System	1	Inhibited DTCs													
Correlation P0045 - Turbocharger Boost	Performance P0234 - Turbocharger Engine	Variation Not Learned P0299 - Turbocharger Engine	P0401 - Exhaust Gas Recirculation	on P0402 - Exhaust Gas Recirculation	n												
Control Circuit P0047 - Turbocharger Boost	Overboost P0234 - Turbocharger Engine	Underboost P0299 - Turbocharger Engine	Flow Insufficient P0401 - Exhaust Gas Recirculation	Flow Excessive on P0402 - Exhaust Gas Recirculation	-												
Control Circuit Low Voltage P0048 - Turbocharger Boost	Overboost P0234 - Turbocharger Engine	Underboost P0299 - Turbocharger Engine	Flow Insufficient P0401 - Exhaust Gas Recirculation	ion P0402 - Exhaust Gas Recirculation Flow Excessive on P0402 - Exhaust Gas Recirculation	-												
Control Circuit High Voltage P006E - Turbocharger Boost High	Overboost P0234 - Turbocherger Engine Overboost	Underboost P0299 - Turbocharger Engine	Flow Insufficient P0401 - Exhaust Gas Recirculation Flow Insufficient	Flow Excessive on P0402 - Exhaust Gas Recirculation	-												
Control Circuit Low Voltage P006F - Turbocharger Boost High	0.10.0000	Underboost	Flow Insufficient P0401 - Exhaust Gas Recirculation	on P0402 - Exhaust Gas Recirculation Flow Excessive	P2510 - ECM Power Relay Circuit	1											
Control Circuit High Voltage	P0234 - Turbocharger Engine Overboost	P0299 - Turbocharger Engine Underboost	Flow Insufficient	Flow Excessive	Performance												
P007C - CAC Temperature Sensor Circuit Low Voltage	P0234 - Turbocharger Engine Overboost	P0299 - Turbocharger Engine Underboost	P0401 - Exhaust Gas Recirculation Flow Insufficient	on P0402 - Exhaust Gas Recirculation Flow Excessive	P2080 - Exhaust Temperature Sensor 1 Performance	P2084 - Exhaust Temperature Sensor 2 Performance	P2428 - Exhaust Temperature Sensor 3 Performance	P246F - Exhaust Temperature Sensor 4 Performance	1								
P007D - CAC Temperature Sensor Circuit Hinh Voltage	P0234 - Turbocharger Engine Overboost	P0299 - Turbocharger Engine Underboost	P0401 - Exhaust Gas Recirculation	on P0402 - Exhaust Gas Recirculation Flow Excessive	P2080 - Exhaust Temperature Sensor 1 Performance	P2084 - Exhaust Temperature Sensor 2 Performance	P2428 - Exhaust Temperature Sersor 3 Performance	P246F - Exhaust Temperature Sensor 4 Performance	1								
P008F - Engine Coolant Temperature (ECT)-Fuel	P0101 - Mass Air Flow Sensor								•								
Temperature Not Plausible P0097 - Intake Air Temperature	Performance P2080 - Exhaust Temperature	P2084 - Exhaust Temperature	P2428 - Exhaust Temperature	P246F - Exhaust Temperature	7												
Sensor 2 Circuit Low P0098 - Intake Air Temperature	Sensor 1 Performance P2080 - Exhaust Temperature	Sensor 2 Performance	Sensor 3 Performance	Sensor 4 Performance	4												
Sensor 2 Circuit High P00CA - Fuel Pressure Regulator	Sensor 1 Performance	Sersor 2 Performance	Sensor 3 Performance	P246F - Exhaust Temperature Sensor 4 Performance	J												
1 High Control Circuit High Voltage	P2510 - ECM Power Relay Circuit Performance																
P0101 - Mass Air Flow Sensor	P0401 - Exhaust Gas Recirculation	P0402 - Exhaust Gas Recirculation	P11CB - NOx Sensor Performano	ce - P11CC - NOx Sensor Performance	- P2002 - Diesel Particulate Filter	P2080 - Exhaust Temperature	P2084 - Exhaust Temperature	P242B - Exhaust Temperature	P2453 - Diesel Particulate Filter Differential Pressure Sensor	P2459 - Diesel Particulate Filter	P246F - Exhaust Temperature	P249D - Closed Loop Reductant Injection Control At Limit - Flow Too	P249E - Closed Loop Reductant Injection Control At Limit - Flow Too	1			
Performance P0102 - Mass Air Flow Sprsor	Flow Insufficient P0101 - Mass Air Flow Sensor	Flow Excessive P0234 - Turborhamer Fonine	Signal High Bank 1 Sensor 1 P0299 - Turbocharger Engine		(DPF) Low Efficiency	Sensor 1 Performance P2080 - Exhaust Temperature	Sensor 2 Performance P2084 - Exhaust Temperature	Sergor 3 Performance	Performance P246F - Exhaust Temperature	Regeneration Frequency	Sensor 4 Performance	Low	High				
P0102 - Mass Air Flow Sensor Circuit Low P0103 - Mass Air Flow Sensor	Performance Performance PO101 - Mass Air Flow Sensor	P0234 - Turbocharger Engine Overboost P0234 - Turbocharger Engine	Underboost P0299 - Turbocharger Engine	Flow Insufficient	P0402 - Exhaust Gas Recirculation Flow Excessive P0402 - Exhaust Gas Recirculation	Sersor 1 Performance P2080 - Exhaust Temperature	Sensor 2 Performance P2084 - Exhaust Temperature	P242B - Exhaust Temperature Sensor 3 Performance P242B - Exhaust Temperature	Sensor 4 Performance P246F - Exhaust Temperature	-							
Circuit High P0106 - Manifold Absolute	Performance P0101 - Mass Air Flow Sensor	Overboost P0234 - Turbocharger Engine	Underboost P0299 - Turbocharger Engine	Flow Insufficient P0401 - Exhaust Gas Recirculation	Flow Excessive	Sersor 1 Performance	Sensor 2 Performance	Sensor 3 Performance	Sersor 4 Performance	j							
Pressure Sensor Performance P0107 - Manifold Absolute	Performance	Overboost	Underboost	Flow Insufficient	Flow Excessive							1					
Pressure (MAP) Sensor Circuit	P0101 - Mass Air Flow Sensor Performance	P0106 - Manifold Absolute Pressure Sensor Performance	P0234 - Turbocharger Engine Overboost	P0299 - Turbocharger Engine Underboost	P0401 - Exhaust Gas Recirculation Flow Insufficient	P0402 - Exhaust Gas Recirculation Flow Excessive	P2080 - Exhaust Temperature Sensor 1 Performance	P2084 - Exhaust Temperature Sersor 2 Performance	P2263 - Turbo Boost System Performance	P242B - Exhaust Temperature Sensor 3 Performance	P246F - Exhaust Temperature Sensor 4 Performance						
Low Voltage P0108 - Manifold Absolute Pressure (MAP) Sensor Circuit	P0101 - Mass Air Flow Sensor	P0106 - Manifold Absolute Pressure	P0234 - Turbocharger Engine	P0299 - Turbocharger Engine	P0401 - Exhaust Gas Recirculation	P0402 - Exhaust Gas Recirculation	P2080 - Exhaust Temperature	P2084 - Exhaust Temperature	P2263 - Turbo Boost System	P2428 - Exhaust Temperature	P246F - Exhaust Temperature						
High Voltage	Performance	Sensor Performance	Overboost	Underboost P040F - Exhaust Gas Recirculation	Flow Insufficient	Flow Excessive	Sersor 1 Performance	Sersor 2 Performance	Performance	Sensor 3 Performance	Sensor 4 Performance						
P0112 - Intake Air Temperature Sensor 1 Circuit Low	P0101 - Mass Air Flow Sensor Performance	P0401 - Exhaust Gas Recirculation Flow Insufficient	P0402 - Exhaust Gas Recirculation Flow Excessive	(EGR) Temperature Sensor 1-2 Correlation	P2080 - Exhaust Temperature Sersor 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								
P0113 - Intake Air Temperature	P0101 - Mass Air Flow Sensor	P0401 - Exhaust Gas Recirculation	P0402 - Exhaust Gas Recirculation	on P040F - Exhaust Gas Recirculation (EGR) Temperature Sensor 1-2	P2080 - Exhaust Temperature	P2084 - Exhaust Temperature	P20E2 - Exhaust Gas Temperature	P242B - Exhaust Temperature	P246F - Exhaust Temperature	1							
Sensor 1 Circuit High P0117 - Engine Coolant	Performance P0106 - Manifold Absolute Pressure	Flow Insufficient P0191 - Fuel Rail Pressure Sensor Performance	Flow Excessive P0234 - Turbocharger Engine Overhoost	Correlation	Sersor 1 Performance	Sersor 2 Performance	(EGT) Sensors 1-2 not plausible	Sersor 3 Performance	Sersor 4 Performance		T	P0299 - Turbocharger Engine		T			
P0117 - Engine Coolant Temperature Sensor Circuit Low	P0106 - Manifold Absolute Pressure Sensor Performance		0.10.0000	_	P0266 - Cly 2 Balance System P0401 - Exhaust Gas Recirculation	P0269 - Cly 3 Balance System P0402 - Exhaust Gas Recirculation	P0272 - Cly 4 Balance System	P0275 - Cly 5 Balance System	P0278 - Cly 6 Balance System P2080 - Exhaust Temperature	P0281 - Cly 7 Balance System P2084 - Exhaust Temperature	P0284 - Cly 8 Balance System P242B - Exhaust Temperature	Underboost P246F - Exhaust Temperature	P0300 - Engine Misfire Detected	P0301 - Cylinder 1 Misfire Detected P0302	2 - Cylinder 2 Misfire Detected	P0303 - Cylinder 3 Misfire Detected	P0304 - Cylinder 4 Misfire I
		P0306 - Cylinder 6 Misfire Detected		ed P0308 - Cylinder 8 Misfire Detected	Flow Insufficient	Flow Excessive	P0506 - Idle Speed Low	P0507 - Idle Speed High	Sensor 1 Performance	Sensor 2 Performance	Sensor 3 Performance	Sensor 4 Performance					1
P0118 - Engine Coolant Temperature Sensor Circuit High	P0106 - Manifold Absolute Pressure Sensor Performance	P0191 - Fuel Rail Pressure Sensor Performance	P0234 - Turbocharger Engine Overboost	P0263 - Cly 1 Balance System	P0266 - Cly 2 Balance System	P0269 - Cly 3 Balance System	P0272 - Cly 4 Balance System	P0275 - Cly 5 Balance System	P0278 - Cly 6 Balance System	P0281 - Cly 7 Balance System	P0284 - Cly 8 Balance System	P0299 - Turbocharger Engine Underboost	P0300 - Engine Misfire Detected	P0301 - Cylinder 1 Misfire Detected P0302	2 - Cylinder 2 Misfire Detected	P0303 - Cylinder 3 Misfire Detected	P0304 - Cylinder 4 Misfire I
	P0305 - Cylinder 5 Misfire Detected	P0306 - Cylinder 6 Misfire Detected	P0307 - Cylinder 7 Misfire Detecte	red P0308 - Cylinder 8 Misfine Detected	P0401 - Exhaust Gas Recirculation Flow Insufficient	P0402 - Exhaust Gas Recirculation Flow Excessive	P0506 - Idle Speed Low	P0507 - Idle Speed High	P2080 - Exhaust Temperature Sensor 1 Performance	P2084 - Exhaust Temperature Sensor 2 Performance	P242B - Exhaust Temperature Sensor 3 Performance	P246F - Exhaust Temperature Sensor 4 Performance					
P0128 - Engine Coolant Temperature Below Thermostat	P0101 - Mass Air Flow Sensor																
	Postore and Control								,				•				
Regulating Temperature P014C - HO2S Slow Response	Performance		T	T	P11CB - NOx Sensor Performance	P11CC - NOx Sensor Performance -	1										
Regulating Temperature P014C - HO2S Slow Response Rich to Lean Sensor 1	Performance P0171 - Fuel Trim System Lean		P026C - Injection Quantity Too Lo	ow P026D - Injection Quantity Too High	P11CB - NOx Sensor Performance Signal High Bank 1 Sensor 1	P11CC - NOx Sensor Performance - Signal Low Bank 1 Sensor 1)						•				
Regulating Temperature P014C - HO2S Slow Response	Performance P0171 - Fuel Trim System Lean	P0172 - Fuel Trim System Rich P11CC - NOx Sensor Performance Signal Low Bank 1 Sensor 1	P028C - Injection Quantity Too Lo	ow P026D - Injection Quantity Too High	P11CB - NOx Sensor Performance Signal High Bank 1 Sensor 1	P11CC - NOx Sensor Performance - Signal Low Bank 1 Sensor 1	1						•				
Regulating Temperature P014C - HO2S Slow Response Rich to Lean Sensor 1	Performance P0171 - Fuel Trim System Lean P11CB - NOx Sensor Performance - Signal High Bank 1 Sensor 1 P11CB - NOx Sensor Performance	P11CC - NOx Sensor Performance Signal Low Bank 1 Sensor 1	P026C - Injection Quantity Too Lo	ow P026D - Injection Quantity Too High	P11CB - NOx Sensor Performance Signal High Bank 1 Sensor 1	P11CC - NOx Sensor Performance - Signal Low Bank 1 Sensor 1	1						•				
Regulating Temperature P014C - H02S Slow Response Rich to Lean Sensor 1 P0171 - Fuel Trim System Lean	Performance P0171 - Fuel Trim System Lean P11CB - NOx Sensor Performance - Signal High Bank 1 Sensor 1 P11CB - NOx Sensor Performance - Signal High Bank 1 Sensor 1	P11CC - NOx Sersor Performance Signal Low Bank 1 Sersor 1	-	ow POSED - Injection Quantity Too High		P11CC - NOx Sensor Performance Signal Low Bank 1 Sensor 1	P01D1 - Cylinder 4 Injection Timing	P01D2 - Cylinder 4 Injection Timing	P01D3 - Cylinder 5 Injection Timing	P01D4 - Cylinder 5 Injection Timing	P01DS - Cylinder 6 Injection Timing	P01D6 - Cylinder 6 Injection Timing	P01D7 - Cylinder 7 Injection Timing	P01D8 - Cylinder 7 Injection Timing P01D1	9 - Cylinder 8 Injection Timing	POIDA - Cylinder 8 Injection Timing	1
Regulating Temperature P014C - H02S Slow Response Rich to Lean Sensor 1 P0171 - Fuel Trim System Lean P0172 - Fuel Trim System Rich P0182 - Fuel Temperature Sensor 1 - Temperature Sensor	Performance P0171 - Fuel Trim System Lean P11CB - NDx Sensor Performance - Signal High Bank 1 Sensor 1 P11CB - NDx Sensor Performance - Signal High Bank 1 Sensor 1 P01CB - Cylinder 1 Injection Timing Researched	P11CC - NOx Sensor Performance Signal Low Bank 1 Sensor 1 P11CC - NOx Sensor Performance Signal Low Bank 1 Sensor 1 P01CC - Oylinder 1 Injection Timing Advanced	P01CD - Cylinder 2 Injection Time Rotansed		PO1CF - Cylinder 3 Injection Timing Retarded	P01D0 - Cylinder 3 Injection Timing Advanced	P01D1 - Cylinder 4 Injection Timing Retarded P01D1 - Cylinder 4 Injection Timing	P01D2 - Cylinder 4 Injection Timing Advanced P01D2 - Cylinder 4 Injection Timing		P01D4 - Cylinder S Injection Timing Advanced P01D4 - Cylinder S Injection Timing	P01D5 - Cylinder 6 trijection Timing Retarbol P01D5 - Cylinder 8 trijection Timing	POID6 - Cylinder 6 Injection Timing Advanced POID6 - Cylinder 6 Injection Timing	P01D7 - Cylinder 7 Injection Timing Retursiod P01D7 - Cylinder 7 Injection Timing	POIDS - Cylindar 7 Injuction Timing POIDS - Advanced Poilts - Cylindar 7 Injuction Timing POIDS - Cyli	9 - Cylinder 8 Injection Timing Retarded 9 - Cylinder 8 Injection Timing	POIDA - Cylinder 8 Injection Timing Advanced POIDA - Cylinder 8 Injection Timing]
Regulating Temperature P014C - HOZS Sliver Response Rich to Lean Sensor 1 P0171 - Fuel Trim System Lean P0172 - Fuel Trim System Rich	Performance P0171 - Fuel Trim System Lean P11CB - NOX Sensor Performance - Signal High Bank 1 Sensor 1 P11CB - NOX Sensor Performance - Signal High Bank 1 Sensor 1 P01CB - Cyteder 1 High Earl 1 Sensor 1 P01CB - Cyteder 1 High Earl 1 Sensor 1 P01CB - Cyteder 1 High Earl 1 High Earl 1 Retarded P0101 - Fuel Rail Pressure Sensor 1 P0101 - Fuel Rail Pressure Sensor 1	P11CC - NOx Sensor Performance Signal Low Bank 1 Sensor 1 P11CC - NOx Sensor Performance Signal Low Bank 1 Sensor 1 P01CC - Oylinder 1 Injection Timing Advanced	-		9 P01CF - Cylinder 3 Injection Timing		P0101 - Cylinder 4 hjedden Timing Returned P0101 - Cylinder 4 hjedden Timing Retarded	P01D2 - Cyfridwr 4 hipedian Timing Advanced P01D2 - Cyfeddwr 4 hipedian Timing Advanced		POID4 - Cylender 5 hyection Timing POID4 - Cylender 5 hyection Timing Advanced	POIDS - Cylerder & typeddon Teming Retarded POIDS - Cylerder & typedon Teming Retarded	P01D6 - Cylerder 6 trijection Timing Advanced P01D6 - Cylender 6 trijection Timing Advanced	P01D7 - Cylinder 7 Injection Timing Retainable P01D7 - Cylender 7 Pojection Timing Retainable	POIDS - Cylinder 7 Rejection Timing POIDS - Cylinder 7 Rejection Timing POIDS - Cylinder 7 Rejection Timing POIDS - Application Timing POIDS - Application Timing POIDS - Application Timing POIDS - Application	9 - Cyfinder 8 Injection Timing Retarded 9 - Cyfinder 8 Injection Timing Retarded	POI DA - Cylinder 8 trijecton Timing Advanced POI DA - Cylinder 8 trijecton Timing Advanced]
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Regulating Temperature FOTAC - HOSS Sow Regionse Rich to Lean Service / POT71 - Fael Time System Lean FOT72 - Fael Time System Rich FOT62 - Fael Temperature Service 1 Circuit Low FOT63 - Feel Temperature Service FOT63 - Feel Temperature FOT63 - Feel Temperature Service Coront Low FOT63 - Feel Temperature Service Coront Low FOT63 - Feel Temperature FOT65 - SCORE SERVICE FOT65 FOT65 - SCORE SERVICE FOT65 FOT65 - SCORE TEMPERATURE FOT65 - SCORE TEMPERATURE FOT65 - SCORE TEMPERATURE	Petformance P0171 - Fuel Time System Lean P1108 - NOx Sensor Performance - Signal High Bank 1 Sensor 1 P1108 - NOx Sensor Performance - Signal High Bank 1 Sensor 1 P0108 - Oysteed 1 High Bank 1 Sensor 1 P0108 - Oysteed 1 High Bank 1 Sensor 1 P0108 - Oysteed 1 High Bank 1 Sensor 1 P0108 - Oysteed 1 High Bank 1 Sensor 1 P0109 - Fuel Rail Peter 1 High Bank 1 Sensor 1 P0101 - Fuel Rail Pressure Sensor P0101 - Fuel Rail Pressure Sensor P0101 - Fuel Rail Pressure Sensor	P11CC - NOx Sensor Performance Signal Low Bank 1 Sensor 1 P11CC - NOx Sensor Performance Signal Low Bank 1 Sensor 1 P01CC - Oylinder 1 Injection Timing Advanced	P01CD - Cylinder 2 Injection Time Rotansed		PO1CF - Cylinder 3 Injection Timing Retarded	P01D0 - Cylinder 3 Injection Timing Advanced	POID1 - Cyfridar 4 hyspadao Timing Retarded POID1 - Cyfridar 4 hyspadao Timing Retarded	Portize - Cylinder 4 hypotion Timing Additional Portize - Cylinder 4 hypotion Timing Advanced		POID4 - Cylender 5 legiciden Timing FOID4 - Cylender 5 legiciden Timing Advanced	POTDS - Cylonder & typeston Timing PotTDS - Cylonder & typeston Timing PotTDS - Cylonder & typeston Timing Returbed	POIDS - Cylinder 6 typector Timing POIDS - Cylinder 6 typector Timing Advanced	PO107 - Cylender 7 Injection Timing Time Time Time Time Time Time Time Time	POIDS Cylinder Telepaten Timing POIDS Advanced Advanced FOIDS Cylinder Telepaten Timing POIDS Advanced POIDS Cylinder Telepaten Timing POIDS	9 - Cylinder 8 Injection Timing Retardad 9 - Cylinder 8 Injection Timing Retardad	POTDA - Cyfeder 8 Njedeon Triang Advanced POTDA - Cyfeder 8 Njedeon Triang Advanced]
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Regulating Temperature POILS: 1-1002 Size Regiona- Rish Is Lean Record Rish Is Lean Record Rish Is Lean Record POITS: Faul Trim System Rich POITS: Faul Trim System Rich POITS: Faul Trim System Rich 1 Circuit Even 1 Size Record Rish Size Re	Performance PTCE - NOX Sersice Performance - Sprint Feat Tree (Sprint Service Performance - Sprint Feat Tree (Sprint Service Performance - Sprint Feat Service Service Performance - Sprint Feat Service Service Performance - Sprint Feat Service Ser	PFICE I VIOL Series Performance Signal Lore Bias 1 Series 1 PFICE I VIOL Series Performance PFICE I VIOL Series Performance POICE - Opinide to Report Interest POICE - Opinide to Report Interest Advanced POICE - Opinide to Transparent Advanced POICE - Opinide to Transparent Advanced POICE - Performance POI	POTCD - Cylleder 2 Hypoton Time Resoulded POTCD - Cylleder 2 Hypoton Time Resoulded POTCB - Cylleder 1 Hypoton Time Resoulded POTCB - Cylleder 1 Hypoton Time POTCB - Cylleder 1 Hypoton Time	ing Poice - Opindur 3 typicoto Timing Advanced Advanced Poice - Opindur 3 typicoto Timing Poice - Opindur 3 typicoto Timing Advanced Ing Poice - Opindur 1 typicoto Timing Advanced Opin Poice - Opindur 1 typicoto Timing Advanced	POTCE - Cylindar 3 ligotion Timing Research 3 POTCE - Cylindar 3 ligotion Timing Research 3 POTCE - Cylindar 2 ligotion Timing Research	Potitio - Cylindar 3 Injection Timing Advanced Potitio - Cylindar 3 Injection Timing Advanced FOTCE - Cylindar 2 Injection Timing Advanced	Ratarded P01D1 - Cyfinder 4 Tripeden Timing Retarded P01D7 - Cyfinder 3 Injection Timing Retarded	Advanced P01D2 - Opinder 4 hipoten Timing Advanced P01D3 - Cylinder 3 hipotein Timing Advanced	POIDS - Cylinder 5 Nysodao Timing Resided POIDS - Cylinder 5 Nysodao Timing Resided Resided POIDS - Cylinder 4 Nysodao Timing Resided	Advanced P01D4 - Cyfinder 1 Pipeden Timing Advanced P01D2 - Cyfinder 4 Injection Timing Advanced	POTDS - Cylinder & Tryscaton Finning Restanded POTDS - Cylinder & Speciator Finning Restanded Restanded Restanded POTDS - Cylinder & Speciator Finning Restanded	POIDs - Cylinder & Vijection Timing Advanced POIDs - Cylinder Experience Timing Advanced POIDs - Cylinder Experience Timing Advanced	Retarded P0107 - Cylinder 7 injection Timing Retarded P0105 - Cylinder 6 injection Timing Retarded	Advanced P0108 - Cylender Tireling P0101 Advanced P0106 - Cylender Elimpeton Tireling P0101 Advanced P0106 - Cylender Elimpeton Tireling P0101 Advanced	Opforder & Psycolon Timery Retarded Opforder & Psycolon Timery Retarded Opforder & Psycolon Timery Retarded Opforder Timery Retarded	POIDA: Cylinder 8 liquidion Trainsy Advanced POIDA: Cylinder Significant Trainsy Advanced POIDA: Cylinder 7 liquidion Trainsy Advanced	POIDS - Cylinder & Injection Researched
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Active DTC				Inhibited DTCs					
P026D - Injection Quantity Too High	P026C - Injection Quantity Too Low	P11CB - NOx Sensor Performance - Signal High Bank 1 Sensor 1	P11CC - NOx Sensor Performance - Signal Low Bank 1 Sensor 1						
P02E7 - Diesel Intake Air Flow	P0401 - Exhaust Gas Recirculation	P0402 - Exhaust Gas Recirculation	angular sole salah 1 salah 1	,					
Position Sensor Circuit Range Performance	Flow Insufficient	Flow Excessive		I.	P122D - Diesel Intake Air Flow				ı
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	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
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
P02EB - Intake Air Flow Valve Control Motor Current	P0234 - Turbocharger Engine Overboost	P0299 - Turbocharger Engine Underboost	P0401 - Exhaust Gas Recirculation Flow Insufficient	P0402 - Exhaust Gas Recirculation Flow Excessive	P122D - Diesel Intake Air Flow Position Sensor Exceeded Learning				
Performance P0335 - Crankshaft Position	P0102 - Mass Air Flow Sensor	P0103 - Mass Air Flow Sensor	P0191 - Fuel Rail Pressure Sensor	P0315 - Crankshaft Position System	Limit		1		
Sensor Circuit P0336 - Crankshaft Position	Circuit Low P0102 - Mass Air Flow Sensor	Circuit High P0103 - Mass Air Flow Sensor	Performance P0191 - Fuel Rail Pressure Sersor	Variation Not Learned P0315 - Crankshaft Position System	P0506 - Idle Speed Low	P0507 - Idle Speed High			
Sersor Performance	Circuit Low	Circuit High	P0191 - Fuel Rail Pressure Sensor Performance	Variation Not Learned	P0506 - Idle Speed Low	P0507 - Idle Speed High			
P0340 - Camshaft Position Sensor Circuit	P0191 - Fuel Rail Pressure Sensor Performance	P0315 - Crankshaft Position System Variation Not Learned							
P0341 - Camshaft Position Sensor Performance	P0191 - Fuel Rail Pressure Sensor Performance	P0315 - Crankshaft Position System Variation Not Learned	l						
P0400 - Exhaust Gas Recirculation (EGR) Flow	P11CB - NOv Sensor Performance -	P11CC - NOv Sensor Performance -	P249D - Closed Loop Reductant Injection Control At Limit - Flow Too	P249E - Closed Loop Reductant Injection Control At Limit - Flow Too	1				
Incorrect	Signal High Bank 1 Sensor 1	Signal Low Bank 1 Sensor 1	Low	High	1			P249D - Closed Loop Reductant	P249E - Closed Loop Reductant
P0401 - Exhaust Gas Recirculation Flow Insufficient	P11CB - NOx Sensor Performance - Signal High Bank 1 Sensor 1	P11CC - NOx Sensor Performance - Signal Low Bank 1 Sensor 1	P2080 - Exhaust Temperature Sensor 1 Performance	P2084 - Exhaust Temperature Sensor 2 Performance	P242B - Exhaust Temperature Sensor 3 Performance	P2459 - Diesel Particulate Filter Regeneration Frequency	P246F - Exhaust Temperature Sensor 4 Performance	Injection Control At Limit - Flow Too Low P249D - Closed Loop Reductant	Injection Control At Limit - Flow To High P249E - Closed Loop Reductant
P0402 - Exhaust Gas Recirculation Flow Excessive	P11CB - NOx Sensor Performance - Signal High Bank 1 Sensor 1	P11CC - NOx Sensor Performance - Signal Low Bank 1 Sensor 1	P2080 - Exhaust Temperature Sensor 1 Performance	P2084 - Exhaust Temperature Sensor 2 Performance	P242B - Exhaust Temperature Sensor 3 Performance	P2459 - Diesel Particulate Filter Regeneration Frequency	P246F - Exhaust Temperature Sensor 4 Performance	Injection Control At Limit - Flow Too Low	Injection Control At Limit - Flow To High
P0405 - Exhaust Gas Recirculation Position Sensor Circuit Low	P0401 - Exhaust Gas Recirculation Flow Insufficient	P0402 - Exhaust Gas Recirculation Flow Excessive	P049D - EGR Control Position Not Learned	P2080 - Exhaust Temperature Sensor 1 Performance	P2084 - Exhaust Temperature Sensor 2 Performance	P242B - Exhaust Temperature Sensor 3 Performance	P246F - Exhaust Temperature Sensor 4 Performance		
P0406 - Exhaust Gas Recirculation Position Sensor	P0401 - Exhaust Gas Recirculation	P0402 - Exhaust Gas Recirculation	P049D - EGR Control Position Not	P2080 - Exhaust Temperature Sensor 1 Performance	P2084 - Exhaust Temperature Sensor 2 Performance	P242B - Exhaust Temperature Sensor 3 Performance	P246F - Exhaust Temperature Sensor 4 Performance	1	
Circuit High		FIOW EXCESSIVE	Learned	Sensor I Periormanoe	Sersor 2 Performance	Sensor 3 Perioritation	Sergor + Performance	J	
P040C - Exhaust Gas Recirculation (EGR) Temperature	P040F - Exhaust Gas Recirculation (EGR) Temperature Sensor 1-2								
Sensor 2 Circuit Low Voltage	Correlation								
P040D - Exhaust Gas Recirculation (EGR) Temperature Sensor 2 Circuit High Voltage	P040F - Exhaust Gas Recirculation (EGR) Temperature Sensor 1-2 Correlation								
P041C - Exhaust Gas	P040F - Exhaust Gas Recirculation								
Recirculation (EGR) Temperature Sensor 1 Circuit Low Voltage	(EGR) Temperature Sensor 1-2 Correlation								
P041D - Evhaust Gas	P040F - Exhaust Gas Renimulation								
Recirculation (EGR) Temperature Sensor 1 Circuit High Voltage	(EGR) Temperature Sensor 1-2 Correlation								
P0420 - NMHC Catalyst Efficiency	P249D - Closed Loop Reductant Injection Control At Limit - Flow Too	P249E - Closed Loop Reductant Injection Control At Limit - Flow Too	1						
Below Threshold Bank 1 P046C - Exhaust Gas	Low	High						-	
Renimulation/EGR) Position	P0101 - Mass Air Flow Sensor Performance	P0234 - Turbocharger Engine Overboost	P0299 - Turbocharger Engine Underboost	P2080 - Exhaust Temperature Sensor 1 Performance	P2084 - Exhaust Temperature Sensor 2 Performance	P242B - Exhaust Temperature Sensor 3 Performance	P246F - Exhaust Temperature Sensor 4 Performance		
Sensor Performance P0545 - Exhaust Gas	P2080 - Exhaust Temperature	P2084 - Exhaust Temperature	P20E2 - Exhaust Gas Temperature	P2428 - Exhaust Gas High					
Temperature (EGT) Sensor 1 Circuit Low Voltage	Sensor 1 Performance	Sensor 2 Performance	(EGT) Sensors 1-2 not plausible	Temperature					
P0546 - Exhaust Gas Temperature (EGT) Sensor 1	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					
Circuit High Voltage P0575 - Cruise Control Input	P0567 - Cruise Control Resume	P0568 - Cruise Control Set Switch	(COT) Deliadia 1/2 fot pattable	remperature	J				
Circuit P057C - Brake Pedal Position	Switch Circuit P057D - Brake Pedal Position	Circuit	l						
Sensor Circuit High Voltage	Sensor Circuit Low Voltage								
P057D - Brake Pedal Position Sensor Circuit Low Voltage	P057C - Brake Pedal Position Sensor Circuit High Voltage				_				
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	P2155 - Injector Positive Voltage Control Circuit Group 4					
P064C - Glow Plug Control Mortule Performance	P11DB - NOx Sensor Current Performance Bank 1 Sensor 1	P2209 - N0x Heater Performance Bank 1 Sensor 1			-				
P0651 - 5 Volt Reference 2 Circuit	P2127 - Accelerator Pedal Position	P2128 - Accelerator Pedal Position	1						
	Sensor 2 Circuit Low	(APP) Sensor 2 Circuit High Voltage	1						
P0697 - 5 Volt Reference 3 Circuit	P2122 - Accelerator Pedal Position Sensor 1 Circuit Low	P2123 - Accelerator Pedal Position Sensor 1 Circuit High	J						
P0851 - Park/Neutral Position (PNP) Switch Circuit Low Voltage	P0852 - Park/Neutral Position (PNP) Switch Circuit High Voltage								
P0852 - Park/Neutral Position	P0851 - Park/Neutral Position (PNP)	1							
(PNP) Switch Circuit High Voltage	Switch Circuit Low Voltage								
P1048 - Reductant Injector High Control Circuit Low Voltage	P202E - Reductant Injector Performance	1							
P1049 - Reductant Injector High	P202E - Reductant Injector Performance	P2510 - ECM Power Relay Circuit	ì						
Control Circuit High Voltage P11DB - NOx Sensor Current	P249D - Closed Loop Reductant	P249E - Closed Loop Reductant	1						
Performance Bank 1 Sensor 1	Injection Control At Limit - Flow Too Low	Injection Control At Limit - Flow Too High							
P11DC - NOx Sensor Current	P249D - Closed Loop Reductant Injection Control At Limit - Flow Too	P249E - Closed Loop Reductant Injection Control At Limit - Flow Too	1						
Performance Bank 1 Sensor 2	Low	High							
P1224 - Injector 1 Control Circuit Shorted	P0201 - Injector 1 Control Circuit	P0606 - Control Module Internal Performance	P2146 - Injector Positive Voltage Control Circuit Group 1						
P1227 - Injector 2 Control Circuit Shorted	P0202 - Injector 2 Control Circuit	P0606 - Control Module Internal Performance	P2152 - Injector Positive Voltage Control Circuit Group 3						
P122A - Injector 3 Control Circuit Shorted	P0203 - Injector 3 Control Circuit	P0606 - Control Module Internal Performance	P2155 - Injector Positive Voltage Control Circuit Group 4	1					
	P0234 - Turbocharger Engine	P0299 - Turbocharger Engine	P0401 - Exhaust Gas Recirculation	P0402 - Exhaust Gas Recirculation	1				
P122D - Diesel Intake Air Flow	Overboost	Underboost	Flow Insufficient	Flow Excessive]				
Position Sensor Exceeded Learning Limit		P0606 - Control Module Internal	P2146 - Injector Positive Voltage Control Circuit Group 1						
Position Sensor Exceeded Learning Limit P1233 - Injector 4 Control Circuit Shorted	P0204 - Injector 4 Control Circuit	Performance							
Position Sensor Exceeded Learning Limit P1233 - Injector 4 Control Circuit Shorted P1236 - Injector 5 Control Circuit Shorted	P0204 - Injector 4 Control Circuit P0205 - Injector 5 Control Circuit	P0606 - Control Module Internal Performance	P2152 - Injector Positive Voltage Control Circuit Group 3	1					
Position Sensor Exceeded Learning Limit *1233 - Injector 4 Control Circuit Shorted *1236 - Injector 5 Control Circuit Shorted		P0606 - Control Module Internal Performance	P2152 - Injector Positive Voltage Control Circuit Group 3						
Position Sensor Exceeded Learning Limit P1233 - Injector 4 Control Circuit Shorted	P0205 - Injector 5 Control Circuit	P0606 - Control Module Internal Performance P0606 - Control Module Internal Performance P0606 - Control Module Internal	P2152 - Injector Positive Voltage Control Circuit Group 3 P2149 - Injector Positive Voltage Control Circuit Group 2 P2149 - Injector Positive Voltage						
Position Sensor Exceeded Learning Limit P1233 - Injector 4 Control Circuit Shorted P1236 - Injector 5 Control Circuit Shorted P1239 - Injector 6 Control Circuit Shorted	P0205 - Injector 5 Control Circuit P0206 - Injector 6 Control Circuit	P0606 - Control Module Internal Performance P0606 - Control Module Internal Performance	P2152 - Injector Positive Voltage Control Circuit Group 3 P2149 - Injector Positive Voltage Control Circuit Group 2						

Active DTC				Inhibited DTCs												
P125B - Fuel Pressure Regulator 2 High Control Circuit High	P2510 - ECM Power Relay Circuit															
Voltage P140B - Exhaust Gas Recirculation Slow Response-	P11CR - NOv Sensor Performance -	P11CC - NOv Sensor Performance -	P249D - Closed Loop Reductant	P249E - Closed Loop Reductant	1											
Recirculation Slow Response- Increasing Flow P140C - Exhaust Gas		P11CC - NOx Sensor Performance Signal Low Bank 1 Sensor 1	LOW	Injection Control At Limit - Flow Too High												
	P11CB - NOx Sensor Performance - Signal High Bank 1 Sensor 1	P11CC - NOx Sensor Performance - Signal Low Bank 1 Sensor 1	P249D - Closed Loop Reductant Injection Control At Limit - Flow Too	P249E - Closed Loop Reductant Injection Control At Limit - Flow Too High												
Decreasing Flow P140F - Exhaust Gas Recirculation (EGR) Motor	P0101 - Mass Air Flow Sensor	P0234 - Turbocharger Engine Overboost	P0299 - Turbocharger Engine	P0401 - Exhaust Gas Recirculation Flow Insufficient	P0402 - Exhaust Gas Recirculation Flow Excessive	P049D - EGR Control Position Not										
Recirculation (EGR) Motor Current Performance P1414 - Exhaust Gas Recirculation (EGR) Cooler	Performance		Underboost P140A - EGR Cooler BY Pass	Flow Insufficient	Flow Excessive	Learned										
Rynass Valve Current	P0401 - Exhaust Gas Recirculation Flow Insufficient	P0402 - Exhaust Gas Recirculation Flow Excessive	Position Sensor Exceeded Learning Limit													
Performance P163C - Glow Plug Control Module Primary Circuit	P11DB - NOx Sensor Current Performance Bank 1 Sensor 1	P2209 - N0x Heater Performance Bank 1 Sensor 1		1												
P2002 - Diesel Particulate Filter (DPF) Low Efficiency P2002 - Exhaust Gas	P2459 - Diesel Particulate Filter Regeneration Frequency	Ballik I deligor I	-													
Temperature (EGT) Sensor 2	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											
Circuit Low Voltage P2033 - Exhaust Gas	P2080 - Exhaust Temperature	P2084 - Exhaust Temperature	P20E2 - Exhaust Gas Temperature	P2428 - Exhaust Gas High	P242B - Exhaust Temperature											
Temperature (EGT) Sensor 2 Circuit High Voltage P2047 - Reductant Injector	Sensor 1 Performance P202E - Reductant Injector	Sensor 2 Performance	(EGT) Sensors 1-2 not plausible	Temperature	Sersor 3 Performance											
P2047 - Reductant Injector Control Circuit P2048 - Reductant Injector	P202E - Reductant Injector Performance P202E - Reductant Injector															
Control Circuit Low Voltage P2049 - Reductant Injector	Performance P202E - Reductant Injector	P2510 - ECM Power Relay Circuit	1													
Control Circuit High Voltage P204B - Reductant Pump	Performance P204F - Reductant System	Performance P20E8 - Reductant Pressure Too	P20E9 - Reductant Pressure Too	ו												
Pressure Sensor Performance P204C - Reductant Pump	Performance Bank 1 (cannot build pump pressure) P204B - Reductant Pump Pressure	Low P20A1 - Reductant Purse Valve	High	J												
Pressure Sensor Circuit Low	Sensor Performance	Performance	4													
P204D - Reductant Pump Pressure Sensor Circuit High P205C - Reductant Tank	P204B - Reductant Pump Pressure Sensor Performance P20BA - Reductant Heater 1	P20A1 - Reductant Purge Valve Performance	_													
Temperature Sensor Circuit Low	Performance	P20BA - Bodystost Hostor 1	1													
P205D - Reductant Tank Temperature Sensor Circuit High	P205B - Reductant Tank Temperature Sensor Performance P204F - Reductant System	P20BA - Reductant Heater 1 Performance														
P208A - Reductant Pump Control Circuit	Performance Bank 1 (cannot build	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	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	pump pressure) P204F - Reductant System Performance Bank 1 (cannot build	P20A1 - Reductant Purge Valve Performance		P20E9 - Reductant Pressure Too												
P20A2 - Reductant Purge Valve	pump pressure) P204F - Reductant System		Low P20E8 - Reductant Pressure Too	High P20E9 - Reductant Pressure Too												
Control Circuit Low Voltage	Performance Bank 1 (cannot build pump pressure) P204F - Reductant System	Performance	Low	High												
P20A3 - Reductant Purge Valve Control Circuit High Voltage	Performance Bank 1 (cannot build	P20A1 - Reductant Purge Valve Performance	P20E8 - Reductant Pressure Too Low	P20E9 - Reductant Pressure Too High	P2510 - ECM Power Relay Circuit Performance											
P20CB - Exhaust Aftertreatment Fuel Injector Control Circuit	P2S10 - ECM Power Relay Circuit Performance															
P20CE - Exhaust Attertreatment Fuel Injector Control Circuit High	P2510 - ECM Power Relay Circuit Performance															
Voltage P20E2 - Exhaust Gas Temperature (EGT) Sensors 1-2	P0101 - Mass Air Flow Sensor Performance	P2080 - Exhaust Temperature Sensor 1 Performance	P2084 - Exhaust Temperature Sensor 2 Performance	P242B - Exhaust Temperature Sensor 3 Performance	P246F - Exhaust Temperature Sensor 4 Performance											
not plausible P2122 - Accelerator Pedal	P2138 - Accelerator Pedal Position (APP) Sensor 1-2 Correlation	Sereor i Perioritance	Sereci 2 Perioritarios	Sereor 3 Performance	Sersor 4 Performance											
Position Sensor 1 Circuit Low																
P2123 - Accelerator Pedal Position Sensor 1 Circuit High	P2138 - Accelerator Pedal Position (APP) Sensor 1-2 Correlation															
P2127 - Accelerator Pedal Position Sensor 2 Circuit Low	P2138 - Accelerator Pedal Position (APP) Sensor 1-2 Correlation															
P2128 - Accelerator Pedal Position (APP) Sensor 2 Circuit	P2138 - Accelerator Pedal Position (APP) Sensor 1-2 Correlation															
P2146 - Injector Positive Voltage	P0606 - Control Module Internal															
Control Circuit Group 1 P2149 - Injector Positive Voltage Control Circuit Group 2	Performance P0606 - Control Module Internal Performance															
Control Circuit Group 2 P2152 - Injector Positive Voltage Control Circuit Group 3	P0606 - Control Module Internal Performance															
Control Circuit Group 3 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												
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	P249E - Closed Loop Reductant Injection Control At Limit - Flow Too												
P2202 - N0x Sensor Circuit Low	P249D - Closed Loop Reductant Injection Control At Limit - Flow Too	P249E - Closed Loop Reductant Injection Control At Limit - Flow Too	Low	ngo	ı											
Bank 1 Sensor 1 P2203 - N0x Sensor Circuit High	Low	High P249E - Closed Loop Reductant Injection Control At Limit - Flow Too	1													
P2203 - N0x Sensor Circuit High Bank 1 Sensor 1	Low	High	P249D - Closed Loop Reductant	P249E - Closed Loop Reductant	1											
P2205 - N0x Heater Control Circuit Bank 1 Sensor 1	P11DB - NOx Sensor Current Performance Bank 1 Sensor 1	P2209 - N0x Heater Performance Bank 1 Sensor 1	Injection Control At Limit - Flow Too Low	Injection Control At Limit - Flow Too High												
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 High														
P220A - 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 1 P220B - N0x Sensor Supply Voltage Out Of Range Bank 1	P11DB - NOx Sensor Current	P2209 - N0x Heater Performance	1													
Sensor 2 P2228 - Barometric Pressure	Performance Bank 1 Sensor 1 P0106 - Manifold Absolute Pressure	Bank 1 Sensor 1 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	P2080 - Exhaust Temperature	P2084 - Exhaust Temperature	P242B - Exhaust Temperature	P246F - Exhaust Temperature				
Sensor Circuit Low P2229 - Barometric Pressure	Sensor Performance P0106 - Manifold Absolute Pressure Sensor Performance	Overboost P0234 - Turbocharger Engine Overboost	Underboost P0299 - Turbocharger Engine Underboost	Flow Insufficient P0401 - Exhaust Gas Recirculation Flow Insufficient	Flow Excessive	Signal High Bank 1 Sensor 1	Signal Low Bank 1 Sensor 1	(DPF) Low Efficiency	Sensor 1 Performance P2080 - Exhaust Temperature Sensor 1 Performance	Sensor 2 Performance P2084 - Exhaust Temperature Sensor 2 Performance	Sensor 3 Performance P242B - Exhaust Temperature Sensor 3 Performance	Sensor 4 Performance P2459 - Diesel Particulate Filter Regeneration Frequency	P246F - Exhaust Temperature Sensor 4 Performance	1		
Sensor Circuit High P2263 - Turbo Boost System Performance	Sersor Performance P0101 - Mass Air Flow Sersor Performance	Overboost P0106 - Manifold Absolute Pressure Sensor Performance	Underboost P0234 - Turbocharger Engine Overboost	Flow Insufficient P0299 - Turbocharger Engine Underboost	P0401 - Exhaust Gas Recirculation Flow Insufficient	P0402 - Exhaust Gas Recirculation	P11CC - NOx Sensor Performance - Signal Low Bank 1 Sensor 1	(UPT) LOW Efficiency	Denteur i Performance	ourous ∠ refformance	overous a refformance	regularisatin Frequency	oursus + refformance	4		
P229E - NOx Sensor Circuit Bank 1 Sensor 2	P11AF - HO2S Performance - Signal High During Moderate Load Bank 1	P11B2 - H02S Performance - Signa Low During Moderate Load Bank 1	Injection Control At Limit - Flow Too	P249E - Closed Loop Reductant Injection Control At Limit - Flow Too	I AN HUMILINE	1 for Laboure	1									
1 Sersor 2	Sensor 2	Sensor 2	Low	High												

Control Cont	Active DTC				Inhibited DTCs													
Manual Control Manu			P249E - Closed Loop Reductant		illilibited DTCs													
Mary		Injection Control At Limit - Flow Too	Injection Control At Limit - Flow Too High															
Mary Control Mary		High During Moderate Load Bank 1	Low During Moderate Load Bank 1	Injection Control At Limit - Flow Too	Injection Control At Limit - Flow Too]												
Manual Parlament Parlame		P249D - Closed Loop Reductant Injection Control At Limit - Flow Too Low	P249E - Closed Loop Reductant Injection Control At Limit - Flow Too High			-												
The part	Recirculation (EGR) System	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]												
Page	Temperature (EGT) Sensor 3					-												
Manual Personal Per	Temperature (EGT) Sensor 3																	
Company Comp	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												
The Continue of the Continue	Differential Pressure Sensor Circuit Low Voltage	P2002 - Diesel Particulate Filter (DPF) Low Efficiency	Differential Pressure Sensor	Differential Pressure Sensor Circuit	P2459 - Diesel Particulate Filter Regeneration Frequency			•										
Processing Content Process	P2455 - Diesel Particulate Filter Differential Pressure Sensor Circuit High Voltage		Differential Pressure Sensor	Differential Pressure Sensor Circuit]												
Mate	Recirculation (EGR) Cooler Bypass Valve Control Circuit	P0401 - Exhaust Gas Recirculation Flow Insufficient	P0402 - Exhaust Gas Recirculation Flow Excessive	Position Sensor Exceded Learning	P2080 - Exhaust Temperature Sensor 1 Performance	P2084 - Exhaust Temperature Sensor 2 Performance	P242B - Exhaust Temperature Sensor 3 Performance	P246F - Exhaust Temperature Sensor 4 Performance	P2510 - ECM Power Relay Circuit Performance									
Mathematical Content	P2463 - Diesel Particulate Filter -	P2002 - Diesel Particulate Filter								<u>.</u> !								
	P2470 - Exhaust Gas Temperature (EGT) Sensor 4	P2428 - Exhaust Gas High]														
Mate Control Property Property Control Property Proper	P2471 - Exhaust Ges Temperature (EGT) Sensor 4	P2428 - Exhaust Gas High Temperature	P246F - Exhaust Temperature Sensor 4 Performance															
PAGE Contact Print PAGE Contact Print PAGE Contact Recordance PAGE PAG	P2493 - EGR Cooler BY Pass	P0401 - Exhaust Gas Recirculation	P0402 - Exhaust Gas Recirculation															
Post Control (Control (Con	P2494 - EGR Cooler BY Pass	P0234 - Turbocharger Engine	P0299 - Turbocharger Engine			Position Sensor Exceded Learning												
Section Sect	P2495 - EGR Cooler BY Pass Position Sensor Circuit High	P0234 - Turbocharger Engine Overboost	P0299 - Turbocharger Engine Underboost			Position Sensor Exceded Learning	P2080 - Exhaust Temperature Sensor 1 Performance											
Settle Control plant Desired Species Control plant Desired Species Control plant Desired Species Control plant Con	Injection Control at Limit-Flow too										•							
Control Particle Space Cross Fig. 1, Factorspace Four Particle Four Particle Space Cross Fig. 1, Factorspace Four Par	P249E - Closed loop Reductant Injection Control at Limit-Flow too low		1															
Count Description Spring Count Description (Count Description Spring Count Description Count Description Spring Count Des	Control Position Sensor Circuit	P0234 - Turbocharger Engine Overboost	P0299 - Turbocharger Engine Underboost]												
Patternise Research Section State Control Control All Line Front Tool With Transcriptor Control All Line Front Too	Control Position Sensor Circuit	P0234 - Turbocharger Engine Overboost	P0299 - Turbocharger Engine Underboost	P0401 - Exhaust Gas Recirculation Flow Insufficient	P0402 - Exhaust Gas Recirculation Flow Excessive]												
Prof. Prof	P2598 - Turbocharger Boost Control Position Sensor "A" Circuit Range/Performance - Stuck Low					_												
1000 Color Mail Or Fee Park Color Mail Or Mail Patter Plant	P2599 - Turbocharger Boost Control Position Sensor "A" Circuit Range/Performance - Stuck High																	
1000 - Local Contract Contract Segment Contract to Vision Part Transmission Contract Produced Fig. 1 (Contract Vision Part Transmission Contract Vision Part Transmission Contra		P0851 - Park/Neutral Position (PNP)	P0852 - Park/Neutral Position (PNP)	1														
### Clase In this Project Age Section Control Age Section Cont	U0101 - Lost Communications	P0851 - Park/Neutral Position (PNP)	P0852 - Park/Neutral Position (PNP)	1														
Fall Leaf Bis Ris Ris 15/16/16 Classed State 15/16/16/16/16/16/16/16/16/16/16/16/16/16/	System U0106 - Lost Communication	P11DB - NOx Sensor Current	P249D - Closed Loop Reductant	P249E - Closed Loop Reductant Injection Control At Limit - Flow Tre-	ו													
Low Hy	With Glow Plug Control Module U029D - N0x 1 loss of comm	P249D - Closed Loop Reductant	Low P249E - Closed Loop Reductant	High	1													
Feature Section Sect	U029E - N0x 2 loss of comm	Low P11DB - NOx Sensor Current	High P249D - Closed Loop Reductant	P249E - Closed Loop Reductant Injection Control At Limit - Flow Too	7													
Part Level loss Bis 1515. Part Confidence Start 1515. Part Confidence Start 1515. Part Confidence Start 1515. Part Confidence Start 1515. Part Confidence Start 1515. Part Confidence Start 1515. Part Confidence Start 1515. Part Confidence Start 1515. Part Confidence Start 1515. Part Confidence Start 1515. Part Confidence Start 1515. Part Confidence Start 1515. Part Confidence Start 1515. Part Confidence Start 1515. Part Confidence Start 1515. Part Confidence Start 1515. Part Confidence Start 1515. Part Confidence Start 1515. Part Confidence Start 1515. Part Confidence Start 1515. Part Confidence Start 1515. Part Confidence Start 1515. Part Confidence Start 1515. Part Confidence Start 1515. Part Confidence Start 1515. Part Confidence Start 1515. Part Confidence Start 1515. Part Confidence Start 1515. Part Confidence Start 1515. Part Confidence Start 1515. Part Confidence Start 1515. Part Confidence Start 1515. Part Confidence Start 1515. Part Confidence Start 1515. Part Confidence Start 1515. Part Confidence Start 1515. Part Confidence Start 1515. Part Confidence Start 1515. Part Confidence Start 1515. Part Confidence Start 1515. Part Confidence Start 1515. Part Confidence Start 1515. Part Confidence Start 1515. Part Confidence Start 1515. Part Confidence Start 1515. Part Confidence Start 1515. Part Confidence Start 1515. Part Confidence Start 1515. Part Confidence Start 1515. Part Confidence Start 1515. Part Confidence Start 1515. Part Confidence Start 1515. Part Confidence Start 1515. Part Confidence Start 1515. Part Confidence Start 1515. Part Confidence Start 1515. Part Confidence Start 1515. Part Confidence Start 1515. Part Confidence Start 1515. Part Confidence Start 1515. Part Confidence Start 1515. Part Confidence Start 1515. Part Confidence Start 1515. Part Confidence Start 1515. Part Confidence Start 1515. Part Confidence Start 1515. Part Confidence Start 1515. Part Confidence Start 1515. Part Confidence Start 1515. Part Confidence Start 1515. Part Confidence Start 1515. Part Confidence Start 1515. Par			Low	High									T					
	Fuel Level less than 15%			Performance	P11AF - H02S Performance - Signa	P11B2 - HO2S Performance - Signal		Pttz:r2 - Cly 4 Balance System	Muz/5 - Cly 5 Balance System	Muz/8 - Cly 6 Balance System	P0281 - Cly 7 Balance System	PCI284 - Cly 8 Balance System	PU300 - Engine Misfire Detected	PU301 - Cylinder 1 Misfire Detect	ed PU302 - Cylinder 2 Misfire Detect	ed Mus03 - Cylinder 3 Misfire Dete	rcted P0304 - Cylinder 4 Misfire D	nected P0305 - Cylinder 5 Misfire D
		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											

DTC		engine is not in standby state (standby state	tional Basic Enable Conditions	engine is not in ready state (which is active					
P0016 - Crankshaft to Camshaft Correlation	Engine not in afterrun mode (defined as engine speed greater than 0 rpm)	occurs after ECM initialization or following spee	is running which means the engine ed is greater than 600 to 850 rpm	when the ignition is on or following a stall of the engine)		Caracha la saula sauda stata (cable) de	1		
P003A - Turbocharger Boost Control Position Not Learned	Engine not in afterrun mode (defined as engine speed greater than 0 rpm)	Engine speed greater than 600 to 850 rpm occurs	s not in standby state (standby state after ECM initialization or following after-run)	battery voltage is above 11 V for at least 3s	Engine is running which means the engine speed is greater than 600 to 850 rpm	engine is not in ready state (which is active when the ignition is on or following a stall of the engine)			
P0045 - Turbocharger Boost Control Circuit	Engine not in afterrun mode (defined as engine speed greater than 0 rpm)	after-run)	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)	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)	after-run)	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 v	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)								
P007C - CAC Temperature Sensor Circuit Low Voltage	Engine not in afterrun mode (defined as engine speed greater than 0 rpm)		s not in standby state (standby state 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 occurs :	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 when the	is not in ready state (which is active ie 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 when the	is not in ready state (which is active ie 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 occurs	s not in standby state (standby state after ECM initialization or following after-run)	Engine is running which means the engine speed is greater than 600 to 850 rpm	engine is not in ready state (which is active when the ignition is on or following a stall of the engine)				
P0090 - Fuel Pressure Regulator 1 Control Circuit/Open	Engine not in afterrun mode (defined as engine speed greater than 0 rpm)	after-run)	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)	after-run)	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)	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)		s not in standby state (standby state 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 occurs	s not in standby state (standby state 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)	voltage is above 11 V for at least 3s	Engine is running which means the engine speed is greater than 600 to 850 rpm				-	
P00CA - Fuel Pressure Regulator 1 High Control Circuit High Voltage	engine is not in 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)		s not in standby state (standby state 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)		s not in standby state (standby state 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)		s not in standby state (standby state 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)		s not in standby state (standby state 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)		s not in standby state (standby state 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)		s not in standby state (standby state 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 engin speed is greater than 600 to 850 rpm	engine is not in ready state (which is active when the ignition is on or following a stall of the engine)
P0102 - Mass Air Flow Sensor Circuit Low	Engine not in afterrun mode (defined as engine speed greater than 0 rpm)		s not in standby state (standby state 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	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							
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				_			
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 - HO2S Bank 1 Sensor 1 circuit low	Engine not in afterrun mode (defined as engine speed greater than 0 rpm)	Engine speed greater than 600 to 850 rpm	engine is not in standby state (standby state occurs after ECM initialization or following after-run)	Manufacturer Enable Counter is zero (value of 0 means ECM is locked and out of assembly plant mode)	battery voltage is above 11 V for at least 3s	Engine Run Time greater than 10 seconds (engine speed greater than 600 to 850 rpm to indicate the engine is running)	Engine is running which means the engine speed is greater than 600 to 850 rpm	engine is not in ready state (which is active when the ignition is on or following a stall of the engine)	
P0132 - HO2S Bank 1 Sensor 1 circuit high	Engine not in afterrun mode (defined as engine speed greater than 0 rpm)	Engine speed greater than 600 to 850 rpm	engine is not in standby state (standby state occurs after ECM initialization or following after-run)	Manufacturer Enable Counter is zero (value of 0 means ECM is locked and out of assembly plant mode)	battery voltage is above 11 V for at least 3s	Engine Run Time greater than 10 seconds (engine speed greater than 600 to 850 rpm to indicate the engine is running)	Engine is running which means the engine speed is greater than 600 to 850 rpm	engine is not in ready state (which is active when the ignition is on or following a stall of the engine)	
P0137 - HO2S Bank 1 Sensor 2 circuit low	Engine not in afterrun mode (defined as engine speed greater than 0 rpm)	Engine speed greater than 600 to 850 rpm	engine is not in standby state (standby state occurs after ECM initialization or following after-run)	Manufacturer Enable Counter is zero (value of 0 means ECM is locked and out of assembly plant mode)	battery voltage is above 11 V for at least 3s	Engine Run Time greater than 10 seconds (engine speed greater than 600 to 850 rpm to indicate the engine is running)	Engine is running which means the engine speed is greater than 600 to 850 rpm	engine is not in ready state (which is active when the ignition is on or following a stall of the engine)	
P0138 - HO2S Bank 1 Sensor 2 circuit high	Engine not in afterrun mode (defined as engine speed greater than 0 rpm)	Engine speed greater than 600 to 850 rpm		Manufacturer Enable Counter is zero (value of 0 means ECM is locked and out of assembly plant mode)	battery voltage is above 11 V for at least 3s	Engine Run Time greater than 10 seconds (engine speed greater than 600 to 850 rpm to indicate the engine is running)	Engine is running which means the engine speed is greater than 600 to 850 rpm	engine is not in ready state (which is active when the ignition is on or following a stall of the engine)	
P014C - HO2S Slow Response Rich to Lean Sensor 1	Engine not in afterrun mode (defined as engine speed greater than 0 rpm)	Engine speed greater than 600 to 850 rpm	engine is not in standby state (standby state occurs after ECM initialization or following after-run)	Manufacturer Enable Counter is zero (value of 0 means ECM is locked and out of assembly plant mode)	battery voltage is above 11 V for at least 3s	Engine Run Time is greater than 10 seconds (engine speed greater than 600 to 850 rpm to indicate the engine is running)	System is not in active regeneration mode	Engine is running which means the engine speed is greater than 600 to 850 rpm	engine is not in ready state (which is active when the ignition is on or following a stall of the engine)
P0171 - Fuel Trim System Lean	System is not in active regeneration mode								
P0172 - Fuel Trim System Rich	System is not in active regeneration mode							_	
P0182 - Fuel Temperature Sensor 1 Circuit Low	Engine not in afterrun mode (defined as engine speed greater than 0 rpm)	Engine speed greater than 600 to 850 rpm	engine is not in standby state (standby state occurs after ECM initialization or following after-run)	battery voltage is above 11 V for at least 3s	Engine Run Time greater than 10 seconds (engine speed greater than 600 to 850 rpm to indicate the engine is running)	Engine is running which means the engine speed is greater than 600 to 850 rpm	engine is not in ready state (which is active when the ignition is on or following a stall of the engine)		
P0183 - Fuel Temperature Sensor 1 Circuit High	Engine not in afterrun mode (defined as engine speed greater than 0 rpm)	Engine speed greater than 600 to 850 rpm	engine is not in standby state (standby state occurs after ECM initialization or following after-run)	battery voltage is above 11 V for at least 3s	Engine Run Time greater than 10 seconds (engine speed greater than 600 to 850 rpm to indicate the engine is running)	Engine is running which means the engine speed is greater than 600 to 850 rpm	engine is not in ready state (which is active when the ignition is on or following a stall of the engine)		
P0191 - Fuel Rail Pressure Sensor 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							
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		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	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						

			Additional Deals Freshis Co. 199						
DTC			Additional Basic Enable Conditions engine is not in ready state (which is active	1	•				
P01D0 - Cylinder 3 Injection Timing 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)			1			
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 3s	Engine Run Time greater than 10 seconds (engine speed greater than 600 to 850 rpm to indicate the engine is running)	Engine is running which means the engine speed is greater than 600 to 850 rpm	engine is not in ready state (which is active when the ignition is on or following a stall of the engine)
P0263 - Cly 1 Balance System	Power Take-Off (PTO) is not engaged								
P0266 - Cly 2 Balance System	Power Take-Off (PTO) is not engaged	1							
P0269 - Cly 3 Balance System	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 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)
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	Power Take-Off (PTO) is not engaged]							
P0278 - Cly 6 Balance System	Power Take-Off (PTO) is not engaged	1							
P0281 - Cly 7 Balance System	Power Take-Off (PTO) is not engaged	4							
P0284 - Cly 8 Balance System	Power Take-Off (PTO) is not engaged								
P0299 - Turbocharger Engine Underboost	Engine not in afterrun mode (defined as engine speed greater than 0 rpm)	Engine speed greater than 600 to 850 rpm	engine is not in standby state (standby state occurs after ECM initialization or following after-run)	ambient air temperature is above -7 deg C	ambient pressure is above 74.8kPa	battery voltage is above 11 V for at least 3s	Engine Run Time greater than 10 seconds (engine speed greater than 600 to 850 rpm to indicate the engine is running)	Engine is running which means the engine speed is greater than 600 to 850 rpm	engine is not in ready state (which is active when the ignition is on or following a stall of the engine)
P02E0 - Intake Air Flow Valve 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 engine speed is greater than 600 to 850 rpm	engine is not in ready state (which is active when the ignition is on or following a stall of the engine)		
P02E8 - Diesel Intake Air Flow Position Sensor Circuit Low	Engine not in afterrun mode (defined as engine speed greater than 0 rpm)	Engine speed greater than 600 to 850 rpm	engine is not in standby state (standby state occurs after ECM initialization or following after-run)	battery voltage is above 11 V for at least 3s	Engine Run Time greater than 10 seconds (engine speed greater than 600 to 850 rpm to indicate the engine is running)	Engine is running which means the engine speed is greater than 600 to 850 rpm	engine is not in ready state (which is active when the ignition is on or following a stall of the engine)		
P02E9 - Diesel Intake Air Flow Position Sensor Circuit High	Engine not in afterrun mode (defined as engine speed greater than 0 rpm)	Engine speed greater than 600 to 850 rpm	engine is not in standby state (standby state occurs after ECM initialization or following after-run)	battery voltage is above 11 V for at least 3s	Engine Run Time greater than 10 seconds (engine speed greater than 600 to 850 rpm to indicate the engine is running)	Engine is running which means the engine speed is greater than 600 to 850 rpm	engine is not in ready state (which is active when the ignition is on or following a stall of the engine)		
P02EB - Intake Air Flow Valve Control Motor Current Performance	engine is not in standby state (standby state occurs after ECM initialization or following after-run)	e battery voltage is above 11 V for at least 3s	3	•	•	•			
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Management Man	DTC	engine is not in ready state (which is active	ī	Additional Basic Enable Conditions						
Size Calcular Uniform Control	P0300 - Engine Misfire Detected	when the ignition is on or following a stall of the engine)								
The Control Workshould be all the co	P0301 - Cylinder 1 Misfire Detected	when the ignition is on or following a stall of the engine)								
Will Control March Control Mar	P0302 - Cylinder 2 Misfire Detected	when the ignition is on or following a stall of the engine)								
The Control Marke Control Section	P0303 - Cylinder 3 Misfire Detected	when the ignition is on or following a stall of the engine)								
See Confusion State Control of State Con	P0304 - Cylinder 4 Misfire Detected	when the ignition is on or following a stall of the engine)								
Will Coulom Plant Service County of the Coun	P0305 - Cylinder 5 Misfire Detected	when the ignition is on or following a stall of the engine)								
Fig. Contact Plance Bases Register Contact Plance Bases Regi	P0306 - Cylinder 6 Misfire Detected	when the ignition is on or following a stall of								
Fig. 5. Coulsing the filted between the county of the coun	P0307 - Cylinder 7 Misfire Detected	when the ignition is on or following a stall of								
Consideration of the Considera	P0308 - Cylinder 8 Misfire Detected	when the ignition is on or following a stall of								
White County in the County in			occurs after ECM initialization or following after-run)	speed is greater than 600 to 850 rpm when the ignition is on or following a stall of the engine)						
See			occurs after ECM initialization or following after-run)	speed is greater than 600 to 850 rpm when the ignition is on or following a stall of the engine)						
Some different control and proposed years that to good a second with CPU And Assessment or Hollows 2 Count of the CPU And Assessment or Hollows 2 Count of the CPU And Assessment or Hollows 2 Count of the CPU And Assessment or Hollows 2 Count of the CPU And Assessment or Hollows 2 Count of the CPU And Assessment or Hollows 2 Count of the CPU And Assessment or Hollows 2 Count of the CPU And Assessment or Hollows 2 Count of the CPU And Assessment or Hollows 2 Count of the CPU And Assessment or Hollows 2 Count of the CPU And Assessment or Hollows 2 Count of the CPU And Assessment or Hollows 2 Count of the CPU And Assessment or Hollows 2 Count of the CPU And Assessment or Hollows 2 Count of the CPU And Assessment or Hollows 2 Count of the CPU And Assessment or Hollows 2 Count of the CPU And Assessment or Hollows 2 Count of the CPU And Assessment or Hollows 2 Count of the CPU And Assessment or Hollows 2 Count of the CPU And Assessment or Hollows 2 Count of the CPU And Assessment or Hollows 2 Count of the CPU And Assessment or Hollows 2 Count of the CPU And Assessment or Hollows 2 Count of the CPU And Assessment or Hollows 2 Count of the CPU And Assessment or Hollows 2 Count of the CPU And Assessment or Hollows 2 Count of the CPU And Assessment or Hollows 2 Count of the CPU And Assessment or Hollows 2 Count of the CPU And Assessment or Hollows 2 Count of the CPU And Assessment or Hollows 2 Count of the CPU And Assessment or Hollows 2 Count of the CPU And Assessment or Hollows 2 Count of the CPU And Assessment or Hollows 2 Count of the CPU And Assessment or Hollows 2 Count of the CPU And Assessment or Hollows 2 Count of the CPU And Assessment or Hollows 2 Count of the CPU And Assessment or Hollows 2 Count of the CPU And Assessment or Hollows 2 Count of the CPU And Assessment or Hollows 2 Count of the CPU And Assessment or Hollows 2 Count of the CPU And Assessment or Hollows 2 Count of the CPU And Assessment or Hollows 2 Count of the CPU And Assessment or Hollows 2 Count of the CPU And Assessment or Hollows 2 Count of t			occurs after ECM initialization or following after-run)	speed is greater than 600 to 850 rpm when the ignition is on or following a stall of the engine)						
Desil Information Control Cont			occurs after ECM initialization or following after-run)	when the ignition is on or following a stall of						
Egins speed greater from 0.00 to 50 to 50 ml control form for the speed greater from 0.00 to 50 to 50 ml control form for the speed greater from 0.00 to 50 to 50 ml control form for the speed greater from 0.00 to 50 to 50 ml control form for the speed greater from 0.00 to 50 to 50 ml control form for the speed greater from 0.00 to 50 to 50 ml control form for the speed greater from 0.00 to 50 to 50 ml control form for the speed greater from 0.00 to 50 to 50 ml control form for the speed greater from 0.00 to 50 to 50 ml control form for the speed greater from 0.00 to 50 to 50 ml control form for the speed greater from 0.00 to 50 to 50 ml control form for the speed greater from 0.00 to 50 to 50 ml control form for the speed greater from 0.00 to 50 to 50 ml control form for the speed greater from 0.00 to 50 to 50 ml control form for the speed greater from 0.00 to 50 to 50 ml control for the speed greater from 0.00 to 50 to 50 ml control form for the speed greater from 0.00 to 50 ml control form for the speed greater from 0.00 to 50 ml control form for the speed greater from 0.00 to 50 ml control form for the speed greater from 0.00 to 50 ml control form for the speed greater from 0.00 to 50 ml control form for the speed greater from 0.00 to 50 ml control form for the speed greater from 0.00 to 50 ml control form for the speed greater from 0.00 to 50 ml control form for the speed greater from 0.00 to 50 ml control form for the speed greater from 0.00 to 50 ml control form for the speed greater from 0.00 to 50 ml control form for the speed greater from 0.00 to 50 ml control form for the speed greater from 0.00 to 50 ml control form for the speed greater from 0.00 to 50 ml control form for the speed greater from 0.00 to 50 ml control form for the speed greater from 0.00 to 50 ml control form for the speed greater from 0.00 to 50 ml control form for the speed greater from 0.00 to 50 ml control form for the speed greater from 0.00 to 50 ml control form for the speed greater from 0.00 to 50 ml control form for the speed			occurs after ECM initialization or following	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						_
Figure 2 for detailed and Engineer and the Engineer and t			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	when the ignition is on or following a stall of	
Eggive for at all attraction floods (positive and positive and positiv			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 not in ready state (which is active when the ignition is on or following a stall of the engine)
POIGS - Enhant Cas Recrolation Poison Service Croat law Poison Service	P0402 - Exhaust Gas Recirculation Flow Excessive		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 not in ready state (which is active when the ignition is on or following a stall of the engine)
Position Sensor Circuit Low General Control Co		occurs after ECM initialization or following	battery voltage is above 11 V for at least 3s							
Engine speed greater than 600 to 850 pm Debtor Settlem Settle			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		when the ignition is on or following a stall o	f		
Eggine speed greater than 600 to 850 pm Foliable Figure speed greater than 600 to 850 pm Foliable Figure speed greater than 600 to 850 pm Foliable Figure speed greater than 600 to 850 pm Foliable Figure speed greater than 600 to 850 pm Foliable Figure speed greater than 600 to 850 pm Foliable Figure speed greater than 600 to 850 pm Foliable Figure speed greater than 600 to 850 pm Foliable Figure speed greater than 600 to 850 pm Foliable Figure speed greater than 600 to 850 pm Foliable Figure speed greater than 600 to 850 pm Foliable Figure speed greater than 600 to 850 pm Foliable Figure speed greater than 600 to 850 pm Foliable Figure speed greater than 600 to 850 pm Foliable Figure speed greater than 600 to 850 pm Foliable Figure speed greater than 600 to 850 pm Foliable Figure speed greater than 600 to 850 pm Foliable Figure speed greater than 600 to 850 pm Foliable Figure speed greater than 600 to 850 pm Foliable Figure speed greater than 600 to 850 pm Foliable Figure speed greater than 600 to 850 pm Foliable Figure speed greater than 600 to 850 pm Foliable Figure speed greater than 600 to 850 pm Foliable Figure speed greater than 600 to 850 pm Foliable Figure speed greater than 600 to 850 pm Foliable Figure speed greater than 600 to 850 pm Foliable Figure speed greater than 600 to 850 pm Foliable Figure speed greater than 600 to 850 pm Foliable Figure speed greater than 600 to 850 pm Foliable Figure speed greater than 600 to 850 pm Foliable Figure speed greater than 600 to 850 pm Foliable Figure speed greater than 600 to 850 pm Foliable Figure speed greater than 600 to 850 pm Foliable Figure speed greater than 600 to 850 pm Foliable Figure speed greater than 600 to 850 pm Foliable Figure speed greater than 600 to 850 pm Foliable Figure speed greater than 600 to 850 pm Foliable Figure speed greater than 600 to 850 pm Foliable Figure speed greater than 600 to 850 pm Foliable Figure speed greater than 600 to 850 pm Foliable Figure speed greater than 600 to 850 pm Foliable Figure speed greater than 600 to 850			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		when the ignition is on or following a stall o	f		
Eggin expected than 0 rpm) Engine speed greater than 600 to 850 rpm En	(EGR) Temperature Sensor 2 Circuit		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		when the ignition is on or following a stall o	t t		
Correlation engine speed greater than 10 pm) POHI C - Exhaust Gas Rectorulation (EGN) Temperature Series of Circuit Low Voltage Engine not in afternum mode (defined as engine speed greater than 60 to 850 pm to indicate the engine) Engine speed greater than 60 to 850 pm to in standby state (standby state cours after EAM initialization or following a state of the engine speed greater than 60 to 850 pm to indicate the engine is not in standby state (standby state cours after EAM initialization or following a state of the engine speed greater than 60 to 850 pm to indicate the engine is numing) POHI D - Exhaust Gas Rectorulation (EGN) Temperature Series of Circuit High Voltage Engine not in afternum mode (defined as engine speed greater than 60 to 850 pm to indicate the engine is not in standby state (standby state cours after EAM initialization or following a state of the engine) Engine speed greater than 60 to 850 pm to in standby state (which is active depine speed greater than 60 to 850 pm to indicate the engine is numing) Engine speed greater than 60 to 850 pm to indicate the engine is numing which means the engine engine is not in ready state (which is active depine speed greater than 60 to 850 pm to indicate the engine is numing) Engine speed greater than 60 to 850 pm to indicate the engine is numing which means the engine is not in ready state (which is active depine speed greater than 60 to 850 pm to indicate the engine is numing) Engine speed greater than 60 to 850 pm to indicate the engine is numing which means the engine is not in ready state (which is active depine speed greater than 60 to 850 pm to indicate the engine is numing) Engine speed greater than 60 to 850 pm to indicate the engine is numing which means the engine is numing w	(EGR) Temperature Sensor 2 Circuit		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		when the ignition is on or following a stall o	t t		
EGBI reperature Serient of Circuit Lovo Voltage Engine speed greater than 600 to 850 rpm Engine s turning which flears the engine is not in ready state of	(EGR) Temperature Sensor 1-2		Engine speed greater than 600 to 850 rpm		when the ignition is on or following a stall of		•	-		
(EGR) Temperature Sensor 1 Circuit High Voltage congrises speed greater than 0 (to 850 rpm) cocurs after ECM initialization or following a stat of speed greater than 0 (to 850 rpm) cocurs after ECM initialization or following a stat of speed greater than 0 (to 850 rpm) cocurs after ECM initialization or following a stat of speed greater than 0 (to 850 rpm) cocurs after ECM initialization or following a stat of speed greater than 0 (to 850 rpm) cocurs after ECM initialization or following a stat of speed greater than 0 (to 850 rpm) cocurs after ECM initialization or following a stat of speed greater than 0 (to 850 rpm) cocurs after ECM initialization or following a stat of speed greater than 0 (to 850 rpm) cocurs after ECM initialization or following a stat of speed greater than 0 (to 850 rpm) cocurs after ECM initialization or following a stat of speed greater than 0 (to 850 rpm) cocurs after ECM initialization or following a stat of speed greater than 0 (to 850 rpm) cocurs after ECM initialization or following a stat of speed greater than 0 (to 850 rpm) cocurs after ECM initialization or following a stat of speed greater than 0 (to 850 rpm) cocurs after ECM initialization or following a stat of speed greater than 0 (to 850 rpm) cocurs after ECM initialization or following a stat of speed greater than 0 (to 850 rpm) cocurs after ECM initialization or following a stat of speed greater than 0 (to 850 rpm) cocurs after ECM initialization or following a stat of speed greater than 0 (to 850 rpm) cocurs after ECM initialization or following a stat of speed greater than 0 (to 850 rpm) cocurs after ECM initialization or following a stat of speed greater than 0 (to 850 rpm) cocurs after ECM initialization or following a stat of speed greater than 0 (to 850 rpm) cocurs after ECM initialization or following a stat of speed greater than 0 (to 850 rpm) cocurs after ECM initialization or following a stat of speed greater than 0 (to 850 rpm) cocurs after ECM initialization or following a stat of speed greater than 0 (to 850 r	(EGR) Temperature Sensor 1 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 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	t f		
engine is not in standby state (standby state	(EGR) Temperature Sensor 1 Circuit		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	t f		
PD400 - NMEC Catalyst Efficiency Below The Gradient Catal	P0420 - NMHC Catalyst Efficiency Below Threshold Bank 1	Engine not in afterrun mode (defined as engine speed greater than 0 rpm)	Engine speed greater than 600 to 850 rpm	engine is not in standby state (standby state occurs after ECM initialization or following after-run) ambient air temperature is above -7 deg 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)		when the ignition is on or following a stall of		

			Additional Deals Freshie Conditions					
DIC			Additional Basic Enable Conditions					
P0461 - Fuel Level Sensor Performance	Engine not in afterrun mode (defined as engine speed greater than 0 rpm)	Engine speed greater than 600 to 850 rpm	engine is not in standby state (standby state occurs after ECM initialization or following after-run)	battery voltage is above 11 V for at least 3s	Engine Run Time greater than 10 seconds (engine speed greater than 600 to 850 rpm to indicate the engine is running)	Engine is running which means the engine speed is greater than 600 to 850 rpm	engine is not in ready state (which is active when the ignition is on or following a stall of the engine)	
P0462 - Fuel Level Sensor Circuit Low	Engine not in afterrun mode (defined as engine speed greater than 0 rpm)	Engine speed greater than 600 to 850 rpm	engine is not in standby state (standby state occurs after ECM initialization or following after-run)	battery voltage is above 11 V for at least 3s	Engine Run Time greater than 10 seconds (engine speed greater than 600 to 850 rpm to indicate the engine is running)	Engine is running which means the engine speed is greater than 600 to 850 rpm	engine is not in ready state (which is active when the ignition is on or following a stall of the engine)	
P0463 - Fuel Level Sensor Circuit High	Engine not in afterrun mode (defined as engine speed greater than 0 rpm)	Engine speed greater than 600 to 850 rpm	engine is not in standby state (standby state occurs after ECM initialization or following after-run)	battery voltage is above 11 V for at least 3s	Engine Run Time greater than 10 seconds (engine speed greater than 600 to 850 rpm to indicate the engine is running)	Engine is running which means the engine speed is greater than 600 to 850 rpm	engine is not in ready state (which is active when the ignition is on or following a stall of the engine)	
P046C - Exhaust Gas Recirculation(EGR) Position Sensor Performance	Engine not in afterrun mode (defined as engine speed greater than 0 rpm)	Engine speed greater than 600 to 850 rpm	engine is not in standby state (standby state occurs after ECM initialization or following after-run)	battery voltage is above 11 V for at least 3s	Engine is running which means the engine speed is greater than 600 to 850 rpm	engine is not in ready state (which is active when the ignition is on or following a stall of the engine)		•
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	after-run)	battery voltage is above 11 V for at least 3s						
P0490 - Exhaust Gas Recirculation (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						•
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	engine is not in standby state (standby state occurs after ECM initialization or following after-run)	battery voltage is above 11 V for at least 3s	Engine Run Time greater than 10 seconds (engine speed greater than 600 to 850 rpm to indicate the engine is running)	Engine is running which means the engine speed is greater than 600 to 850 rpm	engine is not in ready state (which is active when the ignition is on or following a stall of the engine)	
P0545 - 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	engine is not in standby state (standby state occurs after ECM initialization or following after-run)	battery voltage is above 11 V for at least 3s	Engine is running which means the engine speed is greater than 600 to 850 rpm			•
P0546 - 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)	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			
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		Manufacturer Enable Counter is zero (value of 0 means ECM is locked and out of assembly plant mode)	battery voltage is above 11 V for at least 3s	Engine Run Time greater than 10 seconds (engine speed greater than 600 to 850 rpm to indicate the engine is running)	Engine is running which means the engine speed is greater than 600 to 850 rpm	engine is not in ready state (which is active when the ignition is on or following a stall of the engine)
P0575 - Cruise Control Input Circuit	Engine not in afterrun mode (defined as engine speed greater than 0 rpm)	Engine speed greater than 600 to 850 rpm	engine is not in standby state (standby state occurs after ECM initialization or 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 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)		
P0627 - Fuel Pump Relay Control Circuit	battery voltage is above 11 V for at least 3s							
P0628 - Fuel Pump Relay Control	battery voltage is above 11 V for at least 3s	1						
Circuit Low P0629 - Fuel Pump Relay Control	battery voltage is above 11 V for at least 3s	+						
Circuit High 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)	battery voltage is above 11 V for at least 3s						

DTC	engine is not in standby state (standby state		Additional Basic Enable Conditions	-			
P064C - Glow Plug Control Module Performance	occurs after ECM initialization or following after-run)	battery voltage is above 11 V for at least 3s					
P0650 - Malfunction Indicator Lamp Control Circuit	Engine not in afterrun mode (defined as engine speed greater than 0 rpm) engine is not in standby state (standby state	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	gine is running which means the engine speed is greater than 600 to 850 rpm			
P0651 - 5 Volt Reference 2 Circuit	occurs after ECM initialization or following 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	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)						1
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 cocurs after ECM initialization or following after-run)	gine Run Time greater than 10 seconds igine speed greater than 600 to 850 rpm to indicate the engine is running)	Engine is running which means the engine speed is greater than 600 to 850 rpm	engine is not in ready state (which is active when the ignition is on or following a stall of the engine)	
P1044 - Reductant Pump High Control Circuit High Voltage	Engine speed greater than 600 to 850 rpm	engine is not in standby state (standby state occurs after ECM initialization or following after-run)	Engine Run Time greater than 10 seconds (engine speed greater than 600 to 850 rpm to indicate the engine is running)	gine 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)	tery 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)	tery 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	gine 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)		gine is running which means the engine speed is greater than 600 to 850 rpm			
P10CE - Exhaust Aftertreatment Fuel Injector High Control Circuit High Voltage	Engine not in afterrun mode (defined as engine speed greater than 0 rpm)	engine is not in standby state (standby state occurs after ECM initialization or following after-run)	battery voltage is above 11 V for at least 3s	gine 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	after-run)	gine 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)		
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	after-run)	gine 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)		
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		gine 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)		

			Additional Basic Enable Conditions								
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	engine is not in standby state (standby state M 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 s (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)			
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 M 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 s (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)			
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)		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 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)			
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 Moccurs after ECM initialization or following after-run)		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 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)			
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)		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 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)			
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 Moccurs after ECM initialization or following after-run)		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 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)			
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 Moccurs after ECM initialization or following after-run)	fanufacturer 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	Engine Run Time greater than 10 seconds ss (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 Moccurs after ECM initialization or following after-run)	fanufacturer 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	Engine Run Time greater than 10 seconds se (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)
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 Moccurs after ECM initialization or following after-run)		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)	System is not in active regeneration mod	Engine is running which means the engine speed is greater than 600 to 850 rpm	engine is not in ready state (which is active when the ignition is on or following a stall of the engine)		
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 M occurs after ECM initialization or following after-run)	fanufacturer 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)	System is not in active regeneration mod	Engine is running which means the engine speed is greater than 600 to 850 rpm	engine is not in ready state (which is active when the ignition is on or following a stall of the engine)		
P122C - Intake Air Flow Valve Control Circuit Shorted	engine is not in standby state (standby state occurs after ECM initialization or following	battery voltage is above 11 V for at least 3s									
P122D - Diesel Intake Air Flow Position Sensor Exceeded Learning Limit	after-run) engine is not in standby state (standby state occurs after ECM initialization or following after-run)	battery voltage is above 11 V for at least 3s									
P122E - Intake Air Flow Valve Control Circuit 2 Low Voltage	engine is not in standby state (standby state occurs after ECM initialization or following after-run)	battery voltage is above 11 V for at least 3s									
P122F - Intake Air Flow Valve Control Circuit 2 High Voltage	engine is not in standby state (standby state	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	engine is not in standby state (standby state occurs after ECM initialization or following after-run)	battery voltage is above 11 V for at least 3s	Engine is running which means the engine speed is greater than 600 to 850 rpm							
P125B - Fuel Pressure Regulator 2 High Control Circuit High Voltage	occurs after ECM initialization or following after-run)										
P128E - Fuel Rail Pressure Performance	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 standby state (standby state		,								
P1407 - Exhaust Gas Recirculation (EGR) Motor Control Circuit Shorted		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 second s (engine speed greater than 600 to 850 rps to indicate the engine is running)	s 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)	re of
P140C - Exhaust Gas Recirculation Slow Response-Decreasing Flow	Engine not in afterrun mode (defined as engine speed greater than 0 rpm)	Engine speed greater than 600 to 850 rpm	engine is not in standby state (standby state occurs after ECM initialization or following after-run)	ambient air temperature is above -7 deg C	ambient pressure is above 74.8kPa	battery voltage is above 11 V for at least 3s	Engine Run Time greater than 10 seconds (engine speed greater than 600 to 850 rpi to indicate the engine is running)	s 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)	re of
P140D - Exhaust Gas Recirculation (EGR) Motor Control Circuit 2 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									
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									
P144B - Closed Loop Diesel Particulate Filter (DPF) Regeneration Control At Limit - Stage 1 Temperature Too Low	Engine not in afterrun mode (defined as engine speed greater than 0 rpm)	Engine speed greater than 600 to 850 rpm	engine is not in standby state (standby state occurs after ECM initialization or following after-run)	Engine Run Time greater than 10 seconds engine speed greater than 600 to 850 rpm to indicate the engine is running)	Engine is running which means the engine speed is greater than 600 to 850 rpm	engine is not in ready state (which is active when the ignition is on or following a stall of the engine)					
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 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	engine is not in standby state (standby state	1	Additional Basic Enable Conditions		•			
P154A - Intake Air (IA) Heater Feedback Circuit	occurs after ECM initialization or following after-run)	battery voltage is above 11 V for at least 3s	3					
P154B - Intake Air (IA) Heater Voltage Signal Circuit	engine is not in standby state (standby state occurs after ECM initialization or following after-run)	battery voltage is above 11 V for at least 3s	3					
P154C - Intake Air (IA) Heater Current Signal Circuit	engine is not in standby state (standby state occurs after ECM initialization or following after-run)	battery voltage is above 11 V for at least 3s	3					
P154D - Intake Air (IA) Heater Temperature Signal Circuit	engine is not in standby state (standby state occurs after ECM initialization or following after-run)	battery voltage is above 11 V for at least 3s	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)	battery voltage is above 11 V for at least 3s						
P161A - Glow Plug Control Module Not Programed	engine is not in standby state (standby state occurs after ECM initialization or following after-run)	battery voltage is above 11 V for at least 3s						
P1631 - Theft Deterrent Fuel Enable Signal Not Correct	Engine not in afterrun mode (defined as engine speed greater than 0 rpm)	engine is not in standby state (standby state occurs after ECM initialization or following after-run)	Manufacturer Enable Counter is zero (value of 0 means ECM is locked and out of assembly plant mode)					
P163C - Glow Plug Control Module Primary Circuit	engine is not in standby state (standby state occurs after ECM initialization or following after-run)	battery voltage is above 11 V for at least 3s	3	_				
P163D - Glow Plug Control Module Secondary Circuit	Engine not in afterrun mode (defined as engine speed greater than 0 rpm)	engine is not in standby state (standby state occurs after ECM initialization or following after-run)	battery voltage is above 11 V for at least 3s					
P163E - Glow Plug Control ModuleOvertemperature	engine is not in standby state (standby state occurs after ECM initialization or following after-run)	battery voltage is above 11 V for at least 3s						
P166B - Intake Air (IA) Heater Over Temperature	engine is not in standby state (standby state occurs after ECM initialization or following after-run)	battery voltage is above 11 V for at least 3s	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	engine is not in standby state (standby state occurs after ECM initialization or following after-run)	battery voltage is above 11 V for at least 3s	Engine is running which means the engine speed is greater than 600 to 850 rpm			
P2033 - Exhaust Gas Temperature (EGT) Sensor 2 Circuit High Voltage	Engine not in afterrun mode (defined as engine speed greater than 0 rpm)	Engine speed greater than 600 to 850 rpm	engine is not in standby state (standby state occurs after ECM initialization or following after-run)	battery voltage is above 11 V for at least 3s	Engine is running which means the engine speed is greater than 600 to 850 rpm			
P203B - Reductant Level Sensor 1 Performance	Engine not in afterrun mode (defined as engine speed greater than 0 rpm)	Engine speed greater than 600 to 850 rpm	engine is not in standby state (standby state occurs after ECM initialization or following after-run)	battery voltage is above 11 V for at least 3s	Status of the Reductant Tank is not Frozen which means ambient air temperature is >= 7°C and the 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 running which means the engine speed is greater than 600 to 850 rpm	engine is not in ready state (which is active when the ignition is on or following a stall of the engine)	
P203D - Reductant Level Sensor 1 Circuit High	Engine not in afterrun mode (defined as engine speed greater than 0 rpm)	Engine speed greater than 600 to 850 rpm	engine is not in standby state (standby state occurs after ECM initialization or following after-run)	battery voltage is above 11 V for at least 3s	Engine Run Time greater than 10 seconds (engine speed greater than 600 to 850 rpm to indicate the engine is running)	Engine is running which means the engine speed is greater than 600 to 850 rpm	engine is not in ready state (which is active when the ignition is on or following a stall of the engine)	
P2047 - Reductant Injector Control Circuit	Engine not in afterrun mode (defined as engine speed greater than 0 rpm)	Engine speed greater than 600 to 850 rpm	engine is not in standby state (standby state occurs after ECM initialization or following after-run)	battery voltage is above 11 V for at least 3s	Engine Run Time greater than 10 seconds (engine speed greater than 600 to 850 rpm to indicate the engine is running)	Engine is running which means the engine speed is greater than 600 to 850 rpm	engine is not in ready state (which is active when the ignition is on or following a stall of the engine)	
P2048 - Reductant Injector Control Circuit Low Voltage	Engine not in afterrun mode (defined as engine speed greater than 0 rpm)	Engine speed greater than 600 to 850 rpm	engine is not in standby state (standby state occurs after ECM initialization or following after-run)	battery voltage is above 11 V for at least 3s	Engine Run Time greater than 10 seconds (engine speed greater than 600 to 850 rpm to indicate the engine is running)	Engine is running which means the engine speed is greater than 600 to 850 rpm	engine is not in ready state (which is active when the ignition is on or following a stall of the engine)	
P2049 - Reductant Injector Control Circuit High Voltage	Engine not in afterrun mode (defined as engine speed greater than 0 rpm)	Engine speed greater than 600 to 850 rpm	engine is not in standby state (standby state occurs after ECM initialization or following after-run)	battery voltage is above 11 V for at least 3s	Engine Run Time greater than 10 seconds (engine speed greater than 600 to 850 rpm to indicate the engine is running)	Engine is running which means the engine speed is greater than 600 to 850 rpm	engine is not in ready state (which is active when the ignition is on or following a stall of the engine)	
P204B - Reductant Pump Pressure Sensor Performance	engine is not in standby state (standby state occurs after ECM initialization or following after-run)							-
P204C - Reductant Pump Pressure Sensor Circuit Low	Engine not in afterrun mode (defined as engine speed greater than 0 rpm)	Engine speed greater than 600 to 850 rpm	engine is not in standby state (standby state occurs after ECM initialization or following after-run)	battery voltage is above 11 V for at least 3s	Engine Run Time greater than 10 seconds (engine speed greater than 600 to 850 rpm to indicate the engine is running)	Engine is running which means the engine speed is greater than 600 to 850 rpm	engine is not in ready state (which is active when the ignition is on or following a stall of the engine)	
P204D - Reductant Pump Pressure Sensor Circuit High	engine is not in standby state (standby state occurs after ECM initialization or following after-run)							-
P204F - Reductant System Performance Bank 1 (cannot build pump pressure)	SCR Reductant Level not in restriction or empty level state (see reductant level warning definition)	Engine not in afterrun mode (defined as engine speed greater than 0 rpm)		after-run)	battery voltage is above 11 V for at least 3s	Engine Run Time greater than 10 seconds (engine speed greater than 600 to 850 rpm to indicate the engine is running)	Engine is running which means the engine speed is greater than 600 to 850 rpm	engine is not in ready state (which is active when the ignition is on or following a stall of the engine)
P205B - Reductant Tank Temperature Sensor Performance	Engine not in afterrun mode (defined as engine speed greater than 0 rpm)	Engine speed greater than 600 to 850 rpm		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)	
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DTC			Additional Basic Enable Conditions				
P205C - Reductant Tank Temperature Sensor Circuit Low	Engine not in afterrun mode (defined as engine speed greater than 0 rpm)	Engine speed greater than 600 to 850 rpm	engine is not in standby state (standby state occurs after ECM initialization or following after-run)	battery voltage is above 11 V for at least 3s	Engine Run Time greater than 10 seconds (engine speed greater than 600 to 850 rpm to indicate the engine is running)	speed is greater than 600 to 850 rpm	engine is not in ready state (which is active when the ignition is on or following a stall of the engine)
P205D - Reductant Tank Temperature Sensor Circuit High	Engine not in afterrun mode (defined as engine speed greater than 0 rpm)	Engine speed greater than 600 to 850 rpm	engine is not in standby state (standby state occurs after ECM initialization or following after-run)	battery voltage is above 11 V for at least 3s	Engine Run Time greater than 10 seconds (engine speed greater than 600 to 850 rpm to indicate the engine is running)	Engine is running which means the engine speed is greater than 600 to 850 rpm	engine is not in ready state (which is active when the ignition is on or following a stall of the engine)
P2080 - Exhaust Temperature Sensor 1 Performance	Engine speed greater than 600 to 850 rpm	Manufacturer Enable Counter is zero (value of 0 means ECM is locked and out of assembly plant mode)	e Engine Run Time greater than 10 seconds (engine speed greater than 600 to 850 rpm to indicate the engine is running)	Engine is running which means the engine speed is greater than 600 to 850 rpm	engine is not in ready state (which is active when the ignition is on or following a stall of the engine)		
P2084 - Exhaust Temperature Sensor 2 Performance	Engine speed greater than 600 to 850 rpm	Manufacturer Enable Counter is zero (value of 0 means ECM is locked and out of assembly plant mode)	Engine Run Time greater than 10 seconds (engine speed greater than 600 to 850 rpm to indicate the engine is running)	Engine is running which means the engine speed is greater than 600 to 850 rpm	engine is not in ready state (which is active when the ignition is on or following a stall of the engine)		
P208A - Reductant Pump Control Circuit	Engine not in afterrun mode (defined as engine speed greater than 0 rpm)	Engine speed greater than 600 to 850 rpm	engine is not in standby state (standby state occurs after ECM initialization or following after-run)	battery voltage is above 11 V for at least 3s	Engine Run Time greater than 10 seconds (engine speed greater than 600 to 850 rpm to indicate the engine is running)		engine is not in ready state (which is active when the ignition is on or following a stall of the engine)
P208B - Reductant Pump Performance	engine is not in standby state (standby state occurs after ECM initialization or following after-run)	Manufacturer Enable Counter is zero (value of 0 means ECM is locked and out of assembly plant mode)	battery voltage is above 11 V for at least 3s	Status of the Reductant Tank is not Frozen which means ambient air temperature is >= 7°C and the reductatn tank temperature is >= -7°C			_
P208D - Reductant Pump Control Circuit High Voltage	Engine not in afterrun mode (defined as engine speed greater than 0 rpm)	Engine speed greater than 600 to 850 rpm		Engine 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)	
P20A0 - Reductant Purge Valve Control Circuit	Engine not in afterrun mode (defined as engine speed greater than 0 rpm)	Engine speed greater than 600 to 850 rpm	engine is not in standby state (standby state occurs after ECM initialization or following after-run)	Engine Run Time greater than 10 seconds (engine speed greater than 600 to 850 rpm to indicate the engine is running)	Engine is running which means the engine speed is greater than 600 to 850 rpm	engine is not in ready state (which is active when the ignition is on or following a stall of the engine)	
P20A1 - Reductant Purge Valve Performance	engine is not in standby state (standby state occurs after ECM initialization or following after-run)	battery voltage is above 11 V for at least 3s	3				_
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	occurs after ECM initialization or following after-run)	to indicate the engine is running)	Engine is running which means the engine speed is greater than 600 to 850 rpm	engine is not in ready state (which is active when the ignition is on or following a stall of the engine)	
P20A3 - Reductant Purge Valve Control Circuit High Voltage	Engine not in afterrun mode (defined as engine speed greater than 0 rpm)	Engine speed greater than 600 to 850 rpm	engine is not in standby state (standby state occurs after ECM initialization or following after-run)	Engine is running which means the engine speed is greater than 600 to 850 rpm	engine is not in ready state (which is active when the ignition is on or following a stall of the engine)		-
P20B9 - Reductant Heater 1 Control Circuit	engine is not in standby state (standby state occurs after ECM initialization or following	battery voltage is above 11 V for at least 3s	3			<u>.</u>	
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)	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]
P20BB - Reductant Heater 1 Control Circuit Low	after-run)	battery voltage is above 11 V for at least 3s	3				
P20BC - Reductant Heater 1 Control Circuit High	after-run)	battery voltage is above 11 V for at least 3s	3				
P20BD - Reductant Heater 2 Control Circuit	engine is not in standby state (standby state occurs after ECM initialization or following after-run)	battery voltage is above 11 V for at least 3s	3				
P20BF - Reductant Heater 2 Control Circuit Low	engine is not in standby state (standby state	battery voltage is above 11 V for at least 3s	3				
P20C0 - Reductant Heater 2 Control Circuit High	occurs after ECM initialization or following after-run)	battery voltage is above 11 V for at least 3s	3				
P20C1 - Reductant Heater 3 Control Circuit	after-run)	battery voltage is above 11 V for at least 3s	3				
P20C3 - Reductant Heater 3 Control Circuit Low	after-run)	battery voltage is above 11 V for at least 3s	3				
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	3		_		
P20CB - Exhaust Aftertreatment Fuel Injector Control Circuit	Engine not in afterrun mode (defined as engine speed greater than 0 rpm)	engine is not in standby state (standby state occurs after ECM initialization or following after-run)	battery voltage is above 11 V for at least 3s	Engine is running which means the engine speed is greater than 600 to 850 rpm			
P20CC - Exhaust Aftertreatment Fuel Injector Performance	Engine not in afterrun mode (defined as engine speed greater than 0 rpm)	Engine speed greater than 600 to 850 rpm	engine is not in standby state (standby state occurs after ECM initialization or following after-run)	Engine is running which means the engine speed is greater than 600 to 850 rpm	engine is not in ready state (which is active when the ignition is on or following a stall of the engine)		
P20CD - Exhaust Aftertreatment Fuel Injector Control Circuit Low Voltage	Engine not in afterrun mode (defined as engine speed greater than 0 rpm)	engine is not in standby state (standby state occurs after ECM initialization or following after-run)		Engine is running which means the engine speed is greater than 600 to 850 rpm		-	
P20CE - Exhaust Aftertreatment Fuel Injector Control Circuit High Voltage	Engine not in afterrun mode (defined as engine speed greater than 0 rpm)	engine is not in standby state (standby state occurs after ECM initialization or following after-run)		Engine is running which means the engine 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	engine is not in ready state (which is active when the ignition is on or following a stall of the engine)		

Section Section 1 Section	DTC			Additional Rasic Enable Conditions								
Service Servic	DIC		1	- I - I - I - I - I - I - I - I - I - I			L	T				
Well with the control of the control		empty level state (see parameter definitions	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	battery voltage is above 11 V for at least 3:	s seconds (engine speed greater than 600 to		when the ignition is on or following a stall of			
The Control of Control		empty level state (see parameter definitions		Engine speed greater than 600 to 850 rpm	occurs after ECM initialization or following	battery voltage is above 11 V for at least 3	s seconds (engine speed greater than 600 to	speed is greater than 600 to 850 rpm	when the ignition is on or following a stall of			
The color of the		empty level state (see reductant level	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	of 0 means ECM is locked and out of	e battery voltage is above 11 V for at least 3	which means ambient air temperature is >= 7°C and the reductatn tank temperature is	(engine speed greater than 600 to 850 rpm		when the ignition is on or following a stall of	
Section 1.		empty level state (see parameter definitions	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	battery voltage is above 11 V for at least 3:	s seconds (engine speed greater than 600 to	annual is greater than 600 to 950 rpm	when the ignition is on or following a stall of			
Part		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		(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				
Part			Engine speed greater than 600 to 850 rpm	occurs after ECM initialization or following		(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				
Count from the count of present and the count		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		(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				
POST - No. Server Cream Search Search Cream Se			Engine speed greater than 600 to 850 rpm	occurs after ECM initialization or following		(engine speed greater than 600 to 850 rpm		when the ignition is on or following a stall of		_		
Expert of the Special part of the Company to the greater than (CO to 150		empty level state (see parameter definitions	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	battery voltage is above 11 V for at least 3:	s seconds (engine speed greater than 600 to	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			
Egine and in alternation of the gradient and the gradient			Engine speed greater than 600 to 850 rpm	occurs after ECM initialization or following	of 0 means ECM is locked and out of	battery voltage is above 11 V for at least 3	s (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			
Formation 1 and a finished 1 and 1 a			Engine speed greater than 600 to 850 rpm	occurs after ECM initialization or following	of 0 means ECM is locked and out of		s (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			
P200 - Not Heaster Control college for the Performance (active for the Performance for			Engine speed greater than 600 to 850 rpm	occurs after ECM initialization or following	of 0 means ECM is locked and out of	battery voltage is above 11 V for at least 3	s (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			
Engine speed greater than 600 to 850 pm occurs after ECM initialization or following a stall of seasons (supply Voltage out of Rampe Bank 1 Sensor 2 2004 ON			Engine speed greater than 600 to 850 rpm	occurs after ECM initialization or following	of 0 means ECM is locked and out of		s (engine speed greater than 600 to 850 rpm		when the ignition is on or following a stall of			
P221C - Reductant Heater 2 Current To Low P221D - Reductant Heater 4 Current To Heater 4 Current To Low P221D - Reductant Heater 4 Current To Low P221D - Reductant Heater 5 Current To Low P221D - Reductant Heater 5 Current To Low P221D - Reductant Heater 4 Current To Low P221D - Reductant Heater 5 Current To Low P221D		engine speed greater than 0 rpm)	Engine speed greater than 600 to 850 rpm	occurs after ECM initialization or following	of 0 means ECM is locked and out of	battery voltage is above 11 V for at least 3	s (engine speed greater than 600 to 850 rpm		when the ignition is on or following a stall of			
P21C - Reductant Heater 2 Current To Low 221D - Reductant Level rot in restriction or engine is not in standby state (standby state possible in standby state (standby state) standby sta	P220A - N0x Sensor Supply Voltage Out Of Range Bank 1 Sensor 1	occurs after ECM initialization or following	battery voltage is above 11 V for at least 3	8								
P221D - Reductant Heater 2 Current Too Low P221E - Reductant Heater 3 Current Too Low P221F - Reductant Heat		occurs after ECM initialization or following	battery voltage is above 11 V for at least 3:	s			1	1		7		
P221 - Reductant Heater 3 Current To Low SCR Reductant Level not in restriction or empty level state (see parameter definitions) Engine speed greater than 600 to 850 rpm occurs after ECM initialization or following a state of the engine speed greater than 600 to 850 rpm occurs after ECM initialization or following a state of the engine speed greater than 600 to 850 rpm occurs after ECM initialization or following a state of the engine speed greater than 600 to 850 rpm occurs after ECM initialization or following a state of the engine speed greater than 600 to 850 rpm occurs after ECM initialization or following a state of the engine speed greater than 600 to 850 rpm occurs after ECM initialization or following a state of the engine speed greater than 600 to 850 rpm occurs after ECM initialization or following a state of the engine speed greater than 600 to 850 rpm occurs after ECM initialization or following a state of the engine speed greater than 600 to 850 rpm occurs after ECM initialization or following a state of the engine speed greater than 600 to 850 rpm occurs after ECM initialization or following a state of the engine speed greater than 600 to 850 rpm occurs after ECM initialization or following a state of the engine of the engine speed greater than 600 to 850 rpm occurs after ECM initialization or following a state of the engine of the eng		empty level state (see parameter definitions		Engine speed greater than 600 to 850 rpm	occurs after ECM initialization or following	battery voltage is above 11 V for at least 3:	s seconds (engine speed greater than 600 to	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			
emply level state (see parameter definitions) and the ligition is on or following a stati of sections (engine speed greater than 600 to 850 rpm in the ligition is on or following a stati of sections (engine speed greater than 600 to 850 rpm in the ligition is on or following a stati of sections (engine speed greater than 600 to 850 rpm in the ligition is on or following a stati of sections (engine speed greater than 600 to 850 rpm in the ligition is on or following a stati of sections (engine speed greater than 600 to 850 rpm in the ligition is on or following a stati of sections (engine speed greater than 600 to 850 rpm in the ligition is on or following a stati of sections (engine speed greater than 600 to 850 rpm in the ligition is on or following a stati of sections (engine speed greater than 600 to 850 rpm in the ligition is on or following a stati of sections (engine speed greater than 600 to 850 rpm in the ligition is on or following a stati of sections (engine speed greater than 600 to 850 rpm in the ligition is on or following a stati of sections (engine speed greater than 600 to 850 rpm in the ligition is on or following a stati of sections (engine speed greater than 600 to 850 rpm in the ligition is on or following a stati of sections (engine speed greater than 600 to 850 rpm in the ligition is on or following a stati of sections (engine speed greater than 600 to 850 rpm in the ligition is on or following a stati of sections (engine speed greater than 600 to 850 rpm in the ligition is on or following a stati of sections (engine speed greater than 600 to 850 rpm in the ligition is on or following a stati of sections (engine speed greater than 600 to 850 rpm in the ligition is on or following a stati of sections (engine speed greater than 600 to 850 rpm in the ligition is on or following a stati of sections (engine speed greater than 600 to 850 rpm in the ligition is on or following a station of the ligition of the ligition is on or following a station of the ligition is on or following a station of th		empty level state (see parameter definitions		Engine speed greater than 600 to 850 rpm	occurs after ECM initialization or following		s seconds (engine speed greater than 600 to		when the ignition is on or following a stall of			
P221F - Reductant Heater 3 Current empty long close (defined as Engine not in afterrun mode (defined as Engine not in afterrun mode (defined as Engine not in afterrun mode (defined as Engine not in afterrun mode)		empty level state (see parameter definitions		Engine speed greater than 600 to 850 rpm	occurs after ECM initialization or following	battery voltage is above 11 V for at least 3s	s seconds (engine speed greater than 600 to		when the ignition is on or following a stall of			
tor reductant level warning definition) engine speed greater that in Upril) after-run) as50 rpm to indicate the engine is running) speed in greater than 100 to 000 rpm the engine) the engine)	P221F - Reductant Heater 3 Current Too High	empty level state (see parameter definitions	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	battery voltage is above 11 V for at least 3s	s seconds (engine speed greater than 600 to	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			
P2228 - Barrometric Pressure Sensor Circuit Low Engine speed greater than 0 rpm) Engine is running which means the engine is not in ready state (which is active when the ignion is nor following a stati of the engine) Engine is running which means the engine is possible to represent a representation or following a stati of the engine) Engine is running which means the engine			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				
P2229 - Barrometric Pressure Sensor Circuit High Engine not in afternum mode (defined as engine speed greater than 0 00 to 850 pm engine speed greater than 00 to 850 pm cours after ECM initialization or following a static voltage is above 11 V for at least 3 s (engine speed greater than 600 to 850 pm to indicate the engine sunning which means the engine speed greater than 600 to 850 pm speed greater than 600 to 850 pm to indicate the engine sunning which means the engine speed greater than 600 to 850 pm speed greater than			Engine speed greater than 600 to 850 rpm	occurs after ECM initialization or following		(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				

			Addisonal Paula Fachia Condisiona								
DTC			Additional Basic Enable Conditions				1				
P2263 - Turbo Boost System Performance	Engine not in afterrun mode (defined as engine speed greater than 0 rpm)	Engine speed greater than 600 to 850 rpm	engine is not in standby state (standby state occurs after ECM initialization or following after-run)	battery voltage is above 11 V for at least 3s	Engine Run Time greater than 10 seconds (engine speed greater than 600 to 850 rpm to indicate the engine is running)	Engine is running which means the engine speed is greater than 600 to 850 rpm	engine is not in ready state (which is active when the ignition is on or following a stall of the engine)				
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 means the engine speed is greater than 600 to 850 rpm							
P2296 - Fuel Pressure Regulator 2 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							
P229E - NOx Sensor Circuit Bank 1 Sensor 2	Engine not in afterrun mode (defined as engine speed greater than 0 rpm)	Engine speed greater than 600 to 850 rpm	engine is not in standby state (standby state occurs after ECM initialization or following after-run)	Manufacturer Enable Counter is zero (value of 0 means ECM is locked and out of assembly plant mode)	battery voltage is above 11 V for at least 3s	Engine Run Time greater than 10 seconds (engine speed greater than 600 to 850 rpm to indicate the engine is running)	Engine is running which means the 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		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)			
P22A1 - NOx Sensor Circuit High Bank 1 Sensor 2	Engine not in afterrun mode (defined as engine speed greater than 0 rpm)	Engine speed greater than 600 to 850 rpm	engine is not in standby state (standby state occurs after ECM initialization or following after-run)	Manufacturer Enable Counter is zero (value of 0 means ECM is locked and out of assembly plant mode)	battery voltage is above 11 V for at least 3s	Engine Run Time greater than 10 seconds (engine speed greater than 600 to 850 rpm to indicate the engine is running)	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 (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 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)					-	
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 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)						
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 occurs after ECM initialization or following after-run)		Engine is running which means the engine speed is greater than 600 to 850 rpm		T	ı	1		
P2453 - Diesel Particulate Filter Differential Pressure Sensor Performance	Engine not in afterrun mode (defined as engine speed greater than 0 rpm)	Engine speed greater than 600 to 850 rpm	engine is not in standby state (standby state occurs after ECM initialization or following after-run)	Manufacturer Enable Counter is zero (value of 0 means ECM is locked and out of assembly plant mode)	battery voltage is above 11 V for at least 3s	Engine Run Time greater than 10 seconds (engine speed greater than 600 to 850 rpm to indicate the engine is running)	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 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 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)		
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									
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									
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									
P2459 - Diesel Particulate Filter Regeneration Frequency	ambient air temperature is above -7 deg C	ambient pressure is above 74.8kPa			1	I	1				
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)					

DTC			Additional Basic Enable Conditions							
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)	e 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)					
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 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]				
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		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)	
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		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)	
P24A0 - Closed Loop Particulate Filter Regeneration Control At Limit - Temperature Too Low	Engine not in afterrun mode (defined as engine speed greater than 0 rpm)	Engine speed greater than 600 to 850 rpm	engine is not in standby state (standby state occurs after ECM initialization or following after-run)	Engine Run Time greater than 10 seconds (engine speed greater than 600 to 850 rpm to indicate the engine is running)	Engine is running which means the engine speed is greater than 600 to 850 rpm	engine is not in ready state (which is active when the ignition is on or following a stall of the engine)				
P24A1 - Closed Loop Particulate Filter Regeneration Control At Limit - Temperature Too High	Engine not in afterrun mode (defined as engine speed greater than 0 rpm)	Engine speed greater than 600 to 850 rpm		Engine Run Time greater than 10 seconds (engine speed greater than 600 to 850 rpm to indicate the engine is running)	Engine is running which means the engine speed is greater than 600 to 850 rpm	engine is not in ready state (which is active when the ignition is on or following a stall of the engine)				
P2510 - ECM Power Relay Circuit Performance	battery voltage is above 11 V for at least 3s						•			
P2564 - Turbocharger Boost Control Position Sensor Circuit Low	Engine not in afterrun mode (defined as engine speed greater than 0 rpm)	Engine speed greater than 600 to 850 rpm	engine is not in standby state (standby state n 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)			
P2565 - Turbocharger Boost Control Position Sensor Circuit High	Engine not in afterrun mode (defined as engine speed greater than 0 rpm)	Engine speed greater than 600 to 850 rpm	engine is not in standby state (standby state occurs after ECM initialization or following after-run)	battery voltage is above 11 V for at least 3s	Engine Run Time greater than 10 seconds (engine speed greater than 600 to 850 rpm to indicate the engine is running)	Engine is running which means the engine speed is greater than 600 to 850 rpm	engine is not in ready state (which is active when the ignition is on or following a stall of the engine)			
P2598 - Turbocharger Boost Control Position Sensor "A" Circuit Range/Performance - Stuck Low	Engine not in afterrun mode (defined as engine speed greater than 0 rpm)	Engine speed greater than 600 to 850 rpm	engine is not in standby state (standby state occurs after ECM initialization or following after-run)	battery voltage is above 11 V for at least 3s	Engine is running which means the engine speed is greater than 600 to 850 rpm	engine is not in ready state (which is active when the ignition is on or following a stall of the engine)				
P2599 - Turbocharger Boost Control Position Sensor "A" Circuit Range/Performance - Stuck High	Engine not in afterrun mode (defined as engine speed greater than 0 rpm)	Engine speed greater than 600 to 850 rpm	engine is not in standby state (standby state occurs after ECM initialization or following after-run)	battery voltage is above 11 V for at least 3s	Engine is running which means the engine speed is greater than 600 to 850 rpm	engine is not in ready state (which is active when the ignition is on or following a stall of the engine)				
P2610 - Control Module Ignition Off Timer Performance	engine is not in standby state (standby state occurs after ECM initialization or following after-run)	battery voltage is above 11 V for at least 3	s				-			
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)									
P268D - Cylinder 2 Injector Data Incorrect	Manufacturer Enable Counter is zero (value of 0 means ECM is locked and out of assembly plant mode)									
P268E - Cylinder 3 Injector Data Incorrect	Manufacturer Enable Counter is zero (value of 0 means ECM is locked and out of assembly plant mode)									
P268F - Cylinder 4 Injector Data Incorrect	Manufacturer Enable Counter is zero (value of 0 means ECM is locked and out of assembly plant mode)									
P2690 - Cylinder 5 Injector Data Incorrect	Manufacturer Enable Counter is zero (value of 0 means ECM is locked and out of assembly plant mode) Manufacturer Enable Counter is zero (value									
P2691 - Cylinder 6 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									
P2692 - Cylinder 7 Injector Data	of 0 means ECM is locked and out of									
		Ī								
P2693 - Cylinder 8 Injector Data Incorrect	Manufacturer Enable Counter is zero (value of 0 means ECM is locked and out of assembly plant mode)					1	Control of the Destructor Tools In 197	Ī	T	
P2693 - Cylinder 8 Injector Data	Manufacturer Enable Counter is zero (value of 0 means ECM is locked and out of	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 the ambient air temperature is >= -7*C and the reductant tank temperature is >= -7*C	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 o the engine)
P2693 - Cylinder 8 Injector Data Incorrect P2BAD - Exhaust NOx Concentration High - Unknown	Manufacturer Enable Counter is zero (value of 0 means ECM is locked and out of assembly plant mode) SCR Reductant Level not in restriction or empty level state (see parameter definitions	engine speed greater than 0 rpm) engine is not in standby state (standby state occurs after ECM initialization or following after-run)	e	occurs after ECM initialization or following	of 0 means ECM is locked and out of		which means the ambient air temperature is >= -7°C and the reductant tank temperature	seconds (engine speed greater than 600 to	Engine is running which means the engine speed is greater than 600 to 850 rpm	when the ignition is on or following a stall o
P2693 - Cylinder 8 Injector Data Incorrect P2BAD - Exhaust NOx Concentration High - Unknown Reason	Manufacturer Enable Counter is zero (value of 0 means ECM is locked and out of assembly plant mode) 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 occurs after ECM initialization or following	e battery voltage is above 11 V for at least 3s e battery voltage is above 11 V for at least 3s	occurs after ECM initialization or following	of 0 means ECM is locked and out of		which means the ambient air temperature is >= -7°C and the reductant tank temperature	seconds (engine speed greater than 600 to	Engine is running which means the engine speed is greater than 600 to 850 rpm	when the ignition is on or following a stall o

DTC			Additional Basic Enable Conditions			
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)			•	
U010E - Lost Communications With Reductant 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)		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		
U029E - N0x 2 loss of comm	Engine not in afterrun mode (defined as engine speed greater than 0 rpm)	Engine speed greater than 600 to 850 rpm	battery voltage is above 11 V for at least 3s	Engine is running which means the engine speed is greater than 600 to 850 rpm		

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		Electronic circuitry determines fault with GP switch		< 6.6 = On = 0	A	glow plugs are commanded on DTCs P163E, P163C, P0671-P0678	= True Not set	500ms (Internal) + 75% failure rate over 4 seconds. (Same as x out of y 75% failure out of 4 sec of sample time ie out of 8 samples 6 must fail to log a	В
ROM error		Checksum error between calculated and stored values are compared Compariarson of read write values	Checksums match Read write values match	= NO		Module power Module power	= On	failure) 1.5 seconds (internal)+7 5% failure rate over 4 seconds.	В
EEPROM error		Checksum error between calculated and stored values	Checksums match	= NO	•	Module power	= On	(internal) + 75% failure rate over 4 seconds. 200ms (internal) + 75% failure	В
Charge Pump Under Voltage		measured voltage of charge pump is determined to be out of tolerance	Charge Pump Voltage	<= Battery voltage at GPCM + 7	volts	Battery voltage at GPCM	> 6 volts	rate over 4 seconds. 130ms (internal) + 75% failure rate over 4 seconds.	В
Charge Pump Over Voltage		measured voltage of charge pump is determined to be out of tolerance	Charge Pump Voltage	>= Battery voltage at GPCM + 18	volts	Battery	< 19.9 volts	160ms (internal) + 75% failure rate over 4 seconds.	

Component /	Fault	Monitor Strategy	Malfunction	Thresho	ld	Secondary	Enable		Time	MIL
System	Code	Description	Criteria	Value		Parameters	Condition	S	Required	Illum.
GPCM reverse polarity switch "high voltage drop"		Electronic 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	> 9 events in row	ā	none			2 seconds (internal) + 75% failure rate over 4 seconds.	
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.	:
system basic chip VSUPLOW		monitor internal chip supply voltage	internal chip supply voltage	<= 5.8	volts	Intake Air Heater commanded Battery supply at GPCM	= On > 9	volts	130ms (internal) + 75% failure rate over 4 seconds.	
system basic chip (SBC) over temperature		measure temperature of the SBC	temperature of the high side switch inside the SBC	> 155	degC	Internal GPCM temperature	< 100	deg C	130ms (internal) + 75% failure rate over 4 seconds.	:
NOx sensor power supply fault		Electronic circuitry detects a failure in the NOx sensor power supply	Path1: DC/DC booster current. For Path 2: DC/DC booster current. Path 3: Voltage at main switch Path 4: (DC/DC Booster voltage - GPCM	> 25 > 640 > > 60 amps be hardware protection (tir = varies with temperature	ne volts	Battery voltage at the GPCM	> 6	volts	6 seconds (internal) + 75% failure rate over 4 seconds.	
			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.	

Component / System	Fault Code	Monitor Strategy Description	Malfunction Criteria		Threshold Value	ł	Secondary Parameters		nable ditions	Time Required	MIL 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 s > 6	secs	130ms (internal) + 66% failure rate over 1.5 seconds.	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 < 6.0	e	Condition 1 : 130ms, Condition 2: 260ms (internal) + 66%failure over 1.5 seconds.	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 < 7.0	9	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	e e	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 s 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 < 6.0	e	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	9	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		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 3 - glow plug open	P0673	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 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		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 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	= On > 5 not set > 6	secs volts	130ms (internal) + 66% failure rate over 1.5 seconds.	В
Cylinder 4 - 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

Component / System	Fault Code	Monitor Strategy Description	Malfunction Criteria		Threshold Value	i	Secondary Parameters	Enable Conditions		Time Required	MIL Illum.
Cylinder 4 - 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 > 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 volts	130ms (internal) + 66% failure rate over 1.5 seconds.	В

Component / System	Fault Code	Monitor Strategy Description	Malfunction Criteria		Threshold Value	ı	Secondary Parameters		Enable onditions	Time Required	MIL 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 abs[Battery supply at GPCM - IGN voltage at GPCM]	= (a = fa = fa	on on alse alse 6.0 Volts	Condition 1 : 130ms, Condition 2: 260ms (internal) + 66%failure over 1.5	
Cylinder 6 - 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	> 7 = 6 = fa	on 7.0 volts on alse alse 7.0 volts	66% failure over 1.5 seconds.	
Cylinder 6 - glow plug low resistance		Electronic circuitry determines a fault exists on GP circuit	Glow Plug Resistance	<	250	mOhm	voltage at GPCM] glow plugs are commanded on over temperature condition over voltage condition- abs[Battery supply at GPCM - IGN voltage at GPCM]	= fa = fa	on alse alse 7.0 volts	160ms (internal) + 66% failure over 1.5 seconds.	
Cylinder 7 - glow plug open	P0677		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	> no	On 5 secs t set 6 volts	66% failure	
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]	= (a = fa = fa	on on alse alse 6.0 Volts	Condition 1 : 130ms, Condition 2: 260ms (internal) + 66%failure over 1.5 seconds.	
Cylinder 7 - 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]	> 7 = 6 = fa	on 7.0 volts on alse alse 7.0 volts	66% failure over 1.5 seconds.	
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 = fa	on alse alse 7.0 volts	160ms (internal) + 66% failure over 1.5 seconds.	

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

Component / System	Fault Code	Monitor Strategy Description	Malfunction Criteria		Threshold Value		Secondary Parameters		Enable Conditions		Time Required	MIL Illum.
Intake Air (IA) Heater Temperature Signal Circuit	P154D	Electronic GPCM circuitry determines if	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	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			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 or	> <	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	>	+/-3	volts	or GPCM supply voltage Engine speed	>	6 10< rpm >400	volts		
Glow Plug Module		Electronic GPCM circuitry determines	Voltage supply to GPCM) Path 1 glow plug activation request from	=	ON		Path 1: Key state (Ign 1)	=	OFF		1000ms	В
Secondary Circuit		serveral signal voltage levels to GPCM are out of range	ECM or				or		or		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	>	1.5	Volts	or		or			
			Path 3: [GPCM ground - GP ground]		1.5	VOILS	Path 3 GP commanded DTCs not set IAH dutycycle	=	ON P0671,P0675 0 or 100	%	(internal) + 75% failure over 4.0 seconds. 650ms (internal) + 75% failure over 4.0 seconds.	
Glow Plug Module Overtemperature		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	(internal) + 75% failure over 4.0	В
Glow Plug Control Module Temperature- Intake Air Heater Temperature Not		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 / System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions		Time Required	MIL 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 or	> 120 > 90 > -35 = not set	sec % °C		
			PATH2: IAH temperature sensor voltage	, V	Intake Air Temperature (GMLAN) and DTC P154D	> 25 = not set	°C		
			I ATTIZ. IATT terriperature sensul Voltage	> V IAH Battery Voltage* 146/512	(Engine Off Timer (GMLAN) or Intake Air Temperature (GMLAN))	< 8 < -7	hours °C		
					and (IAH Run Time or IAH PWM or Intake Air Temperature (GMLAN)) and	< 120 < 90 < -35	sec % °C		
					(Engine Coolant Temperature (GMLAN)	< 60	°C		\square

Component / System	Fault Code	Monitor Strategy Description	Malfunction Criteria		Threshold Value	I	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	>	25 or	A	reductan heater commanded:	=	ON 123 7.0 16.5 or	°C Volts Volts	1000ms (internal) + 50% failure over 1.0 seconds.	В
			Path 2: Hardware over current	>	80	Α	GPCM temperature GPCM Battery supply voltage	< > <	123 7.0 16.5	°C 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 / System	Fault Code	Monitor Strategy Description	Malfunction Criteria		Threshold Value	l	Secondary Parameters		Enable Conditions		Time Required	MIL Illum.
Reductant Heater 2 Control Circuit	P20BD	ECM monitors serial data from GPCM for P20BD Error Message indicating GPCM detects reductant heater not connected to GPCM or an interruption	Active test function; Connected heater must discharge internal capicitor. Voltage at capacitor checked by GPCM				DTCs not set: reductan heater commanded: GPCM temperature GPCM battery supply voltage and	=	P20BF ON 123 7.0	°C Volts	3440ms (internal) + 50% failure over 1.0 seconds.	В
Reductant Heater 2 Control Circuit Low Voltage	P20BF	ECM monitors serial data from GPCM for P20BF Error Message indicating GPCM detects reductant heater output shorted to ground or an overload condition	Path 1: Reductant Heater Plug Current or	>	25 or	А	reductan heater commanded: GPCM temperature GPCM supply voltage KL30 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	А	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	Α	reductan heater commanded: GPCM temperature GPCM supply voltage KL30	= v	ON 123 7.0 16.5	°C Volts Volts		
Reductant Heater 3 Control Circuit High Voltage	P20C4	ECM monitors serial data from GPCM for P20C4 Error Message indicating GPCM detects reductant heater to be shorted to battery	Electronic circuitry determines voltage at reductant heater pin	>	3.5	volts	reductan heater commanded:	=	OFF		2000ms (internal) + 50% failure over 1.0 seconds.	В

Component / System	Fault Code	Monitor Strategy Description	Malfunction Criteria		Threshold Value	ı	Secondary Parameters	Enable Conditions		Time Required	MIL Illum.
Nox Sensor Supply Voltage Circuit Bank 1 Sensor 1	P220A	ECM monitors serial data from GPCM for P220A Error Message indicating GPCM detects DC/DC booster output shorted to ground or shorted to battery	PATH 1:GPCM Electronic circuitry determines voltage at DC/DC booster output pin or	>	5.0	Volt	status DC/DC booster	= OFF, power up procedure has started after reset		5000ms (internal) + 50% failure over 1.0 seconds.	В
			PATH 2: DC/DC booster output current duration	>	5.0 10	A ms	status DC/DC booster	= ON			
			PATH 3: DC/DC booster output current duration	>	37.5 20	A µs	status Dc/DC booster	= ON			
Nox Sensor Supply Voltage Circuit Bank 1 Sensor 2	P220B	ECM monitors serial data from GPCM for P220B Error Message indicating GPCM detects DC/DC booster output shorted to ground or shorted to battery	PATH 1:Electronic circuitry determines voltage at DC/DC booster output pin or	>	5.0	Volt	status DC/DC booster	= OFF, power up procedure has started after reset		5000ms (internal) + 50% failure over 1.0 seconds.	В
			PATH 2: DC/DC booster output current duration	> >	5.0 10	A ms	or status DC/DC booster	or = ON			
			or		07.5		or	or			
			PATH 3: DC/DC booster output current duration	>	37.5 20	A µs	status Dc/DC booster	= ON			
GMLAN Communication ECM -> GPCM		ECM monitors serial data from GPCM for U0106. Error Message indicating GPCM is not receiving major GMLAN	Timeout of message \$C9 or Timeout of message \$4C1	> >	100 2000	ms ms	Ignition 1 battery voltage at GPCM	> 3.9 > 7.0	volts	inner loop: 10000 ms total time:	В
		signals.	Timeout of message \$4F1	>	3000	ms				11000 ms	