Component / System	Fault Code	Monitor Strategy Description	Primary Malfunction Criteria		Threshold Logic and Value		Secondary Parameters		Enable Conditions	_	Time Required	MIL Illum.
Crankshaft to Camshaft Correlation	P0016	angle by monitoring the average offset angle.	average value of camshaft offset OR average value of camshaft offset	>	-25.00 25.00	Ū	Engine backward rotation detected and NO pending or confirmed DTCs and Ignition on and basic enable conditions met:	=	FALSE see sheet inhibit tables TRUE see sheet enable tables	-	fail conditions exists for more than 2 events test performed continuously 0.01 s rate	В
HO2S Heater Control Circuit Bank 1 Sensor 1 Circuit	P0030	Monitoring the HO2S heater control circuit for open circuit failures	Voltage low during driver off state (indicates open circuit)	=	Open Circuit:≥ 200 K Ω impedance between ECU pin and load		Ignition on HO2S heater control commanded on basic enable conditions met:	=	TRUE FALSE TRUE	-	fault exists for more than 5 sec; monitor runs at 0.1 s when enable conditions are met	В
HO2S Heater Control Circuit Bank 1 Sensor 1 Circuit Low	P0031	Monitoring the HO2S heater control circuit for circuit low failures	Voltage low during driver off state (indicates short-to-ground)	=	Short to ground: ≤ 0.5 Ω impedance between signal and controller ground	-	Ignition on basic enable conditions met:	=	TRUE	•	fault exists for more than 5 sec; monitor runs at 0.1 s when enable conditions are met	В

Component / System HO2S Heater Control Circuit Bank 1 Sensor 1 Circuit High	Fault Code P0032	Monitor Strategy Description Monitoring the HO2S heater control circuit for circuit high failures	Primary Malfunction Criteria Voltage high during driver on state (indicates short to power)	-	Threshold Logic and Value Short to power: ≤ 0.5 Ω impedance between signal and controller power	-	Secondary Parameters HO2S heater control commanded on Ignition on basic enable conditions met:	=	Enable Conditions TRUE TRUE TRUE	:	Time Required fault exists for more than 5 sec; monitor runs at 0.1 s when enable conditions are met	MIL Illum. B
Turbocharger Boost Control Position Not Learned	P003A	Detects in range vane position errors during a vane sweep initiated to learn minimum and maximum vane position values.	Path 1: mean offset learned value at fully closed valve position or mean offset learned value at fully closed valve position	<	70.00 110.00	%	injection quantity and injection quantity and acceleration pedal sensor and Engine Speed and Engine Speed and Vehicle speed and Vehicle speed and Battery voltage and engine coolant temperature and engine coolant temperature and Barometric pressure and Barometric pressure and	×= <= ×= ×= ×= ×= ×= ×= ×= ×= ×= ×= ×= ×= ×=	0.00 24 1.00 575.00 1075.00 0.00 3.11 11.00 59.96 127.96 65.00 105.00	mm^3/r ev mm^3/r ev rpm rpm mph V °C °C kPa kPa	fail conditions exists for 0.01 s monitor runs once per trip 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 10.08		Required	Illum.
					time since start and	>	10.08	sec		
					Rich idle regeneration	=	inactive	-		
					and		indutto			
					Adaption is finished for this driving cycle	=	inactive	-		
					and					
					valve closed	=	TRUE	-		
					and		0.50			
					turbocharger offset adaption timer and	>=	0.50	sec		
					No Pending or Confirmed DTCs:	=	see sheet inhibit	-		
							tables			
					and					
					basic enable conditions met:	=	see sheet enable	-		
							tables			
								_		
			Path 2:		injection quantity	>=	0.00	mm^3/r	fail conditions	
					3				exists for 0.01	
			time taken to learn the mean offset	> 30.00 sec	and				s	
			learned value at fully closed valve						monitor runs	
			position						once per trip	
					injection quantity	<=	24	mm^3/r	with 0.01 s	
					and			ev	rate whenever	
					and Value acceleration pedal sensor 1	<=	1.00	%	enable conditions are	
					and	~-	1.00	70	met	
					Engine Speed	>=	575.00	rpm	met	
					and			I.		
					Engine Speed	<=	1075.00	rpm		
					and					
					Vehicle speed	>=	0.00	mph		
					and Vehicle speed	<=	3.11	mph		
					and	<=	3.11	mph		
					Battery voltage	>=	11.00	V		
					and	-	11.00	v		
					engine coolant temperature	>=	59.96	°C		
					and					
					engine coolant temperature	<=	127.96	°C		
1	1	l	I		and					

Component / System	Fault Code	Monitor Strategy Description	Primary Malfunction Criteria	Threshold Logic and Value	Secondary Parameters		Enable Conditions		Time Required	MIL Illum.
					Barometric pressure and	>=	65.00	kPa		
					Barometric pressure and	<=	105.00	kPa		
					time since start and	>	10.08	sec		
					Rich idle regeneration and	=	inactive	-		
					Adaption is finished for this driving cycle	=	inactive	-		
					and valve closed and	=	TRUE	-		
					turbocharger offset adaption timer and	>=	0.50	sec		
					No Pending or Confirmed DTCs: and	=	see sheet inhibit tables	-		
					basic enable conditions met:	=	see sheet enable tables	-		
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:2 - 200 K Ω impedance between ECU pin and load 	battery voltage for and starter is active cranking and basic enable conditions met:	> = =	3.00 FALSE see sheet enable tables	V sec -	fail conditions exists for 3.0 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.
Gystem	Cour	Diagnoses the Turbocharger	The ECM detects that the commanded state of the driver and the actual state of the control circuit do not match and the IC maximum temperature has been exceeded		for time and starter is active cranking and basic enable conditions met:	> = =	3.00 FALSE see sheet enable tables	V sec -	rate conditions exists for 0.5 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 	battery voltage	>	11.00	V	fail conditions exists for 3.0 s monitor runs with 0.01 s rate whenever enable conditions are met	В
					time and starter is active cranking and basic enable conditions met:	> = =	3.00 FALSE see sheet enable tables	sec - -		
Turbocharger Boost Control Circuit High Voltage	P0048	Diagnoses the Turbocharger Boost Control low side driver circuit for circuit faults.	Voltage high during driver on state (indicates short to power)	 Short to power: ≤ 0.5 Ω impedance between signal and controller power 	battery voltage for	>	11.00	V	fail conditions exists for 1.0 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.
					time and	>	3.00	sec		
					starter is active cranking and	=	FALSE	-		
					basic enable conditions met:	=	see sheet enable tables	-		
							_			_
HO2S Heater Resistance Bank1	P0053	A/F sensor heating control monitoring, which monitors the	Temperature of A/F sensor (based on	> 823.96 °C	Engine is running (please see the definition)	=	TRUE	-	fault exists for more than 30	В
Sensor 1		heater control of the A/F			demnion)				sec; monitor	
		sensor. If the temperature of the A/F sensor, based on the							runs at 0.1 s when enable	
		measured sensor internal							conditions are	
		resistance, exceeds a threshold a fault is detected							met	
					Decel fuel cut-off (DFCO) for time	= >=	FALSE 5.00	- sec		
					(
					duty cycle value during sensor heat-up for time	>= >=	90.25 19.50	% sec		
					or					
					Temperature of A/F sensor (based on sensor internal resistance) and	>	804.96	°C		
					Status bit for valid A/F sensor inner	=	TRUE	-		
					Resistance (see parameter definition table)					
) Status bit for heater control disabled (False = heater control active, True =	=	FALSE	-		
					heater control not active)					
					A/F sensor error status bit (see parameter definition table)	=	FALSE	-		
					NO Pending or Confirmed DTCs:	=	see sheet inhibit tables	-		
					basic enable conditions met:	=	see sheet enable	-		
							tables			
•	•									

Component / System	Fault Code	Monitor Strategy Description	Primary Malfunction Criteria		Threshold Logic and Value		Secondary Parameters		Enable Conditions		Time Required	MIL Illum.
System		A/F sensor heating control monitoring, which monitors the heater control of the A/F sensor. If the temperature of the A/F sensor, based on the measured sensor internal resistance, is less than a threshold a fault is detected	Temperature of A/F sensor (based on	<	805.96	°C	Engine is running (please see the definition)	=	TRUE	-	fault exists for more than 60 sec; monitor runs at 0.1 s when enable conditions are met	autori,
							Decel fuel cut-off (DFCO) for time	= >=	FALSE 5.00	- sec		
							(duty cycle value during sensor heat-up for time	>= >=	90.25 19.50	% sec		
							or Temperature of A/F sensor (based on sensor internal resistance) and	>	804.96	°C		
							Status bit for valid A/F sensor inner Resistance (see parameter definition table)	=	TRUE	-		
) Status bit for heater control disabled (False = heater control active, True = heater control not active)	=	FALSE	-		
							A/F sensor error status bit (see parameter definition table) NO Pending or Confirmed DTCs:	=	FALSE see sheet inhibit	-		
							basic enable conditions met:	=	tables see sheet enable tables	-		
CAC Temperature	P007C		CAC downstream temperature sensor	<	0.11	V	ignition on	=	TRUE	÷	fail conditions	A
Sensor Circuit Low Voltage		sensor circuit short to ground.	voltage same as downstream CAC temperature	>	199.96	°C	and basic enable conditions met:	=	see sheet enable tables	-	exists for 5 s test performed continuously 0.1 s rate	
							and NO Pending or Confirmed DTCs:	=	see sheet inhibit tables	-		

Component / System	Fault Code	Monitor Strategy Description	Primary Malfunction Criteria		Threshold Logic and Value		Secondary Parameters		Enable Conditions		Time Required	MIL Illum.
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	>	4.94 -50.04	°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 #63)	>	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 #66)	>	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	=	TRUE	-	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 basic enable conditions met: and metering unit actuator test active and NO Pending or Confirmed DTCs:	Enable Conditions see sheet enable - tables = FALSE - see sheet inhibit - tables	Time Required	MIL Illum.
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 #64)	< -80000 to -18000 kPa	and fuel temperature 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:	 > 4.00 mm^A ev -40.04 °C = TRUE - see sheet enable - tables = FALSE - see sheet inhibit - tables 	exists for 8 s monitor runs with 0.02 s rate whenever	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 	= TRUE -	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 basic enable conditions met: and NO Pending or Confirmed DTCs:	Enable Conditions see sheet enable tables see sheet inhibit tables	-	Time Required	MIL Illum.
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)	200 K Ω impedance between ECU pin and load	battery voltage for time and ignition on and basic enable conditions met: NO Pending or Confirmed DTCs:	 > 11.00 > 3.00 = TRUE = see sheet enable tables = see sheet inhibit tables 	1	fail conditions exists for 0.22 s monitor runs with 0.01 s rate whenever enable conditions are met	A
			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 ignition on and basic enable conditions met: NO Pending or Confirmed DTCs:	 > 11.00 > 3.00 = TRUE = see sheet enable tables = see sheet inhibit tables 	1	fail conditions exists for 0.2 s monitor runs with 0.01 s rate whenever enable conditions are met	

Component / System	Fault Code	Monitor Strategy Description	Primary Malfunction Criteria	Threshold Logic and Value	Secondary Parameters	Enable Conditions		Time Required	MIL Illum.
Fuel Pressure Regulator 1 Control Circuit Low	P0091		Voltage low during driver off state (indicates short-to-ground)	 Short to ground: - ≤ 0.5 Ω impedance between signal and controller ground 	battery voltage for	> 11.00	V	fail conditions exists for 0.28 s monitor runs with 0.01 s rate whenever enable conditions are met	
					time and ignition on and basic enable conditions met: NO Pending or Confirmed DTCs:	 > 3.00 = TRUE = see sheet enable tables = see sheet inhibit tables 	sec - -		
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)	≤ 0.5 Ω impedance between signal and controller power	battery voltage for time and ignition on and basic enable conditions met: NO Pending or Confirmed DTCs:	 > 11.00 > 3.00 = TRUE = see sheet enable tables = see sheet inhibit tables 	V sec - -	fail conditions exists for 0.22 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.
Intake Air Temperature Sensor 2 Circuit Low		Detects a low PWM frequency	Humidity Temperature sensor frequency (Intake air temperature sensor 2) same as	<	28.03	Hz	Engine Running (please see the definition) and	=	TRUE	-	fail conditions exists for 3.0 s test performed continuously with 0.1 s rate	В
			humidity temperature	<	-50.04	degC	following conditions for time: battery voltage and basic enable conditions met: and no pending or confirmed DTCs	∧ ∧ v = = =	1.00 11.00 655.34 see sheet enable tables see sheet inhibit tables	sec V V -		
		The internal ECM PWM circuit driver detects either a duty cycle which has not been received or the maximum period has been exceeded, indicating short low condition on the humidity sensor circuit.	Internal ECM PWM circuit low voltage	=	TRUE	-	Engine Running (please see the definition)	=	TRUE	-	fail conditions exists for 3.0 s test performed continuously with 0.1 s rate	
			and ECM PWM circuit maximum period detected or Internal ECM PWM period not received	=	TRUE	-	and following conditions for time: battery voltage battery voltage	> > <	1.00 11.00 655.34	sec V V		
							and basic enable conditions met: and no pending or confirmed DTCs	=	see sheet enable tables see sheet inhibit tables	-		

Component / System	Fault Code	Monitor Strategy Description	Primary Malfunction Criteria		Threshold Logic and Value		Secondary Parameters		Enable Conditions		Time Required	MIL Illum.
Intake Air Temperature Sensor 2 Circuit High	P0098	Detects a high PWM frequency from the humidity temperature sensor, indicating an OOR high condition on the humidity temperature sensor circuit	Humidity Temperature sensor frequency (Intake air temperature sensor 2)	>	129.96	Hz	and following conditions for time: battery voltage and basic enable conditions met: and no pending or confirmed DTCs	= ^ ^ ~ = =	1.00 11.00 11.00 655.34 see sheet enable tables see sheet inhibit tables	sec V V -	fail conditions exists for 3.0 s test performed continuously with 0.1 s rate	В
		The internal ECM PWM circuit driver detects either a duty cycle which has not been received or the maximum period has been exceeded, indicating short high condition on the humidity sensor circuit.	Internal ECM PWM circuit high voltage and ECM PWM circuit maximum period detected or Internal ECM PWM period not received	=	TRUE TRUE TRUE	-	Engine Running (please see the definition) and following conditions for time: battery voltage battery voltage and basic enable conditions met:	= ^ ^ =	TRUE 1.00 11.00 655.34 see sheet enable	sec V V	fail conditions exists for 3.0 s test performed continuously with 0.1 s rate	
							and no pending or confirmed DTCs	=	see sheet inhibit tables	-		

Component / System	Fault Code	Monitor Strategy Description	Primary Malfunction Criteria	Threshold Logic and Value	Secondary Parameters	Enable Conditions		/IL lum.
Fuel Pressure Regulator 1 High Control Circuit Low Voltage	Pooce	Diagnoses the Fuel Pressure Regulator 1 high side driver circuit for circuit faults.	Voltage low during driver on state (indicates short to ground)	 Short to ground: - ≤ 0.5 Ω impedance between signal and controller ground 	and basic enable conditions met:	= TRUE - = see sheet enable - tables		A
Fuel Rail Pressure Regulator 1 High Control Circuit High Voltage	POOCA	Diagnoses the Fuel Pressure Regulator 1 high side driver circuit for circuit faults.	Voltage high during driver off state (indicates short to power)	 Short to power: ≤ - 0.5 Ω impedance between signal and controller power 	(engine speed or engine post drive/ afterun) and NO Pending or Confirmed DTCs: for time and basic enable conditions met:	= 0 rpm = TRUE - = see sheet inhibit tables > 7.00 sec = see sheet enable tables	fail conditions exists for 0.1 s monitor runs with 0.1 s rate whenever enable conditions are met	A

Component / System	Fault Code	Monitor Strategy Description	Primary Malfunction Criteria		Threshold Logic and Value		Secondary Parameters		Enable Conditions		Time Reguired	MIL 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.	same as temperature of intake air temperature sensor 3	~ ^	249.96	v °C	and basic enable conditions met: and NO Pending or Confirmed DTCs:	=	see sheet enable tables see sheet inhibit tables	-	fail conditions exists for 5 s test performed continuously 0.1 s rate	B
Intake Air Temperature Sensor 3 Circuit High Voltage		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	~	4.94	v °C	ignition on and basic enable conditions met: and NO Pending or Confirmed DTCs:	=	TRUE see sheet enable tables see sheet inhibit tables	-	fail conditions exists for 5 s test performed continuously 0.1 s rate	В
Humidity Sensor Circuit Low		Detects a low duty cycle signal from the humidity sensor, indicating an OOR low condition on the humidity sensor circuit	Humidity Sensor Duty Cycle same as relative humidity	<	5.00	%	Engine Running (please see the definition) and following conditions for time: battery voltage battery voltage and basic enable conditions met: and no pending or confirmed DTCs	= ^ ^ ~ = =	1.00 11.00 655.34 see sheet enable tables see sheet inhibit tables	- V V -	fail conditions exists for 3.0 s test performed continuously with 0.1 s rate	В

Component / System	Fault Code	Monitor Strategy Description	Primary Malfunction Criteria	I	Threshold _ogic and Value		Secondary Parameters		Enable Conditions		Time Required	MIL Illum.
		The internal ECM PWM circuit driver detects either a duty cycle which has not been received or the maximum period has been exceeded, indicating short low condition on the humidity sensor circuit.	Internal ECM PWM circuit low voltage	=	TRUE	-	Engine Running (please see the definition)	=	TRUE	-	fail conditions exists for 3.0 s test performed continuously with 0.1 s rate	
			and ECM PWM circuit maximum period detected or Internal ECM PWM period not received	=	TRUE TRUE	-	and following conditions for time: battery voltage battery voltage	> > <	1.00 11.00 655.34	sec V V		
							and basic enable conditions met: and no pending or confirmed DTCs	=	see sheet enable tables see sheet inhibit tables	-		
Humidity Sensor Circuit High	P00F5	Detects a high duty cycle signal from the humidity sensor, indicating an OOR high condition on the humidity sensor circuit	Humidity Sensor Duty Cycle same as relative humidity	>	95.00	%	Engine Running (please see the definition) and following conditions for time: battery voltage battery voltage	= ^ ^ V	1.00 11.00 655.34	- sec V V	fail conditions exists for 3.0 s test performed continuously with 0.1 s rate	В
							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		Description 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.	Criteria Internal ECM PWM circuit high voltage	-	Logic and Value TRUE		Parameters Engine Running (please see the definition)	=	Conditions TRUE	-	Required fail conditions exists for 3.0 s test performed continuously with 0.1 s rate	IIIum.
			and ECM PWM circuit maximum period detected or Internal ECM PWM period not received	=	TRUE	-	and following conditions for time: battery voltage battery voltage	> > <	1.00 11.00 655.34	sec V V		
							and basic enable conditions met: and no pending or confirmed DTCs	=	see sheet enable tables see sheet inhibit tables	-		
Humidity Sensor Circuit Intermittent / Erratic		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	>=	50.00	% counts	Engine Running (please see the definition) and no pending or confirmed DTCs	=	TRUE see sheet inhibit	-	fail conditions exists for 4 out of 5 windows (x out of y), test is performed continuously with 0.1 s rate	В
			accumulated over time	>	0.10	Sec	and basic enable conditions met:	=	tables see sheet enable tables	-		

Component /	Fault Code	Monitor Strategy	Primary Malfunction Criteria		Threshold		Secondary		Enable Conditions		Time Required	MIL
System Mass Air Flow (MAF)		Description Detects skewed MAF sensor	Criteria Path 1:		Logic and Value		Parameters		Conditions		fail conditions	Illum. B
Sensor Performance		by comparing measured MAF									exists for 10 s	_
		to calculated expected MAF based on volumetric efficiency									monitor runs with 0.01 s	
		of the engine									rate whenever	
											enable	
			ratio of measured air flow / desired air flow	<	[(a) - (b)] * (c) * (d)		ambient pressure	>	74.80	kPa	conditions are met	
			where		(u)		and				met	
			(a) Engine load dependent MAP for		0.01.0.05				~~~~			
			calculating lower threshold (see Look- Up-Table #1)	=	0.8 to 0.85	-	engine coolant temperature	>=	69.96	°C		
			(b) Air temperature dependent	=	0	-	and					
			correction factor curve	-	0		and					
			(c) Engine temperature based correction factor curve	=	1	-	engine coolant temperature	<=	125.96	°C		
			(d) Barometric pressure based	=	1	-	and					
			correction factor curve				gradient of the charge-air temperature	>=	-2.00	°C/sec		
			or				and					
			Path 2:				gradient of the charge-air temperature and	<=	2.00	°C/sec		
			ratio of measured air flow / desired air									
			flow	>	(e) + (f)	-	(
			where				Engine Running (please see the defintion)	=	TRUE	-		
			(e) Engine load dependent MAP for	=	1.20	-	for					
			calculating higher threshold	-	1.20		101					
			(f) Air temperature dependent correction factor curve	=	0	-	time since start	>	90.00	sec		
)					
							and control value of the throttle valve	>=	-400.00	%		
							and	>=	-400.00	%		
							control value of the throttle valve	<=	5.00	%		
							and					
							setpoint value of Variable swirl actuator	>=	-400.00	%		
							and					
							setpoint value of Variable swirl actuator	<=	399.99	%		
							and					
		I	I I				(

Component /	Fault	Monitor Strategy	Primary Malfunction	Threshold	Secondary		Enable		Time	MIL
System	Code	Description	Criteria	Logic and Value	Parameters		Conditions		Required	Illum.
					setpoint valve position of exhaust-gas recirculation and	>=	-400.00	%		
					setpoint valve position of exhaust-gas recirculation for	<=	2.00	%		
					time	>	3.00	sec		
					and Air System Control is not disabled and (=	TRUE	-		
					NO Pending or Confirmed DTCs:	=	see sheet inhibit tables			
					and actual valve position of exhaust-gas recirculation and	>=	-400.00	%		
					actual valve position of exhaust-gas recirculation for	<=	2.00	%		
					time)	>	3.00	sec		
					and					
					injection quantity	>=	-20.00	mm^3/r ev		
					and injection quantity	<=	150.00	mm^3/r ev		
					and			• ·		
					air pressure in the induction volume and	>=	74.80	kPa		
					air pressure in the induction volume and	<=	280.00	kPa		
					engine speed and	>=	575	rpm		
					engine speed and	<=	1200	rpm		
					intake air temperature and	>=	-7.04	°C		
					intake air temperature and	<=	79.96	°C		
1		l			1					

Component / System	Fault Code	Monitor Strategy Description	Primary Malfunction Criteria	1	Threshold Logic and Value	•	Secondary Parameters		Enable Conditions		Time Required	MIL Illum.
Mass or Volume Air Flow Sensor "A" Circuit Low	P0102	Detects low frequency readings on the MAF circuit, indicating an OOR low condition on the MAF circuit	signal period of air mass flow sensor (MAF) same as air mass flow	N V	833.35	µsec g/sec	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 0.5 s monitor runs 0.01 s rate whenever enable conditions are met	В
Mass or Volume Air Flow Sensor "A" Circuit High	P0103	Detects high frequency readings on the MAF circuit, indicating an OOR high condition on the MAF circuit	PWM period too long or signal period of air mass flow sensor (MAF) same as air mass flow	= < >	TRUE 71.40 245.56	μsec g/sec	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 monitor runs 0.01 s rate whenever enable conditions are met	A
Manifold Absolute Pressure (MAP) Sensor Performance	P0106	Detects a skewed MAP or BARO sensor by comparing MAP readings to the BARO sensor	Path 1: (a) - (b) or Path 2: (a) - (b) where	<	-15.00 15.00	kPa	measured coolant engine downstream temperature and current injection quantity and actuator position of throttle valve and turbo charger (VNT) wiping is active	> < <= =	-3549.94 654.00 327.67 FALSE	°C mm^3/r ev % -	fail conditions exists for 5 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 (a) MAP sensor measured pressure and (b) BARO sensor measured pressure	=	Logic and Value measured parameter measured parameter		Parameters and (engine speed and engine speed) and vehicle speed and	>= <= <	Conditions 0.00 100.00 3.11	rpm rpm mph	Required	Illum.
							ambient air temperature and basic enable conditions met: and NO Pending or Confirmed DTCs:	> = =	-30.04 see sheet enable tables see sheet inhibit tables	°C - -		
Manifold Absolute Pressure (MAP) Sensor Circuit Low Voltage	P0107	on the MAP circuit, indicating an OOR low condition on the MAP circuit	Path 1: (sensor voltage of manifold absolute pressure same as manifold absolute pressure and actuator position of throttle valve)	< < =	0.20 20.00 20.00	V kPa %	engine synchronization completed and basic enable conditions met:	=	TRUE see sheet enable tables	-	fail conditions exists for 5 s test performed continuously 0.01 s rate	В
			or Path 2: (sensor voltage of manifold absolute pressure same as manifold absolute pressure and actuator position of throttle valve	< < >	0.20 20.00 20.00	V kPa %						

Component / System	Fault Code	Monitor Strategy Description	Primary Malfunction Criteria)		Threshold ₋ogic and Value		Secondary Parameters		Enable Conditions		Time Required	MIL Illum.
Manifold Absolute Pressure (MAP) Sensor Circuit High Voltage	P0108	Detects high voltage readings on the MAP circuit, indicating an OOR high condition on the MAP circuit	sensor voltage of manifold absolute pressure same as manifold absolute pressure	>	4.80 300.00	V kPa	NO Pending or Confirmed DTCs: and engine synchronization completed and basic enable conditions met:		see sheet inhibit tables TRUE see sheet enable tables	-	fail conditions exists for 5 s test performed continuously 0.01 s rate	В
Intake Air Temperature Sensor 1 Circuit Low Bank 1	P0112		MAF intake air temperature sensor voltage same as intake air temperature	~	0.16	°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	В
Intake Air Temperature Sensor 1 Circuit High Bank 1	P0113		MAF intake air temperature sensor voltage same as intake air temperature	~	4.80	°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	В

Component / System	Fault Code	Monitor Strategy Description	Primary Malfunction Criteria	ļ	Threshold Logic and Value	!	Secondary Parameters		Enable Conditions		Time Required	MIL Illum.
Engine Coolant Temperature (ECT) Sensor Circuit Low Voltage	P0117	Detects low voltage readings on the ECT circuit, indicating an OOR low condition on the ECT circuit	voltage of engine coolant temperature sensor same as engine coolant temperature	~	0.80		ignition on and basic enable conditions met:	-	TRUE see sheet enable tables	-	fail conditions exists for 2.0 s test performed continuously 0.2 s rate	В
Engine Coolant Temperature (ECT) Sensor Circuit High Voltage	P0118	Detects high voltage readings on the ECT circuit, indicating an OOR high condition on the ECT circuit	voltage of engine coolant temperature sensor same as engine coolant temperature	~	4.75	∨ °C	ignition on and basic enable conditions met:	=	TRUE see sheet enable tables	-	fail conditions exists for 2.0 s test performed continuously 0.2 s rate	В
Engine Coolant Temperature / Intake Air Temperature Correlation	P011B	Detects a biased ECT or IAT1 by comparing start-up temperatures between the two sensors.		> =	20 to 999 measured parameter measured parameter	-	minimum engine-off time and ambient temperature and Engine Running (please see the definition) for time and engine post drive/ afterun	>= >=	28800.00 -60.04 TRUE 0.00 FALSE	sec °C - sec	once per drive cycle	В

Component / System	Fault Code	Monitor Strategy Description	Primary Malfunction Criteria		Threshold Logic and Value	Secondary Parameters		Enable Conditions		Time Required	MIL Illum.
						and diagnostic performed in current dc and basic enable conditions met: and NO Pending or Confirmed DTCs:	=	FALSE see sheet enable tables see sheet inhibit tables	-		
Engine Coolant Temperature (ECT) Below Thermostat Regulating Temperature	P0128	thermostat by comparing actual engine coolant heat up profile to an expected modeled heat up profile.	modeled coolant temperature (model derived from injection quantity, coolant temperature at start, and ambient temperature) and measured engine coolant temperature	>=	87.96	engine pre drive and time since start and measured engine coolant temperature and captured value of coolant temperature during start and (ambient temperature and ambient temperature) and ambient temperature (used for high region determination) and engine idle time ratio which is defined by (idle time divided by time since start) where idle time is incremented when:		FALSE 2880.00 -40.04 57.96 -7.04 59.96 -30.04 0.50	- °C °C °C °C °C	fail conditions exists for 0.2 s monitor runs once per trip with 0.2 s rate whenever enable conditions are met	В

Component / System	Fault Code	Monitor Strategy Description	Primary Malfunction Criteria	Lo	Threshold ogic and Value		Secondary Parameters		Enable Conditions		Time Required	MIL Illum.
							(accelerator pedal value and	<=	10.00	%		
							vehicle speed and	<=	9.94	mph		
							engine speed)	<=	1000.00	rpm		
							and diagnostic performed in current dc and	=	FALSE	-		
							basic enable conditions met:	=	see sheet enable tables	-		
							and NO Pending or Confirmed DTCs:	=	see sheet inhibit tables	-		
					_							_
HO2S Bank 1 Sensor 1 circuit low	P0131	Monitoring the A/F sensor circuits for circuit low failures	AF sensor IP voltage (IP circuit = A/F sensor Input Pump Current line which is the measuring circuit of the O2 concentration)	<	0.90	V	Ignition on	=	TRUE	-	fault exists for more than 2 sec; monitor runs at 0.1 s	В
			or				A/F sensor pumping current control active for time (only for VM & UN circuits)	<=	3.00	sec	when enable conditions are met	
			A/F sensor -> UN circuit voltage / Vvcc (UN Voltage = A/F sensor nernst cell voltage) (Vvcc = system supply voltage varies between -0.3v to 5.5v)	<	0.35	% of V	or				······	
			or				Activation status of open load test at UN and VM	=	TRUE	-		
			A/F sensor -> VM circuit voltage / Vvcc (VM Voltage = reference ground voltage (Vvcc = system supply voltage varies between -0.3v to 5.5v)	<	0.40	% of V	and					
							A/F sensor temperature (only for IP circuit)) and	>	649.96	°C		

Component /	Fault	Monitor Strategy	Primary Malfunction		Threshold	Secondary		Enable		Time	MIL
System	Code	Description	Criteria	Lo	gic and Value	Parameters A/F sensor error status bit (see parameter definition table) and A/F sensor heater control reset conditions (duty cycle value during sensor heat-up for time or Temperature of A/F sensor (based on sensor internal resistance) and Status bit for valid A/F sensor inner Resistance (see parameter definition table) No Pending or Confirmed DTCs: basic enable conditions met:	=	Conditions FALSE FALSE 90.25 19.50 804.96 TRUE see sheet inhibit tables see sheet enable tables	- % sec °C - -	Required	IIIum.
HO2S Bank 1 Sensor 1 circuit high	P0132	circuits for circuit high failures	AF sensor IP voltage (IP circuit = A/F sensor Input Pump Current line which is the measuring circuit of the O2 concentration) or A/F sensor -> UN circuit voltage / Vvcc (UN Voltage = A/F sensor nernst cell voltage) (Vvcc = system supply voltage varies between -0.3v to 5.5v) or A/F sensor -> VM circuit voltage / Vvcc (VM Voltage = reference ground voltage (Vvcc = system supply voltage varies between -0.3v to 5.5v)	>	0.80	Ignition on A/F sensor pumping current control active for time (only for VM & UN circuits) or Activation status of open load test at UN and VM and A/F sensor temperature (only for IP circuit))	= = >	TRUE 3.00 TRUE 649.96	- sec -	fault exists for more than 2 sec; monitor runs at 0.1 s when enable conditions are met	В

Component /	Fault	Monitor Strategy	Primary Malfunction		Threshold		Secondary		Enable		Time	MIL
System	Code	Description	Criteria	Lo	gic and Value		Parameters		Conditions		Required	Illum.
							and A/F sensor error status bit (see parameter definition table) and	=	FALSE	-		
							A/F sensor heater control reset conditions	=	FALSE	-		
							duty cycle value during sensor heat-up for time or	>= >=	90.25 19.50	% sec		
							Temperature of A/F sensor (based on sensor internal resistance) and	>	804.96	°C		
							Status bit for valid A/F sensor inner Resistance (see parameter definition table)	=	TRUE	-		
) No Pending or Confirmed DTCs:	=	see sheet inhibit tables	-		
							basic enable conditions met:	=	see sheet enable tables	-		
O2 Sensor Circuit Slow Response Bank 1 Sensor 1			Time to reach 30 % of expected rise in O2 concentration	>	3	sec	Status: Inactive to Check OpPoint				fault exists for more than 2 fuel cut-off	В
			OR				Influence of InjSys_qTot (Total engine injection quantity) on lambda signal known	=	TRUE	-	events; monitor runs at 0.1 s when enable	
			Time to reach 60% expected rise from 30% expected rise in O2 concentration	>	1.8	sec	Status bit which indicates if A/F sensor raw value is valid for A/F sensor diagnostic modules	=	TRUE	-	conditions are met	
			OR				Test not inhibited through the selected conditions in the Inhibit Conditions		TRUE	-		
			Time to reach 60% expected rise in O2 concentration	>	4.30	sec	Table basic enable conditions met:	=	see sheet enable tables	-		
							Engine speed	>	1100.00	rpm		
							Injection quantity	>	20.00	mm^3/r		
										ev		
							Battery voltage	>	11.00	V		
1	I	I	1				DPF regeneration is not active	=	TRUE	-	I I	I

Component /	Fault	Monitor Strategy	Primary Malfunction	Threshold	Secondary		Enable		Time	MIL
System	Code	Description	Criteria	Logic and Value	Parameters		Conditions		Required	Illum.
					Calculated O2 (lambda) signal A/F sensor error status bit (see parameter definition table) Status: Check OpPoint to Wait for	< =	0.10 FALSE	-		
					Overrun Injection quantity deviation	<	6.00	mm^3/r ev		
					for time Injection quantity deviation (calculated	>= >	1 -6.00	sec mm^3/r		
					for dynamic response rate monitoring)		0.00	ev/sec		
					and Injection quantity deviation (calculated for dynamic response rate monitoring)	<	6.00	mm^3/r ev/sec		
					for time Status: Wait_for_Overrun to Evaluate Edge	>	1.00	sec		
					Injection quantity deviation calculated for dynamic response rate monitoring	<	-4.00	mm^3/r ev/sec		
								_		_
Fuel Trim System Lean			Fuel mass observer emission correction quantity	<= -12.00 mm^3/rev	(Status of the Observer function's lambda-signal	=	TRUE	-	fail conditions exists for 12 s monitor runs with 0.02 s rate whenever	В
					means				enable	
					(lambda signal from A/F sensor ready (see parameter definition)	=	TRUE	-	conditions are met	
					fuel system is in fuel cut off (see parameter definition)	=	FALSE	-		
					Particulate Filter Regeneration Mode ((=	FALSE	-		
					component of combusted fuel in the engine or	>=	1	-		
					calculated EGR rate	>=	0	-		
					for time	>	1.00	sec		

Component /	Fault	Monitor Strategy	Primary Malfunction	Threshold	Secondary		Enable		Time	MIL
System	Code	Description	Criteria	Logic and Value	Parameters		Conditions		Required	Illum.
					AND Controller status of the observer means (=	TRUE	-		
					Load dependent release state (see Look-Up-Table #40)	=	0 to 1	-		
					engine coolant temperature	<=	199.96	°C		
					engine coolant temperature	>=	64.96	°C		
					Normal Injection Mode	=	TRUE	. –		
					Barometric pressure	>=	74.80	kPa		
					Ambient temperature NO Pending or Confirmed DTCs:	>= =	-7.04 see sheet inhibit	°C		
					NO Pending of Committee DTCs.	-	tables	-		
					basic enable conditions met:	=	see sheet enable	-		
							tables			
Fuel Trim System			Fuel mass observer emission correction	>= 12.00 mm^3/rev	(Status of the Observer function's	=	TRUE	-	fail conditions	В
Rich		observer correction quantity. Detects if the correction quantity exceeds the feedback limit.	quantity		lambda-signal				exists for 12 s monitor runs with 0.02 s rate whenever	
					means				enable	
					(lambda signal from A/F sensor ready	=	TRUE	-	conditions are met	
					(see parameter definition)	_	INCL	-	met	
					fuel system is in fuel cut off (see parameter definition)	=	FALSE	-		
					Particulate Filter Regeneration Mode	=	FALSE	-		
					component of combusted fuel in the engine or	>=	1	-		
					calculated EGR rate	>=	0	-		
					for time	>	1.00	sec		
					AND Controller status of the observer means	=	TRUE	-		

Component / System	Fault Code	Monitor Strategy Description	Primary Malfunction Criteria	Threshold Logic and Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
System	Coue	Description	Unteria		Load dependent release state (see Look-Up-Table #40)) engine coolant temperature engine coolant temperature Normal Injection Mode Barometric pressure Ambient temperature NO Pending or Confirmed DTCs: basic enable conditions met:	$= 0 \text{ to } 1 -$ $= 199.96 ^{\circ}C$ $= 199.96 ^{\circ}C$ $= TRUE$ $= 74.80 \text{ kPa}$ $= -7.04 ^{\circ}C$ $= see sheet inhibit - tables$ $= see sheet enable - tables$	Keyuneu	
Fuel Temperature Sensor 1 Circuit Low		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	< 1.07 V > 119.96 °C	ignition on and basic enable conditions met:	= TRUE - = see sheet enable - tables	fail conditions exists for 5.0 s test performed continuously 0.2 s rate	В
Fuel Temperature Sensor 1 Circuit High		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	> 4.75 V < -50.04 °C	ignition on and basic enable conditions met:	= TRUE - = see sheet enable - tables	fail conditions exists for 5.0 s test performed continuously 0.2 s rate	В

Component / System	Fault Code	Monitor Strategy Description	Primary Malfunction Criteria		Threshold Logic and Value	e	Secondary Parameters		Enable Conditions		Time Required	MIL Illum.
Fuel Rail Pressure [FRP] Sensor Performance	P0191	Detects a drifted fuel rail pressure sensor by determining the adaptation factor of the fuel rail pressure regulator 2.	fuel pressure regulator 2 adaptation factor	>=	1.21		fuel pressure regulator 2 in closed loop control (please see the definition) and	=	TRUE	-	fail conditions exists for 0.01 s monitor runs with 0.01 s rate whenever	A
			fuel pressure regulator 2 adaptation factor	<=	0.79	factor	adaptation for fuel pressure regulator 2 active means (=	TRUE	-	enable conditions are met	
							counter for successful adaptation	>	0	counts		
							or counter for the successful calculation of the adaptation and	>	10.00	counts		
							(engine speed	>	0.00	rpm		
							and engine speed)	<	10000.00	rpm		
							and vehicle speed and (<=	203.65	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 / System	Fault Code	Monitor Strategy Description	Primary Malfunction Criteria		Threshold Logic and Value	•	Secondary Parameters		Enable Conditions		Time Required	MIL Illum.
		determining the FRP sensor voltage to be in the correct range for atmospheric pressure at engine off and with sufficient pressure bleed-off time.		<	0.42	V	(TRUE		fail conditions exists for more than 0.30 s monitor runs once per driving cycle	
			or rail pressure sensor voltage	>	0.61	V	engine post drive/ afterun and	=		- °C	with 0.01 s rate whenever	
							fuel temperature and		-40.04		enable conditions are	
							engine has already run in this driving cycle and	=	TRUE	-	met	
							rail pressure is reduced means	=	TRUE	-		
							commanded rail pressure and	<	0.00	kPa		
							fuel pressure regulator 2 current and	<=	1.70	Amps		
							time since engine off)	>	15.04	sec		
							and number of fault measurements during engine postdrive/ afterun and	>	10.00	counts		
							basic enable conditions met:	=	see sheet enable tables	-		
Fuel Rail Pressure	P0193	Detects high voltage readings	rail pressure sensor voltage	>	4.81	V	ignition on	=	TRUE	-	fail conditions	A
[FRP] Sensor Circuit High		on the FRP circuit, indicating an OOR high condition on the	· · · · · · · · · · · · · · · · · · ·								exists for 0.2 s	
		FRP circuit	same as rail pressure	>	220000.00	kPa	and basic enable conditions met:	=	see sheet enable tables	-	monitor runs with 0.01 s rate whenever enable	
							and NO Pending or Confirmed DTCs:	=	see sheet inhibit tables	-	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.
Fuel Rail Pressure [FRP] Sensor Circuit Low	P0192	Detects low voltage readings on the FRP circuit, indicating an OOR low condition on the FRP circuit	rail pressure sensor voltage same as rail pressure	~ ~	0.19	V kPa	ignition on and basic enable conditions met: and NO Pending or Confirmed DTCs:	=	TRUE see sheet enable tables see sheet inhibit tables	-	fail conditions exists for 0.2 s monitor runs with 0.01 s rate whenever enable conditions are met	A
Cylinder 1 Injection Timing Retarded	P01CB	Monitors the correction values for the energizing time of each cylinder. A correction value for the energizing time is learned for each cylinder at a calibrated rail pressure operating point. Detects a fault when the corrected energizing time exceeds the allowed limit.	(corrected energizing time for the rail pressure calibration points and cylinder 1	>	(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) maximum injection energizing time and with (b) offset of the maximum filtered		304.4 32.8	µsec µsec	(fuel temperature and fuel temperature)	>= <=	-0.04 79.96	°C °C		
			energizing time)) for rail pressure point		80000.00	kPa	and engine coolant temperature and battery voltage	>	59.96 11.00	°C V		

Component /	Fault	Monitor Strategy	Primary Malfunction	Threshold	Secondary		Enable		Time	MIL
System	Code	Description	Criteria	Logic and Value	Parameters		Conditions		Required	Illum.
					and combustion chamber is not cooled off means time since last combustion (see Look- Up-Table #83) and	>=	7 to 20	sec		
					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	-		
					for time and	>	0.00	sec		
					(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	=	1170	rpm		
					(c) gear specific maximum engine speed	=	2030	rpm		
					and current gear (see Look-Up-Table #82) and	=	0 to 1	gear		
					vehicle speed and	>	0	mph		
					rail pressure deviation from setpoint calculated out of difference between desired and actual value	<	2500.00	kPa		
					for time and	>	0.20	sec		
					no gear change is occurred and	=	TRUE	-		

Component / System	Fault Code	Monitor Strategy Description	Primary Malfunction Criteria	Threshold Logic and Value		Secondary Parameters		Enable Conditions		Time Required	MIL Illum.
System	Code	Description	Gilleria			basic enable conditions met:	=	see sheet enable	-	Requirea	num.
						and NO Pending or Confirmed DTCs:	=	tables see sheet enable tables	-		
Cylinder 3 Injection Timing Retarded	P01CF	Monitors the correction values for the energizing time of each cylinder. A correction value for the energizing time is learned for each cylinder at a calibrated rail pressure operating point.	(environmental temperature	>	-7.04	°C	fail conditions exists for more than 0.01 s monitor runs with 0.01 s rate whenever enable	В
			corrected energizing time for the rail pressure calibration points and cylinder 2	> (a) - (b)	-	and				conditions are met	
			(with			(fuel temperature	>=	-0.04	°C		
			(a) maximum injection energizing time	304.4		and		-0.04	0		
			and with			fuel temperature	<=	79.96	°C		
			(b) offset of the maximum filtered energizing time	32.8	µsec) and					
)			and					
			for			engine coolant temperature	>	59.96	°C		
			rail pressure point	80000.00		and battery voltage	>	11.00	V		
						and combustion chamber is not cooled off means		11.00	·		
						time since last combustion (see Look- Up-Table #83) and and	>=	7 to 20	sec		
						intake manifold pressure and	>	75.00	kPa		
						intake manifold pressure and	<	150.00	kPa		
						accelerator pedal position and	<	0.05	%		

Component / System	Fault Code	Monitor Strategy Description	Primary Malfunction Criteria	Threshold Logic and Value	Secondary Parameters		Enable Conditions		Time Required	MIL Illum.
					Fuel system status	=	Fuel cut off	-		
					for					
					time	>	0.00	sec		
					and					
					(
					engine speed	>	(b) - (a)	-		
					and					
					engine speed	<	(a) + (c)	-		
					with		~~~~			
					 (a) value of engine speed and with 	=	30.00	rpm		
					(b) gear specific minimum engine	=	1170	rom		
					speed	-	1170	rpm		
					and with					
					(c) gear specific maximum engine	=	2030	rpm		
					speed		2000			
)					
					and					
					current gear (see Look-Up-Table #82)	=	0 to 1	gear		
					and					
					vehicle speed	>	0	mph		
					and					
					rail pressure deviation from setpoint	<	2500.00	kPa		
					calculated out of difference between					
					desired and actual value for time	>	0.20			
					and		0.20	sec		
					no gear change is occurred	=	TRUE	-		
					and		INCL			
					basic enable conditions met:	=	see sheet enable	-		
	1						tables			
					and					
					NO Pending or Confirmed DTCs:	=	see sheet enable	-		
							tables			

Component /	Fault	Monitor Strategy	Primary Malfunction	Threshold		Secondary		Enable		Time	MIL
System	Code	Description	Criteria	Logic and Value		Parameters		Conditions		Required	Illum.
Cylinder 4 Injection Timing Retarded		Monitors the correction values for the energizing time of each cylinder. A correction value for the energizing time is learned for each cylinder at a calibrated rail pressure operating point.	(environmental temperature	>	-7.04	°C	fail conditions exists for more than 0.01 s monitor runs with 0.01 s rate whenever enable	В
		Detects a fault when the corrected energizing time exceeds the allowed limit.	corrected energizing time for the rail pressure calibration points and cylinder 3	> (a) - (b)	-	and				conditions are met	
			((
			with	204.4		fuel temperature	>=	-0.04	°C		
			 (a) maximum injection energizing time and with 	304.4	µsec	and fuel temperature	<=	79.96	°C		
			(b) offset of the maximum filtered	32.8	µsec		~-	79.90	C		
			energizing time	52.0	μσευ)					
						and					
			/ for			engine coolant temperature	>	59.96	°C		
			rail pressure point	80000.00	kPa	and					
						battery voltage	>	11.00	V		
						and					
						combustion chamber is not cooled off					
						means					
						time since last combustion (see Look- Up-Table #83)	>=	7 to 20	sec		
						and					
						and		75.00			
						intake manifold pressure	>	75.00	kPa		
						and intake manifold pressure	<	150.00	kPa		
						and		150.00	кга		
						accelerator pedal position	<	0.05	%		
						and		0.00	70		
						Fuel system status	=	Fuel cut off	-		
						for					
						time	>	0.00	sec		
						and					
						(
						engine speed	>	(b) - (a)	-		
						and					
1	I	I	I I			engine speed	<	(a) + (c)	-		

Component /	Fault	Monitor Strategy	Primary Malfunction		Threshold		Secondary		Enable		Time	MIL
System	Code	Description	Criteria	L	ogic and Value		Parameters with		Conditions		Required	Illum.
							(a) value of engine speed and with	=	30.00	rpm		
							(b) gear specific minimum engine speed and with	=	1170	rpm		
							(c) gear specific maximum engine speed)	=	2030	rpm		
							and current gear (see Look-Up-Table #82) and	=	0 to 1	gear		
							vehicle speed and	>	0	mph		
							rail pressure deviation from setpoint calculated out of difference between desired and actual value	<	2500.00	kPa		
							for time and	>	0.20	sec		
							no gear change is occurred and	=	TRUE	-		
							basic enable conditions met:	=	see sheet enable tables	-		
							and NO Pending or Confirmed DTCs:	=	see sheet enable 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.					environmental temperature	~	-7.04	°C	fail conditions exists for more than 0.01 s monitor runs with 0.01 s rate whenever enable	В
		Detects a fault when the corrected energizing time exceeds the allowed limit.	corrected energizing time for the rail pressure calibration points and cylinder 4	>	(a) - (b)	-	and				conditions are met	
			(with (a) maximum injection energizing time		304.4		(fuel temperature and	>=	-0.04	°C		

Component /	Fault	Monitor Strategy	Primary Malfunction	Threshold		Secondary		Enable		Time	MIL
System	Code	Description	Criteria	Logic and Value		Parameters		Conditions		Required	Illum.
			and with			fuel temperature	<=	79.96	°C		
			(b) offset of the maximum filtered	32.8	µsec)					
			energizing time								
)			and					
)					50.00	*0		
			tor rail pressure point	80000.00		engine coolant temperature and	>	59.96	°C		
			raii pressure point	80000.00		battery voltage	>	11.00	V		
						and	-	11.00	v		
						combustion chamber is not cooled off					
						means					
						time since last combustion (see Look-	>=	7 to 20	sec		
						Up-Table #83)					
						and					
						and					
						intake manifold pressure	>	75.00	kPa		
						and					
						intake manifold pressure	<	150.00	kPa		
						and		0.05	0/		
						accelerator pedal position and	<	0.05	%		
							=	Fuel cut off	_		
						Fuel system status for	-	Fuercuton	-		
						time	>	0.00	sec		
						and	-	0.00	360		
						(
						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	=	1170	rpm		
						speed					
						and with		0000			
						(c) gear specific maximum engine	=	2030	rpm		
						speed					
) and					
						current gear (see Look-Up-Table #82)	=	0 to 1	gear		
						and	_	0.01	yea		
						vehicle speed	>	0	mph		
								Ŭ			
1	I		I			and					

Component / System	Fault Code	Monitor Strategy Description	Primary Malfunction Criteria	Threshold Logic and Value		Secondary Parameters rail pressure deviation from setpoint	<	Enable Conditions 2500.00	kPa	Time Required	MIL Illum.
						calculated out of difference between desired and actual value for time and no gear change is occurred and basic enable conditions met: and NO Pending or Confirmed DTCs:	> = =	0.20 TRUE see sheet enable tables see sheet enable tables	sec - -		
					_			lables	_		
Cylinder 1 Injection Timing Advanced	P01CC	below the allowed limit.	(corrected energizing time for the rail pressure calibration points and cylinder 1 (with (a) minimum injection energizing time and with (b) offset of the minimum filtered energizing time)	< (a) + (b) 107.2 47.2		environmental temperature and (fuel temperature and fuel temperature) and	> = <=	-7.04 -0.04 79.96	2° 2° 2°	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	80000.00		engine coolant temperature and battery voltage and combustion chamber is not cooled off means time since last combustion (see Look- Up-Table #83)	> > >=	59.96 11.00 7 to 20	°C V sec		

Component /	Fault	Monitor Strategy	Primary Malfunction	Threshold	Secondary		Enable		Time	MIL
System	Code	Description	Criteria	Logic and Value	Parameters		Conditions		Required	Illum.
					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	-		
					for					
					time and (>	0.00	sec		
					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	=	1170	rpm		
					(c) gear specific maximum engine speed)	=	2030	rpm		
					and current gear (see Look-Up-Table #82) and	=	0 to 1	gear		
					vehicle speed and	>	0	mph		
					rail pressure deviation from setpoint calculated out of difference between desired and actual value	<	2500.00	kPa		
					for time and	>	0.20	sec		
					no gear change is occurred and	=	TRUE	-		
					basic enable conditions met:	=	see sheet enable tables	-		
					and NO Pending or Confirmed DTCs:	=	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.
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.	(environmental temperature	>	-7.04	°C	fail conditions exists for more than 0.01 s monitor runs with 0.01 s rate whenever enable	В
			corrected energizing time for the rail pressure calibration points and cylinder 2	< (a) + (b)	-	and				conditions are met	
			(with			(fuel temperature	>=	-0.04	°C		
			(a) minimum injection energizing time and with	107.2	µsec	and fuel temperature	<=	79.96	°C		
			(b) offset of the minimum filtered energizing time	47.2	µsec)					
)			and					
			/ for	00000.00		engine coolant temperature	>	59.96	°C		
			rail pressure point	80000.00		and battery voltage	>	11.00	V		
						and combustion chamber is not cooled off means					
						time since last combustion (see Look- Up-Table #83) and	>=	7 to 20	sec		
						and intake manifold pressure	>	75.00	kPa		
						and					
						intake manifold pressure and	<	150.00	kPa		
							<	0.05	%		
						Fuel system status	=	Fuel cut off	-		
						time	>	0.00	sec		
						and (
						engine speed	>	(b) - (a)	-		
						and accelerator pedal position and Fuel system status for time and (=	0.00	sec		

Component / System	Fault Code	Monitor Strategy Description	Primary Malfunction Criteria	Threshold Logic and Value	Secondary Parameters		Enable Conditions		Time Required	MIL Illum.
- Oysteni	0000	Description	Uniona		engine speed with	<	(a) + (c)	-	Required	inum.
					(a) value of engine speed and with	=	30.00	rpm		
					(b) gear specific minimum engine speed	=	1170	rpm		
					and with (c) gear specific maximum engine speed)	=	2030	rpm		
					and current gear (see Look-Up-Table #82) and	=	0 to 1	gear		
					vehicle speed and	>	0	mph		
					rail pressure deviation from setpoint calculated out of difference between desired and actual value	<	2500.00	kPa		
					for time	>	0.20	sec		
					no gear change is occurred	=	TRUE	-		
					and basic enable conditions met:	=	see sheet enable tables	-		
					and NO Pending or Confirmed DTCs:	=	see sheet enable tables	-		
							_	-		_
Cylinder 4 Injection Timing Advanced	P01D2	Monitors the correction values for the energizing time of each cylinder. A correction value for the energizing time is learned for each cylinder at a calibrated rail pressure operating point.			environmental temperature	>	-7.04	°C	fail conditions exists for more than 0.01 s monitor runs with 0.01 s rate whenever enable	В
		Detects a fault when the corrected energizing time falls below the allowed limit.	corrected energizing time for the rail pressure calibration points and cylinder 3	< (a) + (b) -	and				conditions are met	
			(with		(fuel temperature	>=	-0.04	°C		

Component /	Fault	Monitor Strategy	Primary Malfunction	Threshold		Secondary		Enable		Time	MIL
System	Code	Description	Criteria	Logic and Value		Parameters		Conditions		Required	Illum.
			(a) minimum injection energizing time	107.2		and					
			and with	47.0		fuel temperature	<=	79.96	°C		
			(b) offset of the minimum filtered	47.2	µsec)					
			energizing time			and					
) \			and					
) for			anging applant to magneture		59.96	°C		
			tor rail pressure point	80000.00		engine coolant temperature and	>	59.90	C		
				80000.00		battery voltage	>	11.00	V		
						and	-	11.00	v		
						combustion chamber is not cooled off					
						means					
						time since last combustion (see Look-	>=	7 to 20	sec		
						Up-Table #83)					
						and					
						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	-		
						for					
						time	>	0.00	sec		
						and					
						((1-) (-)			
						engine speed and	>	(b) - (a)	-		
								(a) + (a)			
						engine speed with	<	(a) + (c)	-		
						(a) value of engine speed	=	30.00	rpm		
						and with		00.00	ipin		
						(b) gear specific minimum engine	=	1170	rpm		
						speed					
						and with					
						(c) gear specific maximum engine	=	2030	rpm		
						speed			•		
)					
						and					
						current gear (see Look-Up-Table #82)	=	0 to 1	gear		
						and					
	I	I				vehicle speed	>	0	mph		

Component / System	Fault Code	Monitor Strategy Description	Primary Malfunction Criteria	Threshold Logic and Value		Secondary Parameters		Enable Conditions		Time Required	MIL Illum.
						and rail pressure deviation from setpoint calculated out of difference between desired and actual value	<	2500.00	kPa	-	
						for time and	>	0.20	sec		
						no gear change is occurred and	=	TRUE	-		
						basic enable conditions met:	=	see sheet enable tables	-		
						and NO Pending or Confirmed DTCs:	=	see sheet enable tables	-		
					_			_			
Cylinder 2 Injection Timing Advanced			(corrected energizing time for the rail pressure calibration points and cylinder 4 (< (a) + (b)	-	environmental temperature and	>	-7.04	Ĵ	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	>=	-0.04	°C		
			and with (b) offset of the minimum filtered energizing time)	47.2	, hsec	fuel temperature) and	<=	79.96	°C		
			for rail pressure point	80000.00	kPa	engine coolant temperature and	>	59.96	°C		
				0000.00		and battery voltage and combustion chamber is not cooled off means	>	11.00	V		
						time since last combustion (see Look- Up-Table #83)	>=	7 to 20	sec		

Component /	Fault	Monitor Strategy	Primary Malfunction	Threshold	Secondary		Enable		Time	MIL
System	Code	Description	Criteria	Logic and Value	Parameters		Conditions		Required	Illum.
					and and					
					intake manifold pressure	>	75.00	kPa		
					and	ŕ	10.00	Ni u		
					intake manifold pressure	<	150.00	kPa		
					and					
					accelerator pedal position	<	0.05	%		
					and					
					Fuel system status for	=	Fuel cut off	-		
					time	>	0.00	sec		
					and	Ĺ	0.00	360		
					(
					engine speed	>	(b) - (a)	-		
					and					
					engine speed	<	(a) + (c)	-		
					with (a) value of engine speed	=	30.00			
					and with	-	30.00	rpm		
					(b) gear specific minimum engine	=	1170	rpm		
					speed					
					and with					
					(c) gear specific maximum engine	=	2030	rpm		
					speed					
) and					
					and current gear (see Look-Up-Table #82)	=	0 to 1	gear		
					and		0101	gear		
					vehicle speed	>	0	mph		
					and					
					rail pressure deviation from setpoint	<	2500.00	kPa		
					calculated out of difference between					
					desired and actual value for time	>	0.20	sec		
					and	Í	0.20	Sec		
					no gear change is occurred	=	TRUE	-		
					and		-			
					basic enable conditions met:	=	see sheet enable	-		
							tables			
					and					
					NO Pending or Confirmed DTCs:	=	see sheet enable tables	-		
							lanies			
1	1	I		1	1	I .			I I	I /

Component / System	Fault Code	Monitor Strategy Description	Primary Malfunction Criteria		Threshold Logic and Value		Secondary Parameters		Enable Conditions		Time Required	MIL Illum.
Coolant Temperature Dropped Below Diagnostic Monitoring Temperature	P01F0	Detects a stuck open thermostat by monitoring for a decrease of the engine coolant temperature below the OBD monitoring threshold during normal operating conditions	engine coolant temperature	<	69.96	°C	engine pre drive	=	FALSE	-	fail conditions exists for 0.2 s monitor runs with 0.2 s rate whenever enable	В
			for fault counter which is equivalent to fault time	>= >=	400.00 80.00		and ambient temperature and	>=	-7.04	°C	conditions are met	
							engine coolant temperature at least once in a drive cycle and	>=	69.96	°C		
							instantaneous fuel consumption (low- pass filtered)	>=	2.00	l/h		
							and basic enable conditions met:	=	see sheet enable tables	-		
							and NO Pending or Confirmed DTCs:	=	see sheet inhibit tables	-		
Injector 1 Control Circuit	P0201	Diagnoses the Fuel Injector Cylinder #1 low side driver circuit for circuit faults.	Voltage low during driver off state (indicates open circuit)	=	Open Circuit:≥ 200 K Ω impedance between ECU pin and load		Engine Running (see parameter definition)	-	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 MIL Required Illum
Injector 2 Control Circuit	P0202	Diagnoses the Fuel Injector Cylinder #4 low side driver circuit for circuit faults.	Voltage low during driver off state (indicates open circuit)	 Open Circuit: 2 - 200 K Ω impedance between ECU pin and load 	Engine Running (see parameter definition)	= TRUE -	fail conditions A exists for more than 0.04 s monitor runs with 0.01 s rate whenever enable conditions are met
Injector 3 Control Circuit	P0203	Diagnoses the Fuel Injector Cylinder #2 low side driver circuit for circuit faults.	Voltage low during driver off state (indicates open circuit)	 Open Circuit: 2 - 200 K Ω impedance between ECU pin and load 	Engine Running (see parameter definition)	= TRUE -	fail conditions A exists for more than 0.04 s monitor runs with 0.01 s rate whenever enable conditions are met
Injector 4 Control Circuit	P0204	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 A exists for more than 0.04 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.
Turbochager Overboost		Detects an permanent negative control deviation of the boost pressure	control deviation of the boost pressure calculated out of difference between desired and actual value	<	(d) * (e) * (f)	-	following conditions for time	>	0.50	sec	fail conditions exists for 10 s monitor runs	В
			with				(=	FALSE	-	with 0.02 s	
			(d) The lower threshold pressure (see Look-Up-Table #58)	=	-30 to -18	kPa	VNT turbo charger offset adaptation active	=	FALSE	-	rate whenever enable	
			(e) correction factor(f) ECB valve based lower limit correction factor	=	1.00 1.00	-	and turbo charger (VNT) wiping is active	=	FALSE	-	conditions are met	
			correction factor				and absolute filtered gradient of boost pressure setpoint, PCR_pDesVal , calculated over a time dT constitutes the third condition for detecting the	<	5.00	kPa		
							steady state and			10/		
							injection Quantity	>=	84.00	mm^3/r ev		
							injection Quantity	<=	160.00	mm^3/r ev		
							and engine Speed	>=	2200.00	-		
							engine Speed engine Speed and	<=	4250.00	rpm rpm		
							turbocharger control deviation	>=	-10.00	%		
							turbocharger control deviation and	<=	10.00	%		
							commanded turbocharger position and	<	100.00	%		
							particulate filter regeneration and	=	FALSE	-		
							NO Pending or Confirmed DTCs:		see sheet inhibit tables	-		
) and basic enable conditions met:	=	see sheet enable tables	-		
								_	_	-		_

Component /	Fault	Monitor Strategy	Primary Malfunction		Threshold		Secondary		Enable		Time	MIL
System	Code	Description	Criteria		Logic and Val	le	Parameters		Conditions		Required	Illum.
Cylinder 1 Balance System		Detects if the amount of fuel injection compensation is at the control limit as determined by Fuel Balance Control (FBC)	fuel balance correction quantity	<	(a) * (b)	-	fuel balance control in closed loop (see closed loop conditions document for details)	=	TRUE	-	fail conditions exists for 10 s monitor runs with 0.01 s rate whenever	В
			or fuel balance correction quantity	>	(c) * (b)	-	and current injection quantity	>	6.00		enable conditions are	
			with				current injection quantity	<	190.00	ev mm^3/r	met	
			(a) lower limitation (see Look-Up-Table #37)	=	-24 to 0	mm^3/rev	engine coolant temperature	>=	39.96	ev °C		
			and with (b) factor for correction quantity and with (c) upper limitation (see Look-Up-Table #38)	=	0.95 0 to 24	factor mm^3/rev	ambient pressure engine speed engine speed vehicle speed and	>= > < =	0.00 575.00 4000.00 186.45	kPa rpm rpm mph		
			#30)				basic enable conditions met: and NO Pending or Confirmed DTCs:	=	see sheet enable tables see sheet inhibit tables	-		
				_		_				_		
Cylinder 2 Balance System		Detects if the amount of fuel injection compensation is at the control limit as determined by Fuel Balance Control (FBC)	fuel balance correction quantity	<	(a) * (b)	-	fuel balance control in closed loop (see closed loop conditions document for details)	=	TRUE	-	fail conditions exists for 10 s monitor runs with 0.01 s rate whenever	В
			or fuel balance correction quantity	>	(c) * (b)	-	and current injection quantity	>	6.00	mm^3/r ev	enable conditions are met	
			with				current injection quantity	<	190.00	ev mm^3/r ev	met	
			(a) lower limitation (see Look-Up-Table #37)	=	-24 to 0	mm^3/rev	engine coolant temperature	>=	39.96	°C		
			and with (b) factor for correction quantity	=	0.95	factor	ambient pressure engine speed engine speed	>= > <	0.00 575.00 4000.00	kPa rpm rpm		
		l	and with	_	0.00		vehicle speed	<=	186.45	mph		

Component / System	Fault Code	Monitor Strategy Description	Primary Malfunction Criteria		Threshold Logic and Val		Secondary Parameters		Enable Conditions		Time Required	MIL Illum.
			(c) upper limitation (see Look-Up-Table #38)	=	0 to 24	mm^3/rev			see sheet enable tables see sheet inhibit tables	-		
Cylinder 3 Balance System	P0269	Detects if the amount of fuel injection compensation is at the control limit as determined by Fuel Balance Control (FBC)	fuel balance correction quantity or	<	(a) * (b)		fuel balance control in closed loop (see closed loop conditions document for details) and	=	TRUE	-	fail conditions exists for 10 s monitor runs with 0.01 s rate whenever enable	В
			fuel balance correction quantity with	>	(c) * (b)		current injection quantity current injection quantity	> <	6.00 190.00	ev mm^3/r	conditions are met	
			(a) lower limitation (see Look-Up-Table #37)	=	-24 to 0		engine coolant temperature	>=	39.96	ev °C		
			and with (b) factor for correction quantity and with (c) upper limitation (see Look-Up-Table	=	0.95 0 to 24	factor	ambient pressure engine speed engine speed vehicle speed and	>= > < =	0.00 575.00 4000.00 186.45	kPa rpm rpm mph		
			#38)		0 10 2 1		basic enable conditions met:	=	see sheet enable tables	-		
							NO Pending or Confirmed DTCs:	=	see sheet inhibit tables	-		
Cylinder 4 Balance System	P0272	injection compensation is at the control limit as determined by Fuel Balance Control (FBC)	fuel balance correction quantity or	<	(a) * (b)		fuel balance control in closed loop (see closed loop conditions document for details) and	=	TRUE	-	fail conditions exists for 10 s monitor runs with 0.01 s rate whenever enable	В

Component /	Fault	Monitor Strategy	Primary Malfunction		Threshold		Secondary		Enable		Time	MIL
System	Code	Description	Criteria		Logic and Val	Je	Parameters		Conditions		Required	Illum.
			fuel balance correction quantity	>	(c) * (b)	-	current injection quantity	>	6.00	mm^3/r	conditions are	
										ev	met	
			with				current injection quantity	<	190.00	mm^3/r		
										ev		
			(a) lower limitation (see Look-Up-Table	=	-24 to 0	mm^3/rev	engine coolant temperature	>=	39.96	°C		
			#37)									
							ambient pressure	>=	0.00	kPa		
			and with				engine speed	>	575.00	rpm		
			(b) factor for correction quantity	=	0.95		engine speed	<	4000.00	rpm		
			and with				vehicle speed	<=	186.45	mph		
			(c) upper limitation (see Look-Up-Table	=	0 to 24	mm^3/rev	and					
			#38)									
							basic enable conditions met:	=	see sheet enable	-		
									tables			
							and					
							NO Pending or Confirmed DTCs:	=	see sheet inhibit tables	-		
									lables			
												_
CAC Efficiency Below	P026A	Detects insufficient charge-air	filtered charge-air cooler efficiency	<	0.40	factor	vehicle speed	>=	31.08	mph	fail conditions	В
Threshold		cooler efficiency.			0.10	laotoi			01100		exists for 90 s	2
											monitor runs	
		The efficiency is calculated									once per	
		from the temperature									driving cycle	
		upstream of the charge air									with 0.1 s rate	
		cooler, temperature									whenever	
		downstream of the charge air									enable	
		cooler, and modeled ambient									conditions are	
		air temperature									met	
							and					
							air mass flow	>=	27.78	g/sec		
							air mass flow (see Look-Up-Table #14)	<=	55.56 to 277.8	g/sec		
							and					
							engine coolant temperature	>=	69.96	°C		
							engine coolant temperature	<=	125.96	°C		
							and					
							boost pressure ratio	>=	1.22	ratio		
							(maximum value of (a) and (b))					
							the maximum value is then divided by (b)					
1	l	1	l I				with					I

Component /	Fault	Monitor Strategy	Primary Malfunction	Threshold	Secondary		Enable		Time	MIL
System	Code	Description	Criteria	Logic and Value	Parameters		Conditions		Required	Illum.
					(a) boost pressure downstream compressor and with	=	calculated parameter	-		
					(b) ambient pressure	=	measured parameter	-		
					control value of the throttle valve	>=	-400.00	%		
					control value of the throttle valve and	<=	5.00	%		
					diagnostic performed in current Drive Cycle and	=	FALSE	-		
					(a) - (b) with	>=	40.00	°C		
					(a) upstream charge air cooler temperature and with	=	measured parameter	-		
					(b) ambient air temperature	=	measured parameter	-		
					injection quantity	>=	20.00	mm^3/r ev		
					injection quantity and	<=	140.00	mm^3/r ev		
					ambient pressure and	>	74.80	kPa		
					ambient temperature and	>	-7.04	°C		
					NO Pending or Confirmed DTCs:	=	see sheet inhibit tables	-		
Injection Quantity Too Low	P026C	Monitors the fuel mass observer correction quantity.	Unlimited fuel mass observer correction quantity - emission control correction	<= -9.96 mm^3/rev	(Status of the Observer function's lambda-signal	=	TRUE		fail conditions exists for 10 s	В
		Detects if the correction quantity exceeds the emissions limit.	quantity						monitor runs with 0.02 s rate whenever	
					means (enable conditions are	
					lambda signal from A/F sensor ready (see parameter definition)	=	TRUE	-	met	

System Code Description Criteria Logic and Value Parameters Conditions Image: Construction of the parameter definition of theparameter definition of theparameter definition of t	- - - sec	Required	Illum.
parameter definition) = FALSE (() Component of combusted fuel in the engine or calculated EGR rate >= 1 or Calculated EGR rate >= 0)) for time > 1.00 AND Controller status of the observer = TRUE means (Lad dependent release state = 0 to 1 (see look up table #) (see Look-Up-Table #40)) = 199.96 engine coolant temperature <=	-		
((>= 1 component of combusted fuel in the engine >= 1 or or or or calculated EGR rate >= 0)) for time > 1.00) AND Controller status of the observer = TRUE means (Load dependent release state = 0 to 1 (see look up table #) (see Look-Up-Table #40) - - -) engine coolant temperature <=	-		
engine or	-		
Image: state of the state	-		
or calculated EGR rate >= 0)) for time > 1.00)) for time > 1.00 AND Controller status of the observer = TRUE means (Load dependent release state = 0 to 1 (see Look up table #) (see Look-Up- Table #40) - = 0 to 1)) engine coolant temperature <=			ļ
Image: Controlled EGR rate >= 0 Image: I			
<pre></pre>	sec		
) AND Controller status of the observer = TRUE means (Load dependent release state (see look up table #) (see Look-Up- Table #40)) engine coolant temperature <= 199.96 engine coolant temperature >= 64.96 Normal Injection Mode = TRUE	sec		1
Controller status of the observer means (Load dependent release state (see Look-Up- Table #40)) engine coolant temperature engine coolant temperature see Controller status of the observer means (Load dependent release state (see Look-Up- Table #40)) engine coolant temperature see Controller status of the observer means (Load dependent release state (see Look-Up- Table #40)) engine coolant temperature see Controller status of the observer (see Look-Up- Table #40)) engine coolant temperature see Controller status of the observer (see Look-Up- Table #40)) engine coolant temperature see Controller status of the observer (see Look-Up- Table #40)) engine coolant temperature see Controller status of the observer (see Look-Up- Table #40)) engine coolant temperature see Controller status of the observer (see Look-Up- Table #40)) engine coolant temperature see Controller status of the observer (see Look-Up- Table #40)) (see Look-Up- Table #40) (see Look-Up- (see Look-Up- Table #40)) (see Look-Up- (see Look-			
Controller status of the observer means (Load dependent release state (see Look-Up- Table #40)) engine coolant temperature engine coolant temperature see Controller status of the observer means (Load dependent release state (see Look-Up- Table #40)) engine coolant temperature see Controller status of the observer means (Load dependent release state (see Look-Up- Table #40)) engine coolant temperature see Controller status of the observer (see Look-Up- Table #40)) engine coolant temperature see Controller status of the observer (see Look-Up- Table #40)) engine coolant temperature see Controller status of the observer (see Look-Up- Table #40)) engine coolant temperature see Controller status of the observer (see Look-Up- Table #40)) engine coolant temperature see Controller status of the observer (see Look-Up- Table #40)) engine coolant temperature see Controller status of the observer (see Look-Up- Table #40)) (see Look-Up- Table #40) (see Look-Up- (see Look-Up- Table #40)) (see Look-Up- (see Look-			
means (Load dependent release state = 0 to 1 (see look up table #) (see Look-Up- Table #40) -) - - engine coolant temperature >= 64.96 Normal Injection Mode = TRUE			
(= 0 to 1 Load dependent release state = 0 to 1 (see look up table #) (see Look-Up- Table #40) - -) = - 199.96 engine coolant temperature >= 64.96 Normal Injection Mode = TRUE	-		
(see look up table #) (see Look-Up- Table #40)) engine coolant temperature <= 199.96 engine coolant temperature >= 64.96 Normal Injection Mode = TRUE			
Table #40)) engine coolant temperature <= 199.96	-		
) engine coolant temperature <= 199.96 engine coolant temperature >= 64.96 Normal Injection Mode = TRUE			
engine coolant temperature >= 64.96 Normal Injection Mode = TRUE			
engine coolant temperature >= 64.96 Normal Injection Mode = TRUE			
Normal Injection Mode = TRUE	°C ℃		
	U		
Barometric pressure >= 74.80	kPa		
Ambient temperature >= -7.04	°C		
Vehicle speed < 1.86	mph		
and			
(Engine speed >= 575	rom		
Engine speed >- 575 Engine speed <= 1075	rpm rpm		
	ipin		
NO Pending or Confirmed DTCs: = see sheet inhibit	-		
tables			
basic enable conditions met: = see sheet enable	-		
tables			
			1
Injection Quantity Too P026D Monitors the fuel mass Unlimited fuel mass observer correction >= 0.2 to 5.4 mm^3/rev (Status of the Observer function's = TRUE	-	fail conditions	
High observer correction quantity. quantity - emission control correction lambda-signal		exists for 10 s	1
Detects if the correction quantity (see Look-Up-Table #39)		monitor runs	1
quantity exceeds the emissions limit.		with 0.02 s rate whenever	
means		enable	1

Component /	Fault	Monitor Strategy	Primary Malfunction	Threshold	Secondary		Enable		Time	MIL
System	Code	Description	Criteria	Logic and Value	Parameters		Conditions		Required	Illum.
					(lambda signal from A/F sensor ready	=	TRUE	-	conditions are met	
					(see parameter definition) fuel system is in fuel cut off (see	=	FALSE	-		
					parameter definition)					
					Particulate Filter Regeneration Mode	=	FALSE	-		
					component of combusted fuel in the engine	>=	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 #) (see Look-Up- Table #40)	=	0 to 1	-		
) engine coolant temperature	<=	199.96	°C		
					engine coolant temperature	>=	64.96	°Č		
					Normal Injection Mode	=	TRUE	0		
					Barometric pressure	>=	74.80	kPa		
					Ambient temperature	>=	-7.04	°C		
					Vehicle speed	<	1.86	mph		
					and (
					C Engine speed	>=	575	rpm		
					Engine speed	<=	1075	rpm		
)		1010	.6		
					NO Pending or Confirmed DTCs:	=	see sheet inhibit tables	-		
					basic enable conditions met:	=	see sheet enable tables	-		

Component /	Fault	Monitor Strategy	Primary Malfunction		Threshold		Secondary		Enable		Time	MIL
System	Code	Description	Criteria		Logic and Value		Parameters		Conditions		Required	Illum.
Turbochager Underboost	P0299	control deviation of the boost	control deviation of the boost pressure calculated out of difference between desired and actual value	>	(a) * (b) * (c)	-	following conditions for time	>	0.50	Sec	fail conditions exists for 7.5 s monitor runs with 0.02 s rate whenever enable conditions are met	В
							,		EN 05			
			with (a) the upper limit (see Look-Up-Table	=	33 to 60	kPa	(VNT turbo charger offset adaptation	=	FALSE FALSE	-		
			(a) the upper limit (see Look-op-Table #57)	_	55 10 00	κια	active	_	TALOL	-		
			(b) Correction factor	=	1.00	factor	and					
			(c) ECB valve based upper limit correction factor	=	1.00	factor	turbo charger (VNT) wiping is active	=	FALSE	-		
							and absolute filtered gradient of boost pressure setpoint calculated over a time dT constitutes the third condition for detecting the steady state and	<	7.50	kPa		
							injection Quantity	>=	70.00	mm^3/r ev		
							injection Quantity	<=	140.00	mm^3/r ev		
							and					
							engine Speed	>= <=	1750.00 3500.00	rpm		
							engine Speed and	<=	3500.00	rpm		
							particulate filter regeneration and	=	FALSE	-		
							NO Pending or Confirmed DTCs:	=	see sheet inhibit tables	-		
) and					
							basic enable conditions met:	=	see sheet enable tables	-		
										_		

Component /	Fault	Monitor Strategy	Primary Malfunction	Threshold		Secondary		Enable		Time	MIL
System	Code	Description	Criteria	Logic and Value		Parameters		Conditions		Required	Illum.
Cylinder 1 Injection Timing Reached Feedback Limit	P02CD	Monitors the correction values for the energizing time of each cylinder. A correction value for the energizing time is learned for each cylinder at three different rail pressure operating point.	(environmental temperature	~	-7.04	C	fail conditions exists for more than 0.5 s monitor runs with 0.01 s rate whenever enable	В
		Detects a fault when the corrected energizing time exceeds the feedback control limit.	corrected energizing time for the rail pressure calibration points and cylinder 1	> (a) - (b)	-	and				conditions are met	
			with			fuel temperature	>=	-0.04	°C		
			(a) maximum injection energizing time (see Look-Up-Table #20)	0 to 547.2	µsec	and			-		
			and with			fuel temperature	<=	79.96	°C		
			 (b) offset of the maximum filtered energizing time (see Look-Up-Table #22) 	0 to 16	µsec)					
)			and					
) OR (engine coolant temperature and	>	59.96	°C		
			corrected energizing time for the rail pressure calibration points and cylinder 1	< (a) + (b)	-	battery voltage	>	11.00	V		
			(with (a) minimum injection energizing time	0 to 137.2	usec	and combustion chamber is not cooled off means					
			(see Look-Up-Table #21) and with	0 10 101.2	μοσο	time since last combustion (see Look-	>=	7 to 20	sec		
			(b) offset of the minimum filtered energizing time (see Look-Up-Table #23)	0 to 16	µsec	Up-Table #83) and					
)) for			and intake manifold pressure and	>	75.00	kPa		
			rail pressure point (see Look-Up-Table #19)	0 to 80000	kPa	intake manifold pressure	<	150.00	kPa		
						and accelerator pedal position	<	0.05	%		

Component / System	Fault Code	Monitor Strategy Description	Primary Malfunction Criteria	Threshold Logic and Value	Secondary Parameters		Enable Conditions		Time Required	MIL Illum.
System	Coue	Description	Cilteria	Logic and value	and		Conditions		Required	mum.
					Fuel system status	=	Fuel cut off	-		
					for		1 401 041 011			
					time	>	0.00	sec		
					and					
					(
					engine speed	>	(b) - (a)	-		
					and					
					engine speed	<	(a) + (c)	-		
					with (a) value of engine speed	=	30.00	-		
					and with	_	30.00	rpm		
					(b) gear specific minimum engine	=	1170	rpm		
					speed					
					and with					
					(c) gear specific maximum engine	=	2030	rpm		
					speed					
)					
					and		0 +- 4			
					current gear (see Look-Up-Table #82) and	=	0 to 1	gear		
					vehicle speed	>	0	mph		
					and	-	0	прп		
					rail pressure deviation from setpoint	<	2500.00	kPa		
					calculated out of difference between					
					desired and actual value					
					for time	>	0.20	sec		
					and					
					no gear change is occurred	=	TRUE	-		
					and basic enable conditions met:	_	see sheet enable			
					basic enable conditions met.	=	tables	-		
					and		เฉมเธอ			
					NO Pending or Confirmed DTCs:	=	see sheet enable	-		
					ç il il		tables			

Component /	Fault	Monitor Strategy	Primary Malfunction	Threshold		Secondary		Enable		Time	MIL
System	Code	Description	Criteria	Logic and Value		Parameters		Conditions		Required	Illum.
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.	(environmental temperature	>	-7.04	°C	fail conditions exists for more than 0.5 s monitor runs with 0.01 s rate whenever enable	В
		Detects a fault when the corrected energizing time exceeds the feedback control limit.	corrected energizing time for the rail pressure calibration points and cylinder 1	> (a) - (b)	-	and				conditions are met	
			with			fuel temperature	>=	-0.04	°C		
			(a) maximum injection energizing time (see Look-Up-Table #20)	0 to 547.2	µsec	and					
			and with			fuel temperature	<=	79.96	°C		
			 (b) offset of the maximum filtered energizing time (see Look-Up-Table #22) 	0 to 16	µsec)					
)			and					
) OR (engine coolant temperature and	>	59.96	°C		
			corrected energizing time for the rail pressure calibration points and cylinder 1	< (a) + (b)	-	battery voltage	>	11.00	V		
			(with	0 to 127.0		and combustion chamber is not cooled off					
			 (a) minimum injection energizing time (see Look-Up-Table #21) and with 	0 to 137.2	µsec	means time since last combustion (see Look-	>=	7 to 20	sec		
			(b) offset of the minimum filtered	0 to 16	usec	Up-Table #83) and		7 10 20	360		
			energizing time (see Look-Up-Table #23)		μοσο						
)) for			and intake manifold pressure and	>	75.00	kPa		
			rail pressure point (see Look-Up-Table #19)	0 to 80000	kPa	intake manifold pressure	<	150.00	kPa		
			.,			and accelerator pedal position	<	0.05	%		

Component / System	Fault Code	Monitor Strategy Description	Primary Malfunction Criteria	Threshold Logic and Value	Secondary Parameters		Enable Conditions		Time Required	MIL Illum.
					and Fuel system status	=	Fuel cut off	-		
					for time and	>	0.00	sec		
					(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	=	1170	rpm		
					and with (c) gear specific maximum engine speed	=	2030	rpm		
) and					
					current gear (see Look-Up-Table #82) and	=	0 to 1	gear		
					vehicle speed and	>	0	mph		
					rail pressure deviation from setpoint calculated out of difference between	<	2500.00	kPa		
					desired and actual value for time and	>	0.20	sec		
					no gear change is occurred and	=	TRUE	-		
					basic enable conditions met:	=	see sheet enable tables	-		
					and NO Pending or Confirmed DTCs:	=	see sheet enable tables	-		
							_			

Component /	Fault	Monitor Strategy	Primary Malfunction	Threshold	_	Secondary		Enable		Time	MIL
System	Code	Description	Criteria	Logic and Value		Parameters		Conditions		Required	Illum.
Cylinder 3 Injection Timing Reached Feedback Limit	P02D1	Monitors the correction values for the energizing time of each cylinder. A correction value for the energizing time is learned for each cylinder at three different rail pressure operating point.	(environmental temperature	>	-7.04	°C	fail conditions exists for more than 0.5 s monitor runs with 0.01 s rate whenever enable	В
		Detects a fault when the corrected energizing time exceeds the feedback control limit.	corrected energizing time for the rail pressure calibration points and cylinder 1	> (a) - (b)	-	and				conditions are met	
			with			fuel temperature	>=	-0.04	°C		
			(a) maximum injection energizing time (see Look-Up-Table #20)	0 to 547.2	µsec	and					
			and with			fuel temperature	<=	79.96	°C		
			 (b) offset of the maximum filtered energizing time (see Look-Up-Table #22) 	0 to 16	µsec)					
)			and					
) OR (engine coolant temperature and	>	59.96	°C		
			corrected energizing time for the rail pressure calibration points and cylinder 1	< (a) + (b)	-	battery voltage	>	11.00	V		
			(with (a) minimum injection energizing time	0 to 137.2		and combustion chamber is not cooled off means					
			(a) minimum injection energizing time (see Look-Up-Table #21) and with	0 10 137.2	µsec	time since last combustion (see Look-	>=	7 to 20	sec		
			(b) offset of the minimum filtered	0 to 16	usec	Up-Table #83) and					
			energizing time (see Look-Up-Table #23)								
))			and intake manifold pressure	>	75.00	kPa		
			ror rail pressure point (see Look-Up-Table #19)	0 to 80000	kPa	and intake manifold pressure	<	150.00	kPa		
			,, , , , , , , , , , , , , , , , , , ,			and accelerator pedal position	<	0.05	%		

Component / System	Fault Code	Monitor Strategy Description	Primary Malfunction Criteria	Threshold Logic and Value	Secondary Parameters		Enable Conditions		Time Required	MIL Illum.
					and Fuel system status	=	Fuel cut off	-		
					for					
					time and	>	0.00	sec		
					(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	=	1170	rpm		
					speed and with					
					(c) gear specific maximum engine speed	=	2030	rpm		
)					
					and current gear (see Look-Up-Table #82)	=	0 to 1	gear		
					and vehicle speed	>	0	mph		
					and		0	mph		
					rail pressure deviation from setpoint calculated out of difference between	<	2500.00	kPa		
					desired and actual value					
					for time and	>	0.20	sec		
					no gear change is occurred	=	TRUE	-		
					and basic enable conditions met:	=	see sheet enable	-		
					and		tables			
					NO Pending or Confirmed DTCs:	=	see sheet enable	-		
							tables			
						_		_		

Component /	Fault	Monitor Strategy	Primary Malfunction	Threshold		Secondary		Enable		Time	MIL
System	Code	Description	Criteria	Logic and Value		Parameters		Conditions		Required	Illum.
Cylinder 4 Injection Timing Reached Feedback Limit	P02D3	Monitors the correction values for the energizing time of each cylinder. A correction value for the energizing time is learned for each cylinder at three different rail pressure operating point.	(environmental temperature	>	-7.04	°C	fail conditions exists for more than 0.5 s monitor runs with 0.01 s rate whenever enable	В
		Detects a fault when the corrected energizing time exceeds the feedback control limit.	corrected energizing time for the rail pressure calibration points and cylinder 1	> (a) - (b)	-	and				conditions are met	
			with			fuel temperature	>=	-0.04	°C		
			(a) maximum injection energizing time (see Look-Up-Table #20)	0 to 547.2	µsec	and					
			and with			fuel temperature	<=	79.96	°C		
			 (b) offset of the maximum filtered energizing time (see Look-Up-Table #22) 	0 to 16	µsec)					
)			and					
) OR (engine coolant temperature and	>	59.96	°C		
			corrected energizing time for the rail pressure calibration points and cylinder 1	< (a) + (b)	-	battery voltage	>	11.00	V		
			(with (a) minimum injection energizing time	0 to 137.2	usec	and combustion chamber is not cooled off means					
			(a) minimum injection energizing time (see Look-Up-Table #21) and with	0 10 137.2	μsec	time since last combustion (see Look-	>=	7 to 20	sec		
			(b) offset of the minimum filtered	0 to 16	µsec	Up-Table #83) and					
			energizing time (see Look-Up-Table #23)								
)			and intake manifold pressure	>	75.00	kPa		
			for rail pressure point (see Look-Up-Table #10)	0 to 80000	kPa	and intake manifold pressure	<	150.00	kPa		
			#19)			and accelerator pedal position	<	0.05	%		

Component / System	Fault Code	Monitor Strategy Description	Primary Malfunction Criteria	Threshold Logic and Value	Secondary Parameters		Enable Conditions		Time Required	MIL Illum.
					and Fuel system status	=	Fuel cut off	-		
					for time and	>	0.00	sec		
					(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	=	1170	rpm		
					(c) gear specific maximum engine speed	=	2030	rpm		
) and current gear (see Look-Up-Table #82)	=	0 to 1	gear		
					and vehicle speed and	>	0	mph		
					rail pressure deviation from setpoint calculated out of difference between	<	2500.00	kPa		
					desired and actual value for time and	>	0.20	sec		
					no gear change is occurred and	=	TRUE	-		
					basic enable conditions met: and	=	see sheet enable tables	-		
					NO Pending or Confirmed DTCs:	=	see sheet enable tables	-		
Intake Air Flow Valve Control Circuit	P02E0	Diagnoses the Throttle Valve low side driver circuit for circuit faults.	Voltage low during driver off state (indicates open circuit)	 Open Circuit:≥ - 200 K Ω impedance between ECU pin and load 	battery voltage	>	11.00	V	fail conditions exists for 1,1s monitor runs with 0.005 s	В

Component /	Fault	Monitor Strategy	Primary Malfunction	Threshold	Secondary		Enable		Time	MIL
System	Code	Description	Criteria	Logic and Value	Parameters		Conditions		Required	Illum.
					for time	>	3.00	sec	rate whenever enable conditions are	
					and starter is active cranking for	=	FALSE	-	met	
					time and	>	3.00	sec		
					and basic enable conditions met:	=	see sheet enable tables	-		
					Throttle Valve Actuator Solenoid Control Circuit and	=	ACTIVE	-		
					NO Pending or Confirmed DTCs	=	see sheet inhibit tables	-		
							14.00		6.11.114	
			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 0,5 s	
					for time and	>	3.00	sec	monitor runs with 0.005 s rate whenever	
					starter is active cranking for	=	FALSE	-	enable conditions are	
					time and	>	3.00	sec	met	
					basic enable conditions met: and	=	see sheet enable tables	-		
					Throttle Valve Actuator Solenoid Control Circuit and	=	ACTIVE	-		
					Open Load Diagnosis active	=	FALSE	-		
					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.		battery voltage	>	11.00	V	fail conditions exists for 0,5 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	>	3.00	sec	monitor runs with 0.005 s rate whenever	
						starter is active cranking for	=	FALSE	-	enable conditions are	
						time and	>	3.00	sec	met	
						basic enable conditions met:	=	see sheet enable tables	-		
						Throttle Valve Actuator Solenoid Control Circuit and	=	ACTIVE	-		
						Open Load Diagnosis active NO Pending or Confirmed DTCs	=	FALSE see sheet inhibit	-		
						·····g -· -···		tables			
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	battery voltage	>	11.00	V	fail conditions exists for 0,5 s monitor runs with 0.005 s rate whenever enable conditions are	В
						time and	>	3.00	sec	met	
						starter is active cranking for	=	FALSE	-		
						time and	>	3.00	sec		
						basic enable conditions met:	=	see sheet enable tables	-		
						and Throttle Valve Actuator Solenoid Control Circuit and	=	ACTIVE	-		
						Open Load Diagnosis active 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.
Intake Air Flow Valve Control Circuit 1 High Voltage		Diagnoses the Throttle Valve low side driver circuit for circuit faults.	Voltage high during driver on state (indicates short to power)	i	Short to power: $\leq 0.5 \Omega$ impedance between signal and controller power	-	battery voltage for time	>	11.00	V	fail conditions exists for 0,5 s monitor runs with 0.005 s rate whenever enable conditions are met	В
							and starter is active cranking for	=	FALSE	-	met	
							time and	>	3.00	sec		
							and basic enable conditions met:	=	see sheet enable tables	-		
							Throttle Valve Actuator Solenoid Control Circuit	=	ACTIVE	-		
							and Open Load Diagnosis active NO Pending or Confirmed DTCs	=	FALSE see sheet inhibit tables	-		
						_		_		_		
Throttle Valve Actuator (TVA) Position Sensor Performance	P02E7		throttle valve control deviation calculated out of difference between desired and actual value	<	10.00	%	throttle valve controller bypass is active	=	FALSE	-	fail conditions exists for 10 s monitor runs with 0.005 s rate whenever	В
			or throttle valve control deviation calculated out of difference between desired and actual value	>	-10.00	%	and throttle valve is driven to a mechanical stop	=	FALSE	-	enable conditions are met	
							and Throttle Governor is active	=	TRUE	-		
							and Throttle Valve Permanent Control Deviation and	=	FALSE	-		

Component / System	Fault Code	Monitor Strategy Description	Primary Malfunction Criteria		hreshold ic and Value		Secondary Parameters		Enable Conditions		Time Required	MIL Illum.
System	Code	Description	Criteria	LOG	ic and value		throttle valve is detected as frozen	=	TRUE		Required	mum.
							means					
							Engine Coolant Temperature and	<	198.96	°C		
							engine speed (see Look-Up-Table #81)	>	850 to 1100	rpm		
										r		
							and /					
							Offset learning done on previous driving	=	TRUE	-		
							cycle					
							OR Offset learning on going	=	TRUE	_		
)		INOL			
							and					
							basic enable conditions met	=	see sheet enable tables	-		
							and					
							NO Pending or Confirmed DTCs:	=	see sheet inhibit	-		
									tables			
Diesel Intake Air Flow	P02E8	Detects low voltage readings	measured throttle valve position voltage	<	0.41	V	ignition on	=	TRUE		fail conditions	А
Position Sensor	1 0220	on the throttle valve position	measured throttle valve position voltage		0.41	v		_	INCL	-	exists for 5.0	~
Circuit Low Voltage		sensor circuit, indicating an									s; test	
		OOR low condition on the throttle valve position sensor									performed continuously	
		circuit									0.005 s rate	
			same as		10	~ /	and					
			throttle position	<	-10	%	basic enable conditions met	=	see sheet enable tables	-		
							and					
							No Pending or Confirmed DTCs:	=	see sheet inhibit	-		
									tables			
Diesel Intake Air Flow	P02E9	Detects high voltage readings	measured throttle valve position voltage	>	4.61	V	ignition on	=	TRUE		fail conditions	А
Position Sensor	10213	on the throttle valve position	measured throttle valve position voltage	-	4.01	v		_	INCL	-	exists for 5.0	~
Circuit High Voltage		sensor circuit, indicating an									s; test	
		OOR high condition on the throttle valve position sensor									performed continuously	
		circuit									0.005 s rate	

Component / System	Fault Code	Monitor Strategy Description	Primary Malfunction Criteria		Threshold Logic and Value	e	Secondary Parameters		Enable Conditions		Time Required	MIL Illum.
			same as throttle position	>	105	%	and basic enable conditions met and	=	see sheet enable tables	-		
							No Pending or Confirmed DTCs:	=	see sheet inhibit tables	-		
Intake Air Flow Valve Control Motor Current Performance	P02EB		The ECM detects that the commanded state of the driver and the actual state of the control circuit do not match.				battery voltage	>	11.00	V	fail conditions exists for 2.0 s monitor runs	В
							for time and starter is active cranking	>	3.00 FALSE	sec	with 0.005 s rate whenever enable conditions are	
							for time and	>	3.00	sec	met	
							basic enable conditions met: and	=	see sheet enable tables	-		
							Throttle Valve Actuator Solenoid Control Circuit and	=	ACTIVE	-		
							Open Load Diagnosis active NO Pending or Confirmed DTCs	= =	FALSE see sheet inhibit tables	-		
Engine Misfire Detected	P0300	Indicates that the engine has experienced more than one cylinder misfiring, detected by a crankshaft angle delay that is too great, caused by a drop in the engine speed	angular acceleration of the crankshaft (see Look-Up-Table #52)	<	-5.75 to -2.52	sec^(2)	(fail conditions exists for 0.02 s monitor runs with 0.02 s rate whenever	
			and number of detected misfires for	>=	200.00	counts	Engine Running (see parameter definition) and engine speed	=	TRUE 350.00	- rpm	enable conditions are met	

Component /	Fault	Monitor Strategy	Primary Malfunction		Threshold		Secondary		Enable		Time	MIL
System	Code	Description	Criteria		Logic and Valu		Parameters		Conditions		Required	Illum.
			evaluated crankshaft revolutions with	>=	(a) * (b)		and engine speed	<	1400.00	rpm		
			(a) number of crankshaft revolutions per block and with	=	20.00	counts) and					
			and with (b) number of test blocks and	=	45.00	counts	and (a) - (b) with	<	450.00	rpm		
			misfires exist on more than one cylinder	=	TRUE	-	(a) actual desired idle speed	=	calculated parameter	-		
							and with (b) engine speed	=	measured parameter	-		
							and (parameter			
							current injection quantity	>	4.00	mm^3/r ev		
							and current injection quantity	<	180.00	mm^3/r ev		
) and			ev		
							engine coolant temperature and	>=	40.06	°C		
							vehicle speed and	<=	1.86	mph		
							time since start and deletion of error memory (Mode\$4) not	>=	10.00 TRUE	sec		
							executed since last check of the monitoring conditions and	-	IRUE	-		
							adaptation value for tooth wheel has been learned	=	TRUE	-		
							and current change in engine speed for	<=	450.00	rpm		
							time and	=	0.00	sec		
							current change in injection quantity	<=	170.00	mm^3/r ev		
I	I	l	l l				for				I	

Cylinder 1 Misfire P0301 Indicates that the engine has experienced a single cylinder misfiring, detected by a crankshaft angle delay that is to orget, caused by a drop in the engine speed angular acceleration of the crankshaft (see Look-Up-Table #52) < -5.75 to -2.52 sec^/(2) sec sheet enable and NO Pending or Confirmed DTCs: = see sheet inhibit tables - Cylinder 1 Misfire Detected P0301 Indicates that the engine has experienced a single cylinder misfiring, detected by a crankshaft angle delay that is to orget, caused by a drop in the engine speed and number of detected misfires for -5.75 to -2.52 sec^/(2) (- - Fail conditions smonitor runs with 0.02 s monitor runs met = TRUE -	Component / System	MIL Illum.
Detected experienced a single cylinder misfiring, detected by a crankshaft angle delay that is too great, caused by a drop in the engine speed (see Look-Up-Table #52) Image: Construint of the construint of the construint of the engine speed exists for 0.02 s s monitor runs with 0.02 s and and Image: Construint of the engine speed and Image: Construint of the engine speed Image: Construint of the engin the engin the engin the engine speed Image: Cons		
with (a) number of crankshaft revolutions and with (b) number of test blocks = 20.00 counts -		

Component /	Fault	Monitor Strategy	Primary Malfunction		Threshold		Secondary		Enable		Time	MIL
System	Code	Description	Criteria		Logic and Value	9	Parameters	<=	Conditions 1.86	una un les	Required	Illum.
							vehicle speed and time since start	>=	10.00	mph sec		
							and deletion of error memory (Mode\$4) not executed since last check of the monitoring conditions	=	TRUE	-		
							and adaptation value for tooth wheel has been learned	=	TRUE	-		
							and current change in engine speed for	<=	450.00	rpm		
							time and	=	0.00	sec		
							current change in injection quantity	<=	170.00	mm^3/r ev		
							for time and	=	0.00	sec		
							basic enable conditions met:	=	see sheet enable tables	-		
							and NO Pending or Confirmed DTCs:	=	see sheet inhibit tables	-		
						_				_		_
Cylinder 3 Misfire Detected	P0303	Indicates that the engine has experienced a single cylinder misfiring, detected by a crankshaft angle delay that is too great, caused by a drop in	angular acceleration of the crankshaft (see Look-Up-Table #52)	<	-5.75 to -2.52	sec^(2)	(fail conditions exists for 0.02 s monitor runs with 0.02 s	В
		the engine speed	and				Engine Running (see parameter definition)	=	TRUE	-	rate whenever enable conditions are	
			number of detected misfires for	>=	200.00	counts	and engine speed	>	350.00	rpm	met	
			evaluated crankshaft revolutions with	>=	(a) * (b)		and engine speed	<	1400.00	rpm		

Component /	Fault	Monitor Strategy	Primary Malfunction		Thres			Secondary		Enable		Time	MIL
System	Code	Description	Criteria			d Value		Parameters		Conditions		Required	Illum.
			(a) number of crankshaft revolutions per block and with	=	20.0	0	counts) and					
			(b) number of test blocks	=	45.0	0	counts	(a) - (b) with	<	450.00	rpm		
								(a) actual desired idle speed	=	calculated parameter	-		
								(b) engine speed	=	measured parameter	-		
								and (
								current injection quantity	>	4.00	mm^3/r ev		
								and current injection quantity	<	180.00	mm^3/r ev		
) and					
								engine coolant temperature and	>=	40.06	°C		
								vehicle speed and	<=	1.86	mph		
								time since start and	>=	10.00	sec		
								deletion of error memory (Mode\$4) not executed since last check of the monitoring conditions and	=	TRUE	-		
								and adaptation value for tooth wheel has been learned	=	TRUE	-		
								and current change in engine speed	<=	450.00	rpm		
								for time	=	0.00	sec		
								and current change in injection quantity	<=	170.00	mm^3/r		
								for	~-	170.00	ev		
								time and	=	0.00	sec		

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	Gillena		Logic and value	,	basic enable conditions met:	=	see sheet enable tables	-	Required	mum.
							and NO Pending or Confirmed DTCs:	=	see sheet inhibit tables	-		
Ordinalan 4 Miafina	D0004				5 75 to 0 50						feil esseltiene	
Cylinder 4 Misfire Detected		experienced a single cylinder misfiring, detected by a crankshaft angle delay that is too great, caused by a drop in	angular acceleration of the crankshaft (see Look-Up-Table #52)	<	-5.75 to -2.52	sec^(2)	(fail conditions exists for 0.02 s monitor runs with 0.02 s	В
			and		000.00		Engine Running (see parameter definition)	=	TRUE	-	rate whenever enable conditions are	
			number of detected misfires for evaluated crankshaft revolutions	>=	200.00 (a) * (b)	counts	and engine speed and	>	350.00	rpm	met	
			with (a) number of crankshaft revolutions	=	(a) (b) 20.00	counts	engine speed	<	1400.00	rpm		
			per block and with		20.00	counts	and					
			(b) number of test blocks	=	45.00	counts	((a) - (b) with	<	450.00	rpm		
							(a) actual desired idle speed	=	calculated parameter	-		
							and with					
							(b) engine speed	=	measured parameter	-		
							and (
							current injection quantity	>	4.00	mm^3/r ev		
							and current injection quantity	<	180.00	mm^3/r ev		
) and			ev		
							engine coolant temperature and	>=	40.06	°C		
							vehicle speed and	<=	1.86	mph		

Component /	Fault	Monitor Strategy	Primary Malfunction		Threshold		Secondary		Enable		Time	MIL
System	Code	Description	Criteria		Logic and Value	e	Parameters		Conditions		Required	Illum.
							time since start and deletion of error memory (Mode\$4) not	>=	10.00 TRUE	sec -		
							executed since last check of the monitoring conditions and adaptation value for tooth wheel has been learned	=	TRUE	-		
							and current change in engine speed for	<=	450.00	rpm		
							time and	=	0.00	sec		
							current change in injection quantity for	<=	170.00	mm^3/r ev		
							time and	=	0.00	sec		
							basic enable conditions met:	=	see sheet enable tables	-		
							and NO Pending or Confirmed DTCs:	=	see sheet inhibit tables	-		
					_				_	_		
Cylinder 2 Misfire Detected	P0302	Indicates that the engine has experienced a single cylinder misfiring, detected by a crankshaft angle delay that is too great, caused by a drop in	angular acceleration of the crankshaft (see Look-Up-Table #52)	<	-5.75 to -2.52	sec^(2)	(fail conditions exists for 0.02 ms monitor runs with 0.02 s	В
		the engine speed	and				Engine Running (see parameter definition)	=	TRUE	-	rate whenever enable conditions are	
			number of detected misfires for	>=	200.00	counts	and engine speed	>	350.00	rpm	met	
			evaluated crankshaft revolutions with	>=	(a) * (b)	-	and engine speed	<	1400.00	rpm		
			(a) number of crankshaft revolutions per block and with	=	20.00	counts) and					

Component /	Fault	Monitor Strategy	Primary Malfunction	Threshold	Secondary		Enable		Time	MIL
System	Code	Description	Criteria	= 45.00 counts	Parameters		Conditions	10.000	Required	Illum.
			(b) number of test blocks	= 45.00 counts	(a) - (b) with	<	450.00	rpm		
					(a) actual desired idle speed	=	calculated	-		
					(a) actual desired fore speed	_	parameter	-		
					and with		parameter			
					(b) engine speed	=	measured	-		
					(0) 01.9.10 00000		parameter			
					and		P			
					(
					current injection quantity	>	4.00	mm^3/r		
								ev		
					and					
					current injection quantity	<	180.00	mm^3/r		
								ev		
)					
					and					
					engine coolant temperature	>=	40.06	°C		
					and		4.00			
					vehicle speed	<=	1.86	mph		
					and time since start	>=	10.00	sec		
					and		10.00	sec		
					deletion of error memory (Mode\$4) not	=	TRUE	-		
					executed since last check of the	-	TRUE	-		
					monitoring conditions					
					and					
					adaptation value for tooth wheel has	=	TRUE	-		
					been learned					
					and					
					current change in engine speed	<=	450.00	rpm		
					for					
					time	=	0.00	sec		
					and					
					current change in injection quantity	<=	170.00	mm^3/r		
					t			ev		
					for	_	0.00			
					time and	=	0.00	sec		
					and basic enable conditions met:	=	see sheet enable	-		
						-	tables	-		
					and		เลมเธร			
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Component / System	Fault Code	Monitor Strategy Description	Primary Malfunction Criteria	L	Threshold .ogic and Value	Secondary Parameters NO Pending or Confirmed DTCs:	=	Enable Conditions see sheet inhibit tables	-	Time Required	MIL Illum.
Crankshaft Position System Variation Not Learned	P0315	Wheel Learn - Fuel Balance System - Tooth Wheel Variation and Crankshaft Dynamics not learned quickly enough	fuel balance wheel learn complete	=	FALSE	fuel system is in fuel cut off and engine speed engine speed and NO Pending or Confirmed DTCs:	= > < =	TRUE 1000 3500 see sheet inhibit tables	- rpm rpm -	fail conditions exists for 5000 s cumulative time monitor runs with 1 s rate whenever enable conditions are met	В
Crankshaft Position [CKP] Sensor Circuit	P0335	Detects crankshaft sensor circuit failure by monitoring for valid signals from CKP sensor while CMP sensor is also sending valid signals	ECM has detected reference mark on the crankshaft AND number of none detected crankshaft rotations	=	FALSE 6.00	Ignition ON and Engine backward rotation detected and ((engine speed and synchronization completed) or starter is active cranking) and (vehicle speed	= = = =	TRUE FALSE 550.00 TRUE TRUE 0	- rpm - - mph	fail conditions exists for more than 6 events monitor runs with 0.1 s rate whenever enable conditions are met	A

Component / System	Fault Code	Monitor Strategy Description	Primary Malfunction Criteria	L	Threshold .ogic and Value	•	Secondary Parameters		Enable Conditions		Time Required	MIL Illum.
							or vehicle speed and engine speed) and basic enable conditions met: and NO Pending or Confirmed DTCs:	> = =	16 200.00 see sheet enable tables see sheet inhibit tables	mph rpm -		
Crankshaft Position Sensor Performance		sensor operation by detecting incorrect crank sensor signal patterns.	number of disturbances in crankshaft signal crankshaft signal disturbance detected under the following conditions: Current tooth time period or Crankshaft tooth counts between detected gaps or If gap not expected, ratio of current tooth time to previous tooth time (see Look-Up-Table #18) or If gap expected, ratio of current tooth time to previous tooth time (see Look- Up-Table #17)	>=	3.00 200000.00 68.00 1.5 to 2 3.38 to 8	counts µsec counts ratio ratio	Engine Running (see parameter definition) and ECM has detected reference mark on the crankshaft and basic enable conditions met:	=	TRUE FALSE see sheet enable tables	-	fail conditions exists for 0.1 S monitor runs with 0.1 s rate whenever enable conditions are met	A
Camshaft Position [CMP] Sensor Circuit			number of crankshaft revolutions during missed camshaft signal	>=	2.50	counts	NO pending or confirmed DTCs	=	see sheet inhibit tables	-	fail conditions exists for more than 3 events test performed continuously	В

Component / System	Fault Code	Monitor Strategy Description	Primary Malfunction Criteria	Threshold Logic and Value	Secondary Parameters ECM has detected reference mark on the crankshaft and Ignition ON and engine synchronization operation is not finished and basic enable conditions met:	Enable Conditions = TRUE = TRUE = TRUE = TRUE = see sheet enab tables	- - -	Time Required 0.01 s rate	MIL Illum.
Camshaft Position [CMP] Sensor Performance	P0341	Detects implausible camshaft sensor operation by detecting incorrect cam sensor patterns	number of camshaft edges	> 6.00 counts	NO pending or confirmed DTCs and ECM has detected reference mark on the crankshaft and Ignition ON and engine synchronization operation is not finished and basic enable conditions met:	 see sheet inhib tables TRUE TRUE TRUE TRUE see sheet enab tables 	-	fail conditions exists for more than 6 events test performed continuously 0.01 s rate	В
Glow Plug/Heater Indicator Control Circuit Low	P037A		Voltage low during driver on state (indicates short-to-ground)	 Short to ground: - ≤ 0.5 Ω impedance between signal and controller ground 	lamp is commanded on and battery voltage for time and	= TRUE > 11.00 > 3.00	- V sec	fail conditions exists for 3 s monitor runs with 0.01 s rate whenever enable conditions are met	

Component / System	Fault Code	Monitor Strategy Description	Primary Malfunction Criteria	Threshold Logic and Value	Secondary Parameters basic enable conditions met:	=	Enable Conditions see sheet enable tables	-	Time Required	MIL Illum.
Glow Plug/Heater Indicator Control Circuit High	P037B	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 on and battery voltage for time and basic enable conditions met:	= ^ ~ =	FALSE 11.00 3.00 see sheet enable tables	- V sec -	fail conditions exists for 1 s monitor runs with 0.01 s rate whenever enable conditions are met	
Glow Plug/Heater Indicator Control Circuit/Open	P0381	Diagnoses the Glow Lamp Circuit high side driver circuit for circuit faults.	Voltage high during driver off state (open circuit)	200 K Ω impedance between ECU pin and load signal and controller ground	circuit active at low current and battery voltage for time and basic enable conditions met:	=	TRUE 11.00 3.00 see sheet enable tables	V sec -	fail conditions exists for 0.2 s monitor runs 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		Logic and Value		Parameters		Conditions		Required	Illum.
Exhaust Gas Recirculation(EGR) Flow Insufficient	P0401	Actual MAF readings are	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 0.02 s rate whenever enable	В
			with (a) Minimum Controller Deviation	=	-0.15 to -0.04	g/rev	EGR controller is active and	=	TRUE		conditions are met	
			(see Look-Up-Table #11) (b) Environmental Pressure correction factor (see Look-Up-Table #8)	=	0.6 to 1	factor	The maximum possible air-mass flow > The air-mass setpoint	=	TRUE	-		
							and change of injection quantity between actual and last received value	<	25.00	(mm^3/r ev)/sec		
							for time and	=	0.25	sec		
							change of engine speed between actual and last received value	<	150.00	rpm/sec		
							for time and	=	0.50	sec		
							VGT offset learning is active	=	FALSE	-		
							maximum setpoint for EGR mass flow (see Look-Up-Table #9) and	>	0.34 to 0.44	g/rev		
							Engine speed	>=	1300.00	rpm		
							Engine speed and	<=	2000.00	rpm		
							Torque generating engine fuel injection quantity	>=	6.00	mm^3/r ev		
							Torque generating engine fuel injection quantity and	<=	30.00	mm^3/r ev		
							setpoint valve position of exhaust-gas recirculation and	>	2.00	%		
							throttle position and	<	5.00	%		
							basic enable conditions met:	=	see sheet enable tables	-		
			I I				and					ļ

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	Gniena	Logic and Value		NO Pending or Confirmed DTCs:	=	see sheet inhibit tables	-	Required	mum.
) for time	>=	1.00	sec		
				_				_			_
Exhaust Gas Recirculation(EGR) Flow Excessive		Actual MAF readings are	controller deviation of the exhaust gas recirculation (EGR) - calculated out of desired and actual value	> (a)*(b)		(fail conditions exists for 5 s monitor runs 0.02 s rate whenever	В
			with (a) Maximum Controller Deviation (see Look-Up-Table #10)	= 0.033 to 0.075	g/rev	EGR controller is active and	=	TRUE	-	enable conditions are met	
			(b) Environmental Pressure correction factor	= 1	factor	The maximum possible air-mass flow > The air-mass setpoint and	=	TRUE	-	met	
						change of injection quantity between actual and last received value	<		(mm^3/r ev)/sec		
						for time and	=	0.25	sec		
						change of engine speed between actual and last received value	<	150.00	rpm/sec		
						for time and	=	0.50	sec		
						VGT offset learning is active and	=	FALSE	-		
						maximum setpoint for EGR mass flow and	<=	0.35	g/rev		
						maximum setpoint for EGR mass flow and	>=	-0.02	g/rev		
						Engine speed Engine speed	<= >=	2000.00 1200.00	rpm rpm		
						and Torque generating engine fuel injection	<=	120.00	mm^3/r		
						quantity Torque generating engine fuel injection quantity and	>=	50.00	ev 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 Value	Secondary Parameters		Enable Conditions		Time Required	MIL Illum.
					and NO Pending or Confirmed DTCs:	=	see sheet inhibit tables	-		
					for time	>=	0.50	sec		
Exhaust Gas Recirculation (EGR) Motor Control Circuit	P0403	Diagnoses the EGR Valve low side driver circuit for circuit faults.	Voltage low during driver off state (indicates short-to-ground)	 Short to ground: - ≤ 0.5 Ω impedance between signal and controller ground 	EGR Solenoid Control Circuit and offset learning for EGR valve is completed and battery voltage for time and starter is active cranking for time and basic enable conditions met: and NO Pending or Confirmed DTCs		ACTIVE TRUE 11.00 3.00 FALSE 3.00 see sheet enable tables see sheet inhibit tables	- V sec - sec -	fail conditions exists for 7 s monitor runs with 0.005 s rate 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.		EGR Solenoid Control Circuit and offset learning for EGR valve is completed and	=	ACTIVE	-	fail conditions exists for 3 s monitor runs with 0.005 s rate whenever enable conditions are	
1		l			battery voltage	>	11.00	V	met	

Component / System	Fault Code	Monitor Strategy Description	Primary Malfunction Criteria		hreshold ic and Value		Secondary Parameters		Enable Conditions		Time Required	MIL Illum.
							for time and starter is active cranking for time and basic enable conditions met: and NO Pending or Confirmed DTCs	~ " ^ " "	3.00 FALSE 3.00 see sheet enable tables see sheet inhibit tables	sec - sec -		
Exhaust Gas Recirculation(EGR) Position Sensor Circuit Low Voltage	P0405	Detects low voltage readings on the EGR position sensor circuit, indicating an OOR low condition on the EGR position sensor circuit	voltage of EGR position sensor same as EGR actuator position	<	-25	%	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	В
Exhaust Gas Recirculation(EGR) Position Sensor Circuit High Voltage	P0406	Detects high voltage readings on the EGR position sensor circuit, indicating an OOR high condition on the EGR position sensor circuit	voltage of EGR position sensor same as EGR actuator position	>	4.80	%	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	В

Component / System	Fault Code	Monitor Strategy Description	Primary Malfunction Criteria		Threshold Logic and Val	ue	Secondary Parameters		Enable Conditions		Time Required	MIL Illum.
					_	_						
Exhaust Gas Recirculation(EGR) Temperature Sensor A Circuit Low Voltage		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	V	0.14	V	(fail conditions exists for 5 s monitor runs 0.05 s rate whenever enable	В
			same as EGR sensor 2 temperature	>	1000	°C	time since engine start and engine coolant temperature	> <	0.00 199.96	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	-		
							(valve position of EGR cooler bypass and	>	-100.00	%		
							valve position of EGR cooler bypass and	<	200.00	%		
							basic enable conditions met: and	=	see sheet enable tables	-		
							NO Pending or Confirmed DTCs:	=	see sheet inhibit tables	-		
						_						

Component /	Fault	Monitor Strategy	Primary Malfunction		Threshold		Secondary		Enable	_	Time	MIL
System	Code	Description	Criteria		Logic and Value		Parameters		Conditions		Required	Illum.
Exhaust Gas Recirculation(EGR) Temperature Sensor A Circuit High Voltage	P040D	Detects high voltage readings on the EGR temperature cooler circuit, indicating an OOR high condition on the EGR cooler temperature 2 circuit	EGR temperature sensor 2 voltage	^	4.98	V	(fail conditions exists for 5 s monitor runs 0.05 s rate whenever enable	В
			same as EGR sensor 2 temperature	<	-45	°C	(ambient temperature	>	-10.04	°C	conditions are met	
					-+5	U	or	-	-10.04	U	met	
) and	>	100.00	sec		
							engine coolant temperature and	>	-60.04	°C		
							ambient pressure and /	>	20.00	kPa		
							setpoint valve position of exhaust-gas recirculation and	>	-100.00	%		
							setpoint valve position of exhaust-gas recirculation)	<	200.00	%		
							and Engine Running (see parameter definition) and	=	TRUE	-		
							current injection quantity	>	0.00	mm^3/r ev		
							and (
							valve position of EGR cooler bypass and	>	-100.00	%		
							valve position of EGR cooler bypass)) and	<	200.00	%		
							basic enable conditions met:	=	see sheet enable tables	-		
							and NO Pending or Confirmed DTCs:	=	see sheet inhibit tables	-		

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) 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: [(a) - (b)] (see Look-Up-Table #4) with (a) captured EGR sensor 2 temperature at start and with (b) captured EGR sensor 1 temperature at start or	> =	20 to 3276.7 measured parameter measured parameter	°C -	minimum engine-off time and ambient temperature and Engine Running (see parameter definition) for time and engine post drive/ afterun and diagnostic performed in current dc and basic enable conditions met: and NO Pending or Confirmed DTCs:	> = > = =	28800.00 -7.04 TRUE 0.10 FALSE FALSE see sheet enable tables see sheet inhibit tables	°C sec -	fail conditions exists for 0.1 s monitor runs with 0.1 s rate whenever enable conditions are met	В
Exhaust Gas Recirculation(EGR) Temperature Sensor B Circuit Low Voltage	P041C	Detects low voltage readings on the EGR cooler temperature circuit, indicating an OOR low condition on the EGR cooler temperature 1 circuit	voltage of EGR temperature sensor 1 same as EGR sensor 1 temperature	>	0.13	°C	(time since engine start and engine coolant temperature and ambient temperature and ambient pressure	> < > >	0.00 199.96 -60.04 20.00	sec °C °C kPa	fail conditions exists for 5 s monitor runs 0.05 s rate whenever enable conditions are met	В

Component / System	Fault Code	Monitor Strategy Description	Primary Malfunction Criteria		Threshold ogic and Value	Secondary Parameters		Enable Conditions		Time Required	MIL Illum.
Jystem					ngic and value	and (setpoint valve position of exhaust-gas recirculation and setpoint valve position of exhaust-gas recirculation) and Engine Running (see parameter definition) and (valve position of EGR cooler bypass and valve position of EGR cooler bypass)) and basic enable conditions met: and NO Pending or Confirmed DTCs:	> < = .	-100.00 200.00 TRUE -100.00 200.00 see sheet enable tables see sheet inhibit tables	% - % - -	required	
Exhaust Gas Recirculation(EGR) Temperature Sensor B Circuit High Voltage	P041D	Detects high voltage readings on the EGR cooler temperature circuit, indicating an OOR high condition on the EGR cooler temperature 1 circuit	voltage of EGR temperature sensor 1 same as EGR sensor 1 temperature	~		(time since engine start or ambient temperature) and engine coolant temperature ambient pressure and (> > >	4.96 -10.04 -60.04 20.00	sec °C kPa	fail conditions exists for 5 s monitor runs 0.05 s rate whenever enable conditions are met	В

Component / System	Fault Code	Monitor Strategy Description	Primary Malfunction Criteria	Threshold Logic and Value	Secondary Parameters		Enable Conditions		Time Required	MIL Illum.
					setpoint valve position of exhaust-gas recirculation and setpoint valve position of exhaust-gas recirculation	>	-100.00	%		
) and Engine Running (see parameter definition) and	=	TRUE	-		
					current injection quantity and	>	0.00	mm^3/r ev		
					(valve position of EGR cooler bypass and	>	-100.00	%		
					valve position of EGR cooler bypass))	<	200.00	%		
					for time and	>	0.01	sec		
					basic enable conditions met: and	=	see sheet enable tables	-		
					NO Pending or Confirmed DTCs:	=	see sheet inhibit tables	-		
NMHC Catalyst Efficiency Below Threshold Bank 1	P0420	Detects insufficient conversion rate in oxidation catalyst. Actual conversion rate is compared to a conversion rate threshold as an indication of how much HC is converted in the oxidation catalyst.	Calculated HC conversion rate	< 0.25 -	Stage 2 Rapid Heat-up Injection Mode Rapid Heat-up is a catalyst heating strategy. Stage 2 refers to stage of Rapid-Heat-Up where both Pol1 and Pol2 are injected which results in exotherm across DOC and	=	TRUE	-	fail conditions exists for more than 0.1 seconds monitor runs once per driving cycle with 0.1 s rate whenever	В
					monitor already enabled this drive cycle (i.e. once per trip) and (=	FALSE	-	enable conditions are met	

Component / System	Fault Code	Monitor Strategy Description	Primary Malfunction Criteria		Threshold Logic and Valu	e	Secondary Parameters		Enable Conditions		Time Required	MIL Illum.
					9	-	engine speed and	>	500.00	rpm		
							engine speed	<=	2850.00	rpm		
							engine speed for time	> <	2850.00 2,00	rpm		
)	~	2,00	sec		
							and (
							Coolant temperature at engine start and	>	-7.04	°C		
							Coolant temperature at engine start)	<=	35.96	°C		
							and time with DOC monitor released	<	200	sec		
							and integrated modeled combusted fuel mass	>	5.00	g		
							flow into DOC and			3		
							NO Pending or Confirmed DTCs:	=	see sheet inhibit			
							and		tables			
							basic enable conditions met:	=	see sheet enable	-		
									tables			
	D0404				1 10 10				TOUE			
Fuel Level Sensor "A" Circuit	P0461	tank sensor performance by	(a) - (b)	>=	149.13	miles	Engine Running (see parameter definition)	=	TRUE	-	fail conditions exists for 0.02	В
Range/Performance			with				for				s monitor runs	
		mileage to a threshold.	(a) total vehicle distance	=	measured parameter	-	time	>	60.00	sec	0.02 s rate whenever	
			and with (b) saved value of total vehicle distance	=	measured	-	and fuel volume in tank	<	100.00	%	enable conditions are	
			at start of test		parameter		and				met	
			and				basic enable conditions met:		see sheet enable tables	-		
			(c) - (d) with	<	3.00		and NO Pending or Confirmed DTCs:		see sheet inhibit	_		
			with				NOT Enangly of Committee DTCS.		tables	-		

Component / System	Fault Code	Monitor Strategy Description	Primary Malfunction Criteria		Threshold Logic and Value		Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
			 (c) maximum volume of fuel reached in tank during test and with (d) minimum volume of fuel reached in tank during test 	=	measured parameter measured parameter	-				
Fuel Level Sensor 1 Circuit Low	P0462	Detects low voltage readings on the fuel level sensor circuit, indicating an OOR low condition on the circuit	voltage of fuel level sensor 1 same as fuel level	~	0.48		ignition on and basic enable conditions met:	 TRUE see sheet enable tables 	 fail conditions exists for 8 s test performed continuously 0.01 s rate 	В
Fuel Level Sensor 1 Circuit High	P0463	Detects high voltage readings on the fuel level sensor circuit, indicating an OOR high condition on the circuit	voltage of fuel level sensor 1 same as fuel level	~	2.80		ignition on and basic enable conditions met:	= TRUE = see sheet enable tables	 fail conditions exists for 8 s test performed continuously 0.01 s rate 	В
Exhaust Gas Recirculation (EGR) Position Sensor Performance	P046C		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 whenever	В

Component /	Fault	Monitor Strategy	Primary Malfunction		Threshold		Secondary		Enable		Time	MIL
System	Code	Description	Criteria		Logic and Value		Parameters		Conditions		Required	Illum.
			or controller deviation of EGR valve calculated out of difference between desired and actual value	<=	-5.00	%	and offset learning in the previous driving cycle was complete	=	TRUE	-	enable conditions are met	
							and Engine is in the normal state and	=	TRUE	-		
							duty cycle of the Intake Air Heater output and	<	327.67	%		
							battery voltage and	>=	11.00	V		
							The position control is active and EGR Valve Jammed	=	FALSE	-		
							and EGR Valve Jammed	=	TRUE	-		
							and NO Pending or Confirmed DTCs:	=	see sheet inhibit	-		
							basic enable conditions met:	=	tables see sheet enable tables	-		
Fan 1 Control Circuit	P0480	Diagnoses the Cooling Fan 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	>	11.00	V	fail conditions exists for 3 s test performed continuously 0.02 s rate	В
							time and	>	3.00	sec		
							starter is active cranking for	=	FALSE	-		
							time and ignition on	>	3.00 TRUE	sec		
							and basic enable conditions met:	=	see sheet enable	-		
							NO Pending or Confirmed DTCs:	=	tables 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) Motor Control Circuit 1 Low Voltage	P0489		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 3 s monitor runs with 0.005 s rate whenever enable conditions are met	В
					and battery voltage for	>	11.00	V	met	
					time and	>	3.00	sec		
					starter is active cranking for	=	FALSE	-		
					time and	>	3.00	sec		
					ignition on and	=	TRUE	-		
					basic enable conditions met: NO Pending or Confirmed DTCs:	=	see sheet enable tables see sheet inhibit tables	-		
						_	_			_
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	EGR Solenoid Control Circuit	=	ACTIVE	-	fail conditions exists for 3 s monitor runs with 0.005 s rate whenever enable conditions are	В
					and battery voltage for	>	11.00	V	met	
					time and	>	3.00	sec		
1					starter is active cranking	=	FALSE	-	I	I

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 ignition on and basic enable conditions met: NO Pending or Confirmed DTCs:	> = =	3.00 TRUE see sheet enable tables see sheet inhibit tables	sec - -		
Exhaust Gas Recirculation (EGR) Control Position Not Learned	P049D	EGR valve are not plausible. Compares the difference between the maximum and minimum adaptation values to a threshold.	Path 1: the difference between the maximum value of the read position (a) and the minimum value of the read position (b) with (a) maximum learned offset value for EGR valve and with (b) minimum learned offset value for EGR valve or Path 2: (learned offset value for EGR valve in the present driving cycle or learned offset value for EGR valve in the present driving cycle)	> = = > <	5.00 measured parameter measured parameter 10.00 -10.00	% - % %	offset learning finished and (engine coolant temperature and engine coolant temperature) and (battery voltage and battery voltage and EGR sweep has ended - no movement in EGR valve and engine post drive/ afterun and	=	FALSE 69.96 127.96 11.00 655.34 TRUE TRUE	- °C °C V V	fail conditions exists for 0.005 s monitor runs with 0.005 s rate whenever enable conditions are met	В

Component /	Fault	Monitor Strategy	Primary Malfunction		Threshold		Secondary		Enable		Time	MIL
System	Code	Description	Criteria		Logic and Value		Parameters	_	Conditions		Required	Illum.
							engine was running during last driving cycle and NO Pending or Confirmed DTCs:	=	TRUE see sheet inhibit tables	-		
		Detects a jammed EGR valve during opening or closing the valve.					offset learning active	=	TRUE	-	fail conditions exists for 0.005 s	
			EGR valve stuck during opening means (=	TRUE		and engine post drive/ afterun and /	=	TRUE	-	monitor runs with 0.005 s rate whenever enable	
			(a) + (b) with (a) position of EGR valve	>=	20.00 measured	%	Path 1: EGR valve is opening or	=	TRUE	-	conditions are met	
			and with (b) learned offset value of EGR valve in the previous driving cycle	=	parameter calculated parameter	-	Path 2: EGR valve is closing	=	TRUE	-		
) and ()					
			(a) - (c) with	<=	0.01	%						
			(a) position of EGR valve and with	=	measured parameter	-						
			(c) position of EGR valve of previous process cycle	=	calculated parameter	-						
) for time or	>	5.00	sec						
			Path 2: EGR valve stuck during closing means	=	TRUE							
			(((a) * (b)	>	110.00	%						

Component /	Fault	Monitor Strategy	Primary Malfunction		Threshold		Secondary		Enable		Time	MIL
System	Code	Description	Criteria		Logic and Value		Parameters		Conditions		Required	Illum.
			with (a) reference position of the EGR valve in open position and with (b) factor for EGR valve close position	=	calculated parameter 0.20	- factor						
) and ([(c) - (d)] with (c) position of EGR valve and with (d) position of EGR valve of previous process cycle) for time	<= = =	100.00 measured parameter calculated parameter 5.00	% - - sec						
Idle Speed Too Low	P0506	Detects an idle speed governor that is unable to achieve the desired idle speed and the idle speed is too low		<	maximum value of (a) OR (b - (b * c))		engine speed (see Look-Up-Table #81)	>=	850 to 1100	rpm	fail conditions exists for 15 s monitor runs with 0.1 s rate whenever	В
			with (a) minimum engine speed and with (b) minimum idle speed setpoint	=	300.00 calculated parameter		and (engine coolant temperature and	<	125.96	°C	enable conditions are met	
			and with (c) factor for calculation of engine speed interval	=	24.00	%	engine coolant temperature)	>	-7.04	°C		
							and idle speed controller active and	=	TRUE	-		
							vehicle speed and	<	1.86	mph		
							no other torque demanding function active	=	TRUE	-		

Component / System	Fault Code	Monitor Strategy Description	Primary Malfunction Criteria		Threshold Logic and Value		Secondary Parameters		Enable Conditions		Time Required	MIL Illum.
							and setpoint torque of the speed controller and engine speed and basic enable conditions met: and NO Pending or Confirmed DTCs:	> > =	0 300.00 see sheet enable tables see sheet inhibit	NM rpm -		
							NO Feliuling of Committee DTCs.	-	tables	-		
Idle Speed Too High	P0507	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 speed (see Look-Up-Table #81)	>=	850 to 1100	rpm	fail conditions exists for 15 s monitor runs with 0.1 s rate whenever	В
			with (a) maximum engine speed and with	=	2500.00	rpm	and (engine coolant temperature	<	125.96	°C	enable conditions are met	
			(b) minimum idle speed setpoint and with	=	calculated parameter		and engine coolant temperature	>	-7.04	°C		
			(c) factor for calculation of engine speed interval	=	24.00	%	and	-	-1.04	0		
							idle speed controller active and	=	TRUE	-		
							vehicle speed and	<	1.86	mph		
							no other torque demanding function active and	=	TRUE	-		
							setpoint torque of the speed controller and	>	0	NM		
							engine speed and	>	300.00	rpm		
							basic enable conditions met: and	=	see sheet enable tables	-		
							NO Pending or Confirmed DTCs:	=	see sheet inhibit tables	-		

Component / System	Fault Code	Monitor Strategy Description	Primary Malfunction Criteria	L	Threshold ogic and Value		Secondary Parameters	Enable Conditions		Time Required	MIL Illum.
Exhaust Gas Temperature (EGT) Sensor 1 Circuit Low Voltage		Detects low voltage readings on the EGT 1 circuit, indicating an OOR low condition on the EGT circuit	voltage of the temperature sensor upstream of oxidation catalyst same as temperature upstream of oxidation catalyst	<	0.55	°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 5 s monitor runs 0.050 s rate whenever enable conditions are met	В
Exhaust Gas Temperature (EGT) Sensor 1 Circuit High Voltage		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	>	2.33	°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 5 s monitor runs 0.050 s rate whenever enable conditions are met	В

Component /	Fault	Monitor Strategy	Primary Malfunction		Threshold		Secondary		Enable		Time	MIL
System	Code	Description	Criteria		Logic and Valu		Parameters		Conditions		Required	Illum.
Idle Control System - Fuel Quantity Lower	P054E	This diagnostic monitors the fuel injection quantity at low	Current injection quantity	<	minimum expected	mm^3/rev	following conditions for time:	>	5.00	sec	fail conditions exists for 1.5	В
Than Expected		idle. The ECM compares the			injection quantity	/					S	
		actual injection quantity with			(map)						monitor runs	
		calculated thresholds. If the			*						with 0.02 s	
		actual injection quantity is less than a calibrated threshold, a			factor for calculating the						rate whenever enable	
		fault will be set.			minimum						conditions are	
		iduit will be set.			threshold out of						met	
					the reference							
					map							
			with (Current gear unchanged and	=	TRUE	-		
			Current gear in park/neutral and	=	TRUE	-	Vehicle speed and	<=	1.86	mph		
			minimum expected injection quantity (see Look-Up Table #43)	=	5.4 to 22.96	mm^3/rev	Engine operation mode	=	Normal	-		
			and	=	1.00	factor	and	<=	1200.00			
			factor for calculating the minimum threshold out of the reference map	=	1.00	factor	Engine speed	<=	1300.00	rpm		
) OR				and Engine speed	>=	400.00			
			OR				and		400.00	rpm		
			Current injection quantity	<	minimum expected	mm^3/rev	Engine coolant temperature	>	-20.04	°C		
					injection quantity	,						
					(map)							
					factor for							
					calculating the minimum							
					threshold out of							
					the reference							
					map							
							and					
			with (Ambient air temperature and	>	-7.04	°C		
			Current gear in park/neutral and	=	FALSE	-	Idle speed controller active and	=	TRUE	-		
			minimum expected injection quantity (see Look-Up Table #44)	=	9.2 to 41.2	mm^3/rev	Fluctuation range of engine speed	<	16383.50	rpm		
I		I	and				and					I

Component / System	Fault Code	Monitor Strategy Description	Primary Malfunction Criteria factor for calculating the minimum threshold out of the reference map)	Threshold Logic and Va = 1.00		Secondary Parameters NO Pending or Confirmed DTCs: and basic enable conditions met:	=	Enable Conditions see sheet inhibit tables see sheet enable tables	-	Time Required	MIL Illum.
Idle Control System - Fuel Quantity Higher Than Expected		This diagnostic monitors the fuel injection quantity at low idle. The ECM compares the actual injection quantity with calculated thresholds. If the actual injection quantity is greater than a calibrated threshold, a fault will be set.	Current injection quantity	maximum expected injection quant (map) * factor for calculating the maximum threshold out the reference map	ty e	following conditions for time:	>	5.00	Sec	fail conditions exists for 1.5 s monitor runs with 0.02 s rate whenever enable conditions are met	В
			with (Current gear in park/neutral and maximum expected injection quantity	= TRUE = 60.2 to 111.8	- mm^3/rev	Current gear unchanged and Vehicle speed and Engine operation mode	= <= =	TRUE 1.86 TRUE	- mph -		
			(see Look-Up-Table #42) and factor for calculating the maximum threshold out of the reference map	= 1.00	factor	and Engine speed	<=	1300.00	rpm		
) OR			and Engine speed and	>=	400.00	rpm		

Component /	Fault	Monitor Strategy	Primary Malfunction		Threshold		Secondary		Enable		Time	MIL
System	Code	Description	with (Current injection quantity with (Current gear in park/neutral and maximum expected injection quantity (see Look-Up-Table #41) and factor for calculating the maximum threshold out of the reference map)	= =	Logic and Va maximum expected injection quant (map) * factor for calculating the maximum threshold out of the reference map FALSE 81.2 to 176.8	lue mm^3/rev ty of -	Parameters Engine coolant temperature and Ambient air temperature and Idle speed controller active	> = =	Conditions -20.04 -7.04 TRUE 16383.50 see sheet inhibit tables see sheet enable tables	°C - rpm -	Required	IIIum.
Cruise Control Multi- Function Input "A" Circuit	P0564	Set illegal range indicates problem on status of the cruise switch information	Switch state provided by Cruise Control frame	-	E ILLEGAL RANGE	-	ignition on and basic enable conditions met and NO Pending or Confirmed DTCs:	=	TRUE see sheet enable tables see sheet enable tables	-	fail conditions exists for 2.5 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.
Cruise Control Resume Switch Circuit	P0567		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 -	fail conditions exists for 90 s monitor runs with 0.005 s rate whenever enable conditions are met	Special C
Cruise Control Set Switch Circuit	P0568	Set switch state indicates problem with the circuit	Set Switch CAN message in high / active state	= TRUE -	ignition on and input circuit active and basic enable conditions met and NO Pending or Confirmed DTCs:	 TRUE - TRUE - see sheet enable - tables see sheet inhibit - tables 	fail conditions exists for 90 s monitor runs with 0.005 s rate whenever enable conditions are met	Special C
Cruise Control Input Circuit	P0575	Cruise control CAN communication monitoring	amount of errors in consecutive frames with number of consecutive frames	>= 3.00 counts = 10.00 counts	and	= TRUE - = TRUE - = see sheet enable - tables = see sheet inhibit - tables	fail conditions exists for 0.005 s monitor runs with 0.005 s rate whenever enable conditions are met	Special C

Component /	Fault	Monitor Strategy	Primary Malfunction		Threshold		Secondary		Enable		Time	MIL
System Brake Pedal Position	Code P057B	Description Compare maximum delta of	Criteria EWMA filtered test result based on the	<=	Logic and Value 0.40	factor	Parameters following conditions for time:	>	Conditions 4	sec	Required monitor runs	Illum. A
Sensor "A" Circuit Range/Performance	P057B		difference of (a) - (b)	<=	0.40	laciol	ionowing conditions for time.	2	4	Sec	0.02 s rate whenever enable	A
			where (a) maximum analog brake sensor raw voltage during test (b) minimum analog brake sensor raw	= =	calculated parameter calculated	V V	(ignition on and	=	TRUE	-	conditions are met	
			voltage during test where difference of the brake sensor voltage	=	parameter 0 to 1	factor	starter is active cranking for	=	FALSE	-		
			corresponds to a corrected value of (see Look-Up-Table #13)				time	>	3.00	sec		
							and battery voltage for	>	11.00	V		
							time) and	>	3.00	sec		
							gear has been in Park during this driving cycle full test has not been completed this	=	TRUE	-		
							driving cycle gear selector currently not in Park vehicle speed	= >=	TRUE 4.35	- mph		
							accelerator pedal position 1 and No Pending or Confirmed DTCs:	< =	5.00 see sheet inhibit	% -		
							and basic enable conditions met:	=	tables see sheet enable	-		
									tables			
Brake Pedal Position Sensor "A" Circuit Low	P057C	voltage below a threshold for a calibrated period of time	Brake pedal position sensor voltage	<	0.25	V	ignition on	=	TRUE		fail conditions exists for 0.5 s	A
		indicating an OOR low					and No Pending or Confirmed DTCs:	=	see sheet inhibit tables	-	monitor runs 0.01 s rate whenever enable	

Component / System	Fault Code	Monitor Strategy Description	Primary Malfunction Criteria	Threshold Logic and Value	Secondary Parameters and basic enable conditions met:	Enable Conditions = see sheet enable tables	-	Time Required conditions are met	MIL Illum.
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 conditions exists for 0.5 s monitor runs 0.01 s rate whenever enable conditions are met	A
ROM Memory Fault	P0601		ECM detects multiple errors in the ROM- memory by comparing a calculated checksum with a check word	= TRUE -	engine post drive/ afterun	= TRUE	-	fail conditions exists for 0.01 s test performed once per drive cycle during afterrun	A
Control Module Not Programmed	P0602	Detects if the ECM is programmed.	ECM not programmed	= TRUE -	ignition on and engine pre drive	= TRUE = TRUE	-	fail conditions exists for 0.01 s test performed test performed once per driving cycle during ECU initialization	A

Component / System	Fault Code	Monitor Strategy Description	Primary Malfunction Criteria	Threshold Logic and Value	Secondary Parameters	Enable Conditions	Time Required	MIL 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.	Error on starting DC/DC converter of one bank piezo power stage		ignition on and DC/DC converter is in startup	= TRUE -	fail conditions exists for 0.01 s monitor runs with 0.01 s rate whenever enable conditions are met	
			DC/DC converter of one bank cannot be switched off	= TRUE -	ignition on	= TRUE -	fail conditions exists for 0.1 s monitor runs with 0.01 s rate whenever enable conditions are met	

Component / System	Fault Code	Monitor Strategy Description	Primary Malfunction Criteria		Threshold Logic and Value		Secondary Parameters		Enable Conditions		Time Required	MIL Illum.
Gystem	Cours	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.	internal injector driver chip error	-	TRUE	-	Engine running	=	TRUE		fail conditions fail conditions exists for 0.1 s monitor runs with 0.01 s rate whenever enable conditions are met	incum
							and basic enable condition met:	=	see sheet enable tables	-		
			faults detected in the SPI communication	>	485.00	counts	ignition on	=	TRUE	· .	fail conditions	
			IC internal				and NO Pending or Confirmed DTCs:	=	see sheet inhibit tables		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	~ >	4.2 5.25		ignition on and NO Pending or Confirmed DTCs:	=	TRUE see sheet inhibit tables	-	fail conditions exists for 0.08s monitor runs once per trip during pre	

Component / System	Fault Code	Monitor Strategy Description	Primary Malfunction Criteria	Threshold Logic and Value	Secondary Parameters	Enable Conditions	Time MIL Required Illum. drive at least twice every 0.08s rate whenever enable conditions are met met
			 (a) - (b) with (a) parallel redundant calculation of energizing time for fuel injection and with (b) parallel redundant calculation of programmed energizing time for fuel injection 	 72.00 µsec calculated - parameter calculated - parameter 	programmed energizing time for fuel injection has been read back means programmed energizing time for fuel injection and measured energizing time for fuel injection has been read back means measured energizing time for fuel injection and engine speed and rail pressure and engine test active via diagnosis tester and	= TRUE - >= 0 - = TRUE - >= 0 - >= 0 - > 1200.00 rpm > 20000.00 kPa = FALSE -	fail conditions exists for at least 0.05 s monitor runs with 0.01 s rate whenever enable conditions are met
			Path 1: (parallel redundant calculation of angle for pilot injection 1 quantity or parallel redundant calculation of angle for pilot injection 1 quantity) or	< -37.99 degrees > 44.98 degrees	engine speed and engine test active via diagnosis tester	> 1200.00 rpm = FALSE	fail conditions exists for at least 0.05 s monitor runs 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		Logic and Valu	le	Parameters	0	Conditions	Required	Illum.
			Path 2:								
			(
			parallel redundant calculation of angle	<	-37.99	degrees					
			for main injection quantity								
			or								
			parallel redundant calculation of angle	>	32.98	degrees					
			for main injection quantity								
) or								
			Path 3:								
			(
			parallel redundant calculation of angle	<	-360.00	degrees					
			for post injection quantity 1								
			or								
			parallel redundant calculation of angle	>	-67.00	degrees					
			for post injection quantity 1								
) or								
			Path 4:								
			(
			parallel redundant calculation of angle	<	-183.00	degrees					
			for post injection quantity 2								
			or								
			parallel redundant calculation of angle	>	32.98	degrees					
			for post injection quantity 2								
) or								
			Path 5:								
			(
			parallel redundant calculation of angle	<	-183.00	degrees					
			for post injection quantity 3								
			or								
			parallel redundant calculation of angle	>	0.00	degrees					
			for post injection quantity 3								
			,								
			(redundant engine speed calculation	>=	1200.00 rpm	fail conditions	
			parallel redundant calculation of	<	-500 to -50	µsec	and			exists for at	
			energizing times of the correction value							least 0.2 s	
			for pilot injection quantity (see Look-Up- Table #54)							monitor runs with 0.04 s	
1	I	I				I	1			WILLI U.U4 S	

Component /	Fault	Monitor Strategy	Primary Malfunction		Threshold		Secondary		Enable		Time	MIL
System	Code	Description	Criteria		Logic and Value	•	Parameters		Conditions		Required	Illum.
			or parallel redundant calculation of energizing times of the correction value for pilot injection quantity (see Look-Up- Table #53))	>	50 to 500	µsec	engine test active via diagnosis tester	=	FALSE	-	rate whenever enable conditions are met	
			parallel redundant calculation of post injection 2 quantity	>	120.00	mm^3	engine test active via diagnosis tester and	=	FALSE	-	fail conditions exists for at least 0.4 s	
							change in injection operation mode requested	=	TRUE	-	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 #55)	>	200 to 6000	µsec	fuel system is in fuel cut off (see parameter definition line #189)	=	TRUE	·	fail conditions exists for at least 0.8 s	
			and				for				monitor runs with 0.04 s	
			activation counter (intervention) of the surge damper	>=	107.00	counts	time	>	1.00	sec	rate whenever enable	
							and redundant engine speed calculation and	>	2120.00	rpm	conditions are met	
							general engine speed demand (see parameter definition line #213)	=	FALSE	-		
							and external torque demand from stability ECU via CAN and	=	FALSE	-		
							external torque demand from transmission ECU via CAN and ((=	FALSE	-		

Component /	Fault	Monitor Strategy	Primary Malfunction		Threshold	Secondary		Enable		Time	MIL
System	Code	Description	Criteria	Log	gic and Value	Parameters		Conditions		Required	Illum.
						cruise control active or (=	FALSE	-		
						brake pedal status or	=	TRUE	-		
						redundant brake pedal status) for	=	TRUE	-		
						time)	>	0.04	sec		
						and (
						pedal position	=	0	%		
						redundant calculation of pedal position	=	0	%		
						for time) and (>	0.02	sec		
						redundant engine speed calculation after start detected and	>	200.00	rpm		
						redundant engine speed calculation at start) and	>	1360	rpm		
						engine test active via diagnosis tester	=	FALSE	-		
			n and the local state of the st		7.50 mm^3			1000.00		fail conditions	
			parallel redundant calculation of averaged wave correction quantity for pilot injection	>=	7.50 mm^3	redundant engine speed calculation	>=	1200.00	rpm	exists for at least 0.2 s	
			parallel redundant calculation of averaged wave correction quantity for main injection or	>=	7.50 mm^3	and engine test is active via diagnosis tester	=	FALSE	-	monitor runs with 0.04 s rate whenever enable conditions are	
			parallel redundant calculation of averaged wave correction quantity for post injection 2 or	>=	7.50 mm^3					met	

Component / System	Fault Code	Monitor Strategy Description	Primary Malfunction Criteria		Threshold Logic and Value		Secondary Parameters		Enable Conditions		Time Required	MIL Illum.
			parallel redundant calculation of averaged wave correction quantity for post injection 3	>=	7.50	mm^3						
			(rail pressure or	<=	20000.00	kPa	(parallel redundant calculation of voltage of rail pressure sensor or	<	0.19	V	fail conditions exists for 0.120 s monitor runs	
			rail pressure)	>=	164800.00	kPa	parallel redundant calculation of voltage of rail pressure sensor) and	>	4.18	V	with 0.01 s rate whenever enable conditions are	
							delay time	>	0.21	sec	met	
							and parallel redundant calculation of injections active and	=	TRUE	-		
							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 or internal supply voltage	~ >	4.2 5.25	V V	ignition on	=	TRUE	-	fail conditions exists for 0.5 s test performed continuously with 0.01 s rate	
			WDA (watch dog) shut off due to	=	TRUE	-	shut off path test active	=	FALSE	-	fail conditions	
		I	undervoltage	I			1				exists for 0.01	

Component / System	Fault Code	Monitor Strategy Description	Primary Malfunction Criteria		Threshold ogic and Value		Secondary Parameters		Enable Conditions		Time Required	MIL Illum.
System	Coue	Description	means internal supply voltage	<	4.2	V	and battery voltage for time and WDA (watch dog) line active	> > =	8.00 0.01 TRUE	V sec -	s monitor runs with 0.01 s rate whenever enable conditions are met	
			WDA (watch dog) shut off due to overvoltage means internal supply voltage	=	TRUE 5.25		shut off path test active and WDA (watch dog) 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 due to internal security error	=	TRUE		shut off path test active and WDA (watch dog) line active	=	FALSE	-	fail conditions exists for 0.01 s monitor runs with 0.01 s rate whenever enable conditions are met	

Component / System	Fault Code	Monitor Strategy Description	Primary Malfunction Criteria WDA (watch dog) shut off because of corrupt question-and-answer communication	Threshol Logic and V = TRUE	alue -	Secondary Parameters ignition on and WDA (watch dog) line active and shut off path test active	=	Enable Conditions TRUE TRUE FALSE	-	Time Required fail conditions exists for 0.01 s monitor runs with 0.01 s rate whenever enable conditions are met	MIL Illum.
			the actual response time from processor is not equal to the requested response- time	= TRUE	-	ignition on and NO Pending or Confirmed DTCs:	=	TRUE see sheet inhibit tables	-	fail conditions exists for more than 0.08 s monitor runs at least twice every 0.08 s rate whenever enable conditions are met	
			redundant, independent algorithm for plausibility fault of accelerator pedal signal for safety reasons: Path 1: [(maximum (a) (b)) - 2 * (maximum (c) (b))]	> 0.29	V	ignition on and engine test active via diagnosis tester	=	TRUE	-	fail conditions exists for 0.29 s monitor runs with 0.04 s rate whenever	
			with (a) voltage accelerator pedal 1 and with (b) lower limit for accelerator pedal voltage	= measured parameter = 0.85		and Input signal fault present and ADC fault present	=	FALSE	-	enable conditions are met	

Component /	Fault	Monitor Strategy	Primary Malfunction		Threshold		Secondary	Enable	Time	MIL
System	Code	Description	Criteria and with		Logic and Value		Parameters	Conditions	Required	Illum.
			and with (c) voltage accelerator pedal 2 and	=	measured parameter	-				
			(voltage accelerator pedal 1	>	1.54	V				
			or voltage accelerator pedal 2)	>	1.54	V				
			or Path 2:							
			(maximum (a) (b)) - 2 * (maximum (c) (b)) with	>	0.41	V				
			(a) voltage accelerator pedal 1 and with	=	measured parameter	-				
			 (b) lower limit for accelerator pedal voltage and with 		0.85	V				
			(c) voltage accelerator pedal 2	=	measured parameter	-				
			(voltage accelerator pedal 1	<=	1.54	V				
			voltage accelerator pedal 2)	<=	1.54	V				
					_	_				
			Error during positive test 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 / System	Fault Code	Monitor Strategy Description	Primary Malfunction Criteria	Threshold Logic and Value	Secondary Parameters	Enable Conditions		MIL llum.
			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 0.485 monitor runs at the 0.01 s rate whenever enable conditions are met	
			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	
			repetitions of injection shut-off path test	>= 485.00 counts	ignition on and 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	

Component /	Fault	Monitor Strategy	Primary Malfunction	Threshold	Secondary	Enable	Time	MIL
System	Code	Description	Criteria	Logic and Value	Parameters	Conditions	Required rate whenever enable conditions are met	Illum.
			prevention of the execution of the shut- off path test	= TRUE -	ignition on and injection shut-off path test	= TRUE -	fail conditions exists for 0.08 s monitor runs at least twice every 0.08 s rate whenever enable conditions are met	
			too few bytes received by monitoring module from CPU means bytes received by monitoring module from CPU as response	= TRUE - < 4 Bytes	ignition on	= TRUE -	fail conditions exists for more than 0.4 s monitor runs at least twice every 0.08 s rate whenever enable conditions are met	

Component / System	Fault Code	Monitor Strategy Description	Primary Malfunction Criteria	Threshold Logic and Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
			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	
			piezo injector actuator internal feedback voltage or piezo injector actuator internal feedback voltage	< 0.00 V > 3.30 V	main injection	= ACTIVE	fail conditions exists for more than 0.1 s monitor runs	

Component /	Fault	Monitor Strategy	Primary Malfunction	Threshold		Secondary		Enable	Time	MIL
System	Code	Description	Criteria	Logic and Value		Parameters		Conditions	Required with 0.01 s rate whenever	Illum.
									enable conditions are met	
			Path 1:	1700.00	-	injection cut off demand from ECM internal monitoring	=	TRUE	fail conditions exists for 0.02	
			engine speed or Path 2: engine speed	> 1500.00 > 1600.00	rpm rpm				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 267 events test performed continuously with 0.01 s	
			security torque limitation request due to	= TRUE	-	ignition on	=	TRUE -	fail conditions	
			implausible rail pressure request						exists for more than 267 events test performed	

Component / System	Fault Code	Monitor Strategy Description	Primary Malfunction Criteria		Threshold Logic and Value		Secondary Parameters		Enable Conditions		Time Required continuously with 0.01 s	MIL Illum.
			security torque limitation request due to implausible quantity setpoint control requests	-	TRUE	-	ignition on	-	TRUE		ail conditions exists for more than 267 events test performed continuously with 0.01 s	
			indicated torque with (a) modeled inner engine torque and with (b) torque tolerance offset and with (c) torque of engine speed controller and with (d) torque of surge damper control	> = = =	(a) + (b) + (c) + (d) calculated parameter 11.72 calculated parameter calculated parameter		Engine Running and basic enable conditions met:	=	TRUE see sheet enable tables	- I	ail conditions exists for more than 0.28 s monitor runs with 0.04 s ate whenever enable conditions are met	
			voltage of charging switch or voltage of charging switch if buffer of a bank is not charged completely, or not at all	>	210.00 210.00		ECM is in startup before injections are released	=	TRUE	1	ail conditions exists for more than 4 events monitor runs with 0.01 s ate whenever	

Component /	Fault	Monitor Strategy	Primary Malfunction	Threshold	Secondary	Enable	Time	MIL
System	Code	Description	Criteria	Logic and Value	Parameters	Conditions	Required enable	Illum.
							conditions are met	
							met	
			error at startup of DC/DC converter of	= TRUE -	ignition on	= TRUE -	fail conditions	
			one bank				exists for 0.01	
					and DC/DC converter is in startup	= TRUE -	s monitor runs	
							with 0.01 s rate whenever	
							enable	
							conditions are met	
			DC/DC converter cannot be switched off.	= TRUE -	ignition on	= TRUE -		
		ECM Electronic out-put driver circuitry determines if short	Path 1:		Engine pre drive	= TRUE -	fail conditions exists for	
		circuit faults exist on injector					more than	
		charging bank #0.	Voltage high of injector bank #0 charging	> 210.00 V			0.04 s monitor runs	
			switch in case of loaded buffer capacitor				with 0.01 s rate whenever	
			or Dath O				enable	
			Path 2: Voltage high of injector bank #0 charging	> 210.00 V			conditions are met	
			switch in case of not loaded buffer capacitor					
1								

Component / System	Fault Code	Monitor Strategy Description	Primary Malfunction Criteria		Threshold Logic and Value		Secondary Parameters		Enable Conditions	Time Required	MIL Illum.
Jystem	Coue	ECM Electronic out-put driver circuitry determines if short circuit faults exist on injector charging bank #1.	Path 1: Voltage high of injector bank #1 charging switch in case of loaded buffer capacitor or Path 2: Voltage high of injector bank #1 charging switch in case of not loaded buffer capacitor	>	210.00 210.00	v v	Engine pre drive	-	TRUE	fail conditions exists for more than 0.04 s monitor runs with 0.01 s rate whenever enable conditions are met	inditi.
Control Module Analog to Digital Performance	P060B		time for calibration of ADC	>=	0.30	sec	ignition on	-	TRUE	fail conditions exists for 0.01 s test performed continuously 0.01 s	A
			voltage at ADC test voltage input	>	4.83	V				least 0.15 s test performed continuously 0.01 s	

Component / System	Fault Code	Monitor Strategy Description	Primary Malfunction Criteria		Threshold Logic and Value	9	Secondary Parameters		Enable Conditions		Time Required	MIL Illum.
			Voltage at ADC for acceleration pedal signal 2 or Voltage at ADC for acceleration pedal signal 2	>=	0.25	V V	ignition on and (Status Info of ADC monitoring)	=	TRUE No Load Test Pulse Active (released every 320 msec)	-	fail conditions exists for at least 0.12 s monitor runs with 0.01 s rate whenever enable conditions are met	
			(ratio metric correction factor or ratio metric correction factor)	<	0.95 1.05	factor factor	ignition on	=	TRUE	-	fail conditions exists for at least 0.15 s test performed continuously 0.01 s	
Internal Control Module Engine Speed (RPM) Performance	P061C	Monitors main and redundant engine speed calculations for agreement. Detects failure in engine speed calculation through redundant calculation algorithm.	(a) - (b) with (a) redundant calculated engine speed and with (b) engine speed	=	400.00 calculated parameter measured parameter	rpm -	redundant calculated engine speed and engine synchronization	-	600.00 TRUE	rpm -	fail conditions exists for more than 0.32 s monitor runs with 0.04 s rate whenever enable conditions are met	В

Component / System	Fault Code	Monitor Strategy Description	Primary Malfunction Criteria	Threshold Logic and Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
Fuel Pre-supply Pump Control Circuit Open		Diagnoses the Fuel Pre- Supply Pump low side driver circuit for circuit faults.	Voltage low during driver off state (indicates 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:	> 11.00 > 3.00 s	- fail conditions exists for 1.99 s monitor runs with 0.2 s rate whenever enable conditions are / met	
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)	≤ 0.5 Ω impedance between signal and controller ground	engine post drive/ afterun for time and battery voltage for time and ignition on and basic enable conditions met:	> 11.00 > 3.00 s = TRUE	- fail conditions exists for 0.5s monitor runs with 0.2 s rate whenever enable conditions are met ec /	

Component / System	Fault Code	Monitor Strategy Description	Primary Malfunction Criteria		Threshold Logic and Value	e	Secondary Parameters		Enable Conditions		Time Required	MIL Illum.
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: $\leq 0.5 \Omega$ impedance between signal and controller power	-	engine post drive/ afterun	=	FALSE	-	fail conditions exists for 0.27 s monitor runs with 0.2 s rate whenever enable conditions are	В
							time and	>	1.00	sec	met	
							battery voltage for time	>	11.00 3.00	V sec		
							and ignition on	=	TRUE	-		
							and basic enable conditions met:	=	see sheet enable tables	-		
Control Module Long Term Memory Performance	P062F	Each data block of memory is read for a check sum error and flags if a fault is found.	EEPROM sector reports faults regarding:				ignition on	=	TRUE	-	fail conditions exists for 0.01 s test	A
			unable to erase or change whole EEPROM sector	=	TRUE	-	and				performed continuously	
			or				basic enable conditions met:	=	see sheet enable tables	-	at the 0.01 s rate	
			read order is not successfully accomplished for more than amount of blocks	=	3	counts						
			or amount of write errors in current block	=	3	counts						
Sensor Reference	P0641	Sensor supply voltage 1	Reference supply voltage 1	≤	4.70	V	Ignition on	=	TRUE	-	fail conditions	A
Voltage "A" Circuit/Open		circuitry determines if faults related to maintaining the supply voltage level exists.									exists for 0.1 s test	

Component / System	Fault Code	Monitor Strategy Description	Primary Malfunction Criteria		Threshold Logic and Value		Secondary Parameters		Enable Conditions		Time Required	MIL Illum.
			or Reference supply voltage 1	2	5.30		and basic enable conditions met:	=	TRUE	-	performed continuously 0.01s rate	
Sensor Reference Voltage "B" Circuit/Open	P0651	circuitry determines if faults related to maintaining the supply voltage level exists.	Reference supply voltage 2 or Reference supply voltage 2	N N	4.70 5.30		Ignition on and basic enable conditions met:	=	TRUE	-	fail conditions exists for 0.1 s test performed continuously 0.01s rate	A
Sensor Reference Voltage "C" Circuit/Open	P0697	circuitry determines if faults related to maintaining the supply voltage level exists.	Reference supply voltage 3 or Reference supply voltage 3	N N	4.70 5.30		Ignition on and basic enable conditions met:	=	TRUE	-	fail conditions exists for 0.1 s test performed continuously 0.01s rate	A
Internal Control Module O2 Sensor Processor Performance Bank 1	P064D	A/F sensor O2 signal monitor based on comparison to internal ECM circuit	Filtered A/F sensor circuit output with reference to internal ECM calibration resistor within time period	=	0.20	V sec	following conditions met for time: Common conditions: Engine is running for time Operation point 1:	= >	0.26 TRUE 8.00	sec - sec	fault exists for more than 6 sec; monitor runs at 0.1 s when enable conditions are met	В

Component /	Fault	Monitor Strategy	Primary Malfunction		Threshold		Secondary		Enable		Time	MIL
System	Code	Description	Criteria	L	ogic and Value	•	Parameters		Conditions		Required	Illum.
							(Injection quantity	>=	4.00	mm^3/r ev		
							Injection quantity	=<	180.00	mm^3/r ev		
							Engine speed	>=	500.00	rpm		
							Engine speed	=<	4500.00	rpm		
							or					
							Operation point 2:					
							Injection quantity	>=	60.00	mm^3/r ev		
							Injection quantity	=<	180.00	mm^3/r ev		
							Engine speed	>=	3000.00	rpm		
							Engine speed	=<	4500.00	rpm		
							Battery voltage	>	11.00	V		
							DPF regeneration is not active for time	= >	FALSE 0.50	-		
							A/F sensor error status bit (see	=	FALSE	sec		
							parameter definition table)					
							NO Pending or Confirmed DTCs:	=	see sheet inhibit tables	-		
							basic enable conditions met:	=	see sheet enable tables	-		
		A/F sensor O2 signal monitor based on comparison to internal ECM circuit	Filtered A/F sensor circuit output with reference to internal ECM calibration resistor	=<	-0.20	V	following conditions met for time:	>=	0.26	sec	fault exists for more than 600 sec; monitor runs	
			within time period	=	0.10	sec	Common conditions: Engine is running	=	TRUE	-	at 0.1 s when enable	
							for time Operation point 1:	>	8.00		conditions are met	
							Injection quantity	>=	4.00	mm^3/r ev		
							Injection quantity	=<	180.00	mm^3/r ev		

System	Code		Primary Malfunction		Threshold		Secondary		Enable		Time	MIL
	Code	Description	Criteria	Lo	gic and Value		Parameters		Conditions		Required	Illum.
							Engine speed	>=	500.00	rpm		
							Engine speed	=<	4500.00	rpm		
)					
							or					
							Operation point 2:					
							(
							Injection quantity	>=	60.00	mm^3/r		
							1.1.10 04		100.00	ev		
							Injection quantity	=<	180.00	mm^3/r		
							Engine speed	>=	3000.00	ev		
							Engine speed Engine speed	=<	4500.00	rpm rpm		
								-\	4500.00	ipin		
) Battery voltage	>	11.00	V		
							DPF regeneration is not active	=	FALSE	-		
							for time	>	0.50	sec		
							A/F sensor error status bit (see	=	FALSE	-		
							parameter definition table)					
							NO Pending or Confirmed DTCs:	=	see sheet inhibit	-		
									tables			
							basic enable conditions met:	=	see sheet enable	-		
									tables			
					_	_			_	_		
		A/F sensor resistance	Filtered difference between Internal	>=	0.20	V	following conditions met for time:	>=	0.26	sec	fault exists for	
		comparison to internal ECM	resistance raw value and internal				Ū.				more than	
		calibration resistance	resistance reference value								600 sec;	
			within time	=	0.10	sec	Common conditions:				monitor runs	
							Engine is running	=	TRUE	-	at 0.1 s when	
							for time	>	8.00	sec	enable	
							Operation point 1:				conditions are	
							(4.00	40/	met	
	1						Injection quantity	>=	4.00	mm^3/r ev		
	1						Injection quantity	=<	180.00	ev mm^3/r		
	1							- `	100.00	ev		
							Engine speed	>=	500.00	rpm		
							Engine speed	=<	4500.00	rpm		
	1)					
	1						or					
							Operation point 2:					
		1					(
							-					

Component /	Fault	Monitor Strategy	Primary Malfunction		Threshold		Secondary		Enable		Time	MIL
System	Code	Description	Criteria	L	ogic and Value		Parameters		Conditions	4.0.4	Required	Illum.
							Injection quantity	>=	60.00	mm^3/r		
							Injection quantity	=<	180.00	ev mm^3/r		
							injection quantity		100.00	ev		
							Engine speed	>=	3000.00	rpm		
							Engine speed	=<	4500.00	rpm		
)					
							Battery voltage	>	11.00	V		
							DPF regeneration is not active	=	FALSE	-		
							for time	>	0.50	sec		
							A/F sensor error status bit (see	=	FALSE	-		
							parameter definition table)					
							NO Pending or Confirmed DTCs:	=	see sheet inhibit	-		
							hasis spakle conditions mate	_	tables see sheet enable	-		
							basic enable conditions met:	=	tables	-		
									lables			
		A/F sensor resistance	Filtered difference between Internal	=<	-0.20	V	following conditions met for time:	>=	0.26	sec	fault exists for	
			resistance raw value and internal								more than	
		calibration resistance	resistance reference value								600 sec;	
			within time	=	0.10	sec	Common conditions:				monitor runs	
							Engine is running	=	TRUE	-	at 0.1 s when	
							for time	>	8.00	sec	enable	
							Operation point 1:				conditions are	
							(>=	4.00	mm^3/r	met	
							Injection quantity	/-	4.00	ev		
							Injection quantity	=<	180.00	mm^3/r		
							injection quantity	- 1	100.00	ev		
							Engine speed	>=	500.00	rpm		
							Engine speed	=<	4500.00	rpm		
)					
							or					
							Operation point 2:					
							(
							Injection quantity	>=	60.00	mm^3/r		
									100.00	ev		
							Injection quantity	=<	180.00	mm^3/r		
							Engine around	<u> </u>	2000.00	ev		
							Engine speed Engine speed	>= =<	3000.00 4500.00	rpm		
I	I	I	1						4000.00	rpm	I I	I

Component / System	Fault Code	Monitor Strategy Description	Primary Malfunction Criteria	Threshold Logic and Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
0,010111	0000) Battery voltage DPF regeneration is not active for time A/F sensor error status bit (see parameter definition table) NO Pending or Confirmed DTCs: basic enable conditions met:	 > 11.00 V = FALSE - > 0.50 sec = FALSE - = see sheet inhibit - tables = see sheet enable - tables 	roquica	
		control monitoring	Initialization register value of SPI chip is different from the value written into SPI chip in previous cycle	= TRUE -	Ignition on 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 sec; monitor runs at 0.1 s when enable conditions are met	
Malfunction Indicator Lamp (MIL) Control Circuit	P0650	Diagnoses the Malfunction Indicator Lamp (MIL) low side driver circuit for circuit faults.	Voltage low during driver off state (indicates open circuit)	= Open Circuit:≥ - 200 K Ω impedance between ECU pin and load	circuit active at low current and ignition on and ECU Initialization tasks in progress for time and ECU Shutdown tasks in progress for time and Battery voltage for time	= TRUE - = TRUE - = FALSE - > 0.10 sec = FALSE - > 1.00 sec > 10.50 V > 3.00 sec	fail conditions exists for 2 s monitor runs with 0.01 s rate whenever enable conditions are met	

Component / System	Fault Code	Monitor Strategy Description	Primary Malfunction Criteria	Threshold Logic and Value	Secondary Parameters		Enable Conditions		Time Required	MIL Illum.
					and basic enable conditions met:	=	see sheet enable tables	-		
Fan 1 Control Circuit Low		Diagnoses the Cooling Fan 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 ignition on and basic enable conditions met: and NO Pending or Confirmed DTCs:	> = > = =	11.00 3.00 FALSE 3.00 TRUE see sheet enable tables see sheet inhibit tables	V sec - -	fail conditions exists for 3 s test performed continuously 0.02 s rate	В
Fan 1 Control Circuit High		Diagnoses the Cooling Fan 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 time	>	11.00 3.00 FALSE 3.00	V sec sec	fail conditions exists for 1 s test performed continuously 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.
					and ignition on and basic enable conditions met: and NO Pending or Confirmed DTCs:	 TRUE - see sheet enable - tables see sheet inhibit - tables 		
Chassis Control Module 1 Requested MIL Illumination	P26C8		serial data communication from the Fuel Pump Control Module indicates the Fuel Pump Control Module has requested a MIL	= TRUE -	ignition on for time and new message is received via CAN and basic enable conditions met: and NO Pending or Confirmed DTCs:	 TRUE - 3.00 sec TRUE - see sheet enable - tables see sheet inhibit - tables 	fail conditions exists for 1 s monitor runs once per trip with 0.25 s rate whenever enable conditions are met	B (No MIL)
Engine Oil Pressure Control Circuit/Open	P06DA	Detects an open circuit condition of the oil pump pressure selection switch control circuit	The ECM detects that the commanded state of the driver and the actual state of the control circuit do not match	 Open circuit: - ≥ 200 kΩ impedance between ECU pin and load 	ignition is on or running and NO Pending or Confirmed DTCs: and basic enable conditions are met:	 TRUE - see sheet inhibit - tables see sheet enable - tables 	fail conditions exists for 5 s test performed continuously 0.02 s	С

Component / System	Fault Code	Monitor Strategy Description	Primary Malfunction Criteria	Threshold Logic and Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
Engine Oil Pressure Control Circuit Low	P06DB		The ECM detects that the commanded state of the driver and the actual state of the control circuit do not match	Short-to-ground: - ≤ 0.5 Ω impedance between signal and controller ground	ignition is on or running and NO Pending or Confirmed DTCs: and basic enable conditions are met:	= TRUE - = see sheet inhibit - tables = see sheet enable - tables	exists for 5 s test performed continuously 0.02 s	С
Engine Oil Pressure Control Circuit High	P06DC	Detects a short-to-battery circuit condition of the oil pump pressure selection switch control circuit	The ECM detects that the commanded state of the driver and the actual state of the control circuit do not match	Short-to-power: - ≤ 0.5 Ω impedance between signal and controller power	ignition is on or running and NO Pending or Confirmed DTCs: and basic enable conditions are met:	= TRUE - = see sheet inhibit - tables = see sheet enable - tables	fail conditions exists for 5 s test performed continuously 0.02 s	С
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 a MIL	= TRUE -	ignition on for time	= TRUE -	fail conditions exists for 1 s monitor runs once per trip with 0.25 s rate whenever	

Component / System	Fault Code	Monitor Strategy Description	Primary Malfunction Criteria	Threshold Logic and Val	ue	Secondary Parameters and		Enable Conditions		Time Required enable	MIL Illum.
						and new message is received via CAN and basic enable conditions met: and NO Pending or Confirmed DTCs:	=	TRUE see sheet enable tables see sheet inhibit tables	-	enable conditions are met	
Brake Switch "B" Circuit	P0703		number of messages with validation errors in the last number of messages (sliding window) received from body control module	>= 3.00 = 10.00		ignition on for time and basic enable conditions met: and NO Pending or Confirmed DTCs:	= >= =	TRUE 3.00 see sheet enable tables see sheet inhibit tables	- sec -	fail conditions exists for 0.015 s test performed continuously 0.005 s rate	С
Park/Neutral Position (PNP) Switch Circuit High Voltage	P0851	on the PNP circuit by comparing the ECM sensed input to the broadcasted state	ECM (on-board control unit) sensed position based on PNP switch inputs to ECM indicates park or neutral and the GMLAN message from the TCM disagrees	= TRUE		(battery voltage and battery voltage) and engine speed and vehicle speed and	>= <= >= >=	11.00 655.34 800.00 14.92	V V rpm mph	fail conditions exist for more than 3000 events monitor runs with 0.01 s rate whenever enable conditions are met	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	Citteria	Logic and Value	engine torque	>=	60.00	Nm	Kequireu	mum.
					and accelerator pedal position and	>=	0.00	%		
					(selected gear position is park or	=	FALSE	-		
					selected gear position is neutral) and	=	FALSE	-		
					basic enable conditions:	=	see sheet enable tables	-		
					and NO Pending or Confirmed DTCs:	=	see sheet inhibit tables	-		
Park/Neutral Position (PNP) Switch Circuit Low Voltage		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	>= <=	11.00 655.34	v v	fail conditions exist for more than 3000 events monitor runs with 0.01 s rate whenever enable conditions are met	В
) and engine speed and (<=	7000.00	rpm		
					selected gear position is park or	=	TRUE	-		
					selected gear position is neutral) and	=	TRUE	-		
					basic enable conditions met:	=	see sheet enable tables	-		
					and NO Pending or Confirmed DTCs:	=	see sheet inhibit tables	-		

Component / System	Fault Code	Monitor Strategy Description	Primary Malfunction Criteria		Threshold Logic and Value	e	Secondary Parameters		Enable Conditions		Time Required	MIL 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		>=	8.00	counts	ignition on	=	TRUE	-	test performed continuously 0.01 s rate	Special C
			in the last number of messages (sliding window) received from traction control system	=	10.00	counts	for time and basic enable conditions met: and NO Pending or Confirmed DTCs:	>=	3.00 see sheet enable tables see sheet inhibit tables	sec - -		
Reductant Pump High Control Circuit Low Voltage	P1043	Diagnoses the Ruductant Pump Motor high side driver circuit for circuit faults.	Voltage low during driver on state (indicates short to ground)	-	Short to ground: ≤ 0.5 Ω impedance between signal and controller ground	-	ignition on ECU Initialization tasks in progress for time and Battery voltage for time and basic enable conditions met: AND NO Pending or Confirmed DTCs		TRUE FALSE 0.10 10.50 3.00 see sheet enable tables see sheet inhibit tables	- sec V sec -	fail conditions exists for 3 s monitor runs with 0.010 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.
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	ignition on	=	TRUE		fail conditions exists for 3 s monitor runs with 0.010 s rate whenever enable conditions are	В
					ECU Initialization tasks in progress for	=	FALSE	-	met	
					time and	>	0.10	sec		
					Battery voltage for time	>	10.50 3.00	V sec		
					and basic enable conditions met:	=	see sheet enable tables	-		
					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 	ignition on	=	TRUE	-	fail conditions exists for 3 s monitor runs with 0.010 s rate whenever enable	В
					and ECU Initialization tasks in progress for	=	FALSE	-	conditions are met	
					time and	>	0.10	sec		
					Battery voltage for	>	10.50	V		
					time and basic enable conditions met:	>	3.00 see sheet enable	sec		
					AND		tables			

Component / System	Fault Code	Monitor Strategy Description	Primary Malfunction Criteria	Threshold Logic and Value	Secondary Parameters NO Pending or Confirmed DTCs	=	Enable Conditions see sheet inhibit tables	-	Time Required	MIL Illum.
Reductant Injector High Control Circuit Low Voltage	P1048	Reductant Injector Control Circuit	The ECM detects that the commanded state of the driver and the actual state of the control circuit do not match. Voltage low during driver on state (indicates short to ground)	Short to ground: - ≤ 0.5 Ω impedance between signal and controller ground	ignition on ECU Initialization tasks in progress for time and Battery voltage for time and basic enable conditions met: AND NO Pending or Confirmed DTCs		TRUE FALSE 0.10 10.50 3.00 see sheet enable tables see sheet inhibit tables	- sec V sec -	fail conditions exists for 2 s monitor runs with 0.010 s rate whenever enable conditions are met	В
Reductant Injector High Control Circuit High Voltage	P1049	Reductant Injector Control Circuit	The ECM detects that the commanded state of the driver and the actual state of the control circuit do not match. Voltage high during driver off state (indicates short to power)	Short to power: ≤ - 0.5 Ω impedance between signal and controller power	ignition on and ECU Initialization tasks in progress for time and Battery voltage for time and	= > > > >	TRUE FALSE 0.10 10.50 3.00	- sec V sec	fail conditions exists for 2 s monitor runs with 0.010 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 Reguired	MIL Illum.
- Cyclom	0000	Decemption	<u>onona</u>				basic enable conditions met:	=	see sheet enable tables	-	Roquilou	
							NO Pending or Confirmed DTCs	=	see sheet inhibit tables	-		
Fuel Rail Pressure Performance	P1089	checked against desired rail	rail pressure deviation from setpoint calculated as the absolute value of difference between desired and actual value	>	2500.00	kPa	rail pressure control commanded during injection timing correction learning phase	=	TRUE	-	fail conditions exists for 720 crank revolutions monitor runs with 0.02 s	В
							and NO Pending or Confirmed DTCs limiting rail pressure set point	=	see sheet inhibit tables	-	rate whenever enable	
							for time and	>	2.00	sec	conditions are met	
							basic enable conditions met:	=	see sheet enable tables	-		
										_		
Charge Air Cooler Temperature Sensor Performance	P10CF	Detects a biased charge air cooler temperature sensor downstream or charge air cooler temperature sensor upstream by comparing the respective values at startup.	Path 1:				minimum engine-off time and	>=	28800.00	Sec	fail conditions exists for 0.1 s monitor runs once per trip with 0.1 s rate whenever	В
			(a) - (b) (see Look-Up-Table #3)	>	25 to 999	°C	engine-off time is valid and	=	TRUE		enable conditions are	
			(a) captured charge air cooler downstream temperature at start	=	measured parameter		ambient temperature and	>	-60.04	°C	met	
			and with		Parameter		engine speed (see Look-Up-Table #81)	>	850 to 1100	rpm		
			(b) captured charge air cooler upstream temperature at start	=	measured parameter	-	for					
		l			F		time	>	0.01	sec		

Component / System	Fault Code	Monitor Strategy Description	Primary Malfunction Criteria		Threshold Logic and Value		Secondary Parameters		Enable Conditions		Time Required	MIL Illum.
							and engine post drive/ afterun and diagnostic performed in current dc	=	FALSE	-		
							and basic enable conditions met:	=	see sheet enable	-		
							and NO Pending or Confirmed DTCs:	=	tables see sheet inhibit	-		
							Ŭ		tables			
Reductant Injector Temperature - Exhaust Gas	P10D0	Detects an implausible SCR dosing valve coil temperature by comparing the temperature	(a) - (b) (see Look-Up-Table #80)	>	30 to 3276.7	°C	ignition on	=	TRUE	-	fail conditions exists for 0.1 s	В
Temperature 2 Correlation		with a reference temperature									monitor with 0.1 s rate	
			with (a) dosing valve coil temperature	=	calculated		and state of selective catalytic reduction	=	STANDBY or NO	_	whenever enable	
					parameter		system	_	PRESSURE CONTROL		conditions are met	
			and with (b) oxidation catalyst downstream temperature	=	measured parameter		and active heating phase for dosing valve	=	FALSE	-		
							and valve already activated within this driving	=	FALSE			
							cycle and	-	TALSE	-		
							battery voltage and	>	11.00	V		
							ambient temperature and	>=	-60.04	°C		
							engine run time and	<	3.00	sec		
							engine off time and	>	28800.00	sec		
							urea pump motor output duty cycle and	=	0.00	%		
							Max [(a), (b)] - Min [(a), (b)] where	<=	15.00	К		
							(a) ambient temperature	=	measured parameter	-		

Component / System	Fault Code	Monitor Strategy Description	Primary Malfunction Criteria	Threshold Logic and Value	Secondary Parameters	(Enable Conditions		Time Required	MIL Illum.
Oystem	0000	Description	ontona	Logio and Value	(b) oxidation catalyst downstream temperature and	=	measured parameter	-	ricquircu	indin.
					urea dosing valve output duty cycle and	>	3.00	%		
					coil current measurement is valid (e.g. no dosing valve errors present) and	=	TRUE	-		
					basic enable conditions met:	= see	sheet enable tables	-		
					and NO Pending or Confirmed DTCs:	= see	e sheet inhibit tables	-		
						_	_			
O2 Sensor Performance - Signal High During Moderate Load Sensor 1	P11A6	part load mode, which monitors a deviation of the raw	difference between measured A/F sensor concentration and filtered calculated A/F concentration -> refer to Column 1 in the table (see Look-Up-Table #51)	> 0.04 to 0.07 -	following conditions met for Integrated air mass:	>	80	g	fail conditions exists for 0.1 s monitor runs with 0.02 s	В
			Note: Calculated A/F concentration is calculated as a function of Injection Quantity and Air Mass per cylinder (which is calculated on MAF sensor and EGR)		Engine speed ->refer to the Column 1 in the table (see Look-Up-Table #47)	< 2	700 to 4500	rpm	rate whenever enable conditions are met	
					Injection quantity -> refer to the Column 1 in the table (see Look-Up-Table #49)	>	-1 to 16	mm^3/r ev		
					Injection quantity -> refer to the Column 1 in the table (see Look-Up-Table #48)	<	0.4 to 44	mm^3/r ev		
					Air mass per cylinder ->refer to the Column 1 in the table (see Look-Up- Table #46)	> (0.09 to 0.25	g/rev		
					Air mass per cylinder ->refer to the Column 1 in the table (see Look-Up- Table #45)	< 0.	.253 to 0.45	g/.rev		
					DPF regeneration not active Post injection is not active (post injection only active during cold start catalyst heating or DPF regeneration)	= =	TRUE TRUE	-		

Component / System	Fault Code	Monitor Strategy Description	Primary Malfunction Criteria	Threshold Logic and Value	Secondary Parameters		Enable Conditions		Time Required	MIL Illum.
System	Code	Description	Criteria	Logic and value	Temperature of A/F sensor (based on	=<	805.96	°C	Required	mam.
					sensor internal resistance) Temperature of A/F sensor (based on	>=	823.96	°C		I
					sensor internal resistance) Absolute change in actual calculated	<	0.02	-		I
					O2 concentration for time	>=	1.50	sec		
					Fuel volume in fuel tank	>=	0.00	L		
				1	Battery voltage	>=	11.00	V		
					Decel Fuel Cut-Off (DFCO)	=	FALSE	-		
				1	NO Pending or Confirmed DTCs:	=	see sheet inhibit tables	-		
					basic enable conditions met:	=	see sheet enable	-		
						1	tables	ļ		
				1		1		ł		
O2 Sensor	P11A9	A/Econocr signal monitoring in	difference between filtered calculated	> 0.06 to 0.07 -	following conditions met for Integrated air	>	80		fail conditions	В
Performance - Signal			A/F concentration and measured A/F	> 0.08 10 0.07 -	mass:	- í	00	g	exists for 0.1	D
Low During Moderate			sensor concentration -> refer to Column			1		ļ	s	
Load Bank 1 Sensor 1			1 in the table (see Look-Up-Table #50)			1		ļ	monitor runs	
		calculated sensor signal				1		ļ	with 0.02 s	
	1		Note: Calculated A/F concentration is	1	Engine speed refer to the column 1	<	2700 to 4500	rpm	rate whenever	
			calculated as a function of Injection	1	(see Look-Up-Table #47)	1		ł	enable	
			Quantity and Air Mass per cylinder (which is calculated on MAF sensor	1		1		ł	conditions are	
			and EGR)			1		ļ	met	
				1	Injection quantity -> refer to the Column	>	-1 to 16	mm^3/r		
				1	1 in the table (see Look-Up-Table #49)	1		ev		
				1	· · · · ·	1		ł		
				1	Injection quantity -> refer to the Column	<	0.4 to 44	mm^3/r		
					1 in the table (see Look-Up-Table #48)	1		ev		
				1	Air mass per cylinder ->refer to the	>	0.09 to 0.25	alanı		
					Column 1 in the table (see Look-Up-	^	0.09 10 0.25	g/rev		
					Table #46)	1		ļ		
	1			1	Air mass per cylinder ->refer to the	<	0.253 to 0.45	g/.rev		
	1			1	Column 1 in the table (see Look-Up-	1		-		
	1			1	Table #45)	1		ļ		
	1			1	DPF regeneration not active	=	TRUE	-		
	1			1	Post injection is not active (post	=	TRUE	-		
	1			1	injection only active during cold start catalyst heating or DPF regeneration)	1		ļ		
1	1	I I	1	I.	catalyst heating of DPF regeneration)	1			i I	

Component / System	Fault Code	Monitor Strategy Description	Primary Malfunction Criteria		Threshold Logic and Value		Secondary Parameters		Enable Conditions		Time Required	MIL Illum.
Gystein	oode	Description	Ontena		Logic and Value		Temperature of A/F sensor (based on	>=	805.96	°C	Required	inum.
							sensor internal resistance) Temperature of A/F sensor (based on	<=	823.96	°C		
							sensor internal resistance) Absolute change in actual calculated	<	0.02	-		
							O2 concentration for time	>=	1.50	sec		
							Fuel volume in fuel tank	>=	0.00	L		
							Battery voltage	>=	11.00	V		
							Decel Fuel Cut-Off (DFCO)	=	FALSE	-		
							NO Pending or Confirmed DTCs:	=	see sheet inhibit	-		
							basic enable conditions met:	=	tables see sheet enable			
							basic enable conditions met.	-	tables	-		
									lables			
NOx Sensor	P11CB	Detects a high deviation of the measured NOx sensor	EWMA filtered delta high upstream NOx	<	0.00	factor	Duration for averaging upstream NOx	>=	6.00	sec	fault exists for	A
Performance - Signal High Bank 1 Sensor 1		concentration from the	monitor				sensor signal and NOx model				more than 1 event; monitor	
riigii bank i Sensor i		modeled NOx concentration									runs at 0.1 s	
			Threshold for high upstream NOx	=	(a) * (b) * (c) *						once per trip	
			rationality check		(d) * (e)							
			(a) Base threshold for high upstream	=	0.410034 to	factor	(
			NOx rationality check (see Look-Up-		1.400024							
			Table #74)	=	1	factor	Status of NOV signal of upstream NOV	=	TRUE			
			 (b) correction factor dependent on NOx model 	=	1	factor	Status of NOx signal of upstream NOx sensor (please see the definition)	=	IRUE	-		
			NOX Model				sensor (please see the definition)					
			(c) correction factor dependent on	=	1	factor	Normal Mode (Particulate Filter	=	TRUE	-		
			engine coolant temperature and				Regeneration not active)					
			transmission gear									
			(d) correction factor dependent on	=	1.0 to 1.4	factor	for time		30.00	sec		
			ambient pressure (see Look-Up-Table									
			#86) (e) correction factor dependent on	=	1	factor	ambient processo	>=	74.80	kPa		
			relative humidity	-	I	factor	ambient pressure		74.00	кга		
			rolativo humany				ambient pressure	<=	106.00	kPa		
							ambient temperature	>=	-30.04	°C		
							ambient temperature	<=	79.96	°C		
							(filtered and deled NO: compared to "		0.400447	64-		
							filtered modeled NOx concentration percent positive deviation	<=	0.120117	factor		
		I	I I				percent positive deviation	I			I I	I

Component /	Fault	Monitor Strategy	Primary Malfunction	Threshold	Secondary		Enable		Time	MIL
System	Code	Description	Criteria	Logic and Value	Parameters		Conditions		Required	Illum.
					filtered modeled NOx concentration percent positive deviation	>=	0.120117	factor		
					for time	>=	2.00	sec		
					for time	>	2.00	sec		
					time since start	>	0.00	sec		
					engine coolant temperature	>=	59.96	°C		
					engine coolant temperature	<=	125.96	°C		
					Exhaust gas temperature range at Upstream NOx sensor (see Look-Up-	>0	0 to 1	factor		
					Table #76)		40.40			
					Vehicle speed	>=	12.43	mph		
					Vehicle speed	<=	37.29	mph		
					Enable range for the plausibility check of Upstream NOx sensor (see Look-Up- Table #70)	≠0	0 to 1	factor		
					for time	>	1.00	sec		
					filtered modeled NOx-concentration	>=	110.00	ppm		
					upstream of the SCR					
					filtered modeled NOx-concentration upstream of the SCR	<=	600.00	ppm		
					for time	>	0.10	sec		
) Diagnostic has not completed this driving cycle	=	FALSE	-		
					NO Pending or Confirmed DTCs:	=	see sheet inhibit tables	-		
					basic enable conditions met:	=	see sheet enable tables	-		
					EWMA fast initialization mode: filter coefficient for fast initialization number of high upstream NOx monitor measurements for current driving cycle of fast initialization mode	= >=	0.32 1.00	factor counts		
					number of high upstream NOx monitor measurements for fast initialization mode	>=	2.00	counts		

Component /	Fault	Monitor Strategy	Primary Malfunction		Threshold		Secondary		Enable		Time	MIL
System	Code	Description	Criteria		Logic and Value		Parameters		Conditions		Required	Illum.
							EWMA Rapid Response mode: EWMA filtered delta high upstream NOx monitor	>	0.31	factor		
							(a) - (b)	<	0.00	factor		
							(a) threshold of high upstream NOx	=	calculated	-		
							monitor		parameter			
							(b) measured value of high upstream	=	calculated	-		
							NOx monitor	_	parameter	factor		
							filter coefficient for Rapid Response mode	=	0.38	factor		
							number of high upstream NOx monitor	>=	1.00			
							measurements for current driving cycle	/-	1.00			
							of Rapid Response mode					
							or Rapid Response mode					
							Total number of high upstream NOx monitor measurements for Rapid Response mode	>=	6.00	counts		
							EWMA stabilized mode:					
							filter coefficient for stabilized mode number of high upstream NOx monitor	=	0.22 1	factor counts		
							measurements for stabilized mode					
NOx Sensor Performance - Signal Low Bank 1 Sensor 1	P11CC	Detects a low deviation of the measured NOx sensor concentration from the modeled NOx concentration	EWMA filtered delta low upstream NOx monitor	<	0.00	factor	Duration for averaging upstream NOx sensor signal and NOx model	>=	6.00	sec	fault exists for more than 1 event; monitor runs at 0.1 s	A
			Threshold for low upstream NOx rationality check	=	(a) * (b) * (c) * (d) * (e)	factor	Status of NOx signal of upstream NOx sensor (please see the definition)	=	TRUE	-	once per trip	
			(a) Base threshold for high upstream NOx rationality check (see Look-Up-	=	-0.670044 to - 0.52002	factor	Normal Mode (Particulate Filter Regeneration not active)	=	TRUE	-		
			Table #75)		0.52002		Regeneration not active)					
			(b) correction factor dependent on NOx model	=	1	factor	for time		30.00	sec		
			(c) correction factor dependent on	=	1	factor	ambient pressure	>=	74.80	kPa		
			engine coolant temperature and transmission gear			100101		-	14.00	Μu		

Component /	Fault	Monitor Strategy	Primary Malfunction		Threshold		Secondary		Enable		Time	MIL
System	Code	Description	Criteria		Logic and Val	ue	Parameters		Conditions		Required	Illum.
			(d) correction factor dependent on ambient pressure (see Look-Up-Table #87)	=	0.62 to 1.0	factor	ambient pressure	<=	106.00	kPa	·	
			(e) correction factor dependent on relative humidity (see Look-Up-Table #69)	=	1.00	factor	ambient temperature	>=	-30.04	°C		
			,				ambient temperature ((<=	79.96	°C		
							filtered modeled NOx concentration percent positive deviation	<=	0.120117	factor		
							filtered modeled NOx concentration percent negative deviation	>=	0.120117	factor		
							, for time	>=	2.00	sec		
							for time	>	2.00	sec		
							time since start	>	0.00	sec		
							Coolant engine down stream	>=	59.96	°C		
							temperature	-	00.00	Ŭ		
							Coolant engine down stream	<=	125.96	°C		
							temperature	~-	125.90	C		
							Exhaust gas temperature range at	>0	0 to 1	factor		
								-0	0101	Tactor		
							Upstream NOx sensor (see Look-Up-					
							Table #76)		10.10			
							Vehicle speed	>=	12.43	mph		
							Vehicle speed	<=	37.29	mph		
							for time	>	1.00	sec		
							Enable range for the plausibility check	≠0	0 to 1	factor		
							of Upstream NOx sensor (see Look-Up- Table #70)					
							for time	>	1.00	sec		
							filtered modeled NOx-concentration upstream of the SCR	>=	65.00	ppm		
							filtered modeled NOx-concentration upstream of the SCR	<=	600.00	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			
							DASIC ENADE CONULIONS MEL.	-	tables	-		

Component /	Fault	Monitor Strategy	Primary Malfunction		Threshold		Secondary Barameters		Enable		Time	MIL
System	Code	Description	Primary Martunction Criteria	Lo	I hreshold ogic and Value		Secondary Parameters EWMA fast initialization mode: filter coefficient for fast initialization number of low upstream NOx monitor measurements for current driving cycle of fast initialization mode number of low upstream NOx monitor measurements for fast initialization mode EWMA Rapid Response mode: EWMA filtered delta low upstream NOx monitor (a) - (b) (a) measured value of low upstream NOx monitor (b) threshold of low upstream NOx monitor filter coefficient for Rapid Response mode number of low upstream NOx monitor measurements for current driving cycle of Rapid Response mode Total number of low upstream NOx monitor measurements for Rapid Response mode EWMA stabilized mode: filter coefficient for stabilized mode		Conditions 0.32 1.00 2.00 0.21 0.00 calculated parameter calculated parameter 0.38 1.00 6.00 0.22 1	factor counts factor factor factor factor counts factor	Required	MIL IIIum.
						_						
NOx Sensor Offset Learning at Min Limit - Bank 1 Sensor 1	P11D3	Detects NOx offset value min of the upstream NoX Sensor	average NOx offset value NOx sensor signal averaged over time	<		ppm sec	(battery voltage and battery voltage and	>= <=	11.00 655.34	v v	fault exists for more than 2 DFCO events; monitor runs at 0.02 s when enable conditions are met	В

Component /	Fault	Monitor Strategy	Primary Malfunction		Threshold		Secondary		Enable		Time	MIL
System	Code	Description	Criteria	L	ogic and Value		Parameters		Conditions		Required	Illum.
							Oxidation Catalyst upstream temperature and Oxidation Catalyst upstream temperature and	>= <=	99.96 599.96	℃ ℃		
							Engine running	=	TRUE	-		
							for time and	>	20.00	sec		
							Upstream NOx sensor dewpoint achieved (please see the definition)	=	TRUE	-		
							for time	>	160	sec		
							following conditions for time:	=	1.00	sec		
							EGR valve position	>=	0.00	%		
							EGR valve position NOx sensor measured lambda	<= >	100.00 0.00	%		
							for time	>=	0.50	sec		
							DFCO (Decel Fuel Cut-Off) active	=	TRUE	-		
							NOx sensor 1 ready status (see parameter definition)	=	TRUE	-		
							Valid NOx signal from CAN is received (no NOx sensor communication failures)	=	TRUE	-		
							Engine Running (see parameter definition)	=	TRUE	-		
							for time	>	20.00	sec		
							engine speed	>=	1000.00	rpm		
							engine speed	<= >	3500.00 100 to 500	rpm		
							integrated air mass flow (see Look-Up- Table #30)	2	100 10 500	g		
	D11D1	Data da NON Offactural	Nou affectively a		50.00						fourth outlate f	
NOx Sensor Offset Learning at Max Limit - Bank 1 Sensor 1	P11D4	Detects NOx Offset value max. of the upstream NoX Sensor	average NOX oπset value	>	50.00	ppm	(fault exists for more than 2 DFCO events; monitor runs	В
			NOx sensor signal averaged over time	=	1.00	sec	battery voltage	>=	11.00	V	at 0.02 s when enable	
							and battery voltage and	<=	655.34	V	conditions are met	

Component /	Fault	Monitor Strategy	Primary Malfunction		Threshold		Secondary		Enable		Time	MIL
System	Code	Description	Criteria		Logic and Valu	е	Parameters		Conditions	**	Required	Illum.
							Oxidation Catalyst upstream temperature and Oxidation Catalyst upstream temperature	>= <=	99.96 599.96	℃ ℃		
							and					
							Engine running for time	= >	TRUE 20.00	- sec		
							and	-	20.00	360		
							Upstream NOx sensor dewpoint achieved (please see the definition)	=	TRUE	-		
) for time	>	160	sec		
							following conditions for time:	=	1.00	sec		
							EGR valve position	>=	0.00	%		
							EGR valve position	<=	100.00	%		
							NOx sensor measured lambda	>	0.00	-		
							for time DFCO (Decel Fuel Cut-Off) active	>= =	0.50 TRUE	sec		
							NOx sensor 1 ready status (see	=	TRUE	-		
							parameter definition)		INCL			
							Valid NOx signal from CAN is received (no NOx sensor communication failures)	=	TRUE	-		
							Engine Running (see parameter definition)	=	TRUE	-		
							for time	>	20.00	sec		
							engine speed	>=	1000.00	rpm		
							engine speed	<=	3500.00	rpm		
							integrated air mass flow (see Look-Up- Table #30)	>	100 to 500	g		
									_			
NOx Sensor Performance - Sensing Element Status Signal Bank 1 Sensor 2	P11D7	During the NOx sensor self- diagnostic test, the number of aborted self-diagnostics is monitor. If the self-diagnostic is aborted, by NOx sensor indication, a calibrated number of times the fault is set	status NOx-self-diagnosis	=	2 (NOx self diagnosis aborted)		General Conditions required before Shutdown:				fault exists 3 times per driving-cycle; monitor run at 0.1 s rate during ECM afterrun	В
I			for number of counts	>=	1.00	counts	minimum engine run time	>=	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.
				0	NOx sensor signal is valid (e.g. No	=	TRUE	-		
					CAN error of NOx CAN messages)					
					measured downstream NOx	<	200.00	ppm		
					temperature upstream of the SCR	>=	49.96	°C		
					catalyst					
					temperature upstream of the SCR	<=	499.96	°C		
					catalyst			-		
					DPF regeneration active	=	FALSE	-		
					engine speed	>=	0.00	rpm		
					engine speed	<=	1000.00	rpm		
					battery voltage	>=	11.00	v		
					battery voltage	<=	655.34	V		
					NO Pending or Confirmed DTCs:	=	see sheet inhibit	-		
							tables			
					NOx sensor heater status	=	TRUE	-		
					means					
					NOx sensor has sent via CAN that	=	TRUE	-		
					heater temperature setpoint has					
					been reached (i.e. dewpoint					
					achieved and no heater faults)					
					achierea and no noater laater					
					Afterrun Conditions:					
					NO Pending or Confirmed DTCs:	=	see sheet inhibit	-		
					······································		tables			
					ECM operating in Afterrun (please see	=	TRUE	-		
					the definition)					
					vehicle speed	=	0			
					measured downstream NOx	<=	200.00	ppm		
		1			DPF regeneration active	=	FALSE	-		
		1			engine speed	>=	0.00	rpm		
		1			engine speed	<=	1000.00	rpm		
		1			NOx sensor signal is valid (e.g. No	=	TRUE	-		
		1			CAN error of NOx CAN messages)		=			
					maximum duration in afterrun	<=	150	sec		
		1			number of self-diagnostic attempts	>=	4.00	counts		
		1			status sensor reaction in afterrun	<	50.00	sec		
		1								
		1			(sensor is reheated as necessary prior					
		1			to start of afterrun test execution)					
		1								
		1			means					
•	•	•	•			•				•

Component / System	Fault Code	Monitor Strategy Description	Primary Malfunction Criteria	Threshold Logic and Valu	e	Secondary Parameters		Enable Conditions		Time Required	MIL Illum.
0,000		Doonplich				NOx sensor has sent via CAN that heater temperature setpoint has been reached (i.e. dewpoint achieved and no heater faults)	=	TRUE	-	· coquirioù	
NOx Sensor Current Performance Bank1 Sensor 1	P11DB		Ratio of valid to invalid upstream NOx sensor status time count	> 0.50		Sufficient number of valid and invalid NOx status time (sum of valid and invalid NOx status for diagnostic determination)	>=	20.00	sec	fault exists for more than 3 events; monitor runs	В
						engine cranking engine speed (see Look-Up-Table #81)	= >	TRUE 850 to 1100	- rpm	at 0.1 s when enable conditions are	
						A delay time required for the NOx sensor to give valid response) Upstream NoX sensor detects a lean A/F	>	20.00 TRUE	sec	met	
						Valid NOX sensor detects a lean A/F mixture Valid NOX signal from CAN is received (no NOX sensor communication failures)	=	TRUE	-		
						following conditions for time: battery voltage battery voltage SCR upstream temperature SCR upstream temperature Lambda signal is in steady state condition (see Look-Up-Table #28) for time Duration time for lambda steady state condition) NO Pending or Confirmed DTCs:	> ;; ;; ;; ;; ;; ;; ;; ;; ;; ;; ;; ;; ;;	300.00 11.00 655.34 99.96 599.96 0 to 0.5 5.00 see sheet inhibit tables	sec V °C °C - sec		
					_			tables			
NOx Sensor Current Performance Bank1 Sensor 2	P11DC		Ratio of valid to invalid downstream NOx sensor status time count	> 0.50		Sufficient number of valid and invalid downstreamNOx sensor status time (sum of valid and invalid NOx status for diagnostic determination) engine cranking engine speed (see Look-Up-Table #81)	>= >	20.00 TRUE 850 to 1100	sec - rpm	fault exists for more than 3 events; monitor runs at 0.1 s when enable conditions are	В

Component /	Fault	Monitor Strategy	Primary Malfunction	Threshold	Secondary		Enable		Time	MIL
System	Code	Description	Criteria	Logic and Value	Parameters		Conditions		Required	Illum.
					A delay time required for the NOx sensor to give valid response)	>	20.00	sec	met	
					Downstream NoX sensor detects a lean A/F mixture	=	TRUE	-		
					Valid NOx signal from CAN is received (no NOx sensor communication failures)	=	TRUE	-		
					following conditions for time: battery voltage	> >=	300.00 11.00	sec V		
					battery voltage	<=	655.34	v		
					SCR upstream temperature	>=	99.96	°C		
					SCR upstream temperature	<=	599.96	°C		
					Downstream Lambda signal is in steady state condition (see Look-Up-Table	<=	0 to 0.5	-		
					#27) for time					
					Duration time for lambda steady state condition)	>=	5.00	sec		
					NO Pending or Confirmed DTCs:	=	see sheet inhibit	-		
					, , , , , , , , , , , , , , , , , , ,		tables			
							_			_
Intake Air Flow Valve Control Circuit Shorted	P122C		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 0.5 s monitor runs	В
		valve.			for				with 0.005 s	
					time and	>	3.00	sec	rate whenever enable	
					starter is active cranking for	=	FALSE	-	conditions are	
					time	>	3.00	sec	met	
					and basic enable conditions met:	=	see sheet enable tables	-		
					and Throttle Valve Actuator Solenoid Control	=	ACTIVE	_		
					Circuit and	-	ACTIVE	-		
					Open Load Diagnosis active	=	FALSE	-		
					NO Pending or Confirmed DTCs	=	see sheet inhibit	-		
		1					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 Exceeded Learning Limit	P122D	Detects adaptation values of throttle valve that are not plausible. Compares the difference between the maximum and minimum adaption values to a threshold.	throttle valve control deviation adaptation calculated out of difference between desired and actual value	v	-10.00	%	throttle valve controller bypass is active	=	FALSE	-	fail conditions exists for 10.05 s monitor runs once per drivingcycle with 0.005 s	В
			or throttle valve control deviation adaptation calculated out of difference between desired and actual value	>	10.00	%	and throttle valve is driven to a mechanical stop and	=	FALSE	-	rate whenever enable conditions are met	
							engine Coolant Temperature and offset learning for the throttle valve was successful in the previous driving cycle and	< =	199.96 TRUE	°C -		
							engine post drive/ afterun and basic enable conditions met	=	TRUE see sheet enable tables	-		
							and NO Pending or Confirmed DTCs:	=	see sheet inhibit tables	-		
		Detects offset value which are not plausible at the open and	Path 1:				(fail conditions exists for	
		closed throttle position	learned throttle valve offset position at open or closed position	<	-20.00	%	engine coolant temperature	>=	-30.04	°C	0.005 s monitor runs once per	
			learned throttle valve offset position at open or closed position or	>	20.00	%	and engine coolant temperature)	<=	127.96	°C	drivingcycle with 0.005 s rate whenever enable	
			Path 2: difference between the maximum and minimum positions learned at closed position	>	30.00	%	and (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.
			or Path 3: difference between the maximum and minimum positions learned at open position	>	30.00	%	battery voltage and	>=	11.00	V		
							battery voltage) and Throttle Valve is not frozen consisting of: (<=	655.34	V		
							temperature downstream charge air cooler or Engine coolant temperature	>=	6.06	°C °C		
							for time)	>	10.00	sec		
							and engine speed and	=	0	rpm		
							engine post drive/ afterun and NO Pending or Confirmed DTCs:	=	TRUE see sheet inhibit	-		
							and		tables			
							basic enable conditions met		see sheet enable tables	-		
Intake Air Flow Valve Control Circuit 2 Low Voltage	P122E	Diagnoses the Throttle Valve high side driver circuit for circuit faults.	Voltage low during driver on state (indicates short to ground)	=	Short to ground: ≤ 0.5 Ω impedance between signal and controller ground	-	battery voltage	>	11.00	V	fail conditions exists for 0,5 s monitor runs with 0.005 s rate whenever	В
							time and	>	3.00	sec	enable conditions are met	
							for	=		- sec		
Control Circuit 2 Low	P122E	high side driver circuit for		=	≤ 0.5 Ω impedance between signal and controller	-	for time and starter is active cranking	> =		sec	exists for 0,5 s monitor runs with 0.005 s rate whenever enable conditions are	

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: and	=	see sheet enable tables	-		
					Throttle Valve Actuator Solenoid Control Circuit and	=	ACTIVE	-		
					Open Load Diagnosis active	=	FALSE	-		
					NO Pending or Confirmed DTCs	=	see sheet inhibit tables	-		
								-		_
Intake Air Flow Valve Control Circuit 2 High Voltage		Diagnoses the Throttle Valve high side driver circuit for circuit faults.	Voltage high during driver off state (indicates short to power)	 Short to power: ≤ - 0.5 Ω impedance between signal and controller power 	battery voltage	>	11.00	V	fail conditions exists for 0,5 s monitor runs with 0.005 s rate whenever	В
					for				enable	
					time and	>	3.00	sec	conditions are	
					starter is active cranking for	=	FALSE	-	met	
					time and	>	3.00	sec		
					basic enable conditions met:	=	see sheet enable tables	-		
					and Throttle Valve Actuator Solenoid Control Circuit and	=	ACTIVE	-		
					Open Load Diagnosis active 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 = TRUE -	Time MIL Required Illum.
Injector 1 Control Circuit Shorted	P1248		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 A exists for more than 0.04 s monitor runs with 0.01 s rate whenever enable conditions are met
Injector 2 Control Circuit Shorted	P1249		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 A exists for more than 0.04 s monitor runs with 0.01 s rate whenever enable conditions are met
Injector 3 Control Circuit Shorted	P124A		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 A exists for more than 0.04 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.
Injector 4 Control Circuit Shorted	P124B	Diagnoses the Injector Cylinder #3 high side driver circuit for circuit faults.	Voltage low during driver on state (indicates short to 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)	≤ 0.5 Ω impedance between signal and controller ground	battery voltage for time and NO Pending or Confirmed DTCs: and ignition on and basic enable conditions met:	> 11.00 V > 3.00 se = see sheet inhibit tables = TRUE - = see sheet enable tables	exists for 0.07 s monitor runs with 0.01 s rate whenever enable c 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.
Fuel Pressure Regulator 2 High Control Circuit High Voltage		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 	(fail conditions exists for 0.1 s monitor runs with 0.1s rate whenever	В
					engine speed or	= 0	rpm	enable conditions are	
	1				engine post drive/ afterun)	= TRUE	-	met	
					and NO Pending or Confirmed DTCs: for	= see sheet inhibit tables	-		
	1				time and	> 6.00	sec		
					basic enable conditions met:	= see sheet enable tables	-		
Fuel Rail Pressure Performance		Actual rail pressure is compared to fixed absolute value to detect low or high rail pressure conditions.	rail pressure (see Look-Up-Table #62)	< 0 to 15000 kPa	(fail conditions exists for 2 s monitor runs with 0.02 s	A
					state machine rail pressure control transitioning pressure control valve mode	= TRUE	-	rate whenever enable conditions are	
					or state machine rail pressure control transitioning to coupled pressure control mode (rail pressure is controlled by metering unit and pressure control valve)	= TRUE	-	met	
					or state machine rail pressure control equal transitioning to metering unit pressure control mode	= TRUE	-		
					and basic enable conditions met: and	= 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.
System	Code	Description	Unteria	Logic and value		NO Pending or Confirmed DTCs:	=	see sheet inhibit tables	-	Requirea	illum.
			rail pressure (see Look-Up-Table #67)	< 0 to 15000		(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)	=	TRUE TRUE	-		
						and basic enable conditions met: and NO Pending or Confirmed DTCs:	=	see sheet enable tables see sheet inhibit tables	-		
			rail pressure (see Look-Up-Table #65)	< 0 to 15000		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	> 175000.00	kPa	(state machine rail pressure control transitioning pressure control valve mode or	=	TRUE	-	fail conditions exists for 1.01 s. monitor runs with 0.02 s rate	

System	Code Description	Criteria	Logic and Value	Parameters state machine rail pressure control transitioning to coupled pressure control mode (rail pressure is controlled by metering unit and pressure control valve) or state machine rail pressure control equal transitioning to metering unit pressure control mode	Conditions = TRUE = TRUE	- whenever enable conditions are met	Illum.
				transitioning to metering unit pressure	= TRUE	-	
) and			
				basic enable conditions met:	 see sheet enable tables 	-	
				NO Pending or Confirmed DTCs:	 see sheet inhibit tables 	-	
		rail pressure	> 175000.00 kPa	(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	-	
				and NO Pending or Confirmed DTCs:	= see sheet inhibit tables	-	
		rail pressure	> 175000.00 kPa	state machine rail pressure control equal to metering unit control mode	= TRUE	-	
				basic enable conditions met:	 see sheet enable tables 	-	
		rail pressure	> 175000.00 kPa	controlled by metering unit and pressure control valve)) and basic enable conditions met: and NO Pending or Confirmed DTCs: state machine rail pressure control equal to metering unit control mode and	tables = see sheet inhibit tables = TRUE = see sheet enable	-	

Component / System	Fault Code	Monitor Strategy Description	Primary Malfunction Criteria	L	Threshold ogic and Value		Secondary Parameters NO Pending or Confirmed DTCs:	=	Enable Conditions see sheet inhibit tables	-	Time Required	MIL Illum.
Intake Manifold Runner Actuator Feedback Signal Circuit Low	P12B0	Variable Swirl Valve position feedback signal (PWM) low indicating and out of range low failure	variable swirl valve position sensor duty cycle	<=	5.00	%	basic enable conditions met:	=	see sheet enable tables	-	fail conditions exists for more than 3 s monitor runs 0.1 s rate whenever	В
Intake Manifold Runner Actuator Feedback Signal Circuit High	P12B1	Variable Swirl Valve position feedback signal (PWM) low indicating and out of range low failure	variable swirl valve position sensor duty cycle	>=	95.00	%					enable conditions are met	
Cold Start Emission Reduction Control System	P1400		Path 1: Pilot Injection 1 is prohibited due to exceeding the allowed number of injections (see general description for details) or	-	TRUE	-	engine operating mode which means: Cold Start Injection Monitoring and engine operating mode state transition	= = =	exhaust / SCR heat-up ENABLED FALSE	state bit mask - -	fail conditions exists for 20 revs test performed continuously 0.01 s rate	В
			Path 2: Pilot Injection 1 is prohibited due to collision (overlap) with Main Injection and Pilot Injection 2 (see general description or Path 3:	-	TRUE	-	and engine coolant temperature and engine coolant temperature	> <	-10.00 96.00	℃ ℃		
			Injector circuit or activation errors (setpoint deviation) occurred when the injector was being energized for Pilot	=	TRUE	-						

Component / System	Fault Code	Monitor Strategy Description	Primary Malfunction Criteria	Threshold Logic and Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
			or Path 4: Pilot Injection 2 is prohibited due to exceeding the allowed number of injections (see general description for details)	= TRUE -				
			or Path 5: Pilot Injection 2 is prohibited due to collision (overlap) with Pilot Injection 1 (see general description for details) or	= TRUE -				
			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)	= TRUE -				

Component / System	Fault Code	Monitor Strategy Description	Primary Malfunction Criteria	Threshold Logic and Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
			or					
			Path 9: Post Injection 2 is prohibited due to collision (overlap) with Main Injection and Post Injection 1 (see general description	= TRUE -				
			or					
			Path 10: Injector circuit or activation errors (setpoint deviation) occurred when the injector was being energized for Post	= TRUE -				
			or					
			Path 11: Post Injection 1 is prohibited due to exceeding the allowed number of injections (see general description for details)	= TRUE -				
			or					
			Path 12: Post Injection 2 is prohibited due to collision (overlap) with Post Injection 1 (see general description for details)	= TRUE -				
			or					
			Path 13: Injector circuit or activation errors (setpoint deviation) occurred when the injector was being energized for Post	= TRUE -				

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 Shorted		Electronic out-put driver circuitry determines circuit integrity on the EGR solenoid.	The ECM detects that the commanded state of the driver and the actual state of the control circuit do not match.		EGR Solenoid Control Circuit and battery voltage for time and starter is active cranking for time and basic enable conditions met: and NO Pending or Confirmed DTCs	 ACTIVE 11.00 3.00 FALSE 3.00 see sheet enable tables see sheet inhibit tables 	V	fail conditions exists for 3,5 s monitor runs with 0.005 s rate whenever enable conditions are met	В
Exhaust Gas Recirculation Slow Response-Increasing Flow	P140B	response by comparing	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	> 0.05 g/rev	(Engine speed Engine speed and injection quantity injection quantity and ambient pressure and engine coolant temperature and EGR control is in closed loop	>= 1400.00 <= 2700.00 >= 40.00 <= 130.00 > 74.80 > 69.96 = TRUE	rpm rpm mm^3/r ev mm^3/r ev kPa °C	fail conditions exists for 15 s monitor runs with 0.1s rate whenever enable conditions are met	В

SystemCodeDescriptionCriteriaLogic and Valueremainders \sim ConditionsRequiredNum.Systemand and to time and=TRUE < 0.00 =TRUE < 0.00 ==TRUE < 0.00 =TRUE < 0.00 <th>Component /</th> <th>Fault Code</th> <th>Monitor Strategy</th> <th>Primary Malfunction Criteria</th> <th>Threshold</th> <th>Secondary</th> <th></th> <th>Enable</th> <th></th> <th>Time</th> <th>MIL</th>	Component /	Fault Code	Monitor Strategy	Primary Malfunction Criteria	Threshold	Secondary		Enable		Time	MIL
and EGR control is active for time and exhaust gas system regeneration mode $=$ $TRUE$ sec isec 	System	Code	Description	Criteria	Logic and value					Required	ilium.
EGR control is active for time and= $TRUE$ 0.00 \Rightarrow and exhaust gas system regeneration mode and= $FALSE$ \Rightarrow for time and> $FALSE$ \Rightarrow for time for time and> $TRUE$ \Rightarrow \Rightarrow and and> $TRUE$ \Rightarrow \Rightarrow Actuator position EGR Valve and and> 1.00 $\%$ Actuator position EGR Valve and> 1.00 $\%$ Engine speed engine speed injection quantity> $1.00.00$ rpminjection quantity> $2.00.00$ rpminjection quantity> $2.00.00$ rpminjection quantity<							>	1.50	sec		
for time > 0.00 sec and = FALSE - for time 2 5.00 sec and = TRUE - and = TRUE - for time 2 0.00 sec and = TRUE - Actuator position EGR Valve > 1.00 % Actuator position EGR Valve > 1500.00 mm and = 1500.00 mm mm and = 1500.00 mm mm and = 52.00 mm mm and = 52.00 mm mm and = 52.00 mm mm injection quantity <=								TOUE			
and and and and and and for time and bit for time bit for time bit for time bit for time and and and bit for time bit for time bit for time bit for time and and bit for time and chuator position EGR Valve bit for time chuator position EGR Valve bit for time bit for time and and chuator position EGR Valve bit for time chuator position EGR Valve c											
exhaust gas system regeneration mode = FALSE - for time - 5.00 sec and - 7000 sec and - 0.000 sec and - 0.000 sec and - 1.00 % Actuator position EGR Valve - 51.00 % and - 2600.00 rpm and - 1500.00 rpm and - 2600.00 rpm and - - 0.00 sec and - - 0.00 rpm and - - 0.00 rpm and - - 0.00 rpm								0.00	sec		
Image: Section of the section of the section quantity > 5.00 section quantity Image: Section quantity > 1.00 % Image: Addition quantity >= 1500.00 rpm Image: Addition quantity >= 52.00 mm^43/r Image: Addition quantity >= 52.00 grad Image: Addition quantity >= 52.00 grad Image: Addition quantity >= 52.00 grad Image: Addition quantity >= 0.00 grad Image: Additera ir mass flow -0.50 </td <td></td>											
and Engine is running for time and Actuator position EGR Valve Actuator position EGR Valve Actuat						exhaust gas system regeneration mode	-	FALSE	-		
and Engine is running for time Actuator position EGR Valve Actuator position EGR Valve Hending Speed Seed and Engine speed Seed						for time		5.00	800		
Engine is running for time = TRUE o - Actuator position EGR Valve Actuator position EGR Valve and > 1.00 % Actuator position EGR Valve and > 1.00 % Engine speed injection quantity >= 1500.00 rpm Injection quantity >= 52.00 mm^3/r and = - ev and = 100.00 mm^3/r ev = 100.00 mm^3/r ev = 100.00 mm^3/r and = - ev and = - - injection quantity <=							-	5.00	360		
infortime > 0.00 sec and Actuator position EGR Valve > 1.00 % Actuator position EGR Valve > 51.00 % and - 2600.00 rpm Engine speed >= 1500.00 rpm and - 2600.00 mm^3/r engine speed >= 52.00 mm^3/r injection quantity >= 52.00 mm^3/r injection quantity <=							-	TRUE	_		
and											
Actuator position EGR Valve > 1.00 % Actuator position EGR Valve > 51.00 % Actuator position EGR Valve > 510.00 rpm Engine speed >= 1500.00 rpm Engine speed >= 2600.00 rpm and - - - injection quantity >= 52.00 mm^3/r ewised delta air mass flow <							-	0.00	300		
Actuator position EGR Valve and Engine speed <							>	1 00	%		
and Engine speed and injection quantity injection quantity = 52.00 mm^3/r = v injection quantity = 100.00 mm^3/r = v = v = v = v = v = v = v = v											
Engine speed >= 1500.00 rpm Engine speed = 2600.00 rpm injection quantity >= 52.00 rmm^3/r ev injection quantity <= 100.00 rpm injection quantity <= 100.00 rpm mm^3/r ev and desired delta air mass flow <> -0.03 g/sec desired delta air mass flow << -0.03 g/sec and difference of the air mass flow << 0 g/rev and NO Pending or Confirmed DTCs: = see sheet inhibit tables) for time > 0.10 sec and basic enable conditions met: = see sheet enable -							-	01.00	70		
Engine speed <= 2600.00 rpm and injection quantity >= 52.00 mm^3/r eV injection quantity <= 100.00 mm^3/r eV and desired delta air mass flow <> -0.50 g/sec desired delta air mass flow <> -0.03 g/sec and difference of the air mass flow << 0 g/rev and NO Pending or Confirmed DTCs: = see sheet inhibit tables -) for time > 0.10 sec and NO for time = see sheet enable -							>=	1500.00	rpm		
and injection quantity >= 52.00 mm^3/r ev injection quantity <= 100.00 mm^3/r ev and desired delta air mass flow > -0.50 g/sec desired delta air mass flow <> -0.03 g/sec and difference of the air mass << 0 g/rev and NO Pending or Confirmed DTCs: = see sheet inhibit tables) for time > 0.10 sec and basic enable conditions met: = see sheet enable -							<=				
injection quantity >= 52.00 mm^3/r ev ev ev and ev ev and - -0.03 g/sec desired delta air mass flow <											
injection quantity <=							>=	52.00	mm^3/r		
<pre>injection quantity <= 100.00 mm^3/r ev and desired delta air mass flow <> -0.50 g/sec desired delta air mass flow << -0.03 g/sec and difference of the air mass and NO Pending or Confirmed DTCs: = see sheet inhibit - tables -) for time and basic enable conditions met: = see sheet enable -</pre>											
and desired delta air mass flow and desired delta air mass flow and difference of the air mass nO Pending or Confirmed DTCs:) for time and basic enable conditions met: = see sheet enable -						injection quantity	<=	100.00			
desired delta air mass flow > -0.50 g/sec desired delta air mass flow < -0.03 g/sec and difference of the air mass and NO Pending or Confirmed DTCs: = see sheet inhibit - tables) for time and basic enable conditions met: = see sheet enable -									ev		
desired delta air mass flow < -0.03 g/sec and difference of the air mass < 0 g/rev and NO Pending or Confirmed DTCs: = see sheet inhibit - tables) for time > 0.10 sec and basic enable conditions met: = see sheet enable -						and					
desired delta air mass flow and difference of the air mass and NO Pending or Confirmed DTCs:) for time and basic enable conditions met: = see sheet inhibit - tables - - - - - - - - - - - - -						desired delta air mass flow	>	-0.50	g/sec		
difference of the air mass < 0 g/rev and NO Pending or Confirmed DTCs: = see sheet inhibit - tables) for time and basic enable conditions met: = see sheet enable -						desired delta air mass flow	<	-0.03	g/sec		
and NO Pending or Confirmed DTCs: = see sheet inhibit - tables) for time > 0.10 sec and basic enable conditions met: = see sheet enable -											
NO Pending or Confirmed DTCs: = see sheet inhibit - tables) for time > 0.10 sec and basic enable conditions met: = see sheet enable -							<	0	g/rev		
) for time and basic enable conditions met: = see sheet enable -											
) for time > 0.10 sec and basic enable conditions met: = see sheet enable -						NO Pending or Confirmed DTCs:	=		-		
and basic enable conditions met: = see sheet enable -								tables			
and basic enable conditions met: = see sheet enable -)					
basic enable conditions met: = see sheet enable -							>	0.10	sec		
tables						basic enable conditions met:	=		-		
								tables			

Component /	Fault	Monitor Strategy	Primary Malfunction		Threshold		Secondary	_	Enable		Time	MIL
System	Code	Description	Criteria		Logic and Value		Parameters		Conditions		Required	Illum.
Exhaust Gas	P140C	Detects a positive slow	average positive gradient of the air mass	>=	0.04	g/rev	(fail conditions	В
Recirculation Slow		response by comparing	calculated by accumulating control								exists for 15 s	
Response-Decreasing		expected system dynamics	deviation (deviation between desired and								monitor runs	
Flow		with actual value	actual value) over a sampling time and								with 0.1s rate	
			dividing result by sampling time								whenever	
											enable	
							Engine speed	>=	1400.00	rpm	conditions are	
							Engine speed and	<=	2700.00	rpm	met	
							injection quantity	>=	40.00	mm^3/r		
										ev		
							injection quantity	<=	130.00	mm^3/r		
										ev		
							and					
							ambient pressure	>	74.80	kPa		
							and					
							engine coolant temperature	>	69.96	°C		
							and		TOUE			
							EGR control is in closed loop	=	TRUE	-		
							for time	>	1.50	sec		
							and EGR control is active	=	TRUE	-		
							for time	- >	0.00	sec		
							and		0.00	500		
							exhaust gas system regeneration mode	=	FALSE	-		
							for time	>	5.00	sec		
							and					
							Engine is running	=	TRUE	-		
							for time	>	0.00	sec		
							and		0.00	0/		
							Actuator position EGR Valve	> <	0.00 40.00	% %		
							Actuator position EGR Valve and	~	40.00	70		
							Engine speed	>=	1500.00	rom		
							Engine speed Engine speed	>= <=	2600.00	rpm rpm		
							and	~-	2000.00	ipin		
							injection quantity	>=	60.00	mm^3/r		
							injoursen quantity	-	00.00	ev		
							injection quantity	<=	120.00	mm^3/r		
									.20.00	ev		
							and					
							desired delta air mass flow	>	0.03	g/sec		
• •			•			1				5	•	

Component / System	Fault Code	Monitor Strategy Description	Primary Malfunction Criteria	Threshold Logic and Value	Secondary Parameters		Enable Conditions		Time Required	MIL Illum.
o yotom	0000	Decomption	ontonu		desired delta air mass flow and	<	0.70	g/sec	rioquirou	indini
					difference of the air mass and	>	0	g/rev		
					NO Pending or Confirmed DTCs:	=	see sheet inhibit tables	-		
) for time and	>	0.45	sec		
					basic enable conditions met:	=	see sheet enable tables	-		
						_		-		
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 	EGR Solenoid Control Circuit	=	ACTIVE	-	fail conditions exists for 3 s monitor runs with 0.005 s rate whenever enable conditions are	В
					battery voltage for	>	11.00	V	met	
					time and	>	3.00	sec		
					starter is active cranking for	=	FALSE	-		
					time and	>	3.00	sec		
					basic enable conditions met:	=	see sheet enable tables	-		
					NO Pending or Confirmed DTCs	=	see sheet inhibit tables	-		
Exhaust Gas	P140E	Diagnoses the EGR Valve	Voltage high during driver off state	= Short to power: ≤ -	EGR Solenoid Control Circuit	=	ACTIVE	-	fail conditions	В
Recirculation (EGR) Motor Control Circuit 2 High Voltage		high side driver circuit for circuit faults.	(indicates short to power)	0.5Ω impedance between signal and controller power					exists for 3 s monitor runs with 0.005 s rate whenever enable	2

Fault Code	Monitor Strategy Description	Primary Malfunction Criteria	Threshold Logic and Value	Secondary Parameters		Enable Conditions		Time Required	MIL Illum.
				and battery voltage	>	11.00	V	conditions are met	
				time and	>	3.00	sec		
				starter is active cranking for	=	FALSE	-		
				and			sec		
					-	tables	-		
				NO Pending or Confirmed DTCs	=	see sheet inhibit tables	-		
	side driver circuit for circuit		 Short to power: - ≤ 0.5 Ω impedance between signal and controller power 	EGR Solenoid Control Circuit and battery voltage for	=	ACTIVE 11.00	- V	fail conditions exists for 2 s monitor runs with 0.005 s rate whenever enable conditions are met	В
				time and	>	3.00	sec		
				for time	=	3.00	- sec		
				and basic enable conditions met:	=	see sheet enable tables	-		
				and NO Pending or Confirmed DTCs	=	see sheet inhibit tables	-		
	Code P140F	Code Description P140F Diagnoses the EGR Valve low	Code Description Criteria P140F Diagnoses the EGR Valve low side driver circuit for circuit Voltage high during driver on state (indicates short to power)	Code Description Criteria Logic and Value <td>Code Description Criteria Logic and Value Parameters and and battery voltage for itime and and starter is active cranking for itime and and starter is active cranking for itime and P140F Diagnoses the EGR Valve low Voltage high during driver on state = Short to power: - and P140F biagnoses the EGR Valve low Voltage high during driver on state = Short to power: - and side driver circuit for circuit raults. side driver circuit for circuit Short to power: - and and controller and controller and controller - and battery voltage power impedance between signal and controller and battery voltage for and starter is active cranking ime and and starter is active cranking and and controller and and and starter is active cranking<</td> <td>Code Description Criteria Logic and Value Parameters and and battery voltage > for itme > and starter is active cranking = for and > bisic enable conditions met: and and NO Pending or Confirmed DTCs = prover and on ontroller > power and ontroller > power and ontroller > and starter is active cranking = impedance between signal and controller > power and battery voltage > impedance between signal and controller > power and battery voltage > impedance between signal and controller > power and battery voltage > impedance between signal and controller > > and battery voltage > > impedance bettery voltage ></td> <td>Code Description Criteria Logic and Vatue Perameters Conditions and ballery voltage for time and ballery voltage for time > 11.00 1 - - 3.00 and ballery voltage = FALSE for time - - 3.00 and ballers - - 3.00 and ballers - - 3.00 and basic enable conditions met: = - - P140F Diagnoses the EGR Valve low iside driver circuit faults. Voltage high during driver on state (indicates short to power) = Short to power: \$ 0.5 0 - impedance power - - - - and ballery voltage for time - - - for time - - - - and ballery voltage for time - - - and ballery voltage for time - - - and balles - - - and ballery voltage for time - - - and balles - - - - and balles - - - - and balles - - - -<td>Code Description Criteria Logic and Value Parameters Image: Conditions and battery voltage for time and stater is active cranking for time a 3.00 sec P140 Diagnoses the EGR Valve low is de driver circuit for circuit faults. Voltage high during driver on state (ndicates short to power) s Short to power s Sca sca sca P140 Diagnoses the EGR Valve low is de driver circuit for circuit faults. Voltage high during driver on state (ndicates short to power) s Short to power s Sca Sca sca P140 Diagnoses the EGR Valve low is de driver circuit for circuit faults. Voltage high during driver on state (ndicates short to power) s Short to power s Sca sca<td>Code Description Criteria Logic and Value Perameters Conditions Tequited And battery voltage for time and battery voltage and starter is active cranking for time - 1.1.00 V P1407 Diagnoses the EGR Valve low side driver circuit for circuit faults. Voltage high during driver on state index show on the source of time = See sheet inhibit tables - - - - - - - - P1407 Diagnoses the EGR Valve low side driver circuit for circuit faults. Voltage high during driver on state is de driver circuit for circuit faults. = See sheet inhibit tables - - - - - - - - P1407 Diagnoses the EGR Valve low side driver circuit for circuit faults. Voltage high during driver on state side driver circuit for circuit faults. = See sheet inhibit tables -</td></td></td>	Code Description Criteria Logic and Value Parameters and and battery voltage for itime and and starter is active cranking for itime and and starter is active cranking for itime and P140F Diagnoses the EGR Valve low Voltage high during driver on state = Short to power: - and P140F biagnoses the EGR Valve low Voltage high during driver on state = Short to power: - and side driver circuit for circuit raults. side driver circuit for circuit Short to power: - and and controller and controller and controller - and battery voltage power impedance between signal and controller and battery voltage for and starter is active cranking ime and and starter is active cranking and and controller and and and starter is active cranking<	Code Description Criteria Logic and Value Parameters and and battery voltage > for itme > and starter is active cranking = for and > bisic enable conditions met: and and NO Pending or Confirmed DTCs = prover and on ontroller > power and ontroller > power and ontroller > and starter is active cranking = impedance between signal and controller > power and battery voltage > impedance between signal and controller > power and battery voltage > impedance between signal and controller > power and battery voltage > impedance between signal and controller > > and battery voltage > > impedance bettery voltage >	Code Description Criteria Logic and Vatue Perameters Conditions and ballery voltage for time and ballery voltage for time > 11.00 1 - - 3.00 and ballery voltage = FALSE for time - - 3.00 and ballers - - 3.00 and ballers - - 3.00 and basic enable conditions met: = - - P140F Diagnoses the EGR Valve low iside driver circuit faults. Voltage high during driver on state (indicates short to power) = Short to power: \$ 0.5 0 - impedance power - - - - and ballery voltage for time - - - for time - - - - and ballery voltage for time - - - and ballery voltage for time - - - and balles - - - and ballery voltage for time - - - and balles - - - - and balles - - - - and balles - - - - <td>Code Description Criteria Logic and Value Parameters Image: Conditions and battery voltage for time and stater is active cranking for time a 3.00 sec P140 Diagnoses the EGR Valve low is de driver circuit for circuit faults. Voltage high during driver on state (ndicates short to power) s Short to power s Sca sca sca P140 Diagnoses the EGR Valve low is de driver circuit for circuit faults. Voltage high during driver on state (ndicates short to power) s Short to power s Sca Sca sca P140 Diagnoses the EGR Valve low is de driver circuit for circuit faults. Voltage high during driver on state (ndicates short to power) s Short to power s Sca sca<td>Code Description Criteria Logic and Value Perameters Conditions Tequited And battery voltage for time and battery voltage and starter is active cranking for time - 1.1.00 V P1407 Diagnoses the EGR Valve low side driver circuit for circuit faults. Voltage high during driver on state index show on the source of time = See sheet inhibit tables - - - - - - - - P1407 Diagnoses the EGR Valve low side driver circuit for circuit faults. Voltage high during driver on state is de driver circuit for circuit faults. = See sheet inhibit tables - - - - - - - - P1407 Diagnoses the EGR Valve low side driver circuit for circuit faults. Voltage high during driver on state side driver circuit for circuit faults. = See sheet inhibit tables -</td></td>	Code Description Criteria Logic and Value Parameters Image: Conditions and battery voltage for time and stater is active cranking for time a 3.00 sec P140 Diagnoses the EGR Valve low is de driver circuit for circuit faults. Voltage high during driver on state (ndicates short to power) s Short to power s Sca sca sca P140 Diagnoses the EGR Valve low is de driver circuit for circuit faults. Voltage high during driver on state (ndicates short to power) s Short to power s Sca Sca sca P140 Diagnoses the EGR Valve low is de driver circuit for circuit faults. Voltage high during driver on state (ndicates short to power) s Short to power s Sca sca <td>Code Description Criteria Logic and Value Perameters Conditions Tequited And battery voltage for time and battery voltage and starter is active cranking for time - 1.1.00 V P1407 Diagnoses the EGR Valve low side driver circuit for circuit faults. Voltage high during driver on state index show on the source of time = See sheet inhibit tables - - - - - - - - P1407 Diagnoses the EGR Valve low side driver circuit for circuit faults. Voltage high during driver on state is de driver circuit for circuit faults. = See sheet inhibit tables - - - - - - - - P1407 Diagnoses the EGR Valve low side driver circuit for circuit faults. Voltage high during driver on state side driver circuit for circuit faults. = See sheet inhibit tables -</td>	Code Description Criteria Logic and Value Perameters Conditions Tequited And battery voltage for time and battery voltage and starter is active cranking for time - 1.1.00 V P1407 Diagnoses the EGR Valve low side driver circuit for circuit faults. Voltage high during driver on state index show on the source of time = See sheet inhibit tables - - - - - - - - P1407 Diagnoses the EGR Valve low side driver circuit for circuit faults. Voltage high during driver on state is de driver circuit for circuit faults. = See sheet inhibit tables - - - - - - - - P1407 Diagnoses the EGR Valve low side driver circuit for circuit faults. Voltage high during driver on state side driver circuit for circuit faults. = 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.
Closed Loop Diesel Particulate Filter (DPF) Regeneration Control At Limit - Stage 2 Temperature Too Low	P144E	Detects insufficient exhaust temperature or control deviation during DPF regeneration. Temperature readings are compared to desired temperature values as an indication of an insufficient exhaust gas temperature.	commanded control value of the outer control loop of the temperature controller	>=	0.57	-	controller deviation status is active depending on engine operation point out of (see Look-Up-Table #24)	=	0 to 1	-	fail conditions exists for 60 s monitor runs with 0.1 s rate whenever enable conditions are met	A
			and deviation from the temperature setpoint for outer control loop	>	maximum of (a) or (b+(c-d))	°C	for time	>=	12.50	sec		
			(with				and active operation mode of the outer control loop	=	TRUE	-		
			 (a) limitation of the temperature threshold and with (b) temperature threshold value for maximum deviation and with (c) desired temperature value of outer control loop of the exhaust gas temperature control 	= =	70.00 70 calculated parameter	℃ ℃ -	means (temperature upstream of the oxidation catalyst and (>	229.96	°C		
			and with (d) temperature setpoint value of outer control loop of the exhaust gas temperature control	=	calculated parameter	-	temperature downstream of the oxidation catalyst and	>	219.96	°C		
)				(temperature downstream of the oxidation catalyst and	<	679.96	°C		
							particulate filter temperature for activated post injection) and	<	679.96	°C		
							environmental pressure	>=	74.80	kPa		
							environmental temperature	>=	-20.04	°C		
							engine coolant temperature	>=	49.96	°C		
		1					engine coolant temperature	<=	125.96	°C	I	

Component /	Fault	Monitor Strategy	Primary Malfunction		Threshold		Secondary		Enable		Time	MIL
System	Code	Description	Criteria		Logic and Value		Parameters service DPF regeneration commanded	=	Conditions FALSE	-	Required	Illum.
							(idle regen only commanded through GM	-	FALSE	-		
							tool)					
							vehicle speed	>=	9.37	mph		
							vehicle speed	<=	124.30	mph		
							accelerator pedal position	>	3.00	%		
							for time	> <	3.00 910.27	sec g/sec		
							exhaust gas mass flow for time	>=	21474836.47	g/sec sec		
							and	/-	214/4030.47	360		
							stable temperature conditions	=	TRUE	-		
							means					
							(
							temperature upstream of particulate	>	500.00	°C		
							filter					
							for time	>	0.00	sec		
) and					
							basic enable condition met:	=	see sheet enable	_		
							basic enable condition met.	-	tables	-		
							and		abioo			
							NO Pending or Confirmed DTCs:	=	see sheet inhibit	-		
							_		tables			
						_		_		_		
Closed Loop Diesel	P144F	Detects insufficient exhaust	commanded control value of the outer	<=	0.10		controller deviation status is active	=	0 to 1	-	fail conditions	А
Particulate Filter			control loop of the temperature controller		0.10		depending on engine operation point out		0101		exists for 60 s	~
(DPF) Regeneration		deviation during DPF					of (see Look-Up-Table #25)				monitor runs	
Control At Limit -		regeneration. Temperature									with 0.1 s rate	
Stage 2 Temperature		readings are compared to									whenever	
Too High		desired temperature values as									enable	
		an indication of an excessive									conditions are	
		exhaust gas temperature.									met	
			and the second				6					
			and deviation from the temperature setpoint	<	minimum of (a)	°C	for time	>=	12.50	sec		
			for outer control loop		and (b-(c-d))	C	unic	~-	12.00	360		
			(and					
			with				active operation mode of the outer	=	TRUE	-		
							control loop					

Component /	Fault	Monitor Strategy	Primary Malfunction		Threshold		Secondary		Enable		Time	MIL
System	Code	Description	Criteria		Logic and Value		Parameters		Conditions		Required	Illum.
			(a) limitation of the temperature threshold and with	=	-70.00	K	means (-	
			(b) temperature threshold value for minimum deviation and with	=	-70	K	temperature upstream of the oxidation catalyst and	>	229.96	°C		
			(c) desired temperature value of outer control loop of the exhaust gas temperature control	=	calculated parameter	-			040.00	°C		
			and with				temperature downstream of the oxidation catalyst	>	219.96	۰L		
			 (d) temperature setpoint value of outer control loop of the exhaust gas temperature control 	=	calculated parameter	-	and					
)				(temperature downstream of the oxidation catalyst and	<	679.96	°C		
							particulate filter temperature for activated post injection	<	679.96	°C		
							and					
							environmental pressure	>=	74.80	kPa		
							environmental temperature	>=	-20.04	°C		
							engine coolant temperature	>=	49.96	°C		
							engine coolant temperature	<=	125.96	°C		
							service DPF regeneration commanded	=	FALSE	-		
							(idle regen only commanded through GM tool)					
							vehicle speed	>=	9.37	mph		
							vehicle speed	<=	124.30	mph		
							accelerator pedal position	>	3.00	%		
							for time	>	3.00	sec		
							exhaust gas mass flow	<	910.27	g/sec		
							for time and	>=	21474836.47	sec		
							stable temperature conditions means	=	TRUE	-		
							(temperature upstream of particulate filter	>	500.00	°C		
							for time	>	0.00	sec		

Fault Code	Monitor Strategy Description	Primary Malfunction Criteria	Lo	Threshold ogic and Value	e	Secondary Parameters		Enable Conditions		Time Required	MIL Illum.
						and basic enable condition met: and NO Pending or Confirmed DTCs:	=	see sheet enable tables see sheet inhibit tables	-		
P1472	PM Sensor Control Unit (SCU) CAN communication: SCU signal data length is incorrect	SCU diagnostic signal data length is incorrect	=	TRUE	-	Battery voltage (ECM) Ignition on for time	, u ,	11.00 TRUE 1.20	V - sec	fault exists for more than 1.4 sec; monitor runs at 0.1 s when enable conditions are met	
P147F	Range check of sensor sensitivity calibration factor (detected failures: calibration factor manipulated, wrong or not transmitted)	Path 1: Sensitivity Factor adjustment value sent from the sensor control unit (SCU) in the engine ECM has been transmitted Sensor sensitivity calibration factor OR Sensor sensitivity calibration factor OR	= ~ >	TRUE 0.75 1.25	- factor factor	Ignition on SCU is in the state "ready" means Battery voltage (ECM)	=	TRUE TRUE 11.00	- - V	fault exists for more than 0.1 sec; monitor runs at 0.1 s once per trip	В
	Code P1472	Code Description P1472 PM Sensor Control Unit (SCU) CAN communication: SCU signal data length is incorrect P147F Range check of sensor sensitivity calibration factor (detected failures: calibration factor manipulated, wrong or	CodeDescriptionCriteriaP1472PM Sensor Control Unit (SCU) CAN communication: SCU signal data length is incorrectSCU diagnostic signal data length is incorrectP1477Range check of sensor sensitivity calibration factor (detected failures: calibration factor manipulated, wrong or not transmitted)Path 1:P147FRange check of sensor sensitivity calibration factor (detected failures: calibration factor manipulated, wrong or not transmitted)Path 1:	Code Description Criteria Lo P1472 PM Sensor Control Unit (SCU) CAN communication: SCU signal data length is incorrect SCU diagnostic signal data length is incorrect = P147F Range check of sensor sensitivity calibration factor (detected failures: calibration factor manipulated, wrong or not transmitted) Path 1: = Sensor sensitivity calibration factor (oR Sensor sensitivity calibration factor oR Sensor sensitivity calibration factor oR =	Code Description Criteria Logic and Value P1472 PM Sensor Control Unit (SCU) CAN communication: ScU signal data length is incorrect SCU diagnostic signal data length is incorrect = TRUE P1477 Range check of sensor sensitivity calibration factor (detected failures: calibration factor manipulated, wrong or not transmitted) Path 1: Sensitivity Factor adjustment value sent from the sensor control unit (SCU) in the engine ECM has been transmitted = TRUE Sensor sensitivity calibration factor (QR Sensor sensitivity calibration factor OR < 0.75	Code Description Criteria Logic and Value P1472 PM Sensor Control Unit (SCU) CAN communication: SCU signal data length is incorrect SCU diagnostic signal data length is necrrect = TRUE - P1477 Range check of sensor sensitivity calibration factor (detected failures: calibration factor manipulated, wrong or not transmitted) Path 1: = TRUE - Sensor is ensitivity calibration factor Sensitivity Factor adjustment value sent from the sensor control unit (SCU) in the engine ECM has been transmitted = TRUE - OR OR 0.75 factor	Code Description Criteria Logic and Value Parameters and basic enable condition met: and NO Pending or Confirmed DTCs: and basic enable condition met: and NO Pending or Confirmed DTCs: and basic enable condition met: and NO Pending or Confirmed DTCs: P1472 PM Sensor Control Unit (SCU) GAN communication: SCU signal data length is incorrect SCU diagnostic signal data length is incorrect = TRUE - Battery voltage (ECM) P147F Range check of sensor sensitivity calibration factor (decided failures: calibration factor manipulated, wrong or not transmitted) Path 1: Sensitivity Factor adjustment value sent from the sensor control unit (SCU) in the engine ECM has been transmitted or R = TRUE - SCU is in the state "ready" P147F Range check of sensor sensitivity calibration factor (CR SCU is in the state "ready" Ignilion on for time	Code Description Criteria Logic and Value Parameteris and basic enable condition met: and basic enable condition met: = P1472 PM Sensor Control Unit (SCU) signal data length is incorrect SCU diagnostic signal data length is incorrect = TRUE - Battery voltage (ECM) >= P1477 Range check of sensor sensitivity calibration factor (detected failures: calibration factor (detected failures: calibration factor int transmitted) Path 1: = TRUE - Ignition on for time = P147F Range check of sensor sensitivity calibration factor (detected failures: calibration factor manipulated, wrong or not transmitted) Path 1: = TRUE - Ignition on for time = P147F Range check of sensor sensitivity calibration factor (detected failures: calibration factor manipulated, wrong or not transmitted) Path 1: = TRUE - SCU is in the state "ready" = P147F Range check of sensor sensitivity calibration factor (detected failures: calibration factor manipulated, wrong or not transmitted) Path 1: = TRUE - SCU is in the state "ready" = P147F Range check of sensor sensor sensitivity calibration factor (oR <	Code Description Conditions and basic enable condition met: and basic enable condition met: and NO Pending or Contirmed DTCs: = see sheet enable tables P1472 PM Sensor Control Unit (SCU) CAN communication: SCU signal data length is noorrect SCU diagnostic signal data length is noorrect = TRUE - Battery voltage (ECM) >= 11.00 P1477 Range check of sensor sensitivity calibration factor rot transmitted) Path 1: Sensor sensitivity calibration factor rom the sensor control unit (SCU) in the sensor control unit (SCU) factor manipulated, wrong or on the sensor control unit (SCU) rot sensor sensitivity calibration factor rom the sensor control unit (SCU) in the sensor control unit (SCU) factor manipulated, wrong or or control unit (SCU) rot sensor sensitivity calibration factor rom the sensor control unit (SCU) rot sensor sensitivity calibration factor rom the sensor control unit (SCU) rot sensor sensitivity calibration factor rom the sensor control unit (SCU) rot sensor sensitivity calibration factor rom the sensor control unit (SCU) rot sensor sensitivity calibration factor rom the sensor control unit (SCU) rot sensor sensitivity calibration factor rom the sensor control unit (SCU) rot sensor sensitivity calibration factor rom the sensor control unit (SCU) rot sensor sensitivity calibration factor rom the sensor control unit (SCU) rot sensor sensitivity calibration factor rom the sensor control unit (SCU) rot sensor sensitivity calibration factor rom the sensor control unit (SCU) rot sensor sensitivity calibration factor rom the sensor control unit (SCU) rot sensor sensitivity calibration factor rom the sensor control unit (SCU) rot sensor sensitivity calibration factor rom the sensor control unit (SCU) rot sensor sensitivity calibration fa	Code Description Criteria Logic and Value Parameters Conditions and basic enable condition met: and SCU Data communication: SCU, DAN communication: SCU diagnostic signal data length is incorrect = SCU diagnostic signal data length is incorrect = TRUE - Battery voltage (ECM) >= 11.00 V P147F Range check of sensor sensitivity calibration factor factor maniputated, wrong or not transmitted) Path 1: - TRUE - Battery voltage (ECM) = TRUE - P147F Range check of sensor sensitivity calibration factor motitures mitted) Path 1: - TRUE - SCU is in the state "ready" = TRUE - P147F Range check of sensor sensitivity calibration factor root transmitted) Sensor sensitivity calibration factor on the sensor control unit (SCU) in the sensor sensitivity calibration factor on the sensor control unit (SCU) in the sensor sensitivity calibration factor on the sensor sensitivity calibration factor on the senser sensitivity calibration factor	Code Description Criteria Logic and Value Parameters Conditions Required And basic enable condition met: and NP Pending or Confirmed DTCs: assess the ethenable set enable (SU) CAN communication: SCU signal data length is SCU signal data length is SCU signal data length is noorect SCU diagnostic signal data length is noorect aster youtage (ECM) >= 11.00 V fault exists for more than 1.4 set: monther set: monther set: monther P147F Range check of sensor sensitivity calibration factor manipulated, wrong or not transmitted) Path 1: Sensitivity Factor adjustment value sent regime ECM has been transmitted; aster TRUE - agnition on factor = TRUE - fault exists for more than 1.4 set: monther P147F Range check of sensor sensitivity calibration factor infort manipulated, wrong or bot transmitted; Path 1: Sensitivity Factor adjustment value sent regime ECM has been transmitted; = TRUE - fault exists for more than 1.4 set: monther = TRUE - fault exists for more than 2.4 set: monther P147F Range check of sensor sensitivity calibration factor not reserved failures; calibration factor manipulated, wrong or pact manipulated, wrong or pa

Component /	Fault	Monitor Strategy	Primary Malfunction		Threshold		Secondary	Enable		Time	MIL
System	Code	Description	Criteria Sensitivity Factor adjustment value sent	=	Logic and Value FALSE	-	Parameters	Conditions		Required	Illum.
			from the sensor control unit (SCU) in the engine ECM has been transmitted								
			Time after SCU "ready" until sensor sensitivity calibration factor transmitted	>=	2.00	sec					
	5.480							7045		6 H H H	
TCM Engine Speed Request Signal Message Counter Incorrect	P150C	Detects implausible engine speed request information received from the TCM	Path 1:				ignition on	= TRUE	-	fail conditions exists for 0.01 s test	A
			(number of messages with rolling count / protection value errors detected with	>=	7.00	counts	and basic enable conditions met: and	= see sheet enable tables	-	performed continuously 0.01 s	
			number of consecutive frames	=	10.00	counts	NO Pending or Confirmed DTCs:	 see sheet inhibit tables 	-		
			or								
			Path 2:								
			(internal calculated checksum value for transmission is not equal the received value	=	TRUE	-					
			and number of fault results) or	>	5.00	counts					
			Path 3: time since last frame with valid protection value was received from transmission	>	0.08	sec					
Cruise Control Switch Data Integrity		Set invalid data indicated problem on status of the cruise switch information	Switch state provided by Cruise Control frame	=	DATA INVALID	-	ignition on	= TRUE	-	fail conditions exists for 0.005 s	Special C

Component /	Fault	Monitor Strategy	Primary Malfunction		Threshold		Secondary		Enable		Time	MIL
System	Code	Description	Criteria	L	ogic and Value		Parameters		Conditions		Required	Illum.
							and input circuit active means: (=	TRUE	-	monitor runs with 0.005 s rate whenever enable	
							Bus off or error passive on CAN	=	FALSE	-	conditions are	
							The rolling counter and protection value validation is enabled for this CAN frame and	=	TRUE	-	met	
							Frame enabled. The EMC is authorized to read the frame and	=	TRUE	-		
							Protection value error) and	=	FALSE	-		
							basic enable conditions met and	=	see sheet enable tables	-		
							NO Pending or Confirmed DTCs:	=	see sheet inhibit tables	-		
Particulate Filter Efficiency Below Threshold Bank 1	P2002	Monitoring of particulate filter efficiency using particulate sensor (PM sensor)	Path1:				Particulate sensor is in the "measurement" state when failure occurs	=	TRUE	-	fault exists for more than 1 event; monitor	В
			measured and filtered interdigital electrode(IDE) current	>	12.00	uA	which means				runs at 0.1 s when enable	
			measured and filtered interdigital electrode(IDE) current	<	41.00	uA	Sensor regeneration complete	=	TRUE	-	conditions are met once per	
			when integrated reciprocal of the predicted trigger time	< =	1.00	-	and PM sensor dewpoint achieved (please see the definition)	=	TRUE	-	trip	
							DPF regeneration not active		TRUE	-		
			or				Calculated soot particles mass based on sensor flow resistance	>=	0.00	g		
			Path2:				Calculated soot particles mass based on sensor flow resistance	<=	300.00	g		
			measured interdigital electrode(IDE) current	>=	41.00	uA	C Exhaust gas velocity at particulate sensor position	>=	0.00	m/sec		

Component /	Fault	Monitor Strategy	Primary Malfunction		Threshold		Secondary		Enable		Time	MIL
System	Code	Description	Criteria		Logic and Value	•	Parameters		Conditions		Required	Illum.
			then				Exhaust gas velocity at particulate sensor position for	<=	50.00	m/sec		
			then Integrated reciprocal of the predicted trigger time when	<=	1.00	-	time	>=	5.00	sec		
			waiting time for particulate sensor regeneration has elapsed	=	60.00	sec	(
							Exhaust gas pressure	>= <=	75.00 135.00	kPa kPa		
			Note: Two sensor regeneration performed following Path 2 test to confirm sensor not electrically shorted (see general description for flowchart process for Path 2)				Exhaust gas pressure for	<=		кра		
							time)	>=	10.00	sec		
							(Exhaust gas temperature	>=	64.96	°C		
							Exhaust gas temperature for	<=	399.96	°C		
							time)	>=	5.00	sec		
							(Engine running (=	TRUE	-		
							NOx sensor downstream concentration	<	200.00	ppm		
							temperature of particulate matter sensor	<	249.96	°C		
							, and NOx sensor downstream concentration	<	1500.00	ppm		
Intake Manifold Runner Control Circuit/Open Bank 1	P2008	Variable Swirl Valve actuator open circuit	Voltage low during driver off state (indicates open circuit)		Open Circuit:≥ 200 K Ω impedance between ECU pin and load	-	basic enable conditions met:	=	see sheet enable tables	-	fail conditions exists for more than 3 s monitor runs 0.1 s rate whenever enable	В

Component / System	Fault Code	Monitor Strategy Description	Primary Malfunction Criteria	Threshold Logic and Value	Secondary Parameters	Enable Conditions	Time Required conditions are met	MIL Illum.
Intake Manifold Runner Control Circuit Low Bank 1			Voltage low during driver off state (indicates short-to-ground)	 Short to ground: - ≤ 0.5 Ω impedance between signal and controller ground 	basic enable conditions met:	= see sheet enable - tables	fail conditions exists for more than 3 s monitor runs 0.1 s rate whenever enable conditions are met	В
Intake Manifold Runner Control Circuit High Bank 1	P2010	Variable Swirl valve actuator short circuit to battery	Voltage high during driver on state (indicates short to power)	 Short to power: - ≤ 0.5 Ω impedance between signal and controller power 	basic enable conditions met:	= see sheet enable - tables	fail conditions exists for more than 3 s monitor runs 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.
Intake Manifold Runner Performance Bank 1	P200A	variable swirl valve position	difference of the commanded variable swirl valve position from the actual measured variable swirl valve position	< -10.00 %	basic enable conditions met: NO Pending or Confirmed DTCs	 see sheet enable - tables see sheet inhibit - tables 	fail conditions exists for more than 5 s monitor runs 0.1 s rate whenever enable conditions are met	
		variable swirl valve position	difference of the commanded variable swirl valve position from the actual measured variable swirl valve position	> 10 %	basic enable conditions met: NO Pending or Confirmed DTCs	 see sheet enable - tables see sheet inhibit - tables 	fail conditions exists for more than 5 s monitor runs 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.
		Monitors the commanded variable swirl valve position response time, in the afterrun, from an intrusively commanded closed to open position	time required for variable swirl valve to reached open position	>	2.00	sec	engine off time	>=	5.00	sec	fail conditions exists for more than 2 s monitor runs 0.1 s rate whenever	
			where				battery voltage	>=	11.00	V	enable	
			variable swirl valve open position	<	33.20		battery voltage	<=	655.34	V	conditions are	
							basic enable conditions met:	=	see sheet enable tables	-	met	
							NO Pending or Confirmed DTCs	=	see sheet inhibit tables			
		Monitors the commanded variable swirl valve position response time, in the afterrun, from an intrusively commanded open to closed position	time required for variable swirl valve to reached closed position	~	2.00	sec	engine off time	>=	5.00	sec	fail conditions exists for more than 2 s monitor runs 0.1 s rate whenever	
		position	where				battery voltage	>=	11.00	V	enable	
			variable swirl valve open position	>	80.80		battery voltage	<=	655.34	V	conditions are	
							basic enable conditions met: NO Pending or Confirmed DTCs	=	see sheet enable tables see sheet inhibit tables	-	met	
					_				_			

Component / System	Fault Code	Monitor Strategy Description	Primary Malfunction Criteria		Threshold Logic and Value		Secondary Parameters		Enable Conditions		Time Required	MIL Illum.
0,000		Monitors the commanded variable swirl valve position response time, in the afterrun, from an intrusively commanded value (11%) which checks the linkage integrity of the variable swirl valve	or variable swirl valve position	v	75.00 88.00	%	engine off time battery voltage battery voltage basic enable conditions met: NO Pending or Confirmed DTCs	,	5.00 11.00 655.34 see sheet enable tables see sheet inhibit tables	V V -	fail conditions exists for more than 1 s monitor runs 0.1 s rate whenever enable conditions are met	
Exhaust Gas Temperature (EGT) Sensor 2 Circuit Low Voltage	P2032	Detects low voltage readings on the EGT 2 circuit, indicating an OOR low condition on the EGT 2 circuit	temperature sensor voltage downstream of oxidation catalyst same as temperature downstream of oxidation catalyst	<	0.55 - 50		ignition on and basic enable conditions met:	=	TRUE see sheet enable tables	-	fail conditions exists for 5 s monitor runs 0.050 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.
Exhaust Gas Temperature (EGT) Sensor 2 Circuit High Voltage	P2033		temperature sensor voltage downstream	>	2.33 1000	∨ °C	and basic enable conditions met:	-	see sheet enable tables	-	fail conditions exists for 5 s monitor runs 0.050 s rate whenever enable conditions are met	A
Reductant Level Sensor	P203B	check error from CAN	CAN message "Reductant Level Plausibility Check Error" from reductant tank level evaluation module which means ((measured tank level sensor 2 voltage after 1.5 ms since a test impulse was applied) (measured tank level sensor 1 voltage after 1.5 ms since a test impulse was applied)) or ((measured tank level sensor 3 voltage after 1.5 ms since a test impulse was applied) (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) (measured tank level sensor 1 voltage after 1.5 ms since a test impulse was applied)) or (-	TRUE (0.0 to 1.7) (1.71 to 3.56) (0.0 to 1.7) (1.71 to 3.56)	- V V V	ignition on and basic enable conditions met: and NO Pending or Confirmed DTCs:	-	TRUE see sheet enable tables see sheet inhibit tables	-	fail conditions exists for 5 s test performed continuously 1 s rate 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.
			(measured tank level sensor 3 voltage after 1.5 ms since a test impulse was applied) (measured tank level sensor 2 voltage after 1.5 ms since a test impulse was applied))	=	(0.0 to 1.7)	V V						
Reductant Level Sensor 1 Circuit Low		CAN message: Discrete level sensor level 1 short to ground error	Reductant Tank Level 1 Error Status (tank level sensor 1 voltage directly measured after a test impulse was applied)	= ~	1 (0.17)	v	ignition on battery voltage basic enable conditions met:		TRUE 8 see sheet enable tables	- V -	fail conditions exists for more than 3 sec. monitor runs with 0.01 s rate whenever enable conditions are met	В
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)	= > V	3 (3.56) (4.74)	- V V	ignition on battery voltage basic enable conditions met:	= > =	TRUE 8 see sheet enable tables	- V -	fail conditions exists for more than 3 sec monitor runs with 1 s rate whenever enable conditions are met	A

Component / System	Fault Code	Monitor Strategy Description	Primary Malfunction Criteria		Threshold Logic and Value		Secondary Parameters		Enable Conditions		Time Required	MIL Illum.
		Path 2: CAN message: Discrete level sensor 1 short to battery error	Reductant Tank Level 1 Error Status	=	2	-	ignition on	=	TRUE	-	fail conditions exists for more than 3 sec	
			(measured tank level sensor 1 voltage after 1.5 ms since a test impulse was applied)	>	(4.74)	V	battery voltage	>	8	V	monitor runs with 1 s rate whenever	
							basic enable conditions met:	=	see sheet enable tables	-	enable conditions are met	
Reductant Injector Control Circuit	P2047		The ECM detects that the commanded state of the driver and the actual state of	=	Open Circuit:≥	-	ignition on	=	TRUE		fail conditions exists for 5 s	В
Control Circuit		the Reductant Injector Control Circuit	the control circuit do not match. Voltage low during driver off state (indicates open circuit)		200 K Ω impedance between ECU pin and load		and				with 0.010 s rate whenever enable	
							and ECU Initialization tasks in progress for	=	FALSE	-	conditions are met	
							time and	>	0.10	sec		
							Battery voltage for	>	10.50	V		
							time and basic enable conditions met:	>	3.00 see sheet enable	sec		
							AND	-	tables	-		
							NO Pending or Confirmed DTCs	=	see sheet inhibit tables	-		
									_			

Component / System	Fault Code	Monitor Strategy Description	Primary Malfunction Criteria	Threshold Logic and Value	Secondary Parameters		Enable Conditions		Time Required	MIL Illum.
Reductant Injector Control Circuit Low Voltage	P2048	Detects a short circuit to ground in the Reductant Injector Control Circuit	The ECM detects that the commanded state of the driver and the actual state of the control circuit do not match. Voltage low during driver off state (indicates short to-ground)	 Short to ground: - ≤ 0.5 Ω impedance between signal and controller ground 	ignition on	=	TRUE	-	fail conditions exists for 2 s monitor runs with 0.010 s rate whenever enable conditions are met	В
					ECU Initialization tasks in progress for time	= >	FALSE	- sec		
					and Battery voltage for	>	10.50	V		
					time and	>	3.00	sec		
					basic enable conditions met: AND	=	see sheet enable tables	-		
					NO Pending or Confirmed DTCs	=	see sheet inhibit tables	-		
Reductant Injector Control Circuit High Voltage	P2049	Detects a short circuit to battery in the Reductant Injector Control Circuit	The ECM detects that the commanded state of the driver and the actual state of the control circuit do not match. Voltage high during driver on state (indicates short to power)	 Short to power: - ≤ 0.5 Ω impedance between signal and controller power 	ignition on	=	TRUE		fail conditions exists for 2 s monitor runs with 0.010 s rate whenever enable conditions are	B
					and ECU Initialization tasks in progress for	=	FALSE	-	met	
					time and	>	0.10	sec		
					Battery voltage for time	>	10.50 3.00	V sec		
					and basic enable conditions met: AND	=	see sheet enable tables	-		

Component / System	Fault Code	Monitor Strategy Description	Primary Malfunction Criteria	L	Threshold .ogic and Value	3	Secondary Parameters NO Pending or Confirmed DTCs	=	Enable Conditions see sheet inhibit tables	-	Time Required	MIL Illum.
Reductant Pressure Sensor Circuit Range/Performance	P204B		Pressure sensor signal change during No Pressure Control state	~	50.00	kPa	Reductant filling state in the pressure line and status of SCR control state (please see the definition) and State of the defrosting check of pressure line (please see the definition) and ambient pressure and ambient temperature and NO Pending or Confirmed DTCs: and basic enable conditions met:	<=	0.00 No Pressure Control TRUE 0.00 -6.64 see sheet inhibit tables see sheet enable tables	% - kPa °C -	fail conditions exists for more than 0.6 sec monitor runs with 0.01 s rate whenever enable conditions are met	В
Reductant Pressure Sensor Circuit Low	P204C	Measured reductant pump pressure sensor signal low voltage	Reductant pump pressure sensor signal same as: reductant pump pressure	<	0.41	V kPa	ignition on NO Pending or Confirmed DTCs: basic enable conditions met:	-	TRUE see sheet inhibit tables see sheet enable tables	-	fail conditions exists for more than 0.050 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.
Reductant Pressure Sensor Circuit High	P204D	pressure sensor signal high voltage	Reductant pump pressure sensor signal same as: reductant pump pressure	>	4.80 800.00	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 5 sec. monitor runs with 0.01 s rate whenever enable conditions are met	В
Reductant System Performance Bank 1	P204F	Unsuccessful reductant pressure build up	Reductant Pump Module Pressure	<=	375.00	status of SCR control sub state (please see the definition) AND status byte in substate PRESSUREBUILDUP AND Reductant Defrost check (please see the definition) AND ambient pressure AND ambient temperature AND number of pressure build-up attempts in pressure buildup and ventilation states AND Dwell time in Pressure Build up substate	= = > > >= >=	PRESSURE BUILDUP RUNNING 1.00 0.00 -30.04 20 15.00	- kPa °C counts sec	fail conditions exists for 1 event monitor runs with 0.1 s rate whenever enable conditions are met	A
						AND Dwell time in ventilation substate AND Urea heater release reason AND	>= ≠	0.30 COMPONENT PROTECTION	sec -		

Component /	Fault	Monitor Strategy	Primary Malfunction		Threshold		Secondary		Enable		Time	MIL
System	Code	Description	Criteria		Logic and Value		Parameters		Conditions		Required	Illum.
							NO Pending or Confirmed DTCs:	=	see sheet inhibit tables	-		
							basic enable conditions met:	=	see sheet enable tables	-		
											6 H HH	
Reductant Tank Temperature Sensor Performance	P205B	Path 1:									fail conditions exists for more than 0.5	В
renormance		The temperature difference	(a) - (b)	>	35.06	°C	ignition on	=	TRUE	-	sec	
		between reductant tank					-				monitor runs	
		temperature and diesel fuel									with 0.01 s	
		temperature are compared to an upper threshold after									rate whenever enable	
		sufficient engine-off duration									conditions are	
			where				status of SCR control state (please see	=	No Pressure	-	met	
			(a) Reductant tank temperature	=	manurad		the definition) Engine off Time	>	control 28800.00			
			(a) Reductant tank temperature	-	measured parameter	-	Engine on Time		28800.00	sec		
			(b) fuel temperature	=	measured parameter	-	time since start	>	600.00	sec		
							Max [(a), (b), (c)] - Min [(a), (b), (c)] where	<=	14.96	°C		
							(a) Oxidation Catalyst upstream	=	measured	-		
							temperature (b) Oxidation Catalyst downstream	=	parameter measured	-		
							temperature		parameter			
							(c) Particulate filter downstream	=	measured	-		
							temperature NO Pending or Confirmed DTCs:	=	parameter see sheet inhibit			
							No r chang of committee bros.		tables			
							basic enable conditions met:	=	see sheet enable	-		
									tables			
					_				_	١		
		Path 2: OR					ignition on	=	TRUE	-	fail conditions exists for	

Component /	Fault	Monitor Strategy	Primary Malfunction		Threshold		Secondary		Enable		Time	MIL
System	Code	Description The temperature difference between reductant tank temperature and diesel fuel temperature are compared to a lower threshold after sufficient engine-off duration	Criteria (a) - (b) where	<	Logic and Value -35.04	°C	Parameters status of SCR control state (please see the definition) Engine off Time	=	Conditions No Pressure control 28800.00	- sec	Required more than 0.5 sec monitor runs with 0.01 s rate whenever enable conditions are	Illum.
			(a) Reductant tank temperature (b) fuel temperature	=	measured parameter measured	-	time since start Max [(a), (b), (c)] - Min [(a), (b), (c)]	> <=	600.00 14.96	sec °C	met	
					parameter		where (a) Oxidation Catalyst upstream temperature (b) Oxidation Catalyst downstream temperature (c) Particulate filter downstream temperature NO Pending or Confirmed DTCs: basic enable conditions met:	= = =	measured parameter measured parameter measured parameter see sheet inhibit tables see sheet enable tables	- - -		
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	< 	1.00 -55.0 1200 5.0	hex °C kOhm V	basic enable conditions met: and No rolling count or protection value errors. (sliding window errors) in the CAN frame	=	see sheet enable tables TRUE	-	fault exists for more than 6 sec; monitor runs at 1 s 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.
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		>	1022.00	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	В
			Corresponds to a temperature of Corresponds to a resistance of	>= <=	160.0 0.153	°C kOhm	and No rolling count or protection value errors. (sliding window errors) in the CAN frame	=	TRUE	-	met	
			Corresponds to a voltage of	<=	0.270	V	name					
			Raw value of the CAN message for the Reductant Tank Temperature	=	0x3FF 1023	hex dec						
Exhaust Temperature Sensor 1 Performance	P2080	Detects a fault in the exhaust temperature sensor 1 performance by comparing the heat quantity on the sensor position to a threshold.	integrated heat quantity of exhaust gas temperature sensor 1	<	(a) / (b) * (c) / (d) * (e) * (f)	-	exhaust gas system regeneration mode	=	FALSE		fail conditions exists for 3s monitor runs with 0.1 s rate whenever enable	В
			or integrated heat quantity of exhaust gas temperature sensor 1	>	(a) / (b) * (c) / (d) * (e) * (g)	-	for time	>	120.00	sec	conditions are met	
			with (a) exhaust gas mass flow and with	=	calculated parameter	-	and time since start and	>	120.00	sec		
			(b) factor and with		3.60	g/sec	(exhaust-gas temperature sensor 1	>	-20.04	°C		
			(c) heat capacity and with (d) factor	=	1200.00 1000	J/Kg/°C kW/°C	and exhaust-gas temperature sensor 1)	<	499.96	°C		
			and with (e) correction factor for heat flow quantity depending on exhaust gas mass flow for temperature sensor 1	=	1.00	factor	and change in exhaust-gas temperature sensor 1 for	<	20.00	°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		time	=	10.00	sec	Required	mum.
			 (f) minimum permissible temperature deviation for exhaust gas temperature sensor 1 and with (g) maximum permissible temperature 	=	-120.00	3° 2°	and engine operation point suitable for diagnostic for	=255	255	-		
			deviation for exhaust gas temperature sensor 1	-	100.00	C	time	>=	0.05	sec		
							and	/-	0.05	Sec		
							change in modeled exhaust-gas temperature sensor 1 and /	>	20.00	°C		
							l heat quantity for exhaust gas temperature sensor 1 and	>	20.00	kJ		
							heat quantity for exhaust gas temperature sensor 1	<	40.00	kJ		
							, and engine has been in normal mode for time	>=	120.00	sec		
							or engine has been in exhaust warm-up mode for time and	>=	120.00	sec		
							and basic enable conditions met:	=	see sheet enable tables	-		
							NO Pending or Confirmed DTCs:	=	see sheet inhibit tables	-		
Exhaust Temperature Sensor 2 Performance		Detects a fault in the exhaust temperature sensor 2 performance by comparing the heat quantity on the sensor position to a threshold.	integrated heat quantity of exhaust gas temperature sensor 2	<	(a) / (b) * (c) / (d) * (e) * (f)		exhaust gas system regeneration mode	=	FALSE		fail conditions exists for 3s monitor runs with 0.1 s rate whenever enable	В
		l	or				for				conditions are	

Component /	Fault	Monitor Strategy	Primary Malfunction		Threshold		Secondary		Enable		Time	MIL
System	Code	Description	Criteria		Logic and Value	•	Parameters		Conditions		Required	Illum.
			integrated heat quantity of exhaust gas	>	(a) / (b) * (c) / (d)		time	>	240.00	sec	met	
			temperature sensor 2		* (e) * (g)		and					
			with (a) exhaust gas mass flow	=	calculated	-	and time since start	>	120.00	sec		
			(a) exhaust gas mass now	-	parameter	-			120.00	SEC		
			and with		parameter		and					
			(b) factor	=	3.60	g/sec	(
			and with		0.00	g/300	exhaust-gas temperature sensor 2	>	-20.04	°C		
			(c) heat capacity	=	1200.00	J/Kg/°C			20.01	Ũ		
			and with		1200100	oning, o	exhaust-gas temperature sensor 2	<	499.96	°C		
			(d) factor	=	1000	kW/°C)			-		
			and with				and					
			(e) correction factor for heat flow	=	1.00	factor	change in exhaust-gas temperature	<	30.00	°C		
			quantity depending on exhaust gas				sensor 2					
			mass flow for temperature sensor 2									
							for					
			and with				time	=	10.00	sec		
			(f) minimum permissible temperature	=	-140.00	K	and					
			deviation for exhaust gas temperature									
			sensor 2									
			and with				engine operation point suitable for	=	255	-		
							diagnostic					
			(g) maximum permissible temperature	=	100.00	K	for					
			deviation for exhaust gas temperature									
			sensor 2				time	>=	0.05	sec		
							and	/-	0.05	Sec		
							change in modeled exhaust-gas	>	20.00	°C		
							temperature sensor 2	-	20.00	Ŭ		
							and					
							(
							heat quantity for exhaust gas	>	20.00	kJ		
							temperature sensor 2			-		
							and					
							heat quantity for exhaust gas	<	40.00	kJ		
							temperature sensor 2					
)					
							and					
							engine has been in normal mode for time	>=	120.00	sec		
							or					
							engine has been in exhaust warm-up	>=	120.00	sec		
1		l	I I				mode for time				I I	I

Component /	Fault	Monitor Strategy	Primary Malfunction		Threshold		Secondary		Enable		Time	MIL
System	Code	Description	Criteria		Logic and Value		Parameters		Conditions		Required	Illum.
							and basic enable conditions met: and	=	see sheet enable tables	-		
							NO Pending or Confirmed DTCs:	=	see sheet inhibit tables	-		
Exhaust Temperature Sensor 3 Performance			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 3s monitor runs with 0.1 s rate whenever enable	В
			or				for				conditions are	
			integrated heat quantity of exhaust gas temperature sensor 3	>	(a) / (b) * (c) / (d) * (e) * (g)		time	>	240.00	sec	met	
			with				and					
			(a) exhaust gas mass flow	=	calculated parameter		time since start	>	120.00	sec		
			and with				and					
			(b) factor	=	3.60	g/sec	(
			and with		1000.00	1/1/- /80	exhaust-gas temperature sensor 3	>	-20.04	°C		
			(c) heat capacity and with	=	1200.00	J/Kg/°C	and exhaust-gas temperature sensor 3	<	499.96	°C		
			(d) factor	=	1000	kW/°C)		499.90	C		
			and with		1000	KWV/ O	/ and					
			 (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 3	<	30.00	°C		
							for					
			and with				time	=	10.00	sec		
			(f) minimum permissible temperature deviation for exhaust gas temperature sensor 3	=	-120.00	К	and					
			and with				engine operation point suitable for diagnostic	=	255	-		
			(g) maximum permissible temperature deviation for exhaust gas temperature sensor 3	=	100.00	К	for					
			361301 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	*0	Required	Illum.
					change in modeled exhaust-gas temperature sensor 3 and (> 15.00	°C		
					heat quantity for exhaust gas temperature sensor 3 and	> 20.00	kJ		
					heat quantity for exhaust gas temperature sensor 3)	< 40.00	kJ		
					and engine has been in normal mode for time	>= 120.00	sec		
					or engine has been in exhaust warm-up mode for time and	>= 120.00	sec		
					basic enable conditions met:	 see sheet enable tables 	-		
					NO Pending or Confirmed DTCs:	 see sheet inhibit tables 	-		
Reductant Pump Control Circuit		Diagnoses the Reductant Pump Motor low side driver circuit for circuit faults.	Voltage low during driver off state (indicates short-to-ground) The ECM detects that the commanded state of the driver and the actual state of the control circuit do not match.	 Short to ground: - ≤ 0.5 Ω impedance between signal and controller ground 	ignition on	= TRUE	-	fail conditions exists for 6.2 s monitor runs with 0.10 s rate whenever enable	A
					and ECU Initialization tasks in progress for	= FALSE	-	conditions are met	
					time and	> 0.10	sec		
					Battery voltage for	> 10.50	V		
					time and basic enable conditions met:	> 3.00 = see sheet enable	sec		
		l				tables	-		

Component / System	Fault Code	Monitor Strategy Description	Primary Malfunction Criteria		Threshold Logic and Value		Secondary Parameters		Enable Conditions		Time Required	MIL Illum.
							AND NO Pending or Confirmed DTCs	=	see sheet inhibit tables	-		
Reductant Pump Performance			timer for functional acknowledgement of the reductant pump motor timer for functional acknowledgement of the reductant pump motor	~	4	Sec	<pre>(Reductant Pump Warm-up status where the Warm-up state is defined as: (No Pressure control state (please see the definition) SCR Engine State (please see the definition) ((Remaining defrosting time of the tank Remaining defrosting time of the tank) OR Reductant Defrost check (please see the definition))) (ambient temperature) basic enable conditions met: } } </pre>	= = <= = >	FALSE TRUE ON 0 120 TRUE -100.00 see sheet enable tables	- - sec sec - deg C	fault exists for more than 0.3 s; monitor runs at 0.1 s whenever enable conditions are met	В

Component /	Fault	Monitor Strategy	Primary Malfunction	Threshold	Secondary		Enable		Time	MIL
System Reductant Pump	Code P208D	Description Diagnoses the Reductant	Criteria Voltage high during driver on state	Logic and Value = Short to power: -	Parameters ignition on	=	Conditions TRUE	-	Required fail conditions	Illum. B
Control Circuit High Voltage	12000	Pump Motor low side driver circuit for circuit faults.	(indicates short to power)	≤ 0.5 Ω impedance between signal and controller power	ignition on		HOL		exists for 3 s monitor runs with 0.10 s rate whenever enable conditions are	J
					and ECU Initialization tasks in progress for	=	FALSE	-	met	
					time	>	0.10	sec		
					and Battery voltage for	>	10.50	V		
					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:2 - 200 K Ω impedance between ECU pin and load 	ignition on	=	TRUE	•	fail conditions exists for 3 s monitor runs with 0.10 s rate whenever enable	A
					and ECU Initialization tasks in progress for	=	FALSE	-	conditions are met	
					time and	>	0.10	sec		
					Battery voltage for	>	10.50	V		
					time and	>	3.00	sec		
					and basic enable conditions met: AND	=	see sheet enable tables	-		
					NO Pending or Confirmed DTCs	=	see sheet inhibit tables	-		

Component / System	Fault Code	Monitor Strategy Description	Primary Malfunction Criteria		Threshold Logic and Valu	le	Secondary Parameters		Enable Conditions		Time Required	MIL Illum.
Reverting Valve Performance	P20A1		Difference between reductant pump pressure at beginning and end of pressure reduction phase	<	0.00	kPa	(Reductant Dosing System state pressure reduction Reductant Dosing System pump relative pressure to initiate test) AND ((Time attempting to reduce dosing pressure AND Reductant Dosing System pump relative pressure after attempting to reduce pressure) OR Reductant Dosing System pump relative pressure after attempting to reduce pressure) (ambient pressure ambient temperature) NO Pending or Confirmed DTCs basic enable conditions met:	= ,= , = , = =	TRUE 350.00 20.00 100.00 100.00 .0.00 .40.04 see sheet inhibit tables see sheet enable tables	- kPa sec kPa kPa °C -	fault exists for more than 1 event monitor runs with 0.1 s rate whenever enable conditions are met	A

Component /	Fault	Monitor Strategy	Primary Malfunction	Threshold	Secondary		Enable		Time	MIL
System Reductant Purge	Code P20A2	Description Diagnoses the Reductant	Criteria Voltage low during driver off state	Logic and Value = Short to ground: -	Parameters ignition on	=	Conditions TRUE	-	Required fail conditions	Illum. B
Valve Control Circuit Low Voltage		Purge Valve low side driver circuit for circuit faults.	(indicates short-to-ground)	≤ 0.5 Ω impedance between signal and controller ground	and			-	exists for 2 s monitor runs with 0.01 sec rate whenever enable conditions are met	J
					ECU Initialization tasks in progress for time	=	FALSE	- sec		
					and Battery voltage for	>	10.50	V		
					time and	>	3.00	sec		
					basic enable conditions met: AND	=	see sheet enable tables	-		
					NO Pending or Confirmed DTCs	=	see sheet inhibit tables	-		
Reductant Purge Valve Control Circuit High Voltage		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 	ignition on	=	TRUE	-	fail conditions exists for 3 s monitor runs with 0.01 sec rate whenever enable conditions are	В
					and ECU Initialization tasks in progress for	=	FALSE	-	met	
					time and	>	0.10	sec		
					Battery voltage for time	>	10.50 3.00	V sec		
					and basic enable conditions met:	=	see sheet enable	-		
					AND		tables			

Component / System	Fault Code	Monitor Strategy Description	Primary Malfunction Criteria	Threshold Logic and Value		Secondary Parameters NO Pending or Confirmed DTCs	=	Enable Conditions see sheet inhibit tables	-	Time Required	MIL Illum.
Exhaust Gas Temperature (EGT) Sensors 1-2 not plausible	P20E2	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 #31) with (a) captured oxidation catalyst downstream temperature at start and with (b) captured oxidation catalyst upstream temperature at start as reference temperature	 > 20 to 3276.7 measured parameter measured parameter 	°C - -	and ambient temperature and Engine Running (see parameter definition) for time and engine post drive/ afterun and diagnostic performed in current dc and basic enable conditions met: and NO Pending or Confirmed DTCs:	>=	28800.00 -50.04 TRUE 0.10 FALSE FALSE see sheet enable tables see sheet inhibit tables	sec °C - sec - - -	fail conditions exists for 0.050 s monitor runs with 0.050 s rate whenever enable conditions are met	В
Exhaust Gas Temperature Sensor 2/3 Correlation Bank 1	P20E4	Detects biased exhaust temperature sensors by comparing the upstream and downstream particulate filter temperature sensors after a calibrated engine off soak time	Path 1:			minimum engine-off time	>=	28800.00	Sec	fail conditions exists for 0.050 s monitor runs with 0.050 s rate whenever enable	В

Component /	Fault	Monitor Strategy	Primary Malfunction		Threshold		Secondary		Enable		Time	MIL
System	Code	Description	Criteria		Logic and Value	*0	Parameters		Conditions		Required	Illum.
			 (a) - (b) (see Look-Up-Table #32) with (a) captured particle filter downstream temperature at start 	>	20 to 3276.7 measured parameter	°C -	and ambient temperature and	>	-50.04	°C	conditions are met	
			and with	_	·		Engine Running (see parameter definition)	=	TRUE	-		
			(b) captured particle filter upstream temperature at start as reference temperature	=	measured parameter	-	for					
							time and	>	0.10	sec		
							engine post drive/ afterun and	=	FALSE	-		
							diagnostic performed in current dc and	=	FALSE	-		
							basic enable conditions met:	=	see sheet enable tables	-		
							and NO Pending or Confirmed DTCs:	=	see sheet inhibit tables	-		
	DOOFO				400.00				_	-	6 - 1 - 1 - 1 - 1 - 1 - 1 - 1 - 1 - 1 -	
Reductant Pressure Too Low		Compare Reductant tank pressure with lower thresholds under metering control	Reductant Pump Module Pressure	<	420.00	kPa					fail conditions exists for more than 60.0 s	В
							status of SCR control sub state (please see the definition) AND	=	Metering control	-	monitor runs with 0.1 s rate whenever enable	
							status byte in substate METERING CONTROL AND	=	Running		conditions are met	
							Dwell time in Metering control substate	>	2.00	sec		
							ambient pressure AND	>	0.00	kPa		
							ambient temperature AND	>	-30.04	°C		
							NO Pending or Confirmed DTCs:	=	see sheet inhibit tables	-		
							AND					

Component / System	Fault Code	Monitor Strategy Description	Primary Malfunction Criteria		Threshold Logic and Value		Secondary Parameters basic enable conditions met:	=	Enable Conditions see sheet enable tables	-	Time Required	MIL Illum.
Reductant Pressure Too High		Path 1: Compare Reductant tank pressure with upper threshold under metering control	Reductant Pump Module Pressure	>	650.00		status of SCR control sub state (please see the definition) AND status byte in substate METERING CONTROL AND Dwell time in Metering control substate AND ambient pressure AND ambient temperature AND NO Pending or Confirmed DTCs: AND basic enable conditions met:		Metering control Running 2.00 0.00 -30.04 see sheet inhibit tables see sheet enable tables	- sec kPa °C -	fail conditions exists for more than 10 s monitor runs with 0.1 s rate whenever enable conditions are met	В
		Path 2: Or Reductant tank pressure high	Unfiltered Reductant Pump Module Pressure	>=	795.00	kPa	ambient pressure AND ambient temperature AND 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 are met	

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	_	Parameters	_	Conditions	_	Required	mum.
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 event	A
			where (a) measured SCR catalyst efficiency	=	measured parameter	factor	for time and	>	10.00	sec	monitor runs with 0.01 s rate whenever	
			(b) offset-corrected modeled SCR catalyst efficiency (please see the general description for details) (see Look-Up-Table #68)	=	-0.273 to -0.17	factor	Status of NOx signal of upstream NOx sensor (please see the definition)	=	Active	-	enable conditions are met	
			. ,				for time	>	120.00	sec		
							Status of NOx signal of downstream NOx sensor (please see the definition)	=	Active	-		
							for time	>	120.00	sec		
							(Release of dosing strategy (please see the definition)	=	TRUE	-		
							for time	>=	(a) + (b)	sec		
							(a) Turn on delay time 1 of status metering strategy	=	180.00	sec		
							 (b) Turn on delay time 2 of status metering strategy and 	=	20.00	sec		
							(Status for disabling SCR Efficiency monitoring following an SCR Adaptation completion (please see the definition)	=	FALSE	-		
							for time	>	(a) + (b)	sec		
							(a) Debounce time after pre controlled dosing over		0.50	sec		
							(b) delay time the status of disabling SCR Efficiency monitoring or	=	220.00	sec		
							integrated upstream NOx)	>=	1.50	g		
1							(

Component /	Fault	Monitor Strategy	Primary Malfunction	Threshold	Secondary		Enable		Time	MIL
System	Code	Description	Criteria	Logic and Value	Parameters		Conditions		Required	Illum.
					Status of pre controlled dosing (please see the definition)	=	FALSE	-		
					for time	>	(a) + (b)			
					(a) Debounce time after pre controlled	=	0.50	sec		
					dosing off					
					(b) Delay time after pre controlled dosing off	=	220.00	sec		
					or					
					integrated upstream NOx	>=	1.50	g		
)					
					and (
					Decrease of Reductant load level (please	=	FALSE	-		
					see the definition)					
					for time	>	300.00	sec		
) and					
					(
					Average slow filtered NOx mass flow	<=	0.09	g/sec		
					upstream SCR					
					for time	>	0.50	sec		
					Monitor disable time based on average NOx mass flow and the time (see Look-	>	0 to 60	sec		
					Up-Table #79)					
)					
					and					
					for time with	>	12.00	sec		
					((
					SCR temperature gradient (see Look- Up-Table #77)	<	1.36 to 3.96	°C		
					SCR temperature gradient (see Look-	>	-4.04 to -2.04	°C		
					Up-Table #78)					
					filtered SCR catalyst temperature	<=	350.06	°C		
					filtered SCR catalyst temperature	>=	215.06	°C		
) normalized HC load in SCR catalyst	>	4.00	factor		
					ambient pressure	>=	75.00	kPa		
					ambient temperature	>=	-11.04	°C		
					DPF Regeneration in progress	=	FALSE	-		
					integrated upstream NOx during SCR	>=	2.00	g		
I	I	l			adaptation plausibility check active					

Component /	Fault	Monitor Strategy	Primary Malfunction	Threshold	Secondary		Enable		Time	MIL
System	Code	Description	Criteria	Logic and Value	Parameters		Conditions		Required	Illum.
					Status of the SCR adaptation plausibility check active (please see the definition)	=	FALSE	-		
					for time	>	120.00	sec		
					SCR NOx Catalyst Efficiency Below Threshold Bank 1 was performed for the current driving cycle	=	FALSE	-		
					engine speed	>=	-16384.00	rpm		
					engine speed	<=	16383.50	rpm		
					for time	>	0.00	sec		
						-	0.00	300		
					<pre>> SCR estimated current Reductant load (see Look-Up-Table #72)</pre>	>=	0.196 to 1.394	g		
					SCR estimated current Reductant load (see Look-Up-Table #71) (<=	0.23 to 1.64	g		
					Status of the SCR adaptation plausibility check active (please see the definition)	=	FALSE	-		
					with					
					for time	>	120.00	sec		
						-	120.00	360		
					/ Integrated NOx mass upstream SCR (see Look-Up-Table #73)	>	0.65 to 5.5	g		
					for time	>	0.00	sec		
					Average SCR Temperature	<=	350.06	°C		
					Average SCR Temperature	>=	220.06	°C		
					Filtered and delayed upstream NOx raw emission	<=	800.00	ppm		
					Filtered and delayed upstream NOx raw emission	>=	40.00	ppm		
					Filtered and delayed NOx raw emission mass flow upstream of SCR	<=	0.08	g/sec		
					Filtered and delayed NOx raw emission mass flow upstream of SCR	>=	0.00	g/sec		
					Filtered exhaust gas mass flow	<=	63.88	g/sec		
					Filtered exhaust gas mass flow	>=	10.00	g/sec		
					MAP for valid engine operation points for SCR efficiency monitoring	=	1	factor		
					for time	>	1.20	sec		

Component /	Fault	Monitor Strategy	Primary Malfunction	Threshold	Secondary		Enable		Time	MIL
System	Code	Description	Criteria	Logic and Value	Parameters		Conditions		Required	Illum.
					Inverse calculated accelerator pedal	>	5.00	%		
					value					
					for time	>	0.00	sec		
					basic enable conditions met:	=	see sheet enable	-		
							tables			
					EWMA fast initialization mode:					
					filter coefficient for fast initialization	=	0.40	factor		
					number of SCR NOx efficiency	>=	1.00	counts		
					measurements for current driving cycle					
					of code clear mode					
					Total number of SCR NOx efficiency	>=	2.00	counts		
					measurements for Code clear mode					
					EWMA Rapid Response mode:					
					EWMA filtered delta SCR catalyst	>	0.20	factor		
					efficiency					
					(a) - (b)	<	0.00	factor		
					(a) measured SCR catalyst efficiency	=	measured	-		
							parameter			
					(b) offset-corrected modeled SCR	=	calculated	-		
					catalyst efficiency (please see the		parameter			
					general description for details)					
					offset-corrected modeled SCR catalyst	>	0.00	factor		
					efficiency (please see the general					
					description for details)					
					filter coefficient for Rapid Response	=	0.36	factor		
					mode					
					number of SCR NOx efficiency	>=	1.00	counts		
					measurements for current driving cycle					
					of Rapid Response mode					
					Total number of SCR NOx efficiency	>=	6.00	counts		
					measurements for Rapid Response					
					mode					
					EWMA filtered value too small in Fast					
					Init. And Rapid Response modes:					
					EWMA filtered delta SCR catalyst	<	0.00	factor		
					efficiency of (a) - (b)					
					(a) measured SCR catalyst efficiency	=	measured	-		
1 1					I		parameter			

Component / System	Fault Code	Monitor Strategy Description	Primary Malfunction Criteria		Threshold ogic and Value		Secondary Parameters (b) offset-corrected modeled SCR catalyst efficiency (please see the general description for details) EWMA stabilized mode: filter coefficient for stabilized mode number of SCR efficiency measurements for stabilized mode	=	Enable Conditions calculated parameter 0.16 1	- factor counts	Time Required	MIL IIIum.
Accelerator Pedal Position (APP) Sensor 1 Circuit Low Voltage		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	<=	0.74	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 0.20 s monitor runs with 0.01 s rate whenever enable conditions are met	A
Accelerator Pedal Position (APP) Sensor 1 Circuit High Voltage		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	>=	4.78	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 0.20 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 Low Voltage	P2127	Detects low voltage readings on the APP circuit, indicating an OOR low condition on the APP 2 circuit	voltage of acceleration pedal sensor 2 same as acceleration pedal position	<=	0.28	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 0.20 s monitor runs with 0.01 s rate whenever enable conditions are met	A
Accelerator Pedal Position (APP) Sensor 2 Circuit High Voltage		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	>=	2.39 115.1		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 0.20 s monitor runs with 0.01 s rate whenever enable conditions are met	A
Accelerator Pedal Position (APP) Sensor 1-2 Correlation	P2138	Detects in range pedal positions errors by comparing voltages on each sensor.	[maximum value ((a/b) or (c)) - maximum value ((c) or (d))] (see Look-Up-Table #12) with (a) voltage of acceleration pedal position sensor 1 and with	>	0.12 to 0.18 measured parameter		ignition on and basic enable conditions met: and	=	TRUE see sheet enable tables	-	fail conditions exists for 0.21 s monitor runs with 0.01 rate whenever enable conditions are	A

Component / System	Fault Code	Monitor Strategy Description	Primary Malfunction Criteria	Threshold Logic and Value	Secondary Parameters		Enable Conditions		Time Required	MIL Illum.
			 (b) factor between sensor raw values and with (c) minimum voltage and with (d) redundant voltage of acceleration pedal (from pedal position sensor 2) 	= 2.00 = 0.45 = calculated parameter	NO Pending or Confirmed DTCs:	=	see sheet inhibit tables	-	met	
Injector Positive Voltage Control Circuit Group 1		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) and fuel system status	=	TRUE	-	fail conditions exists for more than 0.04 s monitor runs with 0.01 s rate whenever enable conditions are met	A

Component / System Injector Positive Voltage Control Circuit Group 2		Monitor Strategy Description ECM Electronic out-put driver circuitry determines if faults (open/short/no load) exist on injector charging bank #2.	Primary Malfunction Criteria Voltage high during driver off state (indicates short to power, short to ground, or open circuit)	Threshold Logic and Value = Short to power: ≤ 0.5 Ω impedance between signal and controller power Open Circuit: ≥ 200 K Ω impedance between ECU pin and load signal and controller		Secondary Parameters Engine Running (see parameter definition)	-	Enable Conditions TRUE		Time Required fail conditions exists for more than 0.04 s monitor runs with 0.01 s rate whenever enable conditions are met	MIL Illum. A
				ground Short to ground: ≤ 0.5 Ω impedance between signal and controller ground		and fuel system status	=	no fuel cut off	-		
Reductant tank heater short circuit	P214F	Detects a tank heater short circuit by detecting high conductance in the heater	a >= b with (a) maximum conductance of the urea tank heater and with (b) maximum tolerance threshold of the conductance for the urea tank heater	parameter	/Ohm /Ohm	ignition switch on and urea tank heater powerstage on and battery voltage and battery voltage	= >= >=	TRUE TRUE 11.00 655.34	- - V V	fail conditions exists for 0.001 s monitor runs once per trip with 0.001 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 engine off time and urea tank temperature and	>= <=	12.00 41.96	sec °C		
							(conductance of the urea tank heater is steady or falling for	=	TRUE	-		
							time or	>	20.00	sec		
							heater activation time)	>=	50.00	sec		
							and basic enable conditions met:	=	see sheet enable tables	-		
							and NO Pending or Confirmed DTCs:	=	see sheet inhibit tables	-		
					_	_			_	_		_
Intake Air Temp Sensor (IAT) 1 / 2 Correlation	P2199	Detects biased Humidity Temperature Sensor or MAF Intake Air Temperature Sensor by comparing the measured temperatures at start.	Path 1:				minimum engine-off time	>=	28800.00	Sec	fail conditions exists for 0.1 s monitor runs once per trip with 0.1 s rate	В
							and engine off time is valid	=	TRUE	-	whenever enable	
			 (a) - (b) (see Look-Up-Table #2) where (a) captured intake air temperature at 	> =	20 to 999 measured	°C -	and ambient air temperature and	>	-60.04	°C	conditions are met	
			start and (b) captured humidity temperature at	=	parameter measured	-	ignition on (see parameter definition) for	=	TRUE	-		
			start		parameter		time	>	0.01	sec		
							and engine post drive/ afterun and	=	FALSE	-		
							diagnostic performed in current drive cycle	=	FALSE	-		

Component / System	Fault Code	Monitor Strategy Description	Primary Malfunction Criteria	Threshold	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
System	Code	Description	Unteria		and basic enable conditions met: and NO Pending or Confirmed DTCs:	= see sheet enable - tables = see sheet inhibit - tables	Kequirea	illum.
Reductant Level Sensor 2 Circuit Low	P21AA	CAN message: Discrete level sensor level 2 short to ground error	Reductant Tank Level 2 Error Status (tank level sensor 2 voltage directly measured after a test impulse was applied)	< (0.17) V	ignition on battery voltage basic enable conditions met:	= TRUE - > 8 V = see sheet enable - tables	fail conditions exists for more than 3 sec. monitor runs with 0.01 s rate whenever enable conditions are met	В
Reductant Level Sensor 2 Circuit High	P21AB	Path 1: CAN message: Discrete level sensor 2 open load error Path 2:	Reductant Tank Level 2 Error Status (measured tank level sensor 2 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)	> (3.56) V	ignition on battery voltage basic enable conditions met:	= TRUE - > 8 V = see sheet enable - tables	fail conditions exists for more than 3 sec monitor runs with 1 s rate whenever enable conditions are met	A

Component / System	Fault Code	Monitor Strategy Description	Primary Malfunction Criteria		Threshold Logic and Value		Secondary Parameters		Enable Conditions		Time Required	MIL Illum.
System	Coue		(measured tank level 2 Error Status (measured tank level sensor 2 voltage after 1.5 ms since a test impulse was applied)	>	(4.74)	V	basic enable conditions met:	=	RUE 8 see sheet enable tables	- V -	exists for more than 3 sec monitor runs with 1 s rate whenever enable conditions are met	
Reductant Level Sensor 3 Circuit Low	P21AF	CAN message: Discrete level sensor level 3 short to ground error	Reductant Tank Level 3 Error Status (tank level sensor 3 voltage directly measured after a test impulse was applied)	= v	1 (0.17)	V	ignition on battery voltage basic enable conditions met:	=	TRUE 8 see sheet enable tables	- V -	fail conditions exists for more than 3 sec. monitor runs with 0.01 s rate whenever enable conditions are met	
Reductant Level Sensor 3 Circuit High		Path 1: CAN message: Discrete level sensor 3 open load error	Reductant Tank Level 3 Error Status (measured tank level sensor 3 voltage after 1.5 ms since a test impulse was applied) (measured tank level sensor 3 voltage after 1.5 ms since a test impulse was applied)	= > <	3 (3.56) (4.74)	- V V	ignition on battery voltage basic enable conditions met:	= > =	TRUE 8 see sheet enable tables	- V -	fail conditions exists for more than 3 sec monitor runs with 1 s rate whenever enable conditions are met	A

Component / System	Fault Code	Monitor Strategy Description	Primary Malfunction Criteria		Threshold Logic and Valu	e	Secondary Parameters		Enable Conditions		Time Required	MIL Illum.
		Path 2: CAN message: Discrete level sensor 3 short to battery error	Reductant Tank Level 3 Error Status (measured tank level sensor 3 voltage after 1.5 ms since a test impulse was applied)	=	2 (4.74)	V	ignition on battery voltage basic enable conditions met:	= >	TRUE 8 see sheet enable tables	- V -	fail conditions exists for more than 3 sec monitor runs with 1 s rate whenever enable conditions are met	
Reductant tank heater open circuit	P21DD	circuit by detecting low	a <= b with (a) maximum conductance of the urea tank heater and with (b) minimum tolerance threshold of the conductance for the urea tank heater	=	TRUE measured parameter 0.27	1/Ohm	ignition switch on and urea tank heater powerstage on and battery voltage	= = >=	TRUE TRUE 11.00	- - V	fail conditions exists for 0.001 s monitor runs once per trip with 0.001 s rate whenever enable	В
							and battery voltage and engine off time and urea tank temperature and	<= >= <=	655.34 300.00 41.96	V sec °C	conditions are met	
							(conductance of the urea tank heater is steady or falling for time or heater activation time	= > >=	TRUE 400.00 50.00	- sec sec		

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: and NO Pending or Confirmed DTCs:	 see sheet enable tables see sheet inhibit tables 			
NOx Sensor Circuit Bank 1 Sensor 1	P2200	Detects a failure when open circuit status message from NOx sensor is received continuously for a time period	Open circuit NOx signal error	= TRUE -	following conditions for time battery voltage battery voltage SCR upstream temperature SCR upstream temperature Engine Running for time Can Bus Initialized (CAN Bus is Active) consisting of: ignition on for time battery voltage Upstream NOx sensor dewpoint achieved (please see the definition) NO Pending or Confirmed DTCs: basic enable conditions met:	 > 10.00 >= 11.00 <= 655.34 >= 99.96 = TRUE >= 20.00 = TRUE = TRUE >= 3 > 9.8 < 655.34 = TRUE = see sheet inhibit tables = see sheet enable tables 		fail conditions exists for more than 13 sec. monitor runs with 0.01 s rate whenever enable conditions are met	A
		Detects a failure when short circuit status message from NOx sensor is received continuously for a time period	Short Circuit NOx signal error	= TRUE -	following conditions for time battery voltage battery voltage	> 10.00 >= 11.00 <= 655.34	sec V V	fail conditions exists for more than 13 sec. monitor runs with 0.01 s rate whenever	

Component /	Fault	Monitor Strategy	Primary Malfunction	Threshold	Secondary		Enable		Time	MIL
System	Code	Description	Criteria	Logic and Value	Parameters		Conditions		Required	Illum.
					SCR upstream temperature	>=	99.96	°C	enable	
					SCR upstream temperature	<=	599.96	°C	conditions are	
					Status of Start stop condition. (Quick	=	TRUE	-	met	
					Key Cycle Delay) (20 sec)					
					Engine Running	=	TRUE	-		
					for time	>=	20.00	sec		
					Can Bus Initialized (CAN Bus is Active	=	TRUE	-		
)					
					consisting of:					
					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 DTCs:	=	see sheet inhibit	-		
					5		tables			
					basic enable conditions met:	=	see sheet enable	-		
							tables			
N0x Sensor Circuit		Detects an out of range high	NOx sensor signal (raw information	> 2400.00 ppm	NOx sensor 1 ready status (see	=	TRUE	-	fault exists for	В
High Bank 1 Sensor 1			received via CAN from NOx sensor)		parameter definition)				more than 10	
		Sensor							sec; monitor	
					Valid NOx signal from CAN is received	=	TRUE	-	runs at 0.1 s	
					(no NOx sensor communication failures)				when enable	
									conditions are	
					Engine Running (see parameter	=	TRUE	-	met	
					definition)					
					for time	>	20.00	sec		
N0x Sensor Circuit	P2202	Detects an out of range low	NOx sensor signal (raw information	< -90.00 ppm	and					
Low Bank 1 Sensor 1		fault of the upstream NoX	received via CAN from NOx sensor)							
		Sensor								
					Injection Quantity	>	4.00	mm^3/r		
								ev		
					or					
					Upstream NOx sensor dewpoint	=	TRUE	-		
					achieved (please see the definition)					
					for time	>	300.00	sec		
					1					

Component / System	Fault Code	Monitor Strategy Description	Primary Malfunction Criteria	Threshold Logic and Value	Secondary Parameters		Enable Conditions		Time Required	MIL Illum.
NOx Sensor Heater Control Circuit Bank 1 Sensor 1	P2205	Detects a failure when open circuit status message from NOx sensor heater is received continuously for a time period	Open Circuit NOx Heater signal error	= TRUE -	following conditions for time battery voltage	>	10.00	sec V	fail conditions exists for more than 13 sec. monitor runs with 0.01 s	A
					battery voltage	<=	655.34		rate whenever	
					SCR upstream temperature	>=	99.96	°C	enable	
					SCR upstream temperature	<=	599.96		conditions are	
					Status of Start stop condition. (Quick Key Cycle Delay) (20 sec)	=	TRUE	-	met	
					Engine Running for time	=	TRUE	-		
					Can Bus Initialized (CAN Bus is Active	>= =	20.00 TRUE	sec		
)		INOL	-		
					consisting of: 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)	_	ana abaat inhihit			
					NO Pending or Confirmed DTCs:	=	see sheet inhibit tables	-		
					basic enable conditions met:	=	see sheet enable	-		
							tables			
		Detects a failure when short	Short Circuit NOx heater signal error	= TRUE -	following conditions for time	>	10.00	sec	fail conditions	
		circuit status message from NOx sensor heater is received continuously for a time period					10.00	500	exists for more than 13 sec. monitor runs	
		1			battery voltage	>=	11.00	V	with 0.01 s	
		1			battery voltage	<=	655.34	V	rate whenever	
		1			SCR upstream temperature	>=	99.96	°C	enable	
		1			SCR upstream temperature	<=	599.96		conditions are	
					Status of Start stop condition. (Quick Key Cycle Delay) (20 sec)	=	TRUE	-	met	
		I	l	l	Engine Running	=	TRUE	-	I	

Component / System	Fault Code	Monitor Strategy Description	Primary Malfunction Criteria	Threshold Logic and Value	Secondary Parameters		Enable Conditions		Time Required	MIL Illum.
oyotoini	0000	Decemption	ontona	Logio ana valuo	for time	>=	20.00	sec	noquirou	mann
					Can Bus Initialized (CAN Bus is Active	=	TRUE	-		
)					
					consisting of:					
					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 DTCs:	=	see sheet inhibit	-		
							tables			
					basic enable conditions met:	=	see sheet enable	-		
							tables			
								_		
NOx Heater	P2209	Monitoring of the upstream	Upstream NOx sensor heater	= FALSE -	(fault exists for	В
Performance Bank 1		NOx sensor signal readiness	temperature has reached setpoint						more than 1	
Sensor 1		-							event when	
					battery voltage	>=	1.00	V	dewpoint end	
					and				is reached;	
					battery voltage	<=	655.34	V	monitor runs	
					and				at 0.02 s	
					Oxidation Catalyst upstream	>=	99.96	°C	when enable	
					temperature				conditions are	
					and				met	
					Oxidation Catalyst upstream	<=	599.96	°C		
					temperature					
					and					
					Engine running	=	TRUE	-		
					for time	>	20.00	sec		
					and					
					Upstream NOx sensor dewpoint	=	TRUE	-		
					achieved (please see the definition)					
)					
					for time	>	160	sec		
					and					
					basic enable conditions met:	=	see sheet enable tables	-		
					No Pending or Confirmed DTC	=	see sheet inhibit	-		
							tables			

Component / System	Fault Code	Monitor Strategy Description	Primary Malfunction Criteria		Threshold Logic and Valu	e	Secondary Parameters		Enable Conditions		Time Required	MIL Illum.
Reductant pressure line heater open circuit		Detects a pressure line heater open circuit by detecting low conductance in the heater	a <= b with	=	TRUE	-	ignition switch on	=	TRUE	-	fail conditions exists for 3 s monitor runs with 0.1 s rate	В
			(a) conductance of the urea pressure line heater and with	=	measured parameter	1/Ohm	and urea pressure line heater powerstage on and	=	TRUE	-	whenever enable conditions are	
			 (b) minimum tolerance threshold of the conductance for the urea pressure line heater 	=	0.35	1/Ohm	battery voltage	>=	11.00	V	met	
			incutor				and battery voltage and	<=	655.34	V		
							engine off time and	>=	300.00	sec		
							heater activation time and	>=	11.50	sec		
							basic enable conditions met:	=	see sheet enable tables	-		
							and NO Pending or Confirmed DTCs:	=	see sheet inhibit tables	-		
Reductant pressure line heater short circuit	P221D	Detects a pressure line heater short circuit by detecting high conductance in the heater	a >= b with	=	TRUE	-	ignition switch on and	=	TRUE	-	fail conditions exists for 3 s monitor runs with 0.1 s rate	В
			(a) conductance of the urea pressure line heater and with	=	measured parameter	1/Ohm	and urea pressure line heater powerstage on and	=	TRUE	-	whenever enable conditions are	
			(b) maximum tolerance threshold of the conductance for the urea pressure line heater	=	0.78	1/Ohm	battery voltage	>=	11.00	V	met	
							and battery voltage and	<=	655.34	V		
							engine off time and	>=	300.00	sec		
							heater activation time and	>=	11.50	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:	=	see sheet enable tables	-		
							and NO Pending or Confirmed DTCs:	=	see sheet inhibit tables	-		
Reductant supply module heater open circuit	P221E	Detects a supply module heater open circuit by detecting low conductance in the heater	a <= b with	=	TRUE	-	ignition switch on	=	TRUE	-	fail conditions exists for 0.001 s monitor runs	В
		ine neater	(a) maximum conductance of the supply module heater and with	=	measured parameter	1/Ohm	and supply module heater powerstage on and	=	TRUE	-	once per trip with 0.001 s rate whenever	
			(b) minimum tolerance threshold of the conductance for the supply module heater	=	0.14	1/Ohm	battery voltage	>=	11.00	V	enable conditions are met	
							battery voltage and	<=	655.34	V		
							engine off time and (>=	300.00	sec		
							conductance of the urea supply module heater is steady or falling for	=	TRUE	-		
							time or	>	50.00	sec		
							heater activation time) and	>=	50.00	sec		
							basic enable conditions met:	=	see sheet enable tables	-		
							and NO Pending or Confirmed DTCs:	=	see sheet inhibit tables	-		
Reductant supply	P221F	Detects a supply module	a >= b	=	TRUE		ignition switch on	-	TRUE		fail conditions	В
module heater short circuit		heater short circuit by detecting high conductance in	with				and				exists for 0.001 s monitor runs	_

Component /	Fault	Monitor Strategy	Primary Malfunction		Threshold		Secondary		Enable	_	Time	MIL
System	Code	Description	Criteria		Logic and Value		Parameters		Conditions		Required	Illum.
			 (a) maximum conductance of the supply module heater and with (b) maximum tolerance threshold of the conductance for the supply module heater 	=	measured parameter 0.46	1/Ohm 1/Ohm	supply module heater powerstage on and battery voltage	= >=	TRUE 11.00	v	once per trip with 0.001 s rate whenever enable conditions are met	
							and battery voltage and engine off time and	<= >=	655.34 300.00	V sec	inet	
							(conductance of the urea supply module heater is steady or falling for	=	TRUE	-		
							time or	>	50.00	sec		
							heater activation time	>=	50.00	sec		
) and basic enable conditions met:	=	see sheet enable tables	-		
							and NO Pending or Confirmed DTCs:	=	see sheet inhibit tables	-		
								-		-		_
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	<=	1.97	V	ignition on	=	TRUE	-	fail conditions exists for 1.5 s monitor runs 0.1 s rate whenever enable	В
			ambient pressure	<=	50.00	kPa	NO Pending or Confirmed DTCs: and basic enable conditions met:	=	see sheet inhibit tables see sheet enable tables	-	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.
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 same as ambient pressure	>	4.54	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 1.5 s monitor runs 0.1 s rate whenever enable conditions are met	В
O2 Sensor Positive Current Control Circuit/Open Bank 1 Sensor 1	P2237	Monitoring the A/F sensor positive current control circuit (IP circuit) for open circuit failures	Measured O2 concentration	<	0.01	-	Ignition on DPF regeneration active Decel Fuel Cut-Off (DFCO) active Calculated O2 concentration No Pending or Confirmed DTCs: basic enable conditions met:		TRUE FALSE FALSE 0.07 see sheet inhibit tables see sheet enable tables	-	fault exists for more than 2 sec; monitor runs at 0.1 s when enable conditions are met	В
O2 Sensor Reference Voltage Circuit/Open Bank 1 Sensor 1	P2243	Monitoring the A/F sensor reference voltage circuit (UN circuit) for open circuit failures	A/F sensor resistance signal voltage and A/F sensor raw voltage or A/F sensor raw voltage	> <	3.00 -1.30 3.22	V V V	Ignition on (duty cycle value during sensor heat-up for time or Temperature of A/F sensor (based on sensor internal resistance) and	= >= >= >	TRUE 90.25 19.50 804.96	- % sec °C	fault exists for more than 2 sec; monitor runs at 0.1 s when enable conditions are met	В

Component /	Fault	Monitor Strategy	Primary Malfunction		Threshold		Secondary		Enable		Time	MIL
System	Code	Description	Criteria	L	ogic and Value		Parameters Status bit for valid A/F sensor inner Resistance (see parameter definition table)	=	Conditions TRUE	•	Required	Illum.
) Decel Fuel Cut-Off Active (DFCO) Battery voltage A/F sensor error status bit (see parameter definition table) No permanent heater control deviation error present (P0053)	= > = =	FALSE 11.00 FALSE TRUE	V -		
							and Status bit indicates if the ramp up for the A/F sensor heater is released [True = heater ramp up is released, False = heater ramp up is deactivated] for time	=	TRUE 37.00	sec		
							or A/F sensor temperature A/F sensor temperature No Pending or Confirmed DTCs:	> < =	805.96 823.96 see sheet inhibit tables	°C °C -		
							basic enable conditions met:	=	see sheet enable tables	-		
O2 Sensor Negative Current Control Circuit/Open Bank 1 Sensor 1		Monitoring the A/F sensor negative current control circuit (VM circuit) for open circuit failures	A/F sensor resistance signal voltage and	>	3.00	V	Ignition on	=	TRUE	-	fault exists for more than 2 sec; monitor runs at 0.1 s when enable	В
			A/F sensor raw voltage or	>	-0.20	V	duty cycle value during sensor heat-up for time	>= >=	90.25 19.50	% sec	conditions are met	
			A/F sensor raw voltage	<	0.20	V	or Temperature of A/F sensor (based on sensor internal resistance) and	>	804.96	°C	ind	
							Status bit for valid A/F sensor inner Resistance (see parameter definition table)	=	TRUE	-		
							/ Decel Fuel Cut-Off Active (DFCO) Battery voltage	= >	FALSE 11.00	v		

Component /	Fault	Monitor Strategy	Primary Malfunction		Threshold		Secondary		Enable		Time	MIL
System	Code	Description	Criteria	L	ogic and Valu		Parameters		Conditions		Required	Illum.
							A/F sensor error status bit (see parameter definition table)	=	FALSE	-		
							No permanent heater control deviation error present (P0053) and	=	TRUE			
							Status bit indicates if the ramp up for the A/F sensor heater is released [True = heater ramp up is released, False =	=	TRUE			
							heater ramp up is deactivated] for time or	>	37.00	sec		
							A/F sensor temperature	>	805.96	°C		
							A/F sensor temperature	<	823.96	°C		
							No Pending or Confirmed DTCs:	=	see sheet inhibit	-		
									tables			
							basic enable conditions met:	=	see sheet enable	-		
									tables			
											6 H HW	
Turbo Boost System Performance		Detects if the Turbocharger is severely over or under boosting based on control deviation	Path 1:				following conditions for time:	>	0.50	sec	fail conditions exists for 15 s test performed	A
			control deviation of the boost pressure calculated out of difference between desired and actual value	>	(g) * (h)	-	(=	FALSE	-	continuously 0.01 s rate	
			with				VNT turbo charger offset adaptation	=	FALSE	-		
							active					
			(g) the upper limit (see Look-Up-Table #60)	=	35.0 to 85.0	kPa	and					
			(h) correction factor (see Look-Up- Table #85)	=	0.85 to 1.0	factor	turbo charger (VNT) wiping is active	=	FALSE	-		
							and absolute filtered gradient of boost pressure setpoint, PCR_pDesVal, calculated over a time dT constitutes the third condition for detecting the steady state and	<	5.00	kPa		
							injection Quantity	>=	120.00	mm^3/r		
		l					I			ev		

Component /	Fault	Monitor Strategy	Primary Malfunction Criteria	Threshold	Secondary		Enable		Time	MIL
System	Code	Description	Criteria	Logic and Value	Parameters injection Quantity	<=	Conditions 170.00	mm^3/r	Required	Illum.
						~-	170.00	ev		
					and			01		
					engine Speed	>=	2250.00	rpm		
					engine Speed	<=	4000.00	rpm		
					and					
					particulate filter regeneration	=	FALSE	-		
					and					
					NO Pending or Confirmed DTCs:		see sheet inhibit tables	-		
)		lables			
					and					
					basic enable conditions met:	=	see sheet enable			
							tables			
			Path 2:		following conditions for times	>	0.50		fail conditions	
			control deviation of the boost pressure	< (i) * (j) -	following conditions for time:		0.50	sec	exists for 15 s	
			calculated out of difference between		(test	
			desired and actual value						performed	
			with		VNT turbo charger offset adaptation	=	FALSE	-	continuously	
					active				0.01 s rate	
			(i) the upper limit (see Look-Up-Table	= -55.0 to -25.0 kP	a and					
			#59)							
			(j) correction factor (see Look-Up- Table #84)	= 1.00 to 1.25 fact	or turbo charger (VNT) wiping is active	=	FALSE	-		
			Table #64)		and					
					absolute filtered gradient of boost	<	7.50	kPa		
					pressure setpoint, PCR_pDesVal ,		1.00			
					calculated over a time dT constitutes					
					the third condition for detecting the					
					steady state					
					and		400.00			
					injection Quantity	>=	120.00	mm^3/r		
					injection Quantity	<=	170.00	ev mm^3/r		
						~-	170.00	ev		
					and			÷.		
					engine Speed	>=	2250.00	rpm		
					engine Speed	<=	4000.00	rpm		
					and					
I	1		1		particulate filter regeneration	=	FALSE	-	I I	

Component / System	Fault Code	Monitor Strategy Description	Primary Malfunction Criteria	Threshold Logic and Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
					and NO Pending or Confirmed DTCs:) and basic enable conditions met:	see sheet inhibit - tables = see sheet enable tables		
Barometric Pressure (BARO) Sensor 2 Circuit Performance	P227B	Correlation at low engine operating speeds of the barometric pressure sensor 1 and barometric pressure sensor 2 for sensor performance failures	BARO 2 pressure - BARO1 pressure	> 7.50 k	Pa engine speed and No Pending or Confirmed DTCs: and basic enable conditions met:	< 1500 rpm = see sheet inhibit - tables = see sheet enable - tables	fail conditions exists for 7 s monitor runs with 0.01 s rate whenever enable conditions are met	
Barometric Pressure (BARO) Sensor 2 Circuit Low	P227C	pressure sensor 2 circuit for the short circuit to ground indicating an OOR low	barometric pressure sensor 2 circuit voltage same as barometric pressure 2		V Ignition on and Pa basic enable conditions met:	= TRUE -	fail conditions exists for 5 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.
Barometric Pressure (BARO) Sensor 2 Circuit High	P227D	pressure sensor 2 circuit for short circuit to battery and open circuit indicating an OOR high	barometric pressure sensor 2 circuit voltage same as barometric pressure 2	>	4.50 115.00	Ignition on and basic enable conditions met:	=	TRUE see sheet enable tables	-	fail conditions exists for 5 s monitor runs with 0.1 s rate whenever enable conditions are met	В
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 open circuit)	-	Open Circuit: ≥ 200 K Ω impedance between ECU pin and load signal and controller ground	ignition on and Battery voltage for time and basic enable conditions met: and NO Pending or Confirmed DTCs	-	TRUE 10.50 3.00 see sheet enable tables see sheet inhibit tables		fail conditions exists for 0.28 s monitor runs with 0.01 s rate whenever enable conditions are met	

Component / System	Fault Code	Monitor Strategy Description	Primary Malfunction Criteria Electronic power stage circuitry determines over temperature on the fuel pressure regulator 2 control circuit.	Threshold Logic and Value	Secondary Parameters ignition on and Battery voltage for time and basic enable conditions met: and NO Pending or Confirmed DTCs	= > > = =	Enable Conditions TRUE 10.50 3.00 see sheet enable tables see sheet inhibit tables	- V sec -	Time Required fail conditions exists for 0.28 s monitor runs with 0.01 s rate whenever enable conditions are met	MIL IIIum.
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 	ignition on and Battery voltage for time and basic enable conditions met: and NO Pending or Confirmed DTCs	=	TRUE 10.50 3.00 see sheet enable tables see sheet inhibit tables	V sec -	fail conditions exists for 0.05 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 	ignition on	=	TRUE	-	fail conditions exists for 0.28 s monitor runs with 0.01 s rate whenever enable	A

Component / System	Fault Code	Monitor Strategy Description	Primary Malfunction Criteria	Threshold Logic and Value	Secondary Parameters		Enable Conditions		Time Required	MIL Illum.
					and Battery voltage for	>	10.50	V	conditions are met	
					time and basic enable conditions met:	>	3.00 see sheet enable	sec		
					and		tables			
					NO Pending or Confirmed DTCs	=	see sheet inhibit tables	-		
							_	-		
O2 Sensor Out of Range During Deceleration Bank 1 Sensor 1		DFCO, which monitors a deviation of the raw A/F	difference between filtered calculated A/F concentration and measured A/F sensor concentration -> refer to Column 2 in the table (see Look-Up-Table #50)	> 0.06 to 0.07 -	following conditions met for Integrated air mass:	^	80	g	fail conditions exists for 0.1 s monitor runs	В
		sensor signal.	Note: Calculated A/F concentration is calculated as a function of Injection Quantity and Air Mass per cylinder (which is calculated on MAF sensor and EGR)		Engine speed ->refer to the Column 2 in the table (see Look-Up-Table #47)	<	2700 to 4500		with 0.02 s rate whenever enable conditions are met	
					Injection quantity -> refer to the Column 2 in the table (see Look-Up-Table #49)	>	-1.0 to 16	mm^3/r ev		
					Injection quantity -> refer to the Column 2 in the table (see Look-Up-Table #48)	<	0.4 to 44	mm^3/r ev		
					Air mass per cylinder ->refer to the Column 12in the table (see Look-Up- Table #46)	>	0.09 to 0.25	g/rev		
					Air mass per cylinder ->refer to the Column 2 in the table (see Look-Up- Table #45)	<	0.25 to 0.45	g/rev		
					DPF regeneration not active Post injection is not active (post injection only active during cold start catalyst heating or DPF regeneration)	= =	TRUE TRUE	-		
					Temperature of A/F sensor (based on sensor internal resistance)	=<	805.96	°C		
					Temperature of A/F sensor (based on sensor internal resistance)	>=	823.96	°C		

Component / System	Fault Code	Monitor Strategy Description	Primary Malfunction Criteria	Threshold Logic and Value	Secondary Parameters	Enable Condition		Time Reguired	MIL Illum.
System	Coue	Description	Unteria		Absolute change in actual calculated O2 concentration for time Fuel volume in fuel tank Battery voltage Decel Fuel Cut-Off (DFCO) NO Pending or Confirmed DTCs: basic enable conditions met:	 < 0.02 >= 1.50 >= 0.00 >= 11.00 = TRUE = see sheet inh tables = see sheet ena tables 	- I V - ibit -	required	inum.
		DFCO, which monitors a deviation of the raw A/F sensor signal and calculated	difference between measured A/F sensor concentration and filtered calculated A/F concentration -> refer to Column 2 in the table (see Look-Up-Table #51)	> 0.04 to 0.07 -	following conditions met for Integrated air mass:	> 80	g	fail conditions exists for 0.1 s monitor runs	
		sensor signal.	Note: Calculated A/F concentration is calculated as a function of Injection Quantity and Air Mass per cylinder (which is calculated on MAF sensor		Engine speed ->refer to the Column 2 in the table (see Look-Up-Table #47)	< 2700 to 450	0 rpm	with 0.02 s rate whenever enable conditions are met	
			and EGR)		Injection quantity -> refer to the Column 2 in the table (see Look-Up-Table #49)	> -1.0 to 16	mm^3/r ev		
					Injection quantity -> refer to the Column 2 in the table (see Look-Up-Table #48)	< 0.4 to 44	mm^3/r ev		
					Air mass per cylinder ->refer to the Column 12in the table (see Look-Up- Table #46)	> 0.09 to 0.2	5 g/rev		
					Air mass per cylinder ->refer to the Column 2 in the table (see Look-Up- Table #45)	< 0.25 to 0.4	5 g/rev		
					DPF regeneration not active Post injection is not active (post injection only active during cold start	= TRUE = TRUE	-		
					catalyst heating or DPF regeneration) Temperature of A/F sensor (based on sensor internal resistance)	=< 805.96	°C		
					Temperature of A/F sensor (based on sensor internal resistance)	>= 823.96	°C		

Component / System	Fault Code	Monitor Strategy Description	Primary Malfunction Criteria	Threshold Logic and Value	Secondary Parameters	Enable Conditions		Time Required	MIL Illum.
					Absolute change in actual calculated O2 concentration for time Fuel volume in fuel tank Battery voltage Decel Fuel Cut-Off (DFCO) NO Pending or Confirmed DTCs: basic enable conditions met:	< 0.02 >= 1.50 >= 0.00 >= 11.00 = TRUE = see sheet inhibit tables = see sheet enable tables	- Sec I V - -		
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 Engine Running for time Can Bus Initialized (CAN Bus is Active) consisting of: ignition on for time battery voltage Downstream NOx sensor dewpoint achieved (please see the definition) no pending or confirmed faults basic enable conditions met:	 > 10.00 >= 11.00 <= 655.34 >= 99.96 = TRUE >= 20.00 = TRUE = TRUE = 3 > 9.8 < 655.34 = TRUE = see sheet inhibit tables = see sheet enable tables 	V V °C - sec - Sec V V - -	fail conditions exists for more than 13 s monitor runs with 0.1 s rate whenever enable conditions are met	A
		circuit error via the CAN	Short circuit NOx signal error of downstream NOx sensor via CAN message	= TRUE -	following conditions for time	> 10.00	sec	fail conditions exists for more than 13	

s tor runs 1.1 s rate enever hable tions are	monitor runs with 0.1 s rate whenever enable conditions are met	V V°C °C - sec - Sec V V	Conditions 11.00 655.34 99.96 599.96 TRUE 20.00 TRUE	(>= <= >= >= =	Parameters battery voltage battery voltage SCR downstream temperature SCR downstream temperature	Logic and Value	Criteria	Description	Code	System
tor runs 1.1 s rate enever nable tions are	monitor runs with 0.1 s rate whenever enable conditions are met	V °C - sec - sec V	655.34 99.96 599.96 TRUE 20.00	<= >= <= >=	battery voltage SCR downstream temperature					
1.1 s rate enever hable tions are	with 0.1 s rate whenever enable conditions are met	°C °C - sec - sec V	99.96 599.96 TRUE 20.00	>= <= = >=	SCR downstream temperature					
enever hable tions are	whenever enable conditions are met	°C - sec - sec V	599.96 TRUE 20.00	<= = >=						
nable tions are	enable conditions are met	- sec - sec V	TRUE 20.00	= >=	SCR downstream temperature					
tions are	conditions are met	sec - sec V	20.00	>=						
	met	- sec V			Engine Running					
net	5	- sec V	TRUE	=	for time					
		sec V			Can Bus Initialized (CAN Bus is Active					
		sec V)					
		sec V			consisting of:					
		V	TRUE	=	ignition on					
			3	>=	for time					
		1/	9.8	>	battery voltage					
		v	655.34	<	battery voltage					
		-	TRUE	=	Downstream NOx sensor dewpoint					
					achieved (please see the definition)					
		-	see sheet inhibit	= see	no pending or confirmed faults					
			tables							
		-	see sheet enable	= see	basic enable conditions met:					
			tables							
onditions B	fail conditions		See sheet	=	NO Pending or Confirmed DTCs:	< 3.00 ppm	Maximum deviation of downstream NOx	Compares Delta NOx	P229F	NOx Sensor Circuit
	exists for	-	inhibit table		NO Pending of Confirmed DTCs.	< 3.00 ppm	concentration from the state machine 5	concentration of downstream	P229F	Range/Performance
	more than 1						concentration from the state machine_5	NOx sensor with a threshold		Bank 1 Sensor 2
	event							NOX SENSOR WILL A UTLESTICIO		Dalik i Selisui Z
	monitor runs	-	TRUE	=	Status of NOx signal of upstream NOx					
	with 0.01s	-	TRUE	-	sensor (please see the definition)					
			0.00	>	for time					
	enable	sec	TRUE	=	Status of NOx signal of downstream NOx					
	conditions are	-	IRUE	-						
		800	0.00							
liet										
	´ I	360								
		-	FALSE	-						
	1				check active (please see the delifilition)					
		sec	0.00	>	for time					
	, 									
		°C	200.00						1	1
		°C ℃	380.06	>=	SCR catalyst average temperature					
conditi	с еС 1	sec g/sec rpm sec - sec °C	0.00 2.78 200.00 10.00 FALSE 0.00 180.06 285.06	> > > = >=	sensor (please see the definition) for time exhaust gas mass flow engine speed for time Status of the SCR adaptation plausibility check active (please see the definition) for time SCR catalyst average temperature SCR catalyst average temperature					

Component / System	Fault Code	Monitor Strategy Description	Primary Malfunction Criteria	Threshold Logic and Value	Secondary Parameters	Enable Conditions		Time Required	MIL Illum.
					(State machine_0 : starting state and waiting for low upstream NOx mass flow / concentration (Filtered upstream NOx mass flow Filtered NOx concentration Exhaust mass flow message for time)	< 0.03 < 260.00 < 40.28 < 2.00	g/sec ppm g/sec sec		
					State machine_1 : low upstream NOx mass flow /concentration reached				
					(Old State machine_0 : starting state and waiting for low upstream NOx mass flow / concentration	= TRUE	-		
					for time Filtered upstream NOx mass flow	>= 2.00 < 0.03	sec g/sec		
					Filtered NOx concentration Exhaust mass flow message	< 260.00 < 40.28	ppm g/sec		
					captured minimum downstream NOx concentration in State machine_1	= Measured parameter	ppm		
					State machine_2 : start Upstream NOx peak				
					Old State machine_1 : low upstream NOx mass flow /concentration reached	= TRUE	-		
					(Filtered upstream NOx mass flow or	> 0.03	g/sec		
					Filtered NOx concentration	> 260.00	ppm		
					or Exhaust mass flow message)	> 40.28	g/sec		
)))	< 1.50	sec		
					State machine_3 : Upstream NOx peak detection				

Component /	Fault	Monitor Strategy	Primary Malfunction	Threshold	Secondary		Enable		Time	MIL
System	Code	Description	Criteria	Logic and Value	Parameters		Conditions		Required	Illum.
					(Old State machine_2 : start Upstream NOx peak	=	TRUE	-		
					for time	>=	1.50	sec		
					Filtered upstream NOx mass flow	>=	0.04	g/sec		
					Filtered NOx concentration	>=	360.00	ppm		
					Exhaust mass flow message	>=	61.12	g/sec		
					for time	>	1.20	sec		
					State machine_4 : delay for					
					downstream NOx peak evaluation					
					(Old State machine_3 : Upstream NOx peak detection	=	TRUE	-		
					for time	>=	1.20	sec		
					Absolute deviation of downstream NOx concentration: (a) - (b) and with	=	Measured parameter	ppm		
					(a) Filtered downstream NOx concentration	=	Measured parameter	ppm		
					(b) captured minimum downstream NOx concentration in State machine 1	=	Measured parameter	ppm		
					for time	>	50	sec		
					State machine_5 : end of downstream					
					NOx peak and evaluation					
					(
					Old State machine_4 : delay for downstream NOx peak evaluation	=	TRUE	-		
					for time	>=	50	sec		
					Maximum deviation of downstream NOx concentration among different states of state machine	=	3.00	ppm		
					Average upstream NOx mass flow in state machine 3 and 4	>=	0.04	g/sec		
					Average upstream NOx concentration in state machine 3 and 4	>=	320.00	ppm		
					NO Pending or Confirmed DTCs:	=	see sheet inhibit tables	-		
I	I	l	I))					

Component / System	Fault Code	Monitor Strategy Description	Primary Malfunction Criteria		Threshold Logic and Value		Secondary Parameters		Enable Conditions		Time Required	MIL Illum.
							basic enable conditions met:	=	see sheet enable tables	-	·	
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)	>	2400.00	ppm	Downstream NOx sensor ready status (see parameter definition) Valid NOx signal from CAN is received	=	TRUE	-	fault exists for more than 10 sec; monitor runs at 0.1 s	В
NOx Sensor Circuit	P22A0	Detects an out of range low	Downstream NOx sensor signal (raw	<	-90.00	ppm	(no NOx sensor communication failures)	=	TRUE		when enable conditions are met	
Low Bank 1 Sensor 2	FZZAU	fault of the downstream NoX Sensor	information received via CAN from NOx sensor)		-90.00	ррш	definition) for time	>	20.00	sec		
							and Injection Quantity or	>	4.00	mm^3/r ev		
							Downstream NOx sensor dewpoint achieved (please see the definition) for time	= >	TRUE 300.00	- sec		
NOx Heater Control Circuit Bank 1 Sensor 2	P22A3	Downstream NOx sensor heater open circuit error via the CAN message	Open circuit heater error of downstream NOx sensor via CAN message	=	TRUE	-	following conditions for time	>	10.00	sec	fail conditions exists for more than 13	A
							battery voltage battery voltage	>= <=	11.00 655.34	V V	S	
							SCR downstream temperature	>=	99.96	°C	monitor runs with 0.1 s rate	
							SCR downstream temperature	<=	599.96	°Ĉ	whenever	
							Engine Running	=	TRUE	-	enable	
							for time Can Bus Initialized (CAN Bus is Active	>=	20.00 TRUE	sec	conditions are met	
) consisting of:	_			met	
							ignition on	=	TRUE	-		
							for time battery voltage	>=	3 9.8	sec V		
							battery voltage	<	655.34	v		

Component /	Fault	Monitor Strategy	Primary Malfunction	Threshold	Secondary		Enable		Time	MIL
System	Code	Description	Criteria	Logic and Value	Parameters		Conditions		Required	Illum.
					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 heater short circuit error via the CAN message	Short circuit heater error of downstream NOx sensor via CAN message	= TRUE -	following conditions for time battery voltage battery voltage SCR downstream temperature SCR downstream temperature	> > > + + + + + + + + + + + + + + + + +	10.00 11.00 655.34 99.96 599.96	sec V V °C °C	fail conditions exists for more than 13 s monitor runs with 0.1 s rate whenever	
					Engine Running for time Can Bus Initialized (CAN Bus is Active) consisting of: ignition on for time battery voltage battery voltage	= = = = , v	TRUE 20.00 TRUE 3 9.8 655.34	- sec - sec V V	enable conditions are met	
					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	-		
NOx Heater Performance Bank 1 Sensor 2		Monitoring of the downstream NoX sensor signal readiness	Downstream NOx sensor heater temperature has reached setpoint	= FALSE -	(battery voltage and battery voltage and SCR downstream temperature and	>= <= >=	11.00 655.34 99.96	V V °C	fault exists for more than 1 event when dewpoint end is reached; monitor runs at 0.02 s when enable conditions are	В

Component / System	Fault Code	Monitor Strategy Description	Primary Malfunction Criteria		Threshold Logic and Value		Secondary Parameters		Enable Conditions		Time Required	MIL Illum.
		2000.1911011					SCR downstream temperature	<=	599.96	°C	met	
							Engine running	=	TRUE	-		
							for time and	>	20.00	sec		
							Downstream NOx Sensor dewpoint achieved (please see the definition)	=	TRUE	-		
							for time and	>	150	sec		
							basic enable conditions met:	=	see sheet enable tables	-		
							No Pending or Confirmed DTCs	=	see sheet inhibit tables	-		
					_				_			_
NOx Sensor Performance - Slow Response High to Low Bank 1 Sensor 1	P22FA	Compare sensor response time with a threshold or if sensor signal does not reach 60% of initial vale within a	Upstream NOx response time between 30% and 60% of the initial value	>	1.80	sec	engine speed	>=	1320.00	rpm	fault exists for more than 2 events; monitor runs	В
		threshold time	or				Combusted injection quantity	>=	60.00	mm^3/r	at 0.02 s when enable	
			Upstream NOx concentration	>	60% NOx concentration of initial value	-	Combusted injection quantity	<=	(a) + 20	ev mm^3/r ev	conditions are met	
			for time	>=	4.00	sec	(a) initial injection quantity for upstream NOx sensor dynamic response	=	measured parameter	-		
							(b) upper injection quantity limit for upstream NOx sensor dynamic response	=	36.00	mm^3/r ev		
							Combusted injection quantity	>=	(a) - 20	mm^3/r ev		
							(a) initial injection quantity for upstream NOx sensor dynamic response	=	measured parameter	-		
							(b) lower injection quantity limit for upstream NOx sensor dynamic	=	36.00	mm^3/r ev		
							response for time	>	1.20	sec		
I		I	I I				Upstream NOx concentration	>=	80.00	ppm	I I	I

Component /	Fault	Monitor Strategy	Primary Malfunction		Threshold		Secondary		Enable		Time	MIL
System	Code	Description	Criteria	L	ogic and Value		Parameters Operating condition change from fueling to DFCO Combusted injection quantity	<=	Conditions	mm^3/r	Required	Illum.
									0.00	ev		
							for time basic enable conditions met:	>= =	1.60 see sheet enable tables	sec -		
NOx Sensor Performance - Sensing Element Bank 1 Sensor 2	P22FE	which occurs within the NOx sensor and reported to the ECM , which runs in the ECM afterrun, and measures the	average stored NOx sensor self- diagnostic result	>	150.00	%	General Conditions required before Shutdown:				fault exists 3 times per driving-cycle; monitor run at 0.1 s rate	В
		sensor drift by comparing to a reference point.		_	50.00	0/			10.00		during ECM afterrun	
			average stored NOx sensor self- diagnostic result	<	50.00	%	minimum engine run time	>=	10.00	sec		
							NOx sensor signal is valid (e.g. No CAN error of NOx CAN messages)	=	TRUE	-		
							measured downstream NOx temperature upstream of the SCR catalyst	< >=	200.00 49.96	°C		
							temperature upstream of the SCR catalyst	<=	499.96	°C		
							DPF regeneration active	=	FALSE	-		
							engine speed engine speed	>= <=	0.00 1000.00	rpm rpm		
							battery voltage	>=	11.00	V		
							battery voltage	<=	655.34	V		
							NO Pending or Confirmed DTCs:	=	see sheet inhibit tables	-		
							NOx sensor heater status means	=	TRUE	-		
							NOx sensor has sent via CAN that heater temperature setpoint has been reached (i.e. dewpoint achieved and no heater faults)	=	TRUE	-		
1							Afterrun Conditions:					

Component / System	Fault Code	Monitor Strategy	Primary Malfunction Criteria		Threshold ogic and Value		Secondary Parameters		Enable Conditions		Time Required	MIL Illum.
System	Code	Description	Criteria	L	ogic and value		NO Pending or Confirmed DTCs:	=	see sheet inhibit	-	Required	IIIum.
							ECM operating in Afterrun (please see	=	tables TRUE	-		
							the definition) vehicle speed	=	0			
							measured downstream NOx	<=	200.00	ppm		
							DPF regeneration active engine speed	= >=	FALSE 0.00	- rpm		
							engine speed	<=	1000.00	rpm		
							NOx sensor signal is valid (e.g. No	=	TRUE	·		
							CAN error of NOx CAN messages) maximum duration in afterrun	<=	150			
							number of self-diagnostic attempts	>=	4.00	sec counts		
							status sensor reaction in afterrun	<	50.00	sec		
							(sensor is reheated as necessary prior to start of afterrun test execution)					
							means NOx sensor has sent via CAN that heater temperature setpoint has been reached (i.e. dewpoint achieved and no heater faults)	=	TRUE	-		
					_	_						_
Exhaust Gas Temperature Too High Bank 1	P2428	Detects excessive exhaust gas temperatures in order to protect the diesel particulate filter	One of the following five conditions:	=	TRUE	-	Basic enable conditions met:	=	see sheet enable tables	-	fail conditions exists for 6 s test performed	A
			with				and				continuously	
			(a) oxidation catalyst upstream temperature or	>	799.96	°C	NO Pending or Confirmed DTCs:	=	see sheet inhibit tables	-	0.1 s rate	
			(b) oxidation catalyst downstream temperature	>	899.96	°C						
			or (c) particulate filter downstream temperature or	>	799.96	°C						

Component / System	Fault Code	Monitor Strategy Description	Primary Malfunction Criteria		Threshold Logic and Value		Secondary Parameters	Enable Conditio		Time Required	MIL Illum.
-,			 (d) difference between oxidation catalyst downstream temperature and the oxidation catalyst upstream temperature or (e) difference between particulate filter downstream temperature and oxidation catalyst downstream temperature 	~ ~	400.00	°C °C					
Exhaust Gas Temperature (EGT) Sensor 3 Sensor Circuit Low Voltage		Detects low voltage readings on the EGT 3 circuit, indicating an OOR low condition on the EGT 3	particulate filter downstream temperature sensor voltage same as particulate filter downstream temperature	v v	0.55 -50.04	°C	ignition on and basic enable conditions met:	= TRUE = see sheet e tables	nable -	fail conditions exists for 0.05 s monitor runs 0.05 s rate whenever enable conditions are met	A
Exhaust Gas Temperature (EGT) Sensor 3 Circuit High Voltage		Detects high voltage readings on the EGT 3 circuit, indicating an OOR high condition on the EGT 3	particulate filter downstream temperature sensor voltage same as particulate filter downstream temperature	>	2.33 999.6	°C	ignition on and basic enable conditions met:	= TRUE = see sheet e tables	nable -	fail conditions exists for 0.05 s monitor runs 0.05 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.
Diesel Particulate Filter Differential Pressure Sensor Performance	P2453		Absolute differential pressure of particle filter	> 3.20 kPa	Engine control unit in after-run state and NO Pending or Confirmed DTCs and basic enable conditions met	= TRUE - = see sheet inhibit - tables see sheet enable - tables	fail conditions exists for 0,2s monitor runs with 0.001 s rate whenever enable conditions are met	В
		Comparison of change in exhaust gas volume to the resulting change in the measured differential pressure sensor reading	(Exhaust gas volume flow change and Pressure difference change (see Look- Up-Table #26)	> 100.00 m^3/h/sec < 0.5 to 1.5 kPa/sec	Exhaust gas volume flow	>= 40.00 m^3/h <= 60.00 m^3/h	fail conditions exists for 3s monitor runs with 0.001 s rate whenever enable conditions are met	
)		(Engine Speed) for time and NO Pending or Confirmed DTCs basic enable conditions met	>= 600.00 rpm > 5.00 sec = see sheet inhibit - tables = 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.
Diesel Particulate Filter Differential Pressure Sensor Circuit Low Voltage	P2454	Detects low voltage readings on the DPF differential pressure sensor circuit, indicating an OOR low condition on the circuit	voltage of differential pressure sensor same as differential pressure	<	-3.75	V kPa	ignition on and basic enable conditions met: and NO Pending or Confirmed DTCs:	-	TRUE see sheet enable tables see sheet inhibit tables	-	fail conditions exists for 2.5 s test performed continuously 0.020 s rate	В
Diesel Particulate Filter Differential Pressure Sensor Circuit High Voltage	P2455	Detects high voltage readings on the DPF differential pressure sensor circuit, indicating an OOR high condition on the circuit	voltage of differential pressure sensor same as differential pressure	>	4.50	V kPa	ignition on and basic enable conditions met: and NO Pending or Confirmed DTCs:	=	TRUE see sheet enable tables see sheet inhibit tables	-	fail conditions exists for 3 s test performed continuously 0.020 s rate	В
Exhaust Gas 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	<	0.75	-	following conditions for time (engine speed and engine speed) and (>= >= <=	120.00 1000.00 3000.00	sec rpm rpm	fail conditions exists for 0.1 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	Logic and Value	Parameters		Conditions		Required	Illum.
					injection quantity	>=	9.88	mm^3/r ev		
					and					
					injection quantity	<=	120.00	mm^3/r		
					、 、			ev		
) and					
					(
					recirculated exhaust-gas mass flow downstream of the EGR cooler	>=	6.94	g/sec		
					and recirculated exhaust-gas mass flow	<=	27.78	a/200		
					downstream of the EGR cooler	~-	21.10	g/sec		
					and					
					EGR controller is active	=	TRUE	-		
					and					
					((a) - (b)	>=	60.00	к		
					with					
					(a) filtered temperature upstream of					
					EGR-cooler and with					
					(b) engine temperature					
)					
					and					
					((a) - (b)	<=	3276.70	°C		
					with	-	0210.10	Ŭ		
					(a) filtered temperature upstream of	=	measured	-		
					EGR-cooler		parameter			
					and with (b) engine temperature	=	measured	-		
					(b) engine temperature	-	parameter	-		
)					
					and engine coolant temperature	>=	69.96	°C		
					and	~-	09.90	C		
					engine coolant temperature	<=	125.96	°C		
					and (
					actual valve position of exhaust-gas	>=	5	%		
I	I	I	l	I	recirculation			I	l	I

Component /	Fault	Monitor Strategy	Primary Malfunction	Threshold	Secondary	Enable		Time	MIL
System	Code	Description	Criteria	Logic and Value	Parameters	Conditions		Required	Illum.
					and actual valve position of exhaust-gas recirculation) and	<= 100.00	%		
					(control value provided for EGR cooling bypass and	>= -400.00	%		
					control value provided for EGR cooling bypass for	<= 5.00	%		
					time) and	> 10.00	sec		
					ambient pressure and	>= 74.80	kPa		
					ambient temperature	>= -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	comparing a threshold to a soot model.	soot mass in the particulate filter (measured used for determining DPF regeneration trigger)	> ((a) - (b)) + ((c) * g (d))	particulate filter regeneration - transition false to true	= TRUE	-	fail conditions exists for more than 1 event	В
Filter Regeneration	1 2439	regeneration too frequently by comparing a threshold to a soot model.	(measured used for determining DPF	(d)) (d))		- IKUL	-		exists for more than 1

Component /	Fault	Monitor Strategy	Primary Malfunction		Threshold		Secondary		Enable		Time	MIL
System	Code	Description	Criteria (a) engine out soot mass flow in the exhaust-gas (function of vehicle speed only) and with (b) soot mass at the end of previous DPF regeneration and with (c) factor for calculation of a soot mass value offset depending on the simulated maximal base soot mass (see Look-Up-Table #61) and with (d) factor for determination of correction factor for ash in the particulate filter	=	Logic and Value measured parameter calculated parameter 0 to 1040	- g	Parameters last particulate filter regeneration successful or particulate filter regeneration must have been completed and basic enable conditions met: and NO Pending or Confirmed DTCs:	=	Conditions TRUE TRUE see sheet enable tables see sheet inhibit tables	-	Required 0.1 s rate whenever enable conditions are met	IIIum.
EGR Cooler Bypass Control Circuit/Open Bank 1			Voltage low during driver off state (indicates open circuit)	=	Open Circuit: ≥ 200 K Ω impedance between ECU pin and load signal and controller ground		ignition on and basic enable conditions met: and NO Pending or Confirmed DTCs:	=	TRUE see sheet enable tables see sheet inhibit tables	-	fail conditions exists for 3 s monitor runs with 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.
EGR Cooler Bypass Control Circuit Low Bank 1		Monitoring the EGR cooler bypass control circuit for circuit low failures	Voltage low during driver off state	 Short to ground: - ≤ 0.5 Ω impedance between signal and controller ground 	and basic enable conditions met: and NO Pending or Confirmed DTCs:	= TRUE - = see sheet enable - tables = see sheet inhibit - tables	fail conditions exists for 3 s monitor runs with 0.02 s rate whenever enable conditions are met	В
EGR Cooler Bypass Control Circuit High Bank 1	P245D	Monitoring theEGR cooler bypass control circuit for circuit high failures	Voltage high during driver on state (indicates short to power)	 Short to power: - ≤ 0.5 Ω impedance between signal and controller power 	ignition on and basic enable conditions met: and NO Pending or Confirmed DTCs:	 TRUE - see sheet enable - tables see sheet inhibit - tables 	fail conditions exists for 3 s monitor runs with 0.02 s rate whenever enable conditions are met	В
Diesel Particulate Filter - Soot Accumulation	P2463	Detects high levels of soot in the DPF as indicated by the soot model	Soot mass in the particulate filter	> 32.00 g	ignition on and	= TRUE -	fail conditions exists for 30 s test performed	A

Component / System	Fault Code	Monitor Strategy Description	Primary Malfunction Criteria	Threshold Logic and Value	Secondary Parameters basic enable conditions met: and NO Pending or Confirmed DTCs:	Enable Conditions see sheet enable - = tables see sheet inhibit - = tables	Time Required continuously 0.1 s rate	MIL Illum.
Closed loop Reductant Injection Control at Limit-Flow too high			long term adaptation factor of Reductant quantity	> 1.45 factor	long term adaption triggered NO Pending or Confirmed DTCs basic enable conditions met:	= see sheet inhibit - 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		long term adaptation factor of Reductant quantity	< 0.55 factor	long term adaption triggered NO Pending or Confirmed DTCs basic enable conditions met:	= see sheet inhibit - tables = see sheet enable -	fault exists for more than 0.1 s; monitor runs at 0.1 s whenever enable conditions are met	В

Component / System	Fault Code	Monitor Strategy Description	Primary Malfunction Criteria		Threshold Logic and Value		Secondary Parameters		Enable Conditions		Time Required	MIL Illum.
EGR Cooler Bypass Control Stuck Bank 1	P24A5	Monitoring of the absolute	Change in temperature downstream of EGR cooler	×	2.20	℃	for time engine speed engine speed engine speed engine speed EGR flow rate for time vehicle speed DPF regeneration mode active engine coolant temperature engine coolant temperature filtered signal of the exhaust gas temperature time between monitoring attempts diagnostic completed this dc basic enable conditions met: No Pending or Confirmed DTCs	v		sec rpm rpm - °C °C °C °C °C sec - -	fail conditions exists for more than 0.1 sec monitor runs with 0.02 s rate whenever enable conditions are met	B
Particulate Matter Sensor Circuit Range/Performance	P24AF		Measured particulate sensor Interdigital Electrode (IDE) current after sensor regeneration	>	5.00	μΑ	PM Sensor temperature and PM Sensor temperature Particulate sensor regeneration is completed	> < =	200.00 425.00 TRUE	°C °C -	fault exists for more than 5 sec; monitor runs at 0.1 s when enable conditions are met	В

Component /	Fault	Monitor Strategy	Primary Malfunction		Threshold		Secondary		Enable		Time	MIL
System	Code	Description	Criteria		Logic and Value		Parameters		Conditions		Required	Illum.
							Battery voltage (ECM) IDE supply voltage	>= >=	11.00 41.55	V V		
							and IDE supply voltage	<=	49,72	V		
							Ignition on	=	TRUE	v -		
							for time	>	3.00	sec		
									0.00			
Particulate Matter	P24B4	The PM sensor protection tube	accumulated change in heater voltage	<	100.00	%	Accumulated change in exhaust gas	>	30.00	m/sec	fault exists for	В
Sensor Heater Control		monitor uses the cooling effect	accumulated change in heater voltage		100.00	70	velocity	-	30.00	11/560	more than 0.1	Б
Circuit		of exhaust gas flow inside									sec; monitor	
Range/Performance		protection tube during									runs at 0.1 s	
		protection heating, to ensure									once per trip	
		the exhaust gas is reaching										
		the sensor. If the change in										
		heater voltage is less than a threshold a fault is set										
		(detected failures: protection										
		tube plugged or manipulated,										
		or sensor removed from exhaust stream)										
		,										
			with				(
			accumulated change in heater voltage	=	((a) / (b)) * (100)	-	Absolute, filtered and temperature compensated exhaust gas acceleration	>	0.65	m/sec^ 2		
			where				and					
			(a) change in the heater voltage	=	measured parameter	-	Absolute, filtered and temperature compensated exhaust gas acceleration	<	6.51	m/sec^ 2		
			and with)					
			(b) minimum change in the heater voltage	=	1.10	V	for time	>	0.90	sec		
							Diagnosis by the local unit is released means (=	TRUE	-		
							C PM sensor temperature and	>	190.00	°C		
							PM sensor temperature	<	210.00	°C		

Component /	Fault	Monitor Strategy	Primary Malfunction		Threshold		Secondary		Enable		Time	MIL
System	Code	Description	Criteria		Logic and Value	e	Parameters		Conditions		Required	Illum.
							Time has elapsed since diagnosis by the local unit is released	>=	15.00	sec		
							Protection heating is active means	=	TRUE	-		
							PM sensor heater target temperature	=	200	degC		
							PM sensor dewpoint achieved (please see the definition)	=	FALSE	-		
							Initialization values have been transferred (i.e. CAN communication with ECM established)	=	TRUE	-		
							Sensor temperature at engine start and	>	-10.04	°C		
							Sensor temperature at engine start	<	249.96	°C		
							Exhaust gas temperature and	>	-10.04	°C		
							Exhaust gas temperature	<	179.96	°C		
							PM sensor temperature start temperature	>	-10.04	°C		
							and					
							and PM sensor temperature start temperature	<	99.96	°C		
							Battery voltage (ECM)	>=	11.00	V		
Particulate Matter	P24B7	Rationality check of heater	A functional error of the heater self	=	TRUE	_	Functional heater self diagnosis is tested	=	TRUE		fault exists for	В
Sensor Heater Resistance	12107	resistance (heater aged),	diagnosis of the particulate sensor is detected in the sensor control unit		INCL				into 2		more than 0.1 sec; monitor runs at 0.1 s	D
			means				means				when enable conditions are	
			Electric heater resistance based on temperature as measured by temperature meander (see Look-Up-	>	2.93 to 4.13	Ohm	(met	
			Table #33)				Battery voltage (ECM)	>=	11.00	V		
			Electric heater resistance based on temperature as measured by temperature meander (see Look-Up-	<	1.09 to 1.81	Ohm	PM sensor temperature	>=	-30.00	°C		
			Table #34)				and					
							PM sensor temperature (a) - (b)	<= <	150.00 150.00	°C ℃		

Component / System	Fault Code	Monitor Strategy Description	Primary Malfunction Criteria	Threshold Logic and Value	Secondary Parameters	Enable Conditions		Time Required	MIL Illum.
					with (a) maximum PM sensor temperature and with (b) minimum PM sensor temperature)	= calculated parameter = calculated parameter	-		
					Debouncing time for the functional heater self diagnosis	> 0.00	sec		
ECM/PCM Power Input Signal	P2505		permanent supply voltage is interrupted via open circuit	= TRUE -	ignition on and basic enable conditions met:	= TRUE = see sheet enable tables		fail conditions exists for more than 1 event monitor runs once per driving cycle with 0.01 s rate whenever enable conditions are met	В
ECM Power Relay Circuit Performance	P2510		counter value out of EEPROM for open the main relay	> 2.00 counts	ignition on and engine pre drive	= TRUE = TRUE		fail conditions exists for 0.02 s monitor runs once per driving cycle during predrive with 0.02 s rate whenever enable	В

Component / System	Fault Code	Monitor Strategy Description	Primary Malfunction Criteria	L	Threshold ogic and Value		Secondary Parameters		Enable Conditions		Time Required	MIL Illum.
							and basic enable conditions met:	=	256.00	-	conditions are met	
		Opening too soon is indicated by a lack of EEPROM write at the last after run.	sticky main relay is detected	=	TRUE	-	ignition off	=	TRUE	-	fail conditions exists for 0.02 s monitor runs	
			means time after request to open the main relay	>	2.00	sec	and engine pre drive and	=	FALSE	- V	once per driving cycle during predrive with	
							battery voltage and basic enable conditions met: and	=	see sheet enable tables	-	0.02 s rate whenever enable conditions are met	
							NO Pending or Confirmed DTCs:	=	see sheet inhibit tables	-	inec	
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
			number of messages with rolling count / protection value errors detected with	>=	7.00	-	and basic enable conditions met:	=	see sheet enable	-	test performed continuously	
			number of consecutive frames or	=	10.00		and NO Pending or Confirmed DTCs:	=	tables see sheet inhibit tables	-	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	-						

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 Position Sensor Circuit Low Voltage	P2564	Detects low voltage readings on the turbo boost control position sensor circuit, indicating an OOR low condition on the circuit	voltage of boost pressure position sensor same as boost pressure position	<	0.23 4,6		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 0.5 s test performed continuously 0.01 s rate	В
Turbocharger Boost Control Position Sensor Circuit High Voltage	P2565	Detects high voltage readings on the turbo boost control position sensor circuit, indicating an OOR high condition on the circuit	voltage of boost pressure position sensor same as boost pressure position	>	4.68 93,5		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 0.5 s test performed continuously 0.01 s rate	В
Turbocharger Boost Control Position Sensor "A" Circuit Range/Performance - Stuck Low	P2598	Detects in range Turbo vane position errors by comparing desired vane position to actual vane position	turbo charger control deviation calculated out of difference between desired and actual value	>	10.00	%	engine running and valve not jammed and	=	TRUE - FALSE -	fail conditions exists for 10 s monitor runs with 0.02 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.
Turbocharger Boost Control Position Sensor "A" Circuit Range/Performance - Stuck High	P2599	Detects in range Turbo vane position errors by comparing desired vane position to actual vane position	turbo charger control deviation calculated out of difference between desired and actual value	<	-10.00	%	engine speed	>=	500.00	rpm		
Oluck High							and					
							system not faulty and	=	TRUE	-		
							adaption not active and	=	FALSE	-		
							offset learned since last clearing of fault code memory	=	TRUE	-		
							and engine running for	=	TRUE	-		
							time and	>	1.00	sec		
							(Engine temperature enable condition	>=	69.96	°C		
							and Engine temperature enable condition	<=	125.96	°C		
) and (
							Air temperature enable condition and	>=	-15.04	°C		
							Air temperature enable condition)	<=	199.86	°C		
							and Governor Deviation Diagnosis not disabled	=	TRUE	-		
							and (
							brake position sensor voltage for	<	1.20	V		
							time (see Look-Up-Table #35))	>	5 to 15	sec		
							and basic enable conditions met: and	=	see sheet enable tables	-		
							no pending or confirmed DTCs	=	see sheet inhibit tables	-		

Component / System	Fault Code	Monitor Strategy Description	Primary Malfunction Criteria	Threshold Logic and Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
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 and disabling the fuel injectors		> 5400.00 rpm	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 .01 s test performed continuously	A
Control Module Power Off Timer Performance	P262B	Detects a failure in the engine off timer if during the after run the internal SW timer and the EOT do not correlate. A failure is detected when the respective timers are started after a calibration time then both are stopped, if the difference between the calculated times exceeds a calibrated threshold a fault is set.	Path 1: acquired engine off time or Path 2: acquired engine off time (< (a) * (b) - > (c) * (b) -	time since engine post drive/ afterun and engine post drive/ afterun and basic enable conditions met:	< 20.00 sec = TRUE - = see sheet enable - tables	fail conditions exists for 0.01 s monitor runs once per driving cycle with 0.01 s rate whenever enable conditions are met	В

Component / System	Fault Code	Monitor Strategy Description	Primary Malfunction Criteria		Threshold Logic and Valu	10	Secondary Parameters		Enable Conditions		Time Required	MIL Illum.
			where (a) lower tolerance factor and (b) evaluation time period and (b) upper tolerance factor)	= =	0.94 20.00 1.06	factor sec factor						
MIL Control Circuit Low	P263A	Diagnoses the Malfunction Indicator Lamp (MIL) low side driver circuit for circuit faults.	Voltage low during driver off state (indicates short-to-ground)	=	Short to ground: ≤ 0.5 Ω impedance between signal and controller ground		circuit active at low current and ignition on and ECU Initialization tasks in progress for time and ECU Shutdown tasks in progress for time and Battery voltage for time and basic enable conditions met:	= = > > >	TRUE TRUE FALSE 0.10 FALSE 1.00 10.50 3.00 see sheet enable tables	- sec sec V sec	fail conditions exists for 3 s monitor runs with 0.01 s rate whenever enable conditions are met	
MIL Control Circuit High	P263B	Diagnoses the Malfunction Indicator Lamp (MIL) low side driver circuit for circuit faults.	Voltage high during driver on state (indicates short to power)	=	Short to power: $\leq 0.5 \Omega$ impedance between signal and controller power		lamp is commanded off and				fail conditions exists for 2 s monitor runs with 0.01 s rate whenever enable conditions are met	A (no MIL)

Component / System	Fault Code	Monitor Strategy Description	Primary Malfunction Criteria	Threshold Logic and Value	Secondary Parameters		Enable Conditions		Time Required	MIL Illum.
					ignition on and ECU Initialization tasks in progress for time and ECU Shutdown tasks in progress for time and Battery voltage for time and basic enable conditions met:	= 	TRUE FALSE 0.10 FALSE 1.00 10.50 3.00 see sheet enable tables	sec V sec -		
Fuel Supply Heater Control Circuit/Open	P2687	Diagnoses the Fuel Filter Heater low side driver circuit for open circuit faults.	Voltage low during driver off state (indicates open circuit)	 Open Circuit:> - 200 K Ω impedance between ECU pin and load 	engine post drive/ afterun for time and battery voltage for time and engine speed (see Look-Up-Table #81) for time and basic enable conditions met:	= ^ ^ ~ ~ ~	FALSE 1.00 11.00 3.00 850 to 1100 0.10 see sheet enable tables	sec V sec rpm sec -	fail conditions exists for 2 s monitor runs with 0.2 s rate whenever enable conditions are met	В

Component /	Fault	Monitor Strategy	Primary Malfunction	Threshold	Secondary	Enable	Time	MIL
System Fuel Supply Heater Control Circuit Low	Code P2688	Description Diagnoses the Fuel Filter Heater low side driver circuit for short circuit to ground faults.	Criteria Voltage low during driver off state (indicates short-to-ground)	Logic and Value = Short to ground: -	Parameters engine post drive/ afterun for time and battery voltage for time and engine speed (see Look-Up-Table #81) for time and basic enable conditions met:	Conditions = FALSE > 1.00 > 11.00 > 3.00 > 850 to 1100 > 0.10 = see sheet enable tables	Required fail conditions exists for 2 s monitor runs with 0.2 s rate whenever enable conditions are met	IIIum. B
Fuel Supply Heater Control Circuit High	P2689	Diagnoses the Fuel Filter Heater low side driver circuit for short circuit to battery faults.	Voltage high during driver on state (indicates short to power)	 Short to power: - ≤ 0.5 Ω impedance between signal and controller power 	engine post drive/ afterun for time and battery voltage for time and engine speed (see Look-Up-Table #81) for time and	 FALSE 1.00 11.00 3.00 850 to 1100 0.10 	fail conditions exists for 2 s monitor runs with 0.2 s rate whenever enable conditions are met	В

Component / System	Fault Code	Monitor Strategy Description	Primary Malfunction Criteria	Threshold Logic and Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
System	Code	Description	Gilena		basic enable conditions met:	= see sheet enable - tables	Keyuneu	mum.
Cylinder 1 Injector Data Incompatible	P268C	Detects a unprogrammed Injector Calibration Data (IQA) in ECM	Path 1: the checksum of the injector adjustment code value is plausible	= FALSE -	engine pre drive and basic enable conditions met:	= TRUE -	fail conditions exist for 1 s monitor runs once per driving cycle during predrive with 1 s rate	В
Cylinder 3 Injector Data Incompatible	P268E	Injector Calibration Data (IQA) in ECM	Path 1: the checksum of the injector adjustment code value is plausible	= 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	В
Cylinder 4 Injector Data Incompatible	P268F		Path 1: the checksum of the injector adjustment code value is plausible	= FALSE -	engine pre drive and	= TRUE -	fail conditions exist for 1 s monitor runs once per driving cycle	В

Component / System	Fault Code	Monitor Strategy Description	Primary Malfunction Criteria	Threshold Logic and Value	Secondary Parameters basic enable conditions met:	=	Enable Conditions see sheet enable tables		Time Required during predrive with 1 s rate	MIL Illum.
Cylinder 2 Injector Data Incompatible	P268D	Detects a unprogrammed Injector Calibration Data (IQA) in ECM	Path 1: the checksum of the injector adjustment code value is plausible	= 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	В
O2 Sensor Circuit Range/Performance Bank 1 Sensor 1	P2A00	Monitoring the measured A/F sensor voltage for higher than expected values, indicating an OOR high failure	filtered A/F sensor voltage	>= 4.70 V	modeled exhaust-gas pressure The calibration scheduler has requested a calibration sequence during signal acquisition A/F sensor temperature (based on sensor internal resistance) and Status bit for valid A/F sensor inner Resistance (see parameter definition table) and	< = >= =	250.00 TRUE 804.96 TRUE	kPa - °C -	fault exists for more than 2 sec; monitor runs at 0.1 s when enable conditions are met	В

Component /	Fault	Monitor Strategy	Primary Malfunction	Threshold	Secondary		Enable		Time	MIL
System	Code	Description	Criteria	Logic and Value	Parameters		Conditions		Required	Illum.
					A/F sensor error status bit (see parameter definition table) and Temperature of lambda sensor	= <	FALSE 823.96	- °C		
					and			°C		
					Temperature of lambda sensor	>	805.96	°C		
					basic enable conditions met:	=	see sheet enable	-		
						_	tables see sheet inhibit			
					NO Pending or Confirmed DTCs:	-	tables	-		
Reductant Delivery		Compared EWMA filtered	EWMA filtered pressure drop	< 365.00 kPa					fault exists for	A
Performance monitor		pressure drop with the							more than 1	
		threshold			Modeled SCR catalyst temperature	>=	199.96	°C	event; monitor runs at 0.1 s	
					Modeled SCR catalyst temperature	<=	399.96	°C	runs at 0.1 s	
					Temperature gradient of SCR	>=		°C/sec		
					Temperature gradient of SCR	<=	40.00	°C/sec		
					for time	>	0.20	sec		
					Exhaust mass flow	>	0.56	g/sec		
					Exhaust mass flow	<=	13.89	g/sec		
					(a) - (b) (a) Desired NH3 load level	> =	-0.30 calculated	g		
					(a) Desired NH3 load level	-	parameter	-		
					(b) estimated NH3 load level	=	calculated	-		
							parameter			
					Estimated NH3 load level	<	3.00	g		
					Status of the SCR adaptation plausibility	=	FALSE	-		
					check active (please see the definition)					
					DPF Regen not active	=	TRUE	-		
					Reductant dosing off request	=	FALSE	-		
					SCR control sub state (please see the	=	COSCR_METERI			
					definition) Dosed reductant amount of current		NGCONTROL	~		
					driving cycle	>=	7.00	g		
					Dosed reductant amount of current driving cycle	<=	100.00	g		
					Dwell time in Metering control substate	<=	42949672.95	sec		
					amplitude of SCR pressure signal	>=	0.00	kPa		
		1			amplitude of SCR pressure signal	<=	100.00	kPa		

Component /	Fault	Monitor Strategy	Primary Malfunction	Threshold	Secondary		Enable		Time	MIL
System	Code	Description	Criteria	Logic and Value	Parameters		Conditions		Required	Illum.
					State of Reductant injection valve	=	FALSE	-		
					Component Protection (please see					
					definition)					
					vehicle speed	<	4.38	mph		
					for time	>	4.00	sec		
					NO Pending or Confirmed DTCs	=	see sheet inhibit tables	-		
					basic enable conditions met:	=	see sheet enable	-		
							tables			
					EWMA fast initialization mode:					
					EWMA filter coefficient for Fast Initialization mode	=	0.28	factor		
					Maximum number of pressure drop per driving cycle in Fast Initialization mode	>=	3.00	counts		
					Total number of pressure drop for Fast	=	4.00	counts		
					Initialization mode					
					EWMA Rapid Response mode:		10.00			
					Pressure difference: (a) - (b)	>	-12.00	kPa		
					(a) measured pressure drop	=	measured parameter	-		
					(b) EWMA filtered pressure drop	=	calculated	-		
							parameter			
					EWMA filter coefficient for Response	=	0.20	factor		
					to Step Change mode Maximum number of pressure drop per	>=	3.00	count		
					driving cycle in Response to Step Change mode					
					Total number of pressure drop		8.00	count		
					measurement for Response to Step Change mode					
					EWMA stabilized mode:					
					EWMA filter coefficient for stabilized mode	=	0.20	factor		
					Total number of pressure drop for	=	1.00	counts		
l	I	I	1	I	stabilized mode					

Component / System	Fault Code	Monitor Strategy Description	Primary Malfunction Criteria	Threshold Logic and Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
Control Module Communication Bus "A" Off	U0073	ECM CAN 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 with 0.01 s rate.	В
Control Module Communication Bus "B" Off	U0074	ECM CAN Bus B off monitoring (sensor CAN network)	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 with 0.01 s rate.	В
Lost Communications with Transmission Control Module		between ECM (on-board	time since last message from transmission control module was received	> 0.60 sec	ignition on for time and battery voltage and battery voltage and basic enable conditions met: and NO Pending or Confirmed DTCs:	 TRUE - 3.00 sec 9.00 V 655.34 V see sheet enable - tables see sheet inhibit - tables 	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 Value		Parameters		Conditions		Required	Illum.
Lost Communications with Glow Plug Control Module	U0106	Detects loss of communication between ECM (on-board control unit) and GPCM (Glow Plug Control Module)	time since last message from glow plug control module was received	>	0.25	Sec	ignition on	=	TRUE	-	fail conditions exists for 10 s test performed continuously	В
							for time and	>=	3.00	sec	0.02 s rate	
							battery voltage and	>=	9.00	V		
							battery voltage and	<=	655.34	V		
							basic enable conditions met:	=	see sheet enable tables	-		
							and NO Pending or Confirmed DTCs:	=	see sheet inhibit tables	-		
Lost Communication	U012A	Detects loss of communication	time since last message from fuel pump	>	0.50	sec	ignition on	=	TRUE	-	fail conditions	В
With Chassis Control Module "A"		between ECM (on-board control unit) and Fuel Pump Control Module	control module was received								exists for 10 s test performed continuously	
							for time and	>=	3.00	sec	0.1 s rate	
							battery voltage and	>=	9.00	V		
							battery voltage and basic enable conditions met:	<=	655.34	V		
							and	-	see sheet enable tables	-		
							NO Pending or Confirmed DTCs:	=	see sheet inhibit tables	-		
						_				_		
Lost Communication with Reductant Control Module	U010E	CAN frame not received after a calibrated number of times	Counts up when message frame is not received in the time out interval	>	40.00	counts	CAN Bus is Active	=	TRUE	-	fail conditions exists for more than 5	A

Component /	Fault	Monitor Strategy	Primary Malfunction		Threshold		Secondary		Enable		Time	MIL
System	Code	Description	Criteria		ogic and Valu	Ie	Parameters Can Bus Initialized (CAN Bus is Active) consisting of: ignition for time battery voltage battery voltage	= > < > >	Conditions TRUE 5.00 655.34 9.00	- sec V V	Required sec monitor runs with 0.1 s rate	IIIum.
		protection value verification using a sliding window evaluation	DLS1 Sliding Window error counter within a number of message frames	>=	8.00 9.00		CAN Bus is Active Can Bus Initialized (CAN Bus is Active)	-	TRUE		monitor runs with 1 s rate	
							consisting of: ignition for time battery voltage battery voltage	= > < > > > > > > > > > > > > > > > > >	TRUE 5.00 655.34 9.00	sec V V		
		CAN frame rolling counter and protection value verification using a sliding window evaluation	DLS2 Sliding Window error counter	>=	8.00	counts	CAN Bus is Active	=	TRUE	-	monitor runs with 1 s rate	
		Check of temperature sensor	within a number of message frames	=	9.00	counts	Can Bus Initialized (CAN Bus is Active) consisting of: ignition for time battery voltage battery voltage	= > < >	TRUE 5.00 655.34 9.00	sec V V		

Component / System	Fault Code	Monitor Strategy Description	Primary Malfunction Criteria		Threshold Logic and Valu	10	Secondary Parameters		Enable Conditions		Time Required	MIL Illum.
System	Code		DLS3 Sliding Window error counter	>=	8.00		CAN Bus is Active	=	TRUE	-	monitor runs with 1 s rate	mum.
			within a number of message frames	=	9.00	counts	Can Bus Initialized (CAN Bus is Active) consisting of: ignition for time battery voltage battery voltage	= ^ ~ >	TRUE 5.00 655.34 9.00	- sec V V		
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		CAN Bus is Active Can Bus Initialized (CAN Bus is Active) consisting of: ignition for time battery voltage battery voltage	= > < >	TRUE 5.00 655.34 9.00	- sec V 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 concentration	Sliding window error counter within a number of message frames	=	4.00	counts	CAN Bus is Active Can Bus Initialized (CAN Bus is Active) consisting of: ignition for time battery voltage battery voltage	= = ^ ~ ~	TRUE 5.00 655.34 9.00	- sec V V	monitor runs whenever enable conditions are met	

Component / System	Fault Code	Monitor Strategy Description	Primary Malfunction Criteria	L	Threshold ogic and Valu	Je	Secondary Parameters		Enable Conditions		Time Required	MIL Illum.
		CAN frame rolling counter and protection value verification using a sliding window evaluation Check of engine out NOx	Sliding window error counter within a number of message frames	>=	4.00		CAN Bus is Active Can Bus Initialized (CAN Bus is Active)	=	TRUE	-	monitor runs whenever enable conditions are met	
		sensor status					consisting of: ignition for time battery voltage battery voltage	= > < >	TRUE 5.00 655.34 9.00	sec V V		
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: ignition for time battery voltage battery voltage	= = ^ ~ ^	TRUE 5.00 655.34 9.00	- sec V V	fail conditions exists for more than 20 sec monitor runs with 0.005 s rate	
		CAN frame rolling counter and protection value verification using a sliding window evaluation Check of engine out NOx sensor error status	Sliding window error counter within a number of message frames	=	4.00	counts	CAN Bus is Active Can Bus Initialized (CAN Bus is Active) consisting of: ignition for time battery voltage	= = > <	TRUE TRUE 5.00 655.34	- sec V	monitor runs whenever enable conditions are met	

Component / System	Fault Code	Monitor Strategy Description	Primary Malfunction Criteria	I	Threshold .ogic and Valu	ue	Secondary Parameters battery voltage	>	Enable Conditions 9.00	V	Time Required	MIL Illum.
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		CAN Bus is Active Can Bus Initialized (CAN Bus is Active) consisting of: ignition for time battery voltage battery voltage	= > < >	TRUE 5.00 655.34 9.00	- sec V V	fail conditions exists for more than 20 sec monitor runs with 0.005 s rate	
		CAN frame rolling counter and protection value verification using a sliding window evaluation Check of engine out NOx sensor oxygen concentration	Sliding window error counter within a number of message frames	=	8.00		CAN Bus is Active Can Bus Initialized (CAN Bus is Active) consisting of: ignition for time battery voltage battery voltage	= > < >	TRUE 5.00 655.34 9.00	- sec V V	monitor runs whenever enable conditions are met	
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		CAN Bus is Active Can Bus Initialized (CAN Bus is Active) consisting of: ignition for	=	TRUE	-	fail conditions exists for more than 20 sec monitor runs with 0.02 s rate	

Component / System	Fault Code	Monitor Strategy Description	Primary Malfunction Criteria	L	Threshold ogic and Valu	e	Secondary Parameters time battery voltage	> <	Enable Conditions 5.00 655.34	sec V	Time Required	MIL Illum.
							battery voltage	>	9.00	V		
		CAN frame rolling counter and protection value verification using a sliding window evaluation Check of engine out NOx	Sliding window error counter within a number of message frames	>=	8.00		CAN Bus is Active Can Bus Initialized (CAN Bus is Active)	=	TRUE	-	monitor runs whenever enable conditions are met	
		sensor heater resistance					consisting of: ignition for time	=	TRUE 5.00 655.34	- sec		
							battery voltage battery voltage	< >	9.00	V V		
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	>	12.00		CAN Bus is Active Can Bus Initialized (CAN Bus is Active)	=	TRUE	-	fail conditions exists for more than 20 sec monitor runs with 0.1 s rate	
							consisting of: ignition for time battery voltage battery voltage	= ^ < >	TRUE 5.00 655.34 9.00	sec V V		
Post Catalyst NOx Sensor CAN Message #1	U029E	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 more than 21	A
		number of times					Can Bus Initialized (CAN Bus is Active) consisting of:				sec monitor runs with 0.005 s rate	

Component /	Fault	Monitor Strategy	Primary Malfunction		Threshold		Secondary		Enable		Time	MIL
System	Code	Description	Criteria	L	ogic and Valu	e	Parameters ignition	=	Conditions TRUE	-	Required	Illum.
							for time	>	5.00	sec		
							battery voltage	<	655.34	V		
							battery voltage	>	9.00	V		
					_	_		_	_	_		
		CAN frame rolling counter and	Sliding window error counter	>=	4.00	counts	CAN Bus is Active	=	TRUE	-	monitor runs	
		protection value verification using a sliding window									whenever enable	
		evaluation									conditions are	
		Check of post catalyst NOx concentration	within a number of message frames	=	10.00	counts	Can Bus Initialized (CAN Bus is Active)				met	
		concentration					consisting of:					
							ignition for	=	TRUE	-		
							time	>	5.00	sec		
							battery voltage battery voltage	< >	655.34 9.00	V V		
							ballery vollage	-	9.00	v		
					_	_		_	_	_	_	
		CAN frame rolling counter and	Sliding window error counter	>=	4.00	counts	CAN Bus is Active	=	TRUE	-	monitor runs	
		protection value verification using a sliding window									whenever enable	
		evaluation									conditions are	
		Check of post catalyst NOx sensor status	within a number of message frames	=	10.00	counts	Can Bus Initialized (CAN Bus is Active)				met	
							consisting of:					
							ignition for	=	TRUE	-		
							time	>	5.00	sec		
							battery voltage battery voltage	< >	5.00 655.34	sec V		
							ballery vollage	-	9.00	v		
					_							
Post Catalyst NOx			Counts up when message frame is not	>	5.00	counts	CAN Bus is Active	=	TRUE	-	fail conditions	
Sensor CAN Message #2		message #2 frame not received after a calibrated	received in the time out interval								exists for more than 21	
	I	number of times									sec	

Component / System	Fault Code	Monitor Strategy Description	Primary Malfunction Criteria	I	Threshold Logic and Valu	ie	Secondary Parameters		Enable Conditions		Time Required	MIL Illum.
							Can Bus Initialized (CAN Bus is Active) consisting of: ignition for time battery voltage battery voltage	= > < >	TRUE 5.00 655.34 9.00	sec V V	monitor runs with 0.005 s rate	
			Sliding window error counter within a number of message frames	>=	4.00		CAN Bus is Active Can Bus Initialized (CAN Bus is Active)	-	TRUE	-	monitor runs whenever enable conditions are met	
		sensor error status					consisting of: ignition for time battery voltage battery voltage	= > < >	TRUE 5.00 655.34 9.00	sec V V		
Post 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		CAN Bus is Active Can Bus Initialized (CAN Bus is Active) consisting of: ignition for time battery voltage battery voltage	= > ~ >	TRUE 5.00 655.34 9.00	- sec V V	fail conditions exists for more than 21 sec monitor runs with 0.005 s rate	

ſ	Component /	Fault	Monitor Strategy	Primary Malfunction		Threshold		Secondary		Enable		Time	MIL
	System	Code	Description	Criteria		Logic and Value		Parameters		Conditions		Required	Illum.
				Sliding window error counter within a number of message frames	>=	8.00		CAN Bus is Active Can Bus Initialized (CAN Bus is Active)	=	TRUE	-	monitor runs whenever enable conditions are met	
			sensor oxygen concentration					consisting of: ignition for time battery voltage	= > <	TRUE 5.00 655.34	- sec V		
								battery voltage	>	9.00	V		
	Post Catalyst NOx Sensor CAN Message #4		Post catalyst NOx sensor CAN message #4 frame not received after a calibrated number of times	Counts up when message frame is not received in the time out interval	>	25.00		CAN Bus is Active Can Bus Initialized (CAN Bus is Active)	=	TRUE	-	fail conditions exists for more than 21 sec monitor runs with 0.02 s	
								consisting of: ignition for time battery voltage battery voltage	= ^ < >	TRUE 5.00 655.34 9.00	sec V V	rate	
			CAN frame rolling counter and protection value verification using a sliding window evaluation		>=	8.00	counts	CAN Bus is Active	=	TRUE	·	monitor runs whenever enable conditions are	
			Check of post catalyst NOx sensor heater resistance	within a number of message frames	=	9.00	counts	Can Bus Initialized (CAN Bus is Active) consisting of: ignition for time battery voltage battery voltage	= ^ < >	TRUE 5.00 655.34 9.00	- sec V V	met	

Component / System	Fault Code	Monitor Strategy Description	Primary Malfunction Criteria		Threshold Logic and Valu	ıe	Secondary Parameters		Enable Conditions		Time Required	MIL Illum.
Post Catalyst NOx Sensor CAN Message #5			Counts up when message frame is not received in the time out interval	>	12.00	counts	CAN Bus is Active Can Bus Initialized (CAN Bus is Active) consisting of: ignition for time battery voltage battery voltage	= = > < >	TRUE 5.00 655.34 9.00	- sec V V	fail conditions exists for more than 21 sec monitor runs with 0.1 s rate	
Lost Communication With PM Sensor	U02A3	(SCU) CAN communication: SCU signal not received; SCU detects missing CAN- communication or SCU ready- signal not received	SCU sensor signal timeout (no message received) OR SCU detects missing CAN- communication (i.e. no signal received by SCU but SCU still sends a signal)	=	TRUE	-	Battery voltage (ECM) Ignition on for time	= >	11.00 TRUE 1.20	V - sec	fault exists for more than 1.4 sec; monitor runs at 0.1 s when enable conditions are met	В

Component / System	Fault Code	Monitor Strategy Description	Primary Malfunction Criteria		Threshold Logic and Value	9	Secondary Parameters		Enable Conditions		Time Required	MIL Illum.
Particulate Matter Sensor Circuit	P24AE	Range check on IDE-supply voltage for higher and lower threshold (short to ground, short to battery plus) and range check on IDE-supply voltage for higher threshold (IDE+ short to battery plus)	Path 1: IDE supply voltage is on	_	TRUE		Ignition on	=	TRUE	- sec	fault exists for more than 0.1 sec; monitor runs at 0.1 s when enable conditions are met	В
			and IDE supply voltage or IDE supply voltage	>= <=	49.72 41.55		Battery voltage (ECM) Battery voltage (ECM) Battery voltage (SCU)	>= <= >	11.00 6553.40 9.00	V V V		
			or Path 2: (IDE supply voltage is on	=	FALSE	-						
			and IDE supply voltage) or	>=	2.00	V						
			Path 3: IDE supply voltage is on and ADC voltage for IDE current (SCU	= <	TRUE 0.3	- V						
			internal value) or									
			Path 4: ADC voltage for IDE current (SCU internal value)	>=	4.70	V						
						_		_		_		

Component / System	Fault Code	Monitor Strategy Description	Primary Malfunction Criteria		Threshold Logic and Valu	le	Secondary Parameters		Enable Conditions		Time Required	MIL Illum.
		Comparison IDE-current at high temperature (when sensor regeneration occurs) with threshold (detected failures: open circuit IDE+, short to ground IDE-, open circuit IDE-, IDE removed)	Measured IDE-current @ 785°C sensor temperature	<	2.00	μA	Functional IDE self diagnosis is tested	=	TRUE	-	fault exists for more than 5 sec; monitor runs at 0.1 s when enable conditions are met	
			OR Measured IDE current change (when temperature changed from higher temperature to lower temperature)	<	0.094	μA	means (
			temperature to lower temperature)				PM Sensor temperature (for absolute current threshold) and	>	770.00	°C		
							PM Sensor temperature (for absolute current threshold) Battery voltage (ECM)	< >=	800.00 11.00	°C V		
) Sensor regeneration is active	=	TRUE	-		
							with PM Sensor temperature (for change in temperature) and	>	770.00	°C		
							PM Sensor temperature (for change in temperature)	<	800.00	°C		
							PM Sensor temperature (for change in temperature) and	>	580.00	°C		
							PM Sensor temperature (for change in temperature)	<	670.00	°C		
Particulate Matter Sensor Circuit High	P24B1	(IDE) electric fault when supply voltage is off (Range	measured ADC (analog to digital converter) voltage for IDE current (SCU internal value)	>=	4.10	V	Particulate sensor is in the "standby" state	=	TRUE	-	fault exists for more than 2 sec; monitor	В
		check high)	for time	>=	2.00	sec	means Particulate sensor is not in the "measure" or "regeneration" state Battery voltage (ECM)	= >=	TRUE 11.00	- V	runs at 0.1 s when enable conditions are met	

Component / System	Fault Code	Monitor Strategy Description	Primary Malfunction Criteria	L	Threshold ogic and Value		Secondary Parameters		Enable Conditions		Time Required	MIL Illum.
							Battery voltage (ECM) Supply voltage is off Ignition on for time	<= = >	6553.40 TRUE TRUE 3.00	V - - sec		
		supply voltage is on during PM	measured ADC (analog to digital converter) voltage for IDE current (SCU internal value)	>=	4.10	V	Particulate sensor is in the "measurement" state when failure occurs	=	TRUE	-	fault exists for more than 2 sec; monitor runs at 0.1 s when enable conditions are met	
		IDE.	for time	>=	2.00		Particulate sensor plausibility check is terminated means One sucessful sensor-Regeneration is completed Battery voltage (ECM) Supply voltage is on Ignition on for time	= . 	TRUE TRUE 11.00 TRUE TRUE 3.00	- V - sec		
Particulate Matter Sensor Heater Contro Circuit/Open	P24B3	Heater voltage check in the state "heater on" (as detected by µC-in-port)	Electrical error of the heater self diagnosis of the particulate sensor is detected in the state "heater on" means Heater voltage (detected by µC-digital- in-port)	-	TRUE 3.00	v	Battery voltage (ECM) Heater on with Heater duty cycle Ignition on for time	>= > > >	11.00 TRUE 0.00 TRUE 3.00	V - % - sec	fault exists for more than 2 sec; monitor runs at 0.1 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.
Particulate Matter Sensor Heater Control Circuit High	P24B6	PM Sensor heater voltage (as detected by μ C-in-port) and heater current check in the state "heater off"	Electrical error of the heater self diagnosis of the particulate sensor is detected in the state "heater off" means (Heater voltage (detected by µC-digital- in-port)	=	TRUE 7.00		Battery voltage (ECM) Heater off with Heater duty cycle	>= = <=	11.00 TRUE 0.00	V - %	fault exists for more than 2 sec; monitor runs at 0.1 s when enable conditions are met	В
			OR Heater current	>	0.20	A	Ignition on for time	= >	TRUE 3.00	sec		
Particulate Matter Sensor Temperature Circuit	P24C6	Range check of meander temperature raw signal: comparison voltage of meander temperature signal with maximum and minimum threshold	Voltage of PM sensor temperature signal	>	3.00	V	Ignition on	=	TRUE	-	fault exists for more than 2 sec; monitor runs at 0.1 s when enable conditions are	В
			or Voltage of PM sensor temperature signal	<	0.30	V	for time Battery voltage (ECM)	> >=	3.00 11.00	sec V	met	
			or Temperature as measured by PM sensor temeprature	>	920.00		Exhaust gas temperature and	>=	-40.04	°C		
							Exhaust gas temperature	<=	799.96	°C		
Particulate Matter Sensor Temperature Circuit Range/Performance	P24C7	The PM Sensor temperature sensor is monitored for temeprature deviations compared to a modeled exhaust temperature.	difference of the measured PM sensor temperature and the modeled exhaust gas temperature (see Look-Up-Table #2) or	>	69.96 to 194.96		Sensor in a measurement phase with	=	TRUE	-	fault exists for more than 5 sec; monitor runs at 0.1 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.
			difference of the measured PM sensor temperature and the modeled exhaust gas temperature (see Look-Up-Table #1)	<	-155.04 to -30.04	°C	Time after the end of sensor regeneration	>	180	sec		
							vehicle speed and	>=	15.54	mph		
							vehicle speed	<=	155.38	mph		
							Barometric pressure	>	75.00	kPa		
							Engine running (please see the definition)	=	TRUE	-		
							exhaust model temperature at PM sensor	>	-40.04	°C		
							and exhaust model temperature at PM sensor	<	399.96	°C		
							(00.00	*0		
							(a) - (b)	<=	29.96	°C		
							for time since stationary modeled temperature in the driving mode is detected with	>=	90	sec		
							(a) exhaust gas temperature model	=	calculated parameter	-		
							and with (b) frozen exhaust gas model temperature value at beginning of enable conidition release	=	calculated parameter	-		
)					
					_				_	_		
		sensor temperature value upon start-up after a calibrated	difference of the measured PM sensor temperature at start and the average value of the reference exhaust gas temperature sensors	>	45.46	°C	PM sensor start temperature available	=	TRUE	-	fault exists for more than 0.1 sec; monitor runs at 0.1 s once per trip	
		stuck high check (temperature cross check of PM temperature with 3 reference sensors after cold start)										

Component / System	Fault Code	Monitor Strategy Description	Primary Malfunction Criteria		Threshold Logic and Value		Secondary Parameters		Enable Conditions		Time Required	MIL Illum.
-,												
			where reference temperatures (a) DOC upstream temperature	=	measured	-	means Raw value of start temperature of	>=	-40.00	°C		
			(b) DOC downstream temperature	=	parameter measured	-	particulate sensor Particulate sensor can be reached via CAN	=	TRUE	-		
			(c) SCR upstream temperature	=	parameter measured parameter	-	CAN Barometric pressure	>	75.00	kPa		
					parameter		Cold start detection means	=	TRUE	-		
							(Engine ECU shut-off time is reported as valid (see P2505 or P2610 for details on ECU / Engine-Off Time	=	TRUE	-		
							Shut-off time of the particulate sensor control unit	>	21600	sec		
) Temperature range check of the reference sensors is set means	=	TRUE	-		
							(Temperature before Oxi-Catalyst and	>=	-40.04	°C		
							Temperature before Oxi-Catalyst	<=	79.96	°C		
							Temperature before particulate filter and	>=	-40.04	°C		
							Temperature before particulate filter	<=	79.96	°C		
							Temperature before SCR-Catalyst and	>=	-40.04	°C		
							Temperature before SCR-Catalyst)	<=	79.96	°C		
Particulate Matter Sensor Supply Voltage Circuit Low	P24D0	PM Sensor Sensor Control Unit (SCU) battery supply plausibility check which compares the difference in voltages as measured by ECM and SCU with threshold	Path 1:				Ignition on	=	TRUE		fault exists for more than 1.5 sec; monitor runs at 0.1 s when enable conditions are met	В
I	l	l	Battery voltage (ECM)	>	15.00	V	for time	>	3.00	sec	mot	I

Component /	Fault	Monitor Strategy	Primary Malfunction		Threshold		Secondary		Enable		Time	MIL
System	Code	Description	Criteria		Logic and Value	e	Parameters		Conditions	_	Required	Illum.
			and				Initialization values have been transferred (i.e. CAN communication with ECM established)	=	TRUE	-		
			difference of SCU voltage and ECM measured voltage or	>	1.10		Sensor is in the state "ready"	=	TRUE	-		
			difference of ECM measured voltage and SCU voltage	>	3.00	V	Battery voltage (ECM)	>=	11.00	V		
			or				Battery voltage (ECM)	<=	6553.40	V		
			Path 2: Battery voltage (ECM)	<	11.70	V						
			and difference of SCU voltage and ECM measured voltage	>	3.00	V						
			or difference of ECM measured voltage and SCU voltage	>	1.90	V						
			or									
			Path 3:	>=	11.70	V						
			Battery voltage (ECM) and Battery voltage (ECM)	>= <=	15.00	v						
			and difference of SCU voltage and ECM		2.10	v						
			measured voltage	>	2.10	v						
			or difference of ECM measured voltage and SCU voltage	>	2.60	V						
					_				_			

Component / System	Fault Code	Monitor Strategy Description	Primary Malfunction Criteria	I	Threshold ogic and Value		Secondary Parameters		Enable Conditions		Time Required	MIL Illum.
											. coquined	
		Plausibility check of the PM Sensor Sensor Control Unit (SCU) battery supply during sensor regeneration: comparison the difference in voltages as measured by ECU and SCU with voltage dependent threshold	Path 1:				Ignition on	=	TRUE	-	fault exists for more than 1.5 sec; monitor runs at 0.1 s when enable conditions are met	
			Battery voltage (ECM)	>	15.00	V	for time	=	3.00	sec		
			and				Initialization values have been transferred (i.e. CAN communication with ECM established)	=	TRUE	-		
			difference of SCU voltage and ECM measured voltage	>	1.10	V	Sensor is in the state "ready"	=	TRUE	-		
			or difference of ECM measured voltage and SCU voltage	>	3.00	V	means Battery voltage (ECM)	=	11.00	V		
			or				Battery voltage (ECM) Heater duty cycle of PM Sensor	<= >	6553.40 23.00	V %		
			Path 2: Battery voltage (ECM)	>	11.70	V						
			and difference of SCU voltage and ECM measured voltage	>	3.00	V						
			or difference of ECM measured voltage and SCU voltage	>	1.90	V						
			or									
			Path 3: Battery voltage (ECM) and	>=	11.70	V						
			Battery voltage (ECM) and	<=	15.00	V						
			difference of SCU voltage and ECM measured voltage or	>	2.10	V						
			difference of ECM measured voltage and SCU voltage	>	2.60	V						

Component / System	State or Status Sub-Grouping	Description of State or Status found in 150BDG05	Defined by:		Enable Conditions	
ECM Operating States		Engine Pre-Drive	processor operating normally ignition on processor powerup boot initialization or key off bookkeeping cleanup (accessory, post-wake-up, pre-sleep)	= = =	TRUE FALSE complete complete	- - -
		Engine Running (see Look-Up table #81)	ignition on engine speed engine speed was at start	= = >	TRUE 200.00 850	- rpm rpm
		Engine Post-Drive/ Afterun also includes "engine stopping" during engine spin down	processor operating normally ignition on key off bookkeeping cleanup	= = =	TRUE FALSE in process	-
Engine Operating Modes	Exhaust Operating Mode	Normal Mode				
		Particulate Filter Regeneration Mode				
		Particulate Filter Regen Service Mode				

Component / System	State or Status Sub-Grouping	Description of State or Status found in 15OBDG05	Defined by:	Enable Conditions
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	
			Atmospheric pressure too low	
			Battery voltage too low	

Component /	State or Status	Description of State or Status	Defined by:	Enable
System	Sub-Grouping	found in 15OBDG05	-	Conditions
			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)	

Component / System	State or Status Sub-Grouping	Description of State or Status found in 15OBDG05	Defined by:		Enable Conditions	
			Atmospheric Pressure too low in Regeneration			
			Engine Temperature too low in Regeneration			
			Engine Temperature too high in Regeneration			
Engine Position Management		Engine Position Sync Complete	synchronization completed consisting of: crankshaft sensor pulses received camshaft sensor pulse received and aligned properly or sync via crank only invoked then crankshaft rotations	>=	4.00	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 1.00	- Nm
		Status of Diesel Fuel Refill Detection	((Filtered total fuel volume available with (a) Amount of fuel volume change that indicates a refueling event occurred and	> =	(a) + (b) 25.26	- %

Component / System	State or Status Sub-Grouping	Description of State or Status found in 150BDG05	Defined by:		Enable Conditions	
Oyoon	Can creaping		(b) captured remaining diesel fuel volume under the following conditions	=	measured parameter	-
			(Vehicle speed for time) and	<= >	1.24 4.00	mph sec
			(Vehicle speed for time)) er	<= >	1.24 30.00	mph sec
			or at initialization of Diesel fuel level	=	TRUE	
	Rail Pressure Control - Operating States	Rail Control at ECM Start	reset condition	=	TRUE	-
			or NO Pending or Confirmed DTCs:	=	see sheet inhibit tables	
		Rail Pre-Control (Just after start)	Rail Control at ECU Start	=	TRUE	_
			and engine speed and /	<=	400.00	rpm
			(rail pressure or	>=	50000	kPa

Component / System	State or Status Sub-Grouping	Description of State or Status found in 15OBDG05	Defined by:		Enable Conditions	
			(a) - (b) and with (a)Fuel Rail Pressure Setpoint and	< =	1000 measured parameter	kPa -
			(b)Maximum Rail Pressure for last 10ms)	=	measured parameter	-
		Rail Control - PCV Closed Loop Control Only	(
			Rail Pressure Precontrol (Just after start)	=	TRUE	-
		PCV = Pressure Control Valve	and Number of Crankshaft revolutions since entering Rail Pressure Precontrol	>=	10.00	revs
) or (
			state machine rail pressure control transitioning pressure control valve mode	=	TRUE	-
			and setpoint volume flow of the metering unit out of rail pressure control (see Look-Up- Table #7)) or	>	20000 to 33080	mm3/sec

Component / System	State or Status Sub-Grouping	Description of State or Status found in 15OBDG05	Defined by:		Enable onditions	
			(Fuel system pressure and high pressure pump outlet and engine status)	< = R	0.00 RUNNING	kPa -
		Control	state machine rail pressure control equal transitioning to metering unit pressure control mode and Controller for PCV not wound-up (large corrective control)	=	TRUE	-
			state machine rail pressure control transitioning to coupled pressure control mode (rail pressure is controlled by metering unit and pressure control valve) and (a) + (b) (see Look-Up-Table #8) and with (a)Torque Generating fuel injection quantity and	= c	TRUE 9 to 26 alculated parameter	- mm^3/re v -

Component /	State or Status	Description of State or Status	Defined by:	Enable	
System	Sub-Grouping	found in 15OBDG05		Conditions	
			(b)Non-Torque generating fuel injection quantity	= calculated parameter	-
		Switchever Detween Metering Unit + DOV	(
		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	= TRUE	-
			or state machine rail pressure control transitioning pressure control valve mode	= TRUE	-
) and		
			(a) + (b)	< (c) + (d)	-
			(a)Torque Generating fuel injection quantity	= calculated parameter	-
			(b)Non-Torque generating fuel injection quantity	= calculated parameter	-
			(c) (see Look-Up-Table #8)	= 9 to 26	mm^3/re v
			(d)	= 2.00	mm^3/re v
			and NO Pending or Confirmed DTCs:	= see sheet inhibit table	-

Component / System	State or Status Sub-Grouping	Description of State or Status found in 15OBDG05	Defined by:		Enable Conditions	
			or (state machine rail pressure control equal to metering unit control mode	=	TRUE	-
			or state machine rail pressure control equal transitioning to metering unit pressure control mode)	=	TRUE	-
			and NO Pending or Confirmed DTCs:	=	see sheet inhibit tables	-
			Fuel system pressure and high pressure pump outlet and	<	0.00	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	ľ			

Component / System	State or Status Sub-Grouping	Description of State or Status found in 15OBDG05	Defined by:		Enable Conditions	
			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) or	=	TRUE	-
			state machine rail pressure control transitioning pressure control valve mode	=	TRUE	-
			or state machine rail pressure control equal transitioning to metering unit pressure control mode	=	TRUE	-
			, and (
			t exhaust gas system regeneration mode	!=	REGEN	-
) and NO Pending or Confirmed DTCs:	=	see sheet inhibit tables	-

Component /	State or Status	Description of State or Status	Defined by:	Enable	
System	Sub-Grouping	found in 15OBDG05	Denned by.	Conditions	
		Switchover Between Metering Unit + PCV Closed Loop Control to PCV Closed Loop Control only			
			state machine rail pressure control equals coupled pressure control (rail pressure is controlled by metering unit and pressure control valve) or	= TRUE	-
			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 #8) with	< 9 to 26	mm^3/re v
			(a)Torque Generating fuel injection quantity and	= calculated parameter	-
			(b)Non-Torque generating fuel injection quantity	= calculated parameter	-
			no eventidos for		
Idle Speed Control		Idle Speed Controller Active "normal" low idle speed governor	no overrides for: Gear-Shift Harmonization Intrusive Diagnosis Action		

Component / System	State or Status Sub-Grouping	Description of State or Status found in 15OBDG05	Defined by:	C	Enable Conditions	
A/F Sensor	A/F sensor error status bit	A/F SPI communication error A/F Sensor heater powerstage error	A/F SPI communication error HO2S Heater Control Circuit Bank 1 Sensor 1 Circuit High or	= =	TRUE TRUE	-
			HO2S Heater Control Circuit Bank 1 Sensor 1 Circuit Low or	=	TRUE	-
			HO2S Heater Control Circuit Bank 1 Sensor 1 Circuit	=	TRUE	-
		A/F sensor short circuit to battery of sensor lines or A/F sensor short circuit to ground of sensor lines error detected	A/F sensor short circuit to battery of sensor lines	=	TRUE	-
			or			
			A/F sensor short circuit to ground of sensor lines	=	TRUE	-
		Open load detected at sensor lines UN (A/F sensor nernst cell) or VG (A/F sensor virtual ground)	A/F Sensor Reference Voltage Circuit/Open Bank 1 Sensor 1	=	TRUE	-
			A/F Sensor Negative Current Control Circuit/Open Bank 1 Sensor 1	=	TRUE	-
		A/F sensor signal range check error	A/F sensor Circuit Range/Performance Bank 1 Sensor 1	=	TRUE	-

Component /	State or Status	Description of State or Status	Defined by:		Enable	
System	Sub-Grouping	found in 15OBDG05	Denned by.	C	Conditions	
		A/F signal calibration error	A/F sensor calibration resistor circuit output high or	=	TRUE	-
			A/F sensor calibration resistor circuit output low	=	TRUE	-
		A/F sensor calibration error of resistance signal	A/F sensor calibration resistance max	=	TRUE	-
			or A/F sensor calibration resistance min	=	TRUE	
		A/F sensor heater control deviation error	A/F sensor Heater Resistance Bank1	=	TRUE	-
			Sensor 1 high or	-	INOL	-
			A/f sensor Heater Resistance Bank1 Sensor 1 low	=	TRUE	-
		A/F sensor open load at input pump current line	A/F Sensor Positive Current Control Circuit/Open Bank 1 Sensor 1	=	TRUE	-
		A/F sensor plausibility error at different engine conditions	A/F Sensor Performance - Signal High during Deceleration Bank 1 Sensor 1 or	=	TRUE	-
			O2 Sensor Performance - Signal low during Deceleration Bank 1 Sensor 1 or	=	TRUE	-
			O2 Sensor Performance - Signal High during Moderate Load Sensor 1 or	=	TRUE	-
			A/F Sensor Performance - Signal Low during Moderate Load Bank 1 Sensor 1	=	TRUE	-
		A/F sensor dynamic error	A/F Sensor Circuit Slow Response Bank 1 Sensor 1	=	TRUE	-

Component / System	State or Status Sub-Grouping	Description of State or Status found in 150BDG05	Defined by:	Enable Conditions	
	Status bit for valid A/F sensor inner Resistance	Status bit for valid A/F sensor inner Resistance			
			No Permanent wire errors are present (Short circuit to battery, short circuit to ground and open load)	= TRUE	-
			No permanent Resistance calibration value error No Errors in CJ125 SPI communication	= TRUE = TRUE	-
			and no low battery voltage detected by CJ125		
	Dewpoint Detection	A/F Sensor Dewpoint Reached	Integrated heat quantity (see Look-Up- Table #1) and	>= 130 to 600	kJ
			NO Pending or Confirmed DTCs: (related to A/F sensor heater circuit or A/F sensor circuit used for sensor internal resistance calculation)	= see sheet inhibit tables	-
Upstream NOx Sensor		Status of NOx signal of upstream NOx sensor			

Component / System	State or Status Sub-Grouping	Description of State or Status found in 15OBDG05	Defined by:		Enable Conditions	
			(following condition met for time: (Integrated heat quantity (see Look-Up- Table #1)	> >=	30.00 130 to 600	sec kJ
			NOx status signal received via CAN message (Please see the definition) for time calculated lambda value based on air mass flow and injection quantity	= > >	TRUE 1 0.90	- sec -
			for time engine speed for time NO Pending or Confirmed DTCs:))	> > =	2 200.00 20.00 see sheet inhibit tables	sec rpm sec -
		Upstream NOx sensor dewpoint achieved	Integrated heat quantity (see Look-Up- Table #1)	>=	130 to 600	kJ
Downstream NOx Sensor		Status of NOx signal of downstream NOx sensor	(following condition met for time: (>	30.00	sec

Component / System	State or Status Sub-Grouping	Description of State or Status found in 150BDG05	Defined by:		Enable Conditions	
			Integrated heat quantity (see Look-Up- Table #3)	>=	310 to 1460	kJ
			NOx status signal received via CAN message (Please see the definition)	=	TRUE	-
			for time	>	1	sec
			calculated lambda value based on air mass flow and injection quantity	>	0.90	-
			for time	>	2	sec
			engine speed	>	200.00	rpm
			for time	>	20.00	sec
			NO Pending or Confirmed DTCs:	=	see sheet	-
			\\		inhibit tables	
))			
		Downstream NOx sensor dewpoint achieved	Integrated heat quantity (see Look-Up- Table #3)	>=	310 to 1460	kJ
		Enabling Downstream NOx sensor heater diagnosis				
			(SCR Catalyst downstream temperature	>=	99.96	°C
			SCR Catalyst downstream temperature	<=	599.96	°C
			battery voltage	>=	11.00	V

Component / System	State or Status Sub-Grouping	Description of State or Status found in 150BDG05	Defined by:		Enable Conditions	
			battery voltage and	<=	655.34	V
			Integrated heat quantity (see Look-Up- Table #3)	>=	310 to 1460	kJ
			for time)	>	30.00	sec
			and for time	>	0.5	sec
			NO Pending or Confirmed DTCs:	=	see sheet inhibit tables	-
PM Sensor		PM sensor dewpoint achieved	Integrated heat quantity (see Look-Up- Table #3)	>=	310 to 1460	kJ
Regeneration of the Diesel Particulate Filter		Status thermal regeneration active				
			Reduced particle mass flow in simulation by thermal regeneration (a) * (b) * (c) with (a) Correction factor for thermal soot burn-out dependent on lambda and oxygen mass flow (see Look-Up-Table	>	0 0 to 1.619995	- factor
			#5)			

Component / System	State or Status Sub-Grouping	Description of State or Status found in 15OBDG05	Defined by:		Enable Conditions	
			 (b) Effect of temperature on regenerated particle mass (see Look- Up-Table #6) (c) Basis value of produced soot mass flow dependent on actual soot mass (see Look-Up-Table #4) 	=	0 to 0.949951 0.013 to 0.054	- g/sec
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 0.00 -100 42949672.95 159.96 3003.56 203.648228713 487 550.00 see sheet inhibit tables	- - °C/sec °C °C °C °C mph rpm -

Component / System	State or Status Sub-Grouping	Description of State or Status found in 150BDG05	Defined by:		Enable Conditions	
	NOx Control System		ignition	=	on	-
	Reductant Dosing Pressure	State of Reductant Pressure Control System: Standby	Dwell time in the state of standby	<	2.10	sec
			NO Pending or Confirmed DTCs:	=	see sheet inhibit tables	-
		State of Reductant Pressure Control System: No Pressure control	Old SCR control state (please see the definition)	=	Stand by	-
			ignition	=	on	-
			Dwell time in the state of standby	>=	2.10	sec
			Dwell time in the state of no pressure control	<	2.00	sec
			NO Pending or Confirmed DTCs:	=	see sheet inhibit tables	-
		State of Reductant Pressure Control	Old SCR control state (please see the	=	NO Pressure	-
		System: Pressure control	definition)		Control	
			ignition	=	on	-
			engine speed	>	600.00	rpm
			Dwell time in the state of no pressure control	>=	2.00	sec
			exhaust gas temperature Upstream SCR	>=	179.96	°C
			(Reductant Defrost check (please see the definition)	=	TRUE	-

Component / System	State or Status Sub-Grouping	Description of State or Status found in 150BDG05	Defined by:		Enable Conditions	
			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	<	70.00	%
			and Reductant Pump Module Pressure	<	95.00	kPa
) Set-point duty cycle for Reductant dosing valve	=	100.00	%
			Set-point duty cycle for the Reductant Pump pressure Motor actuator	=	60.00	%

Component / System	State or Status Sub-Grouping	Description of State or Status found in 150BDG05	Defined by:		Enable Conditions	
			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	>=	70.00	%
			Reductant Pump Module Pressure	>=	95.00	kPa
			for time)	>	0.50	sec
			Reductant Pump Module Pressure	<	375.00	kPa
			Set-point duty cycle for Reductant dosing valve	=	0%	%
			Set-point duty cycle for the Reductant Pump pressure Motor actuator	=	40.00	%
			NO Pending or Confirmed DTCs:	=	see sheet inhibit tables	-
					_	
		State of Reductant Pressure Control System: Ventilation (substate of Pressure control)	SCR control state (please see the definition)	=	Pressure Control	-
			Reductant Pump Module Pressure	<	375.00	kPa

Component / System	State or Status Sub-Grouping	Description of State or Status found in 150BDG05	Defined by:		Enable Conditions	
			Dwell time in Pressure Build up substate	>	15.00	sec
			system pressurizes in pressure buildup and ventilation states	<	10.00	counts
			Set-point duty cycle for Reductant dosing valve	=	0.00	%
			Set-point duty cycle for the Reductant Pump pressure Motor actuator	=	40.00	%
			Dwell time in the sub state ventilation NO Pending or Confirmed DTCs:	< =	0.30 see sheet inhibit tables	sec -
		State of Reductant Pressure Control System: Metering control (substate of Pressure control)	SCR control state (please see the definition)	=	Pressure Control	-
			Reductant Pump Module Pressure Set-point duty cycle for Reductant dosing valve	>= =	375.00 0	kPa %
			NO Pending or Confirmed DTCs:	=	see sheet inhibit tables	-
		State of Reductant Pressure Control System: Pressure reduction	ignition	=	off	-
			dwell time in the state of pressure reduction	<	20.00	sec

Component / System	State or Status Sub-Grouping	Description of State or Status found in 15OBDG05	Defined by:		Enable Conditions	
			Activation state of Reductant reverting valve power stage	=	On	-
			Set-point duty cycle for Reductant dosing valve	=	0	%
			Set-point duty cycle for the Reductant Pump pressure Motor actuator	=	0.00	%
			NO Pending or Confirmed DTCs:	=	see sheet inhibit tables	-
	SCR Engine State required	SCR Engine State	Ignition	=	TRUE	-
	for operation		engine speed	>	600.00	rpm
		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	-

Component /	State or Status	Description of State or Status	Defined by:		Enable Conditions	
System	Sub-Grouping	found in 15OBDG05	(b) Estimated current Reductant load	=	calculated	-
			(c) Reductant Dosing quantity limitation	=	parameter 0.90	factor
			or SCR catalyst temperature too high to convert Reductant under Particle filter Regeneration request Average temperature inside the SCR catalyst:	>	3003.56	°C
	Reductant Heater and					
	Defrost System Control States and Status					
		Reductant Defrost check	status of reductant tank heater	=	TRUE	-
			temperature (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	-
			(duration, for which the conditions for a hydraulic release reset of pressure line heater circuit are satisfied	<=	600.00	sec
			ambient temperature Release heater pressure line	> =	-7.14 FALSE	°C -

Component / System	State or Status Sub-Grouping	Description of State or Status found in 15OBDG05	Defined by:		Enable Conditions	
			and duration, for which the conditions for a hydraulic release reset of supply module heater circuit are satisfied ambient temperature Release heater supply module)	<= > =	600.00 -7.14 FALSE	sec °C -
		Status of reductant tank heater	status of reductant tank heater			
		temperature	temperature (please see the definition)			
			Reductant tank heat temperature at Standby state or Engine off Time Reductant tank heat temperature at Standby state	> > >	-8.04 2147483647.00 3003.56	°C sec °C
		÷ .	State of the defrosting check of pressure line (please see the definition) time since pressure line heating on under pressure line defrost mode or status of SCR control state (please see the definition)	>= =	0 to 2200 No Pressure Control	sec -

Component / System	State or Status Sub-Grouping	Description of State or Status found in 15OBDG05	Defined by:		Enable Conditions	
System	Sub-Grouping		Pressure line defrost timer	=	0	sec
			or			
			ignition	=	on	sec
			engine speed (>	600.00	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 (see Look-Up-Table #21)	<	120 to 900	sec
			NO Pending or Confirmed DTCs:	=	TRUE	-
		State of the defrosting check of supply module	State of the defrosting check of supply module (please see the definition)			
			time since supply module heating on under supply module defrost mode or	>=	0 to 2200	sec
			status of SCR control state (please see the definition)	=	No Pressure Control	-
			Supply module defrost timer or	=	0	sec
			ignition	=	on	sec
			engine speed	>	600.00	rpm
			Pressure line defrost check in last driving cycle	=	TRUE	-

Component / System	State or Status Sub-Grouping	Description of State or Status found in 15OBDG05	Defined by:	(Enable Conditions	
			status of SCR control state (please see the definition) Engine off Time (see Look-Up-Table #20) NO Pending or Confirmed DTCs:		No Pressure Control 120 to 900 TRUE	- sec -
			Current time for heating / not heating of heater circuit 1 (tank) Reductant Defrost check (please see the definition)	>= =	32767 FALSE	sec -
		for the main state machine	Preliminary release of the heater control for the main state machine (please see the definition) (>=	0 to 3276	
			Current time for heating / not heating of heater circuit 1 (tank) status of reductant tank heater defrost status of reductant tank heater temperature (please see the definition) State of the defrosting check of pressure line (please see the definition)	= = =	FALSE FALSE TRUE	sec - -
			State of the defrosting check of supply module (please see the definition)	=	TRUE	-

Component / System	State or Status Sub-Grouping	Description of State or Status found in 150BDG05	Defined by:		Enable Conditions	
) or (
			ignition	=	on	sec
			engine speed	>	600.00	rpm
			Engine off Time	<=	0.00	sec
			State of the defrosting check of pressure line (please see the definition)	=	TRUE	-
			State of the defrosting check of supply module (please see the definition) and	=	TRUE	-
			if the following conditions were met in previous driving cycle	=	TRUE	-
			ignition	=	on	sec
			engine speed	>	600.00	rpm
			Engine off Time	<=	0.00	sec
			State of the defrosting check of pressure line (please see the definition)	=	TRUE	-
			State of the defrosting check of supply module (please see the definition)))	=	TRUE	
		Release of tank heater circuit	(

Component /	State or Status	Description of State or Status	Defined by:		Enable	
System	Sub-Grouping	found in 15OBDG05	Donnou xy:		Conditions	
			Requested defrosting time for Reductant tank heater (see Look-Up-Table #24)	>=	10 to 4170	sec
			or Requested heating time for Reductant tank heater (see Look-Up-Table #17))	>=	0 to 300	sec
			or ((
			Requested defrosting time for Reductant tank heater (see Look-Up-Table #24)	>=	10 to 4170	sec
			or Requested heating time for Reductant tank heater (see Look-Up-Table #17))	>=	0 to 300	sec
			, and (
			Requested defrosting time for pressure line heater (see Look-Up-Table #18)	>=	0 to 2200	sec
			or Requested heating time for pressure line heater (see Look-Up-Table #22)))	>=	0 to 180	sec
			or ((

Component /	State or Status	Description of State or Status	Defined by:		Enable Conditions	
System	Sub-Grouping	found in 15OBDG05	Requested defrosting time for Reductant	>=	10 to 4170	sec
			tank heater (see Look-Up-Table #24)		1010 4170	300
			or Requested heating time for Reductant	>=	0 to 300	sec
			tank heater (see Look-Up-Table #17)		0.0000	000
) and			
			and (
			Requested defrosting time for supply	>=	0 to 2200	sec
			module heater (see Look-Up-Table #19)			
			or			
			Requested heating time for supply	>=	0 to 180	sec
			module heater (see Look-Up-Table #23)			
))			
			or			
			((
			Requested defrosting time for Reductant tank heater (see Look-Up-Table #24)	>=	10 to 4170	sec
			or Desire the basting time for Deductors		0.45,000	
			Requested heating time for Reductant tank heater (see Look-Up-Table #17)	>=	0 to 300	sec
)			
			and /			
I	I	l	(

Component /	State or Status	Description of State or Status	Defined by:		Enable	
System	Sub-Grouping	found in 15OBDG05	20000000		Conditions	
			Requested defrosting time for pressure line heater (see Look-Up-Table #18) or Requested heating time for pressure line heater (see Look-Up-Table #22)	>=	0 to 2200 0 to 180	sec
			, and (Requested defrosting time for supply module heater (see Look-Up-Table #19)	>=	0 to 2200	sec
			or Requested heating time for supply module heater (see Look-Up-Table #23)	>=	0 to 180	sec
)) and NO Pending or Confirmed DTCs:	=	TRUE	-
		Release of pressure line heater circuit	(Requested defrosting time for pressure line heater (see Look-Up-Table #18)	>=	0 to 2200	sec
			or Requested heating time for pressure line heater (see Look-Up-Table #22)	>=	0 to 180	sec

Component / System	State or Status Sub-Grouping	Description of State or Status found in 15OBDG05	Defined by:		Enable Conditions	
) or			
			((Requested defrosting time for pressure line heater (see Look-Up-Table #18)	>=	0 to 2200	sec
			or Requested heating time for pressure line heater (see Look-Up-Table #22)) and	>=	0 to 180	sec
			(Requested defrosting time for supply module heater (see Look-Up-Table #19)	>=	0 to 2200	sec
			or Requested heating time for supply module heater (see Look-Up-Table #23)	>=	0 to 180	sec
)) and NO Pending or Confirmed DTCs:	=	see sheet	-
		Release of tank heater circuit			inhibit tables	_

Component /	State or Status	Description of State or Status	Defined by:		Enable	
System	Sub-Grouping	found in 15OBDG05	Defined by:		Conditions	
			Requested defrosting time for supply module heater (see Look-Up-Table #19)	>=	0 to 2200	sec
			or Requested heating time for supply module heater (see Look-Up-Table #23)	>=	0 to 180	sec
)			
			or ((
			Requested defrosting time for Reductant tank heater (see Look-Up-Table #24)	>=	10 to 4170	sec
			or Requested heating time for Reductant tank heater (see Look-Up-Table #17)	>=	0 to 300	sec
) and (
			Requested defrosting time for supply module heater (see Look-Up-Table #19)	>=	0 to 2200	sec
			or Requested heating time for supply module heater (see Look-Up-Table #23)	>=	0 to 180	sec
))			
			or			

Component / System	State or Status Sub-Grouping	Description of State or Status found in 150BDG05	Defined by:		Enable Conditions	
			((Requested defrosting time for pressure line heater (see Look-Up-Table #18)	>=	0 to 2200	sec
			or Requested heating time for pressure line heater (see Look-Up-Table #22)	>=	0 to 180	sec
			, and			
			(Requested defrosting time for supply module heater (see Look-Up-Table #19)	>=	0 to 2200	sec
			or Requested heating time for supply module heater (see Look-Up-Table #23)	>=	0 to 180	sec
)) or (/			
			Requested defrosting time for Reductant tank heater (see Look-Up-Table #24)	>=	10 to 4170	sec
			or Requested heating time for Reductant tank heater (see Look-Up-Table #17))	>=	0 to 300	sec
			, and (

Component /	State or Status	Description of State or Status	Defined by:		Enable Conditions	
System	Sub-Grouping	found in 15OBDG05	Requested defrosting time for pressure line heater (see Look-Up-Table #18) or	>=	0 to 2200	sec
			Requested heating time for pressure line heater (see Look-Up-Table #22)) and	>=	0 to 180	sec
			(Requested defrosting time for supply module heater (see Look-Up-Table #19)	>=	0 to 2200	sec
			or Requested heating time for supply module heater (see Look-Up-Table #23)	>=	0 to 180	sec
)) and NO Pending or Confirmed DTCs:	=	see sheet inhibit tables	-
			battery voltage battery voltage for time	< >	655.34 11.00 2.00	V V sec

Component / System	State or Status Sub-Grouping	Description of State or Status found in 15OBDG05	Defined by:		Enable Conditions	
		Status of the battery voltage being in the valid working range for pressure line heater	battery voltage battery voltage for time	< > >	655.34 11.00 2.00	V V sec
		Status of Reductant Tank Heater				
		Release	(
			status of reductant tank heater temperature (please see the definition)	=	TRUE	-
			Waiting time after tank heater release expired)	>	0	sec
			or			
			((Waiting time before tank heater released	<	32767.00	sec
			started with status of reductant tank heater temperature (please see the definition)) and	=	FALSE	-

Component / System	State or Status Sub-Grouping	Description of State or Status found in 150BDG05	Defined by:		Enable Conditions	
			(status of reductant tank heater temperature (please see the definition)	=	TRUE	-
			Waiting time after tank heater release expired))	>	0	sec
			or ((Waiting time before tank heater released	>	32767.00	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))	>	0.00	sec
				_	_	
	Reductant Tank Level System States and Status	status of Reductant tank level	Tank level > full (100%)	=	Full	-
	,		Warning (66.67%) < tank level < full (100%)	=	OK	-

Component /	State or Status	Description of State or Status	Defined by:		Enable	
System	Sub-Grouping	found in 15OBDG05			Conditions	
			Restriction (33.33%) < tank level < Warning (66.67%)	=	Warning	-
			Empty < tank level < Restriction (33.33%)	=	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	>=	8.00	sec
			L Derivation of the PT1 filtered level signal (DT1)	>=	1.00	%/sec
			ignition	=	on	-
			engine speed	>	600.00	rpm
			Vehicle speed	>=	6.22	mph
			time since engine started	<=	(a) * (b)	
			 (a) Time period for a positive slope to detect refueling 	=	8.00	sec
			(b) Factor for the extension of the detection time for refueling	=	3.00	factor
			since the following conditions met:	=	TRUE	-
			Γ Falling edge of ignition or	=	TRUE	-

Component /	State or Status	Description of State or Status	Defined by:		Enable	
System	Sub-Grouping	found in 15OBDG05			Conditions	
			Reductant Refill enabling conditions reset timers	=	TRUE	-
)))			
			or (
			time since potential Reductant refill detection is set and with	>=	4.00	sec
			(Derivation of the PT1 filtered level signal (DT1)	>=	1.00	%/s
			filter release for Reductant tank level calculation at T15 on (Please see the definition) and with	=	TRUE	-
			Frozen state is active during a certain warning level (please see the definition)	=	TRUE	-
			and with			
			(Reductant tank Temperature or	>=	-100.04	°C
			Reductant low warning level (Please see the definition))))	>=	0.00	level

Component /	State or Status	Description of State or Status	Defined by:		Enable	
System	Sub-Grouping	found in 15OBDG05	Denned by.		Conditions	
		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 ((status of reductant tank heater	>=	-100.04 FALSE	°C
			temperature (please see the definition) Waiting time before tank heater released	= <	32767.00	- sec
			and status of reductant tank heater temperature (please see the definition)	=	TRUE	-
			Waiting time after tank heater release expired	>	0	sec
			or			
			(status of reductant tank heater temperature (please see the definition)	=	FALSE	-
			Waiting time before tank heater released	>=	32767.00	sec
			and status of reductant tank heater temperature (please see the definition)	=	TRUE	-
			Waiting time after tank heater release expired	>=	0.00	sec

Component / System	State or Status Sub-Grouping	Description of State or Status found in 15OBDG05	Defined by:		Enable Conditions	
)) or Frozen state is active during a certain warning level (please see the definition)	=	TRUE	-
) Vehicle speed)	>=	6.22	mph
			or filter release for Reductant tank level calculation at T15 on (Please see the definition)	=	TRUE	-
				_		
		Status of Filter release for reductant tank		_		
		level calculation	Reductant tank Temperature	>=	-100.04	°C
			or Reductant low warning level (Please see the definition)	>=	0.00	-
			NO Pending or Confirmed DTCs:	=	TRUE	-
			Frozen state is active during a certain warning level (please see the definition)	=	TRUE	-

Component /	State or Status	Description of State or Status	Defined by:		Enable	
System	Sub-Grouping	found in 15OBDG05	Dennied by.		Conditions	
		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	>=	49.00	level
			((
			Raw Reductant tank level and with	>=	33.3	%
			Remaining Reductant quantity (a) - (b):	<	(a) - (b)	
			(a) Tank level for reserve mode (Restriction level) in [g]	=	1870.00	g
			(b) Tank level threshold range below Restriction threshold for T15 refill detection release	=	0.00	g
)			
			or			
			Raw Reductant tank level and with	>=	66.7	%
			(Remaining Reductant quantity (a) - (b):	<	(a) - (b)	
			(a) Tank level for reserve mode (Warning level) in [g]	=	5060.00	g
			(b) Tank level threshold range below WARNING threshold for T15 refill detection release	=	0.00	g

Component / System	State or Status Sub-Grouping	Description of State or Status found in 15OBDG05	Defined by:		Enable Conditions	
) or Raw Reductant tank level and with (Remaining Reductant quantity (a) - (b): (a) Tank level for reserve mode (Warning level) in [g] (b) Tank level threshold range below WARNING threshold for T15 refill detection release))	>= >= =	100 (a) - (b) 5060.00 0.00	% g g
		Status of Refill detection of Reductant tank	Status of Refill detection of Reductant tank (please see the definition) Reductant tank level changed ((Captured Reductant tank level at last tank level change or Captured Reductant tank level at last	=	TRUE Empty Restriction	-
			tank level change) and (one or more of following conditions are met	_	TCSUICUON	-

Component /	State or Status	Description of State or Status	Defined by:		Enable	
System	Sub-Grouping	found in 15OBDG05	Bonnou by:		Conditions	
			status of Reductant tank level (please see the definition) or	=	Warning	-
			status of Reductant tank level (please see the definition) or	=	OK	-
			status of Reductant tank level (please see the definition)))	=	Full	-
				1		
			((Captured Reductant tank level at last tank level change or	=	Warning	-
			Captured Reductant tank level at last tank level change	=	OK	-
) and (
			status of Reductant tank level (please see the definition)	=	Full	-
) or (
			Captured Reductant tank level at last tank level change	=	OK	-
			status of Reductant tank level (please see the definition)))	=	Full	-
			tank level change) and (status of Reductant tank level (please see the definition)) or (Captured Reductant tank level at last tank level change status of Reductant tank level (please	=	Full OK	

Component / System	State or Status Sub-Grouping	Description of State or Status found in 150BDG05	Defined by:		Enable Conditions	
		Engine on timer is expired	time since engine started (a) calibrated rise timer (b) factor and with ((>=	(a) * (b) 12 20	sec sec -
			ignition engine speed	= >	on 600.00	- rpm
			Vehicle speed	>=	6.22	mph
) or (
			Vehicle speed	>=	6.22	mph
			NO Pending or Confirmed DTCs:	=	TRUE	-
			for time))	>	1.00	sec
			and with timer reset conditions			
			Falling edge of ignition	=	TRUE	-
			Reductant Refill enabling conditions reset timers	=	TRUE	-
)			
	Reducant Tank Level Low Warning States	Normal_Operation_OK: 0 decimal, normal operation	Reductant tank level	=	Full	-
			and with			

Component / System	State or Status Sub-Grouping	Description of State or Status found in 15OBDG05	Defined by:		Enable Conditions	
			(Warning level or	<=	49	-
			(Previous warning level vehicle speed))	> <=	49 98.18	- mph
			or Reductant Quality state	>	0	-
		Warning_Leve1: 1 decimal, Warning level 1	Reductant tank level	<	Full	-
			Remaining mileage and with	>	1500.00	miles
			(Warning level	<=	49	Warning level in decimal
			or (
			V Previous warning level	>	49	Warning level in decimal
			vehicle speed)) and with	<=	98.18	mph

Component / System	State or Status Sub-Grouping	Description of State or Status found in 15OBDG05	Defined by:		Enable Conditions	
			Reductant Quality state	=	0	-
		Warning_Level2: 2 decimal, Warning level 2	Reductant tank level	<	Full	-
			Remaining mileage and with /	<=	1500.00	miles
			Warning level	<=	49	Warning level in decimal
			or (Dravieve wereing level		40	\\/omion
			Previous warning level	>	49	Warning level in decimal
			vehicle speed))	<=	98.18	mph
			and with Reductant Quality state	=	0	-
		Warning Lougly 46 desired Warning			E.U.	
		Warning_Level3: 16 decimal, Warning level 3	Reductant tank level Remaining mileage and with (<	Full 800.00	- miles

Component / System	State or Status Sub-Grouping	Description of State or Status found in 15OBDG05	Defined by:		Enable Conditions	
			Warning level or	=	2	Warning level in decimal
			Warning level	=	16	Warning level in decimal
			, and with initialization phase after Reductant refill event is active Reductant Quality state	=	TRUE 0	-
					5	_
		Warning_Level4: 32 decimal, Warning level 4	Reductant tank level	<	Full	-
			Remaining mileage and with /	<=	800.00	miles
			` Warning level	<=	49	Warning level in decimal
			or (
			Previous warning level	>	49	Warning level in decimal
			vehicle speed))	<=	98.18	mph

Component / System	State or Status Sub-Grouping	Description of State or Status found in 150BDG05	Defined by:		Enable Conditions	
Cystom			and with Reductant Quality state	=	0	-
		Warning_Level5: 48 decimal, Warning level 5	((Reductant tank level Remaining mileage and with	< <=	Full 575.00	- miles
			(Warning level or	<=	49	Warning level in decimal
			(Previous warning level	>	49	Warning level in decimal
			vehicle speed)))) or	<=	98.18	mph
			(Warning level	=	48	Warning level in decimal
			initialization phase after Reductant refill event is active))	=	TRUE	-

Component / System	State or Status Sub-Grouping	Description of State or Status found in 150BDG05	Defined by:		Enable Conditions	
			and with Reductant Quality state	=	0	-
		Warning_Level6: 49 decimal, Warning level 6	((
			Warning level	=	49	Warning level in decimal
			initialization phase after Reductant refill event is active	=	TRUE	-
) or (
			(Warning level	<	49	Warning level in
			Failed Reductant system pressure build up	=	1	decimal -
)) and with Reductant Quality state	=	0	-
		Warning_Level8: 80 decimal,Vehicle speed restriction mild	Warning level	=	80	Warning level in decimal

Component / System	State or Status Sub-Grouping	Description of State or Status found in 150BDG05	Defined by:		Enable Conditions	
			initialization phase after Reductant refill event is active and with Reductant Quality state	=	TRUE 0	-
		Warning_Level10: 112 decimal,Vehicle	Warning level	=	112	Warning
		speed restriction aggressive			112	level in decimal
			initialization phase after Reductant refill event is active and with	=	TRUE	-
			Reductant Quality state	=	0	-
		Warning_Level12: 144 decimal, Vehicle speed restriction severe	Warning level	=	144	Warning level in decimal
			initialization phase after Reductant refill event is active and with	=	TRUE	-
			Reductant Quality state	=	0	-
		Warning_Level14: 176 decimal, Vehicle speed restriction final	Warning level	=	176	Warning level in decimal

Component / System	State or Status Sub-Grouping	Description of State or Status found in 150BDG05	Defined by:		Enable Conditions	
			initialization phase after Reductant refill event is active and with Reductant Quality state	=	TRUE 0	-
	Reductant frozen System States	Frozen state is active during a certain warning level	ignition for time Reductant tank Temperature Reductant low warning level (Please see the definition)	= > <= >=	On 5.00 -9.04 96.00	sec °C level
		Status of Reductant tank as frozen	(Engine off Time Reductant tank Temperature) or (Engine off Time time since the following conditions are	> < < <= <=	14400.00 -11.04 7200.00 7200.00	sec °C sec sec
			met (status of reductant tank heater defrost Vehicle speed	= >	On or Defrost 6.22	- mph

Component / System	State or Status Sub-Grouping	Description of State or Status found in 15OBDG05	Defined by:		Enable Conditions	
			Status of urea tank as frozen (please see the definition)))	=	TRUE	-
		Status of Low Reductant Pump Pressure - Under Reductant warning level 3 - Main state 0x30				
			Reductant low warning level (Please see the definition)	>=	64.00	-
			number of pressure build-up attempts and (>=	2.00	counts
			status of SCR control sub state (please see the definition)	=	Pressure Build up	-
			Reductant Pump Module Pressure	<	375.00	kPa
			Dwell time in Pressure Build up substate	>	15.00	sec
			system pressurizes in pressure buildup and ventilation states	>=	10.00	counts
			Reductant Defrost check (please see the definition))	=	TRUE	-
SCR System Diagnosis	SCR System Long Term Adaptation Release States	Long-term Adaption Triggered				
			underdosing detected (please see the definition)	=	TRUE	-

Component / System	State or Status Sub-Grouping	Description of State or Status found in 150BDG05	Defined by:		Enable Conditions	
			OR overdosing detected (please see the definition)	=	TRUE	-
		Underdosing detected	Difference between the NOx mass of the sensor and of the model during first functional evaluation (see Look-Up-Table #13) OR	>=	0.4 to 0.45	g
			Difference between the NOx mass of the sensor and of the model during second functional evaluation (see Look-Up-Table #14) OR	>=	0.08 to 0.09	g
			Difference between the NOx mass of the sensor and of the model during third functional evaluation (see Look-Up-Table #15)	>=	-0.1 to -0.07	g
		Overdosing detected				
			Difference between the NOx mass of the sensor and of the model during first functional evaluation (see Look-Up-Table #10) OR	<=	-0.55 to -0.38	g

Component /	State or Status	Description of State or Status	Defined by:		Enable	
System	Sub-Grouping		Difference between the NOx mass of the sensor and of the model during second functional evaluation (see Look-Up-Table #11) OR Difference between the NOx mass of the sensor and of the model during third functional evaluation (see Look-Up-Table #12)	<=	Conditions -0.39 to -0.3 -0.27 to -0.2	g
		Status of the SCR adaptation plausibility check active	(Status of NOx signal of downstream NOx sensor (please see the definition)	=	True	
			NOx concentration downstream SCR catalyst for time	>	15.00 0.50	ppm sec
			Estimated SCR catalyst efficiency for time	> >	0.70 1.00	factor sec
			NOx concentration deviation between sensor reading and modeled NOx concentration downstream SCR catalyst	>	measured parameter	-
			for time	>	0.50	sec

Component / System	State or Status Sub-Grouping	Description of State or Status found in 150BDG05	Defined by:		Enable Conditions	
			(Time since when the Reductant load level adaptation and the plausibility have been locked or	>=	240.00	sec
			Time since when the Reductant load level adaptation and the plausibility have been locked	>=	120.00	sec
			Integrated NOx mass since Reductant load level adaptation and plausibility have been locked)	>=	1.20	g
			Difference between nominal and estimated Reductant	<	0.10	g
			Difference between nominal and estimated Reductant	>=	-1.00	g
			Filtered Upstream NOx mass flow	>=	0.00	g/sec
			Filtered Upstream NOx mass flow	<=	0.05	g/sec
			Upstream NOx mass flow difference : (a) ⋅ (b)	>=	-0.05	g/sec
			Upstream NOx mass flow difference : (a) - (b) and with (a) Filtered Upstream NOx mass flow (b) Filtered actual upstream NOx mass flow	<=	0.04	g/sec
			,			

Component /	State or Status	Description of State or Status	Defined by:		Enable	
System	Sub-Grouping	found in 15OBDG05	Defined by.		Conditions	
			Status of pre controlled dosing (please see the definition)	=	False	
			Difference between nominal and estimated Reductant	<	0.05	g
			Difference between nominal and estimated Reductant	>=	-1.00	g
			for time	>	0.20	sec
			HC load in SCR catalyst	<=	1.20	factor
			overall aging factor of the SCR catalyst for time	>= >	0.00 10.00	factor sec
			Temperature gradient of SCR	>=	-327.68	°C/sec
			Temperature gradient of SCR for time	<= >	327.67 0.20	°C/sec sec
			Integrated NOx mass flow after engine start	>=	0.00	g
			Release of Reductant dosing	=	active	
			engine operating condition based on engine speed and injection quantity	>	0	factor
			(Difference between nominal and estimated Reductant	>	-0.05	g
			Reductant mass flow (see Look-Up-Table #9)	>	0 to 0.04	g
			Elapsed time of the fill level timer)	>	20.00	sec

Component / System	State or Status Sub-Grouping	Description of State or Status found in 15OBDG05	Defined by:		Enable Conditions	
		State of the NH3 (Ammonia) slip detection				
			Reductant concentration downstream SCR	<	30.00	ppm
			and (a) - (b)	<	0.00	g/sec
			(a) Filtered NOx mass flow downstream SCR measured by the sensor	=	measured parameter	-
			(b) Filtered and delayed NOx raw emission mass flow upstream of SCR	=	measured parameter	-
		Deactivation of dosing to execute the NOx Offset test				
			SCR catalyst temperature	>	49.96	°C
			SCR catalyst temperature	<	349.96	°C
			time	>	60.00	sec
			and			
			Currently dosed Reductant mass flow	<=	0.05	g/sec
			time	>	300.00	sec
			and Feed ratio			
1	l	l	(a) / ((b) * (c))	<=	0.10	ratio

Component /	State or Status	Description of State or Status	Defined by:		Enable	
System	Sub-Grouping	found in 15OBDG05	Donnou by:		Conditions	
			(a) Currently dosed Reductant massflow(b) NOx raw emission mass flow	=	measured parameter measured	-
			(c) Stoichiometric conversion factor	=	parameter calculated	-
			NOx to Reductant for time	>	parameter 300.00	sec
			and Estimated current Reductant load	<=	1.30	g
			time	>	30.00	sec
					_	_
		Release plausibility of Reductant Load	Release plausibility timer active	>=	240.00	sec
			or (Deleges plausikility timer active	>=	120.00	222
			Release plausibility timer active Integrated NOx raw emission since fill level adaptation and plausibility have been locked)	>=	1.20	sec g
		Status for disabling the SCR Efficiency monitor following an SCR Adaptation cycle completion				
1			Maximum dosing quantity	<	0.60	g/sec

Component / System	State or Status Sub-Grouping	Description of State or Status found in 150BDG05	Defined by:	Enable Conditions
			or (a) - (b) (a) Reductant Dosing quantity (b) Maximum Reductant Dosing quantity or (a) - (b) (a) Reductant Desired value (b) Reductant Dosing quantity limitation due to frozen tank	 > 0 measured - parameter calculated - parameter > 0 calculated - parameter calculated - parameter 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, dependent on HC- contamination (b) Upper hysteresis threshold for filtered exhaust-gas mass flow, dependent on thermal ageing and	> (a) * (b) - = 1 factor = 910.17 g/sec

Component /	State or Status	Description of State or Status	Defined by:		Enable	
System	Sub-Grouping	found in 15OBDG05	Definica by:		Conditions	
			Filtered NOx mass flow upstream SCR	>	(a) * (b)	-
			(a) Correction factor for the upper hysteresis threshold for filtered exhaust- gas mass flow, dependent on HC- contamination SCR	=	1	factor
			(b) Upper hysteresis threshold for filtered exhaust-gas mass flow, dependent on thermal ageing SCR	=	0.02	g/sec
			and			
			Engine coolant temperature	<	(a) + (b)	
			(a) Lower hysteresis threshold for	=	2999.96	°C
			engine temperature			
			(b) Offset for lower hysteresis switch on threshold for engine temperature	=	0.00	°C
			Engine coolant temperature	>	3003.56	°C
			and			
			ambient pressure	>	(a) + (b)	
			(a) Upper hysteresis threshold for environment pressure	=	74.00	kPa
			(b) Offset for upper hysteresis switch on threshold for environment pressure	=	27.00	kPa
			or			
			ambient pressure	<	73.50	kPa
			and			
			Intake air temperature	>	(a) + (b)	° 0
			(a) Lower hysteresis switch on threshold for inlet air temperature	=	-10.04	°C

Component /	State or Status	Description of State or Status	Defined by:		Enable	
System	Sub-Grouping	found in 15OBDG05	Defined by.		Conditions	
			(b) Offset for upper hysteresis switch on threshold for inlet air temperature or	=	403.00	°C
			Intake air temperature)	<	-50.04	°C
			and (
			t ambient temperature ambient pressure Selected temperature used for locking	>= >= >=	-9.04 74.80 -3549.94	°C kPa °C
			pre controlled mode Selected temperature used for locking pre controlled mode	<=	369.96	°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)	>	0.00	
			(k) = (a) * (b)			

Component / System	State or Status Sub-Grouping	Description of State or Status found in 15OBDG05	Defined by:		Enable Conditions	
			(a) entry condition for pre controlled dosing at sea level	=	0	-
			(b) Altitude multiplier factor for sea level	=	measured parameter	-
			(l) = (c) * (d) * (e)			
			(c) entry condition for online dosing at Mid level	=	0	-
			(d) Multiplier to Mid Level enable speed load map	=	1	factor
			(e) Altitude multiplier factor for medium altitude	=	measured parameter	-
			(m) = (f) * (g) * (h) (f) Entry condition for online dosing at Hi level	=	0	-
			(g) Multiplier to Hi Level enable speed load map	=	1	factor
			(h) Altitude multiplier factor for high altitude	=	measured parameter	-
) and			
			Low pass filtered upstream NOx sensor signal)	>	0	ppm
						_

Component / System	State or Status Sub-Grouping	Description of State or Status found in 150BDG05	Defined by:		Enable Conditions	
	Reductant Tank Heater Performance Diagnosis	start temperature is captured in EERPOM if monitoring is active over several driving		=	1.56	°C
			(continuation of previously started tank temperature performance monitoring cycle (see definition)	=	FALSE	
			(ignition on for time or ice detection by tank temperature difference:	> =	60.00 TRUE	sec
			(a) - (b)(a) filtered current tank temperature	<= =	-0.54 measured parameter	°C -
			(b) tank temperature captured at the beginning of current monitoring cycle))	=	measured parameter	-
			(a) - (b) (a) filtered current tank temperature	<= =	-0.54 measured parameter	°C -
			(b) tank temperature captured at the beginning of current monitoring cycle	=	measured	-
			monitoring was performed in previous driving cycle	=	TRUE	-

Component / System	State or Status Sub-Grouping	Description of State or Status found in 150BDG05	Defined by:		Enable Conditions	
		continuation of previously started tank temperature performance monitoring cycle	temperature difference: (a) - (b)	<=	1.56	°C
			(a) filtered current tank temperature	=	measured parameter	-
			(b) tank temperature of the previous driving cycle	=	measured parameter	-
			temperature difference: (a) - (b)	<=	. 0	°C
			(a) tank temperature of the previous driving cycle	=	measured parameter	-
			(b) filtered current tank temperature	=	measured parameter	-
			temperature difference: (a) - (b)	>=	0	°C
			(a) tank temperature of the previous driving cycle	=	measured parameter	-
			(b) start tank temperature of current monitoring cycle from EEPROM (see definition)	=	measured parameter	-
			Engine off Time	<=	2000.00	sec
			This monitor was complete in the last driving cycle ice detection by tank temperature difference:	=	FALSE	
			(a) - (b)	>	-0.54	°C
			(a) filtered current tank temperature	=	measured parameter	-

Component / System	State or Status Sub-Grouping	Description of State or Status found in 150BDG05	Defined by:	Enable Conditions
			(b) tank temperature captured at the beginning of current monitoring cycle	= measured - parameter
		State of Reductant injection valve Component Protection	((status of SCR control sub state (please see the definition) and with	= Metering control -
			(PM Filter Regeneration Reluctant dosing valve modeled temperature (see Look-Up-Table #16)	= not active - > 119.96 to °C 134.96
) or (PM Filter Regeneration Reluctant dosing valve modeled temperature)) or	= active - > 119.96 °C
			(status of SCR control sub state (please see the definition) and with (✓ Metering control -
I	I	l	PM Filter Regeneration	= not active -

Component / System	State or Status Sub-Grouping	Description of State or Status found in 150BDG05	Defined by:		Enable Conditions	
			Modeled Reductant injection valve tip temperature based on its coil temperature (see Look-Up-Table #16)) or (PM Filter Regeneration Modeled Reductant injection valve tip temperature based on its coil temperature	> = >	119.96 to 134.96 active 119.96	°C - °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.			

Label (Internal Manufacturer Reference)

Table no.	Fault Codes	Label (Internal M	lanufact	turer Refe	rence)												
1	P0101	AFS_rAirThresLo	_MAP														
		0 2 0.85 4 0.85 70 0.85 80 0.8 100 0.8 120 0.8 140 0.8 200 0.8	95 0.85 0.85 0.8 0.8 0.8 0.8 0.8 0.8 0.8 0.8	110 0.85 0.85 0.85 0.8 0.8 0.8 0.8 0.8 0.8	180 0.85 0.85 0.85 0.8 0.8 0.8 0.8 0.8 0.8	250 0.8 0.8 0.8 0.8 0.8 0.8 0.8 0.8 0.8	300 0.8 0.8 0.8 0.8 0.8 0.8 0.8 0.8 0.8	400 0.8 0.8 0.8 0.8 0.8 0.8 0.8 0.8 0.8	500 0.8 0.8 0.8 0.8 0.8 0.8 0.8 0.8 0.8								
2	P2199	Air_tDiffMaxHiTAI	FS_CUF	र													
	Engine Off Time (sec) Delta Temperature (°C)	600 999	700 999	800 999	900 999	1000 999	2000 999	3000 999	4000 999	5000 999	8000 999	17999 999	18000 999	28799 999	28800 20	30000 20	32000 20
3	P10CF	Air_tDiffMaxHiTC	ACDs_C	CUR													
	Engine Off Time (sec)	600	700	800	900	1000	2000	3000	4000	5000	8000	17999	18000	28799	28800		32000
	Delta Temperature (°C)	999	999	999	999	999	999	999	999	999	999	999	999	999	25	25	25
4	P040F	Air_tDiffMaxHiTE	GRClr2	Ds_CUR													
	Engine Off Time (sec)	600	700	800	900	1000	2000	3000	4000	5000	8000	10000	15000	20000	25000	28800	30000
	Delta Temperature (°C)	3276.7 3	276.7	3276.7	3276.7	3276.7	3276.7	3276.7	3276.7	3276.7	3276.7	3276.7	3276.7	3276.7	3276.7	20	20
8	P0401	AirCtl_facEnvPres	sMinDvt	_CUR													
	Ambient Pressure (kPa)	70	77	80	85	90	95	100	110								
	Correction Factor (factor)	0.6	0.6	0.625	0.7	0.8	1	1	1								
9	P0401	AirCtl_mEGRMinDvtL	.im_CUR														
	Ambient Pressure (kPa)	67	75	76	77	80	82	85	88	91	95	98	101				
	EGR Commanded Air Mass (g/rev)	0.34	0.34	0.34	0.34	0.34	0.34	0.344	0.368	0.384	0.406	0.424	0.44				

Table no. Fault Codes

Label (Internal Manufacturer Reference)

10 P0402

AirCtl_mMaxDvt_MAP

Injection Qty (mm^3/rev) / Engine Speed (rpm)	1000	1200	1400	1500	1600	1800	2000	2200
1	0.033	0.033	0.033	0.033	0.033	0.033	0.033	0.033
2	0.033	0.033	0.033	0.033	0.033	0.033	0.033	0.033
3	0.033	0.033	0.050	0.033	0.033	0.033	0.033	0.033
4	0.033	0.033	0.050	0.033	0.033	0.033	0.033	0.033
6	0.033	0.033	0.045	0.033	0.040	0.060	0.075	0.07
8	0.035	0.035	0.035	0.035	0.040	0.060	0.075	0.07
9	0.040	0.040	0.040	0.040	0.040	0.060	0.075	0.075
10	0.060	0.060	0.060	0.060	0.060	0.060	0.075	0.075

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AirCtl_mMinDvt_MAP

Injection Qty (mm^3/rev) / Engine Speed (rpm)	1000	1300	1400	1500	1600	1800	1900	2000
2	-0.040	-0.050	-0.050	-0.050	-0.050	-0.050	-0.075	-0.150
6	-0.040	-0.050	-0.050	-0.050	-0.050	-0.050	-0.075	-0.150
10	-0.040	-0.050	-0.050	-0.050	-0.050	-0.050	-0.075	-0.150
15	-0.040	-0.050	-0.050	-0.050	-0.050	-0.050	-0.075	-0.150
20	-0.040	-0.048	-0.050	-0.050	-0.050	-0.075	-0.075	-0.150
25	-0.040	-0.040	-0.053	-0.053	-0.053	-0.075	-0.075	-0.150
30	-0.040	-0.040	-0.075	-0.075	-0.075	-0.075	-0.075	-0.150
40	-0.040	-0.040	-0.150	-0.150	-0.150	-0.150	-0.150	-0.150

12 P2138

APP_uSync_CUR

Accel Pedal Voltage (V)	0.500	2.100	2.100
Pedal Deviation (V)	0.120	0.180	0.180

13	P057B
13	1 03/ 0

Brk_facEWMASlowTest_CUR

Brake Position Sensor Voltage (V)	0	0.0346	0.035	0.04	0.045	0.051	0.0512	5
factor (-)	0	0	0	0	0	0	1	1

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CAClg_dmThresHi_CUR

Table no.	Fault Codes	Label (Internal Manufacturer Reference)
	Vehicle Speed (mph)	24.85 74.56
	Air Mass Flow (g/sec)	55.556 277.78
15	P011B	CEngDsT_tDiffMaxHi_CUR
	Engine Off Time (sec)	600 700 800 900 1000 2000 3000 4000 5000 8000 17999 18000 28799 28800 30000 32767
	Delta Temperature (°C)	999 999 999 999 999 999 999 999 999 999 999 999 999 999 20 20 20
17	P0336	EpmCrS_facGapPlausHigh_CA
	-	8 5.81 3.38 3.38
18	P0336	EpmCrS_facIncPlausHigh_CA
40		
	P02CD, P02CF, P02D1, P02D3	
	Rail Pressure Setpoint (kPa)	0 30000 80000
20	P02CD, P02CF, P02D1, P02D3	ETCIb_tiET_MAX_CA
	Injector Energizing Time (µsec)	0 547.2 304.4
21	P02CD, P02CF, P02D1, P02D3	ETCIb_tiET_MIN_CA
	Injector Energizing Time (µsec)	0 137.2 107.2
	······································	

Table no. 22	Fault Codes P02CD, P02CF, P02D1, P02D3		Label (Interna ETClb_tiETFb			ference)
	Injector Energizing Time (µsec)		0	16	12]
23	P02CD, P02CF, P02D1, P02D3		ETClb_tiETFb	OfsMin_C	CA	
	Injector Energizing Time (µsec)		0	16	12]
24	P144E		ETCtl_stPOpC	CtVOLopN	/lax_MAP	
	Injection Qty (mm^3/rev) / Engine Speed (rpm)		850	1000	2000	3500
		10	0	0	0	0

Injection Qty (mm^3/rev) / Engine Speed (rpm)	850	1000	2000	3500
1	0 0	0	0	0
1	6 0	1	1	1
4) 1	1	1	1
16) 1	1	1	1

25 P144F

ETCtl_stPOpCtVOLopMin_MAP

Injection Qty (mm^3/rev) / Engine Speed (rpm)	900	1000	2000	3500
1	0 0	0	0	0
1	3 0	1	1	1
4	1	1	1	1
16	1	1	1	1

26 P2453

Exh_dpMinPosPPFItDiff_CUR

Exhaust Gas Volume Flow Change (m^3/h/sec)	100	500
Differential Pressure Change Threshold (kPa/sec)	0.5	1.5

27 P11DC

Exh_facLamStatNoCat2Ds_CUR

-	1	1.5	2	5	7	9	10	15	20	25	30
-	0	0	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5

Table no. Fault Codes

Label (Internal Manufacturer Reference)

28 P11DB

Exh_facLamStatNSCDs_CUR

]	-	1	1.5	2	5	7	9	10	15	20	25	30
[-	0	0	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5

30 P11D3, P11D4 Exh_mAirAdapActvNSCDs_CUR

Upstream Measure NOx at DFCO Start (ppm)	0	20	50	100	200	300	400	500	600	700		900	1000	1200	1400	1600
Integrated Air Mass Flow (g)	100	100	125	150	250	300	300	350	350	400	400	500	500	500	500	500

31 P20E2

Exh_tDiffMaxHiTOxiCatDs_CUR

Engine Off Time (sec)	600	700	800	900	1000	2000	3000	4000	5000	8000	10000	15000	20000	25000	28800	32000
Delta Temperature (°C)	3276.7	3276.7	3276.7	3276.7	3276.7	3276.7	3276.7	3276.7	3276.7	3276.7	3276.7	3276.7	3276.7	3276.7	20	20

32 P20E4

Exh_tDiffMaxHiTPFItDs_CUR

Engine Off Time (sec)	600	700	800	900	1000	2000	3000	4000	5000	8000	10000	15000	20000	25000	28800	32000
Delta Temperature (°C)	3276.7	3276.7	3276.7	3276.7	3276.7	3276.7	3276.7	3276.7	3276.7	3276.7	3276.7	3276.7	3276.7	3276.7	20	20

33 P24B 7

PM Sensor Temperature (°C)	-30.00	19.98	69.98	119.98	150.00
Heater Resistance (Ohm)	2.93	3.26	3.60	3.93	4.13

-

-

34 P24B 7

PM Sensor Temperature (°C)	-30.00	19.98	69.98	119.98	150.00
Heater Resistance (Ohm)	1.09	1.29	1.49	1.69	1.81

35 P2598, P2599

TrbCh_tiEnaMonDlyBrk_CUR

Ambient Pressure (kPa)	50.00	59.80	59.90	60.00	65.00	70	76	84	96	100
Delay Time (sec)	15.00	15.00	15.00	15.00	15.00	10	10	5	5	5

Table no. Fault Codes

Label (Internal Manufacturer Reference)

37 P0263, P0266, P0269, P0272 FBC_qLimNeg_MAP

ECT (°C) / Inj. Qty (mm^3/rev)		0	4	28	200	202	204	206	208
	-40.04	0	0	-24	-24	-24	-24	-24	-24
	-15.04	0	0	-24	-24	-24	-24	-24	-24
	9.96	0	0	-24	-24	-24	-24	-24	-24
	34.96	0	0	-24	-24	-24	-24	-24	-24
	59.96	0	0	-24	-24	-24	-24	-24	-24
	84.96	0	0	-24	-24	-24	-24	-24	-24
	109.96	0	0	-24	-24	-24	-24	-24	-24
	134.96	0	0	-24	-24	-24	-24	-24	-24

38 P0263, P0266, P0269, P0272

FBC_qLimPos_MAP

ECT (°C) / Inj. Qty (mm^3/rev)	0	4	28	200	202	204	206	208
-40.04	0	0	24	24	24	24	24	24
-15.04	0	0	24	24	24	24	24	24
9.96	0	0	24	24	24	24	24	24
34.96	0	0	24	24	24	24	24	24
59.96	0	0	24	24	24	24	24	24
84.96	0	0	24	24	24	24	24	24
109.96	0	0	24	24	24	24	24	24
134.96	0	0	24	24	24	24	24	24

39 P026D

FMO_qFISysThresMax_MAP

Injection Qty (mm^3/rev) / Air Mass per Cylinder (g/rev)	0.135	0.15	0.175	0.2	0.225	0.25	0.275	0.3
12	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2
14	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6
16	1	1	1	1	1	1	1	1
18	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8
20	2.4	2.4	2.4	2.4	2.4	2.4	2.4	2.4
22	3.4	3.4	3.4	3.4	3.4	3.4	3.4	3.4
24	4.4	4.4	4.4	4.4	4.4	4.4	4.4	4.4
26	5.4	5.4	5.4	5.4	5.4	5.4	5.4	5.4

Table no. Fault Codes

Label (Internal Manufacturer Reference)

40 P026C, P026D

FMO_stOutObsvr_MAP

Injection Qty (mm^3/rev) / Engine Speed (rpm)	500	1000	1500	2000	2500	3000	3500	4000	4500	5000
4	0	0	0	0	0	0	0	0	0	C
12	1	1	1	1	1	1	1	1	1	1
24	1	1	1	1	1	1	1	1	1	1
36	1	1	1	1	1	1	1	1	1	1
48	1	1	1	1	1	1	1	1	1	
60	1	1	1	1	1	1	1	1	1	
72	1	1	1	1	1	1	1	1	1	
84	1	1	1	1	1	1	1	1	1	
100	1	1	1	1	1	1	1	1	1	
120	1	1	1	1	1	1	1	1	1	

41 P054F

InjCtl_qDesGearMonMax_MAP

ECT (°C) / Engine Speed (rpm)	0	400	600	825	1050	5000
-20.04	176.8	176.8	176.8	176.8	176.8	176.8
-10.04	133.8	133.8	133.8	133.8	133.8	133.8
-0.04	132.4	132.4	132.4	132.4	132.4	132.4
19.96	106.2	106.2	106.2	106.2	106.2	106.2
39.96	85.8	85.8	85.8	85.8	85.8	85.8
69.96	81.2	81.2	81.2	81.2	81.2	81.2

42 P054F

InjCtl_qDesNeutrGearMonMax_MAP

ECT (°C) / Engine Speed (rpm)	0	400	600	825	1050	5000
-20.04	111.8	111.8	111.8	111.8	111.8	111.8
-0.04	93.4	93.4	93.4	93.4	93.4	93.4
9.96	79.2	79.2	79.2	79.2	79.2	79.2
39.96	70.6	70.6	70.6	70.6	70.6	70.6
69.96	66	66	66	66	66	66
84.96	60.2	60.2	60.2	60.2	60.2	60.2

43 P054E

InjCtl_qDesNeutrGearMonMin_MAP

Table no. Fault Codes

Label (Internal Manufacturer Reference)

ECT (°C) / Engine Speed (rpm)		0	400	600	825	1050	5000
	-20.04	22.6	22.6	22.6	22.6	22.6	22.6
	0.04	16.4	16.4	16.4	16.4	16.4	16.4
	9.96	11.6	11.6	11.6	11.6	11.6	11.6
	39.96	8.8	8.8	8.8	8.8	8.8	8.8
	69.96	7.2	7.2	7.2	7.2	7.2	7.2
	84.93	5.4	5.4	5.4	5.4	5.4	5.

44 P054E

InjCtl_qDesGearMonMin_MAP

ECT (°C) / Engine Speed (rpm)	0	400	600	825	1050	5000
-20.04	41.2	41.2	41.2	41.2	41.2	41.2
-0.04	26.8	26.8	26.8	26.8	26.8	26.8
9.90	26.4	26.4	26.4	26.4	26.4	26.4
19.90	17.6	17.6	17.6	17.6	17.6	17.6
39.90	10.8	10.8	10.8	10.8	10.8	10.8
69.90	9.2	9.2	9.2	9.2	9.2	9.2

45 P11A6, P11A9, P2297

LSU_mAirMax_C

LSU_nMax_C

Column Number (-)	0	1	2
Air Mass per Cylinder (g/rev)	0.2525	0.275	0.45

46 P11A6, P11A9, P2297 LSU_mAirMin_C

Column Number (-)	0	1	2
Air Mass per Cylinder (g/rev)	0.25	0.09	0.1

47 P11A6, P11A9, P2297

Column Number (-)	0	1	2
Engine Speed (rpm)	2800	2700	4500

48 P11A6, P11A9, P2297 LSU_qMax_C

Column Number (-)		0	1	2
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Table no.	Fault Codes	Label (Internal Manufacturer Reference)
	Injection Quantity (mm^3/rev)	44 36 0.4
40		
49	P11A6, P11A9, P2297	LSU_qMin_C
	Column Number (-)	0 1 2
	Injection Quantity (mm^3/rev)	
50	P11A9, P2297	LSU_rO2NegDvt_C
	Column Number (-)	0 1 2
	Difference between Calculated and Mesaured O2 (-)	0.07 0.07 0.06
51	P11A6, P2297	LSU_rO2PosDvt_C
	Column Number (-)	0 1 2
	Difference between Calculated and Mesaured O2 (-)	0.07 0.07 0.04
52	P0300, P0301, P0302, P0303, P0304	MisfDet_dnThresIdI_CUR
	Injection Quantity (mm^3/rev)	8.64 26.1 45 75.24
	Crankshaft Angular Acceleration (s^(-2))	-2.5234 -3.9609 -5.0391 -5.7578
53	P0606	MoFInjQnt_tiZFCETMax_CUR
	Rail Pressure (kPa)	30400 70400 80000 90400 120000 130400
	Energizing Time (µsec)	500 300 275.2 250 158 50
54	P0606	MoFInjQnt_tiZFCETMin_CUR
	Rail Pressure (kPa)	30400 70400 80000 90400 120000 130400
	Energizing Time (µsec)	-500 -300 -274.8 -250 -158 -50
55	P0606	MoFOvR_tiLimET_CUR

Table no.	Fault Codes	Label (Inte	ernal Manuf	acturer Re	ference)
	Engine Speed (rpm)		0 208	2120	4000
	Energizing Time (µsec)	60	600	200	200

57 P0299

PCR_pMaxDvt_MAP

Injection Qty (mm^3/rev) / Engine Speed (rpm)	1000	1500	1750	2000	2500	3000	3500	4000
60	35	35	35	40	40	34	40	35
70	35	35	37.5	40	50	50	40	35
80	37	37	38	48	56	59	45	35
100	40	40	40	49	60	60	60	42
120	45	45	45	55	60	60	60	50
140	33	33	40	49	60	52.5	60	60
160	46	46	46	54	57	60	60	60
170	47	47	47	45	57	60	60	60

58 P0234

PCR_pMinDvt_MAP

Injection Qty (mm^3/rev) / Engine Speed (rpm)	2000	2200	2400	2600	2800	3000	3500	4000
100	-25	-25	-25	-25	-25	-25	-25	-25
110	-25	-25	-25	-25	-25	-25	-25	-25
120	-25	-25	-25	-25	-25	-25	-25	-25
130	-25	-25	-25	-25	-25	-25	-25	-25
140	-25.5	-25.5	-25.5	-25.5	-25.5	-25.5	-25.5	-25.5
150	-26	-26	-26	-26	-26	-26	-26	-26
160	-27	-27	-27	-27	-27	-27	-27	-27
170	-27	-27	-27	-27	-27	-27	-27	-27

59 P2263

PCR_pOvrBstDvt_MAP

Injection Qty (mm^3/rev) / Engine Speed (rpm)	1500	2000	2250	2500	2750	3000	3500	5500
10	0 -40	-40	-40	-40	-40	-40	-40	-40
11	0 -40	-40	-40	-40	-40	-40	-40	-40
12	0 -40	-40	-42	-41	-40.5	-42	-44.5	-45
13	0 -40	-40	-43	-42	-42	-42	-40.5	-40
14	0 -40	-40	-44	-43	-43	-43	-43	-37
15	0 -40	-40	-40.5	-44	-40	-40.5	-40	-34
16	0 -40	-40	-38	-35	-35	-34	-31.5	-34

Table no.	Fault Codes	Lab	oel (Internal	Manufact	urer Refe	erence)				
		170	-40	-40	-30	-30	-30	-30	-30	-30

60 P2263

PCR_pUndrBstDvt_MAP

Injection Qty (mm^3/rev) / Engine Speed (rpm)	2	000	2250	2500	2750	3000	3500	4000	4500
	100	100	100	100	100	100	100	100	100
	110	100	100	100	100	100	100	100	100
	120	100	100	102.5	105	107.5	105	100	100
	130	100	102.5	105	105	107.5	105	100	100
	140	100	102.5	105	105	107.5	105	100	100
	150	100	102.5	105	105	105	105	100	100
	160	100	102.5	105	105	105	105	100	10
	170	100	100	100	100	100	100	100	100

61 P2459

PFIt_mSotThresRgnFreq_CUR

Soot Mass at End of Regen (g)	0	4	8	20	24	26
Soot Mass (g)	0	24.6	49.1	122.8	147.4	159.6

62 P128E

Rail_pCPCFItMin_CUR

Engine Speed (rpm)	0	200	400	600	700	725	775	850	900	1000	1200	1650	2000	3000	4000	5000
Rail Pressure (kPa)	0	0	0	0	0	0	15000	15000	15000	15000	15000	15000	15000	15000	15000	15000

63 P0087

Rail_pMeUnDvtMax_CUR

Engine Speed (rpm)	0	200	400	600	700	725	775	850	900	1000	1200	1650	2000	3000	4000	5000
Rail Pressure (kPa)	80000	80000	80000	80000	80000	80000	11000	11000	11000	11000	11000	11000	11000	11000	11000	11000

725

-80000

775

-18000

850

-18000

900

-18000 -18000

1000

1200

-18000

1650

2000

3000

-18000 -18000 -18000 -18000 -18000

4000

5000

64	P0088	Rail_pMeUnD	vtMin_CUI	२			
	Engine Speed (rpm)	0	200	400	600	700	
	Rail Pressure (kPa)	-80000	-80000	-80000	-80000	-80000	

65 P128E

Rail_pMeUnFItMin_CUR

Table no. Fault Codes

Label (Internal Manufacturer Reference)

Engine Speed (rpm)	0	200	400	600	700	725	775	850	900	1000	1200	1650	2000	3000	4000	5000
Rail Pressure (kPa)	0	0	0	0	0	0	15000	15000	15000	15000	15000	15000	15000	15000	15000	15000

66 P0087

Rail_pPCVDvtMax_CUR

Engine Speed (rpm)	0	200	400	600	700	725	775	850	900	1000	1200	1650	2000	3000	4000	5000
Rail Pressure (kPa)	80000	80000	80000	80000	80000	80000	11000	11000	11000	11000	11000	11000	11000	11000	11000	11000

67 P128E

Rail_pPCVFltMin_CUR

Engine Speed (rpm)	0	200	400	600	700	725	775	850	900	1000	1200	1650	2000	3000	4000	5000
Rail Pressure (kPa)	0	0	0	0	0	0	15000	15000	15000	15000	15000	15000	15000	15000	15000	15000

68 P20EE

SCRChk_facEtaEstOfs1_MAP

Filtered Exh Mass Flow (g/s) / SCR Upstream Temp (°C)	149.96	199.96	229.96	249.96	269.96	289.96	309.96	359.96
11.11	-0.187	-0.187	-0.187	-0.161	-0.2	-0.206	-0.206	-0.206
16.67	-0.187	-0.187	-0.187	-0.161	-0.22	-0.206	-0.206	-0.206
22.22	-0.198	-0.198	-0.198	-0.171	-0.24	-0.206	-0.206	-0.206
27.78	-0.235	-0.235	-0.235	-0.22	-0.24	-0.195	-0.188	-0.188
33.33	-0.273	-0.273	-0.273	-0.23	-0.225	-0.185	-0.178	-0.178
41.67	-0.294	-0.294	-0.294	-0.25	-0.22	-0.175	-0.172	-0.172
50.00	-0.294	-0.294	-0.294	-0.26	-0.22	-0.173	-0.17	-0.17
69.45	-0.294	-0.294	-0.294	-0.26	-0.22	-0.172	-0.17	-0.17

69 P11CC

SCRChk_facRatHumMinNOxUs_CUR

Relative Humidity (%)	0	30.0049	40.0024	50	59.9976	75	90.002	100
Correction Factor (factor)	1	1	1	1	1	1	1	1

70 P11CB, P11CC

SCRChk_idcPOpMinNOxUsPlaus_GMAP

Injection Qty (mm^3/rev) / Engine Speed (rpm)	600	800	1000	1320	1400	1600	1800	2000	2200	2600	2800	3000	3200	4000	5000	10000
10	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
14	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

Table no. Fault Codes

Label (Internal Manufacturer Reference)

20	0	0	0	1	1	1	1	1	1	1	1	C	0 0	0	0	0
26	0	0	0	1	1	1	1	1	1	1	1	C	0 0	0	0	0
32	0	0	0	1	1	1	1	1	1	1	1	0	0 0	0	0	0
38	0	0	0	0	0	1	1	1	1	1	0	C	0 0	0	0	0
44	0	0	0	0	0	1	1	1	1	1	0	C	0 0	0	0	0
50	0	0	0	0	0	0	0	0	0	0	0	0	0 0	0	0	0
60	0	0	0	0	0	0	0	0	0	0	0	C	0 0	0	0	0
80	0	0	0	0	0	0	0	0	0	0	0	C	0 0	0	0	0

71 P20EE

SCRChk_mEstNH3LdMax_CUR

SCR Temperature (°C)	149.96	199.96	249.96	299.96	349.96	399.96	449.96	499.96
Ammonia Load (g)	1.31	1.51	1.64	1.45	1.05	0.65	0.4	0.23

72 P20EE

SCRChk_mEstNH3LdMin_CUR

SCR Temperature (°C)	149.96	199.96	249.96	299.96	349.96	399.96	449.96	499.96
Ammonia Load (g)	1.114	1.284	1.394	1.233	0.893	0.553	0.34	0.196

73 P20EE

SCRChk_mNOxUsMin1_MAP

Exhaust Gas Mass Flow (g/sec) / SCR Temperature (°C)	149.96	199.96	229.96	259.96	289.96	319.96	359.96	599.96
11.11	0.65	0.65	0.65	0.65	0.65	0.65	0.65	0.65
16.67	0.65	0.65	0.65	0.65	0.65	0.65	0.65	0.65
22.22	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7
27.78	0.77	0.77	0.77	0.77	0.77	0.77	0.77	0.77
33.33	1.03	1.03	1.03	1.03	1.03	1.03	1.03	1.03
41.67	1.55	1.55	1.55	1.55	1.59	1.64	1.64	1.64
50.00	2.28	2.28	2.28	2.28	2.44	2.6	2.6	2.6
69.45	4.4	4.4	4.4	4.4	4.95	5.5	5.5	5.5

74 P11CB

SCRChk_rNOxDiffThresBasMaxUs_GMAP

Injection Qty (mm^3/rev) / Engine Speed (rpm)	800	1250	1400	1600	2000	2250	2500	3000	3200	4000
10	0.57	0.57	0.57	0.76	1.14	1.40	1.30	1.30	1.30	1.30
14	0.57	0.57	0.57	0.76	1.09	1.40	1.30	1.30	1.30	1.30
20	0.57	0.57	0.57	0.76	0.99	1.30	1.15	1.22	1.22	1.22

Table no. Fault Codes

Label (Internal Manufacturer Reference)

26	0.57	0.57	0.57	0.62	0.82	0.90	0.91	1.03	1.03	1.03
32	0.53	0.53	0.53	0.46	0.66	0.80	0.76	0.88	0.88	0.88
38	0.44	0.44	0.44	0.41	0.62	0.75	0.71	0.83	0.83	0.83
44	0.42	0.42	0.42	0.42	0.59	0.65	0.68	0.80	0.80	0.80
50	0.42	0.42	0.42	0.42	0.59	0.62	0.61	0.80	0.80	0.80
60	0.42	0.42	0.42	0.42	0.59	0.62	0.61	0.80	0.80	0.80
80	0.42	0.42	0.42	0.42	0.59	0.62	0.61	0.80	0.80	0.80

75 P11CC

SCRChk_rNOxDiffThresBasMinUs_GMAP

Injection Qty (mm^3/rev) / Engine Speed (rpm)	800	1250	1400	1600	2000	2250	2500	3000	3200	4000
10	-0.60	-0.6	-0.6	-0.5699	-0.58	-0.52	-0.52	-0.52	-0.52	-0.52
14	-0.60	-0.6	-0.6	-0.5699	-0.58	-0.52	-0.52	-0.52	-0.52	-0.52
20	-0.60	-0.6	-0.6	-0.5699	-0.58	-0.52	-0.52	-0.52	-0.52	-0.52
26	-0.61	-0.61	-0.61	-0.62	-0.63	-0.58	-0.58	-0.5601	-0.5601	-0.5601
32	-0.62	-0.62	-0.62	-0.64	-0.65	-0.6	-0.6	-0.58	-0.58	-0.58
38	-0.62	-0.62	-0.62	-0.64	-0.66	-0.62	-0.62	-0.59	-0.59	-0.59
44	-0.63	-0.63	-0.63	-0.64	-0.67	-0.63	-0.63	-0.6	-0.6	-0.6
50	-0.63	-0.63	-0.63	-0.64	-0.67	-0.64	-0.64	-0.6	-0.6	-0.6
60	-0.63	-0.63	-0.63	-0.64	-0.67	-0.64	-0.64	-0.6	-0.6	-0.6
80	-0.63	-0.63	-0.63	-0.64	-0.67	-0.64	-0.64	-0.6	-0.6	-0.6

76 P11CB, P11CC

SCRChk_stExhTempRlsUsPlaus_CUR

Exhaust Gas Temp @ NOx Sensor (°C)	179.96	199.96
Enable Condition (1 = Enable) (-)	0	1

77 P20EE

SCRChk_tDeltaTempSCRMax_CUR

Filtered SCR Temp (°C)	179.96	229.96	249.96	279.96	299.96	309.96	319.96	399.96
Delta SCR Temp (°C)	-3.04	-3.04	-3.44	-4.04	-2.84	-2.54	-2.34	-2.04

78 P20EE

SCRChk_tDeltaTempSCRMin_CUR

Filtered SCR Temp (°C)	179.96	229.96	249.96	279.96	299.96	309.96	319.96	399.96
Delta SCR Temp (°C)	-3.04	-3.04	-3.24	-3.64	-2.54	-2.24	-2.04	-2.04

Table no. Fault Codes

Label (Internal Manufacturer Reference)

79 P20EE

SCRChk_tiAddDisbl_MAP

Nox Peak Duration (s) / Nox Mass Flow (g/s)	0	0.08	0.1	0.15	0.2	0.3	0.4	1.65
(0	0	5	5	5	5	5	5
1	0	0	5	5	5	5	5	5
2	0	0	5	5	5	5	5	5
5	0	0	5	10	10	10	10	10
10	0	0	10	20	20	20	20	20
60	0	0	30	60	60	60	60	60
120	60	60	60	60	60	60	60	60
1000	60	60	60	60	60	60	60	60

80 P10D0

SCRPOD_tMaxDiff_CUR

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

81 Engine Running

StSys_nStrtCutOut_MAP

BARO Pressure (kPa) / ECT at Start (°C)		-40.04	-20.04	-10.04	-0.04	29.96	38.96	39.96	59.96
	57.7	1100	1100	1000	1000	1000	1000	850	850
	61.6	1100	1100	1000	1000	1000	1000	850	850
	65.8	1100	1100	1000	1000	1000	1000	850	850
	70.1	1100	1100	1000	1000	1000	1000	850	850
	74.5	1100	1100	1000	1000	1000	1000	850	850
	79.5	1100	1100	1000	1000	1000	1000	850	850
	83	1100	1100	1000	1000	1000	1000	850	850
	101.3	1100	1100	1000	1000	1000	1000	850	850

82 P01CB, P01CC, P01CD, P01CE, P01CF, P01D0, P01D1, ZFC_stGearRis_CA P01D2, P02CD, P02CF, P02D1, P02D3

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

Table no. 83	Fault Codes P01CB, P01CC, P01CD, P01CE, P01CF, P01D0, P01D1, P01D2, P02CD, P02CF, P02D1, P02D3	Label (Internal ZFC_tiCldCham		urer Refer	ence)								
	ECT (°C)	-7.04	-5.04	0.96	5.96	13.96	18.96	24.96	29.96	37.96	49.96	59.96	69.96
	Time (sec)	7	8	10	11	15	17	20	20	20	20	20	20
84	P2263	PCR_facOvrBs	tDvt_CUR										
	BARO Pressure (kPa)	70	75	80	85	90	95	100	125				
	Correction Factor (-)	1.25	1.25	1.25	1.20	1.00	1.00	1.00	1.00				
85	P2263 BARO Pressure (kPa) Correction Factor (-)	PCR_facUndrB	stDvt_CUF 75 0.85	80 0.90	85 0.95	90 1.00	95 1.00	100 1.00	125 1.00				
86	P11CB	SCRChk_facEn	vPCorMax	NOxUs_C	UR								
	BARO Pressure (kPa)	70	75	80	85	90	95	100	110	120			
	Correction Factor (-)	1.40	1.40	1.75	1.72	1.40	1.00	1.00	1.00	1.00			
87	P11CC BARO Pressure (kPa)	SCRChk_facEnvPCorMinNOxUs_CUR											
	Correction Factor (-)	0.62	0.62	0.70	0.72	0.85	1.00	1.00	1.00	1.00			
		0.02	0.0-	00	···-	0.00							

end S1-15OBDG05 - Calibration Tables

S2-15OBDG05_PM_Sensor - Calibration Tables

Table no	. Fault Codes	Label (Interna	I Manufac	turer Refe	erence)				
Table no	. Fault Codes	Label (Interna	I Manufac	turer Refe	erence)				
1	P24C7	Exh_tPPDsTe	mpMeaDift	Neg_CUR					
	Exhaust Temperature Average (deg C)	-0.04	49.96	139.96	159.96	179.96	239.96	299.96	399.96
	Diagnostic Threshold (deg C)	-30.04	-30.04	-70.04	-75.04	-80.04	-95.04	-110.04	-155.04
2	P24C7	Exh_tPPDsTe	•	-					
		0.04	40.00	100.00	450.00			000 00	

Exhaust Temperature Average (deg C)	-0.04	49.96	139.96	159.96	179.96	239.96	299.96	399.96
Diagnostic Threshold (deg C)	69.96	69.96	109.96	114.96	119.96	134.96	149.96	194.96

end S1-15OBDG05_PM_Sensor - Calibration Tables

Calibration Parameter Definition - Calibration Tables

Status and State Calibration Tables

Table no. Status or State

Label (Internal Manufacturer Reference)

1 A/F Sensor Dewpoint Reached, Status of NOx signal of upstream NOx sensor, Upstream NOx sensor dewpoint achieved

ECT at Start (°C) / Modeled Exhaust Wall Temp (°C)	-40.14	-30.04	-20.04	-10.04	-0.04	9.96	19.96	29.96
-40.14	600	600	600	600	600	600	600	600

DewDet_wThresLSU0_MAP

Table no. Fault Codes

Label (Internal Manufacturer Reference)

-30.04	600	600	600	600	600	600	600	600
-20.04	600	600	570	570	570	570	570	570
-10.04	600	600	570	530	530	530	530	530
-0.04	600	600	570	530	370	370	370	370
9.96	600	600	570	530	370	300	300	300
19.96	600	600	570	530	370	300	130	130
29.96	600	600	570	530	370	300	130	130

3 Status of NOx signal of downstream NOx sensor, DewDet_wThresLSU2_MAP Downstream NOx sensor dewpoint achieved, Enabling Downstream NOx sensor heater diagnosis, PM sensor dewpoint achieved

ECT at Start (°C) / Modeled Exhaust Wall Temp (°C)	-40.14	-30.04	-20.04	-10.04	-0.04	9.96	19.96	29.96
-40.14	1460	1460	1460	1460	1460	1460	1460	1460
-30.04	1460	1460	1460	1460	1460	1460	1460	1460
-20.04	1460	1460	1380	1380	1380	1380	1380	1380
-10.04	1460	1460	1380	1300	1300	1300	1300	1300
-0.04	1460	1460	1380	1300	1200	1200	1200	1200
9.96	1460	1460	1380	1300	1200	560	560	560
19.96	1460	1460	1380	1300	1200	560	310	310
29.96	1460	1460	1380	1300	1200	560	310	310

4 Status thermal regeneration active

PFItLd_dmSotSimRgnBas_CUR

Produced Soot (g)	0	4	6.5	7.5	8	12.5	18	20	22	25	50	100
Soot Mass flow (g/sec)	0.01	0.01	0.01	0.02	0.02	0.03	0.04	0.05	0.05	0.05	0.05	0.05

5 Status thermal regeneration active

PFItLd_facO2SimRgn_MAP

Exhaust Mass Flow (g/s) / Lambda (-)	0.9	1	1.05	1.1	1.2	1.4	1.8	3
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.42	2 0.00	0.00	0.26	0.39	0.52	0.52	0.52	0.52
1.39	0.00	0.00	0.47	0.70	0.94	0.94	0.94	0.94
2.78	0.00	0.00	0.60	0.90	1.20	1.20	1.20	1.20
4.17	0.00	0.00	0.74	1.11	1.48	1.48	1.48	1.48
5.50	0.00	0.00	0.76	1.13	1.51	1.51	1.51	1.51

Table no.	Fault Codes	Label	(Internal	Manufactu	irer Refere	ence)				
		6.95	0.00	0.00	0.76	1.14	1.53	1.53	1.53	1.53
		9.72	0.00	0.00	0.81	1.22	1.62	1.62	1.62	1.62

6 Status thermal regeneration active PFltLd_facTempSimRgn_CUR

Particulate Filter Surface Temp (°C)	499.96	524.96	549.96	569.96	579.96	589.96	599.96	624.96	649.96	699.96
Temperature Factor (-)	0	0.13989	0.22473	0.35376	0.52844	0.67993	0.8	0.9	0.9	0.95

7 Rail Control - PCV Closed Loop Control Only Rail_dvolMeUnCtlUpLim_CUR

Engine Speed (rpm)	500	750	1400	1700	1950	2804	3054	3304	5000	5001	5002	5003	5004	5005	5006	5007
Rail Volume Flow (mm^3/sec)	20000	20000	20000	21000	22700	30370	32580	33080	33080	33080	33080	33080	33080	33080	33080	33080

Rail Control - Metering Unit + PCV Closed Loop Control

8

Rail_qMeUnCtIType_CUR

Engine Speed (rpm)	850	1025	1200	1300	1500	1700	1900	2100
Injection Qty (mm^3/rev)	9	14	20	24	26	24	21	20

9 Status of the SCR adaptation plausibility check active SCRAd_mNH3MinTrg_MAP

SCR Modeled Efficieny (-)/ SCR Temp (°C)	-0.04	99.96	299.86	299.96	399.96	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

10 Overdosing detected

SCRAd_mNOxOvrMetPh1_CUR

SCR Avg. Temp (°C)	249.96	299.96	349.96	399.96
Nox Mass (g)	-0.55	-0.45	-0.4	-0.38

11 Overdosing detected

SCRAd_mNOxOvrMetPh2_CUR

Table no.	Fault Codes	Label (Internal Manufacturer Reference)
	SCR Avg. Temp (°C)	249.96 299.96 349.96 399.96
	Nox Mass (g)	-0.39 -0.34 -0.3 -0.3
12	Overdosing detected	SCRAd_mNOxOvrMetPh3_CUR
	SCR Avg. Temp (°C)	249.96 299.96 349.96 399.96
	Nox Mass (g)	-0.27 -0.23 -0.2 -0.2
13	Underdosing detected	SCRAd_mNOxUndrMetPh1_CUR
	SCR Avg. Temp (°C)	249.96 299.96 349.96 399.96
	Nox Mass (g)	0.45 0.42 0.4 0.4
14	Underdosing detected	SCRAd_mNOxUndrMetPh2_CUR
	SCR Avg. Temp (°C)	249.96 299.96 349.96 399.96
	Nox Mass (g)	0.09 0.08 0.08 0.08

15 Underdosing detected SCRAd_mNOxUndrMetPh3_CUR

SCR Avg. Temp (°C)	249.96	299.96	349.96	399.96
Nox Mass (g)	-0.1	-0.08	-0.07	-0.07

16 State of Reductant injection valve Component Protection UDC_tUDosVIvCoPrActv_MAP

Vehicle Speed (mph) / Exhaust Gas Temp (°C)	199.96	299.96	399.96	499.96	599.96
0	134.96	134.96	129.96	119.96	119.96
31.25	124.96	124.96	124.96	119.96	119.96
125	119.96	119.96	119.96	119.96	119.96

17 Release of tank heater circuit

UHC	tiC1On	CUR

Reductant Tank Temp. (°C)	-30.04	-7.04	-6.04	-0.04

-6.04 0

> -6.04 0

Table no.	Fault Codes	Label (Internal	I Manufact	turer Refe	rence)		
	Reductant Heater Time (sec)	300	300	0	0		
18	Release of tank heater circuit	UHC_tiDfrstC2	_CUR				
	Reductant Tank Temp. (°C)	-45.04	-30.04	-25.04	-18.04	-9.04	-8.04
	Reductant Heater Time (sec)	2200	1800	1600	1200	600	300
19	Release of tank heater circuit	UHC_tiDfrstC3		25.04	19.04	-9.04	9.04
	Reductant Tank Temp. (°C) Reductant Heater Time (sec)	-45.04 2200	-30.04 1800	-25.04 1600	-18.04 1200	-9.04 600	-8.04 300
20	State of the defrosting check of supply module	UHC_tiEngOff			1200		
	Reductant Tank Temp. (°C)	-30.04	-25.04	-20.04	-15.04	-11.04	-5.04
	Engine Off Time (sec)	120	120	120	180	550	900
21	State of the defrosting check of pressure line Reductant Tank Temp. (°C)	UHC_tiEngOffF	-25.04	-20.04	-15.04	-11.04	-5.04
	Engine Off Time (sec)	120	120	120	180	550	900
22	Release of tank heater circuit Release of pressure line heater circuit	UHC_tiOnC2_0					
	Reductant Tank Temp. (°C)	-60.04	-7.04	-6.04	9.96		
	Reductant Heater Time (sec)	180	180	0	0		
23	Release of tank heater circuit Release of pressure line heater circuit Reductant Tank Temp. (°C) Reductant Heater Time (sec)	UHC_tiOnC3_0 -60.04 180	CUR -7.04 180	-6.04 0	<u>9.96</u> 0		
24	Release of tank heater circuit	UHC_tiC1Dfrst	FirstCyc_N	/IAP			

Table no. Fault Codes

Label (Internal Manufacturer Reference)

Ambient Air Temp (°C) / Reductant Tank Temp (°C)	-45.04	-30.04	-25.04	-18.04	-9.04	-8.04	-6.04
-45.04	4170	3270	2670	1800	1200	600	10
-25.04	4170	3270	2670	1800	1200	600	10
-18.04	4170	3270	2670	1800	1200	600	10
-9.04	4170	3270	2670	1800	1200	600	10
-8.04	4170	3270	2670	1800	1200	600	10
-5.04	4170	3270	2670	1800	1200	600	10
9.96	4170	3270	2670	1800	1200	600	10
19.96	4170	3270	2670	1800	1200	600	10

1.1. 070				Inhibited DTCs										
P0016 - Crankshaft to Camshaft	P0315 - Crankshaft Position System	1		Inhibited DTCs										
Correlation P0030 - HO2S Heater Control	Variation Not Learned P0133 - O2 Sensor Circuit Slow Response Bank 1 Sensor 1	P11A6 - HO2S Performance - Signa High During Moderate Load Sensor	P11A9 - O2 Sensor Performance - Signal Low During Moderate Load	P2237 - O2 Sensor Positive Current Control Circuit/Open Bank 1 Sensor	P2243 - O2 Sensor Reference Voltage Circuit/Open Bank 1 Sensor	P2251 - O2 Sensor Negative Current Control Circuit/Open Bank 1 Sensor	P2A00 - O2 Sensor Circuit Range/Performance Bank 1 Sensor							
Circuit Bank 1 Sensor 1	P0133 - O2 Sensor Circuit Slow	P11A6 - HO2S Performance - Signa	Bank 1 Sensor 1	1 P2237 - O2 Sensor Positive Current	1 P2243 - O2 Sensor Reference	1 P2251 - O2 Sensor Negative Current	P2A00 - O2 Sensor Circuit	-						
P0031 - HO2S Heater Control Circuit Low Bank 1 Sensor 1	Response Bank 1 Sensor 1 P0133 - O2 Sensor Circuit Slow	High During Moderate Load Sensor 1 P11A6 - HO2S Performance - Signa	Signal Low During Moderate Load Bank 1 Sensor 1 P11A9 - O2 Sensor Performance -	Control Circuit/Open Bank 1 Sensor 1 P2227 02 Sensor Parities Current	Voltage Circuit/Open Bank 1 Sensor 1 P2243 - O2 Sensor Reference	Control Circuit/Open Bank 1 Sensor 1 P2251 - O2 Sensor Negative Current	Range/Performance Bank 1 Sensor P2A00 - O2 Sensor Circuit	1						
P0032 - HO2S Heater Control Circuit High Bank 1 Sensor 1	Response Bank 1 Sensor 1	High During Moderate Load Sensor	Signal Low During Moderate Load Bank 1 Sensor 1	Control Circuit/Open Bank 1 Sensor 1	Voltage Circuit/Open Bank 1 Sensor 1	Control Circuit/Open Bank 1 Sensor 1	Range/Performance Bank 1 Sensor	1						
P0047 - Turbocharger Boost Control Circuit Low Voltage	P0133 - O2 Sensor Circuit Slow Response Bank 1 Sensor 1	P0234 - Turbocharger Engine Overboost	P0299 - Turbocharger Engine Underboost	P0401 - Exhaust Gas Recirculation Flow Insufficient	P0402 - Exhaust Gas Recirculation Flow Excessive	P11A6 - HO2S Performance - Signal High During Moderate Load Sensor 1	P11A9 - O2 Sensor Performance - Signal Low During Moderate Load Bank 1 Sensor 1	P2002 - Diesel Particulate Filter (DPF) Low Efficiency	P2237 - O2 Sensor Positive Current Control Circuit/Open Bank 1 Sensor 1	P2A00 - O2 Sensor Circuit Range/Performance Bank 1 Sensor 1				
P0048 - Turbocharger Boost Control Circuit High Voltage	P0133 - O2 Sensor Circuit Slow Response Bank 1 Sensor 1	P0234 - Turbocharger Engine Overboost	P0299 - Turbocharger Engine Underboost	P0401 - Exhaust Gas Recirculation Flow Insufficient	P0402 - Exhaust Gas Recirculation Flow Excessive	P11A6 - HO2S Performance - Signal High During Moderate Load Sensor 1	P11A9 - O2 Sensor Performance - Signal Low During Moderate Load Bank 1 Sensor 1	P2002 - Diesel Particulate Filter (DPF) Low Efficiency	P2237 - O2 Sensor Positive Current Control Circuit/Open Bank 1 Sensor 1	P2A00 - O2 Sensor Circuit Range/Performance Bank 1 Sensor 1				
P007C - CAC Temperature Sensor Circuit Low Voltage	P0171 - System Too Lean Bank 1	P0172 - System Too Rich Bank 1	P01CB - Cylinder 1 Injection Timing Retarded	P01CC - Cylinder 1 Injection Timing Advanced	P01CD - Cylinder 2 Injection Timing Retarded	P01CE - Cylinder 2 Injection Timing Advanced	P01CF - Cylinder 3 Injection Timin Retarded	P01D0 - Cylinder 3 Injection Timing Advanced	P01D1 - Cylinder 4 Injection Timing Retarded	P01D2 - Cylinder 4 Injection Timing Advanced	P0234 - Turbocharger Engine Overboost	P026C - Injection Quantity Too Low	P026D - Injection Quantity Too High	P0299 - Turbocharger Engine Underboost
P007D - CAC Temperature Sensor Circuit High Voltage	P0171 - System Too Lean Bank 1	P0172 - System Too Rich Bank 1	P01CB - Cylinder 1 Injection Timing Retarded	P01CC - Cylinder 1 Injection Timing Advanced	P01CD - Cylinder 2 Injection Timing Retarded	P01CE - Cylinder 2 Injection Timing Advanced	P01CF - Cylinder 3 Injection Timin Retarded	P01D0 - Cylinder 3 Injection Timing Advanced	P01D1 - Cylinder 4 Injection Timing Retarded	P01D2 - Cylinder 4 Injection Timing Advanced	P0234 - Turbocharger Engine Overboost	P026C - Injection Quantity Too Low	P026D - Injection Quantity Too High	P0299 - Turbocharger Engine Underboost
		P0401 - Exhaust Gas Recirculation Flow Insufficient	P0402 - Exhaust Gas Recirculation Flow Excessive	P168A	P168B			÷						
		P0401 - Exhaust Gas Recirculation Flow Insufficient	P0402 - Exhaust Gas Recirculation Flow Excessive	P168A	P168B									
P0087 - Fuel Rail/System Pressure - Too Low Bank 1	P2002 - Diesel Particulate Filter (DPF) Low Efficiency					I								
P0088 - Fuel Rail Pressure Too High	P2002 - Diesel Particulate Filter (DPF) Low Efficiency													
P0091 - Fuel Pressure Regulator 1 Control Circuit Low	P2002 - Diesel Particulate Filter (DPF) Low Efficiency													
P0092 - Fuel Pressure Regulator 1 Control Circuit High	P2002 - Diesel Particulate Filter (DPF) Low Efficiency													
P0102 - Mass Air Flow Sensor Circuit Low	P0128 - Engine Coolant Temperature Below Thermostat Regulating Temperature	e P0133 - O2 Sensor Circuit Slow Response Bank 1 Sensor 1	P0234 - Turbocharger Engine Overboost	P0299 - Turbocharger Engine Underboost	P0401 - Exhaust Gas Recirculation Flow Insufficient	P0402 - Exhaust Gas Recirculation Flow Excessive	P0420 - NMHC Catalyst Efficiency Below Threshold Bank 1	P11A6 - HO2S Performance - Signa High During Moderate Load Sensor 1	I P11A9 - O2 Sensor Performance - Signal Low During Moderate Load Bank 1 Sensor 1	P2237 - O2 Sensor Positive Current Control Circuit/Open Bank 1 Sensor	P2459 - Diesel Particulate Filter Regeneration Frequency	P2484 - Particulate Matter Sensor Heater Control Circuit Range/Performance		
P0107 - Manifold Absolute Pressure (MAP) Sensor Circuit Low Voltage	P01CB - Cylinder 1 Injection Timing Retarded	P01CC - Cylinder 1 Injection Timing Advanced	P01CD - Cylinder 2 Injection Timing Retarded	P01CE - Cylinder 2 Injection Timing Advanced	P01CF - Cylinder 3 Injection Timing Retarded	P01D0 - Cylinder 3 Injection Timing Advanced	P01D1 - Cylinder 4 Injection Timin Retarded	P01D2 - Cylinder 4 Injection Timing Advanced	P0234 - Turbocharger Engine Overboost	P0299 - Turbocharger Engine Underboost	P0401 - Exhaust Gas Recirculation Flow Insufficient	P0402 - Exhaust Gas Recirculation Flow Excessive	P24B4 - Particulate Matter Sensor Heater Control Circuit Range/Performance	
P0108 - Manifold Absolute Pressure (MAP) Sensor Circuit High Voltage	P01CB - Cylinder 1 Injection Timing Retarded	P01CC - Cylinder 1 Injection Timing Advanced	P01CD - Cylinder 2 Injection Timing Retarded	P01CE - Cylinder 2 Injection Timing Advanced	P01CF - Cylinder 3 Injection Timing Retarded	P01D0 - Cylinder 3 Injection Timing Advanced	P01D1 - Cylinder 4 Injection Timin Retarded	P01D2 - Cylinder 4 Injection Timing Advanced	P0234 - Turbocharger Engine Overboost	P0299 - Turbocharger Engine Underboost	P0401 - Exhaust Gas Recirculation Flow Insufficient	P0402 - Exhaust Gas Recirculation Flow Excessive	P24B4 - Particulate Matter Sensor Heater Control Circuit Range/Performance	
P0112 - Intake Air Temperature Sensor 1 Circuit Low	P0128 - Engine Coolant Temperature Below Thermostat Regulating Temperature	e P0401 - Exhaust Gas Recirculation Flow Insufficient	P0402 - Exhaust Gas Recirculation Flow Excessive	P040F - Exhaust Gas Recirculation (EGR) Temperature Sensor 1-2 Correlation	P0420 - NMHC Catalyst Efficiency Below Threshold Bank 1	P20E2 - Exhaust Gas Temperature (EGT) Sensors 1-2 not plausible		1				I	Kaigerenomance	
P0113 - Intake Air Temperature Sensor 1 Circuit High	P0128 - Engine Coolant Temperature Below Thermostat Regulating	e P0401 - Exhaust Gas Recirculation Flow Insufficient	P0402 - Exhaust Gas Recirculation Flow Excessive	P040F - Exhaust Gas Recirculation (EGR) Temperature Sensor 1-2	P0420 - NMHC Catalyst Efficiency Below Threshold Bank 1	P20E2 - Exhaust Gas Temperature (EGT) Sensors 1-2 not plausible								
P0117 - Engine Coolant Temperature Sensor Circuit Low	Temperature P0128 - Engine Coolant Temperature Below Thermostat Regulating	e P01CB - Cylinder 1 Injection Timing Retarded	P01CC - Cylinder 1 Injection Timing Advanced	Correlation P01CD - Cylinder 2 Injection Timing Retarded	P01CE - Cylinder 2 Injection Timing Advanced	P01CF - Cylinder 3 Injection Timing Retarded	P01D0 - Cylinder 3 Injection Timin Advanced	P01D1 - Cylinder 4 Injection Timing Retarded	P01D2 - Cylinder 4 Injection Timing Advanced	P0234 - Turbocharger Engine Overboost	P0263 - Cly 1 Balance System	P0266 - Cly 2 Balance System	P0269 - Cly 3 Balance System	P0272 - Cly 4 Balance System
P0118 - Engine Coolant Temperature Sensor Circuit High	Temperature P0128 - Engine Coolant Temperature Below Thermostat Regulating	e P01CB - Cylinder 1 Injection Timing Retarded	P01CC - Cylinder 1 Injection Timing Advanced	P01CD - Cylinder 2 Injection Timing Retarded	P01CE - Cylinder 2 Injection Timing Advanced	P01CF - Cylinder 3 Injection Timing Retarded	P01D0 - Cylinder 3 Injection Timin Advanced	P01D1 - Cylinder 4 Injection Timing Retarded	P01D2 - Cylinder 4 Injection Timing Advanced	P0234 - Turbocharger Engine Overboost	P0263 - Cly 1 Balance System	P0266 - Cly 2 Balance System	P0269 - Cly 3 Balance System	P0272 - Cly 4 Balance System
	Temperature	P0299 - Turbocharger Engine Underboost	P0300 - Engine Misfire Detected	P0301 - Cylinder 1 Misfire Detected	P0302 - Cylinder 2 Misfire Detected	P0303 - Cylinder 3 Misfire Detected	P0304 - Cylinder 4 Misfire Detecter	P0401 - Exhaust Gas Recirculation Flow Insufficient	P0402 - Exhaust Gas Recirculation	P0420 - NMHC Catalyst Efficiency Below Threshold Bank 1	P0506 - Idle Speed Low	P0507 - Idle Speed High		
		P0299 - Turbocharger Engine	P0300 - Engine Misfire Detected	P0301 - Cylinder 1 Misfire Detected	P0302 - Cylinder 2 Misfire Detected	P0303 - Cylinder 3 Misfire Detected	P0304 - Cylinder 4 Misfire Detecter	P0401 - Exhaust Gas Recirculation	Flow Excessive P0402 - Exhaust Gas Recirculation Flow Excessive	P0420 - NMHC Catalyst Efficiency Below Threshold Bank 1	P0506 - Idle Speed Low	P0507 - Idle Speed High		
P011B - Engine Coolant Temperature/Intake Air Temperature Correlation	P0420 - NMHC Catalyst Efficiency Below Threshold Bank 1	Underbooss			1		1	Plow insufficient	Flow Excessive	Below Theshold Balk 1		I	4	
P0128 - Engine Coolant Temperature Below Thermostat														
	P01F0 - Coolant Temperature Dropped Below Diagnostic Monitorin	9												
Regulating Temperature P0131 - HO2S Bank 1 Sensor 1 circuit low		g P0133 - O2 Sensor Circuit Slow Response Bank 1 Sensor 1	P11A6 - HO2S Performance - Signal High During Moderate Load Sensor 1	P11A9 - O2 Sensor Performance - Signal Low During Moderate Load	P2002 - Diesel Particulate Filter (DPF) Low Efficiency	P2237 - O2 Sensor Positive Current Control Circuit/Open Bank 1 Sensor	P2243 - O2 Sensor Reference Voltage Circuit/Open Bank 1 Senso	P2251 - O2 Sensor Negative Curren Control Circuit/Open Bank 1 Sensor	t P2A00 - O2 Sensor Circuit Range/Performance Bank 1 Sensor	1				
P0131 - HO2S Bank 1 Sensor 1 circuit Iow P0132 - HO2S Bank 1 Sensor 1	Dropped Below Diagnostic Monitorin Temperature P0132 - HO2S Bank 1 Sensor 1	9 P0133 - O2 Sensor Circuit Slow Response Bank 1 Sensor 1 P0133 - O2 Sensor Circuit Slow Response Bank 1 Sensor 1	P11A6 - HO2S Performance - Signal High During Moderate Load Sensor 1 P11A6 - HO2S Performance - Signal High During Moderate Load Sensor 1	Bank 1 Sensor 1 P11A9 - O2 Sensor Performance - Signal Low During Moderate Load	P2002 - Diesel Particulate Filter (DPF) Low Efficiency P2002 - Diesel Particulate Filter (DPF) Low Efficiency	P2237 - O2 Sensor Positive Current Control Circuit/Open Bank 1 Sensor 1 P2237 - O2 Sensor Positive Current Control Circuit/Open Bank 1 Sensor	P2243 - O2 Sensor Reference Voltage Circuit/Open Bank 1 Senso 1 P2243 - O2 Sensor Reference Voltage Circuit/Open Bank 1 Senso	r Control Circuit/Open Bank 1 Sensor 1 P2251 - O2 Sensor Negative Curren	Range/Performance Bank 1 Sensor t P2A00 - O2 Sensor Circuit					
P0131 - HO2S Bank 1 Sensor 1 circuit low P0132 - HO2S Bank 1 Sensor 1 circuit high P0133 - Q2 Sensor Circuit Slow	Dropped Below Diagnostic Monitorin Temperature P0132 - HO2S Bank 1 Sensor 1 circuit high P0131 - HO2S Bank 1 Sensor 1 circuit low P2002 - Diesel Particulate Filter	P0133 - O2 Sensor Circuit Slow	High During Moderate Load Sensor 1 P11A6 - HO2S Performance - Signal	Bank 1 Sensor 1 P11A9 - O2 Sensor Performance -	(DPF) Low Efficiency P2002 - Diesel Particulate Filter	1 P2237 - O2 Sensor Positive Current	1 P2243 - O2 Sensor Reference	r Control Circuit/Open Bank 1 Sensor 1 P2251 - O2 Sensor Negative Curren	Range/Performance Bank 1 Sensor t P2A00 - O2 Sensor Circuit					
P0131 - HO2S Bank 1 Sensor 1 circuit low P0132 - HO2S Bank 1 Sensor 1 circuit high	Dropped Below Diagnosti: Monitoriny memperature P0132 - H025 Bank 1 Sensor 1 circuit high P0131 - H025 Bank 1 Sensor 1 circuit low P2002 - Diesel Particulate Filter (DPF) Low Efficiency P11CB - NO. Sensor Performance-	P0133 - O2 Sensor Circuit Slow Response Bank 1 Sensor 1 P11CC - NOx Sensor Performance	High During Moderate Load Sensor 1 P11A6 - HO2S Performance - Signal High During Moderate Load Sensor 1 P2002 - Diesel Particulate Filter	Bank 1 Sensor 1 P11A9 - O2 Sensor Performance - Signal Low During Moderate Load	(DPF) Low Efficiency P2002 - Diesel Particulate Filter	1 P2237 - O2 Sensor Positive Current	1 P2243 - O2 Sensor Reference	r Control Circuit/Open Bank 1 Sensor 1 P2251 - O2 Sensor Negative Curren	Range/Performance Bank 1 Sensor t P2A00 - O2 Sensor Circuit					
P0131 - HO2S Bank 1 Sensor 1 circuit low P0132 - HO2S Bank 1 Sensor 1 circuit high P0133 - O2 Sensor Circuit Slow Response Bank 1 Sensor 1	Dropped Below Diagnosti. Monitorin Temperature P0132 - H02S Bank 1 Sensor 1 circuit high P0131 - H02S Bank 1 Sensor 1 circuit low P0032 - Decel Particulate Filter (DPF) Low Efficiency P11CB - NOX Sensor Pedromance- Signal High Bank 1 Sensor 1. P11CB - NOX Sensor Pedromance- Signal High Bank 1 Sensor 1.	P0133 - 02 Sensor Circuit Slow Response Bank 1 Sensor 1 P11CC - NOx Sensor Performance Signal Low Bank 1 Sensor 1 P11CC - NOx Sensor Performance	High During Moderate Load Sensor 1 P11A6 - HO2S Performance - Signal High During Moderate Load Sensor 1 P2002 - Diesel Particulate Filter (DPF) Low Efficiency P2002 - Diesel Particulate Filter	Bank 1 Sensor 1 P11A9 - O2 Sensor Performance - Signal Low During Moderate Load	(DPF) Low Efficiency P2002 - Diesel Particulate Filter	1 P2237 - O2 Sensor Positive Current	1 P2243 - O2 Sensor Reference	r Control Circuit/Open Bank 1 Sensor 1 P2251 - O2 Sensor Negative Curren	Range/Performance Bank 1 Sensor t P2A00 - O2 Sensor Circuit]				
P0131 - HO2S Bank 1 Sensor 1 circuit low P0132 - HO2S Bank 1 Sensor 1 ercuit high P0133 - O2 Sensor Tocinut Slow Response Bank 1 Sensor 1 P0171 - System Too Rich Bank 1 P0172 - System Too Rich Bank 1 P0172 - System Too Rich Bank 1	Dropped Below Diagnosti: Monitorin Temperature P0132 - H025 Bark 1 Sensor 1 circuit high P0131 - H025 Bark 1 Sensor 1 circuit low P0202 - Deeped Patriculed Filter (DPD Law Efficiency P11CB - H0X Sensor Performance- Signal High Bark 1 Sensor 1 P11CB - H0X Sensor Performance- Signal High Bark 1 Sensor 1 P11CB - H0X Sensor Performance- Signal High Bark 1 Sensor 1	P013 - 02 Sensor Circuit Slow Response Bank 1 Sensor 1 P11CC - NOx Sensor Performance Signal Low Bank 1 Sensor 1 P11CC - NOx Sensor Performance Signal Low Bank 1 Sensor 1 P01CC - Cylinder 1 Ingestion Timing	High During Moderate Load Senzor 1 P11A6 - H02S Performance - Signa High During Moderate Load Senzor 1 P2002 - Diesel Particulate Filter (DPF) Low Efficiency P2002 - Diesel Particulate Filter (DPF) Low Efficiency P2012D - Ciptanez 1 particulate Timing	Bank 1 Sensor 1 19 11A9-02 Sensor Performance - Signal Low During Moderate Load Bank 1 Sensor 1 P01CE - Cylinder 2 Injection Timing	(DPF) Low Efficiency P2002 - Diesel Particulate Filter (DPF) Low Efficiency P01CF - Cylinder 3 Injection Timing	1 P2237 - 02 Sensor Positive Current Control Circuit/Open Bank 1 Sensor 1 P01D0 - Cylinder 3 Injection Timing	1 P2243 - O2 Sensor Reference Voltage Circuit/Open Bank 1 Senso 1 P01D1 - Cylinder 4 Injection Timin	Control Circuit/Open Bank 1 Sensor P2251 - 02 Sensor Negative Curren Control Circuit/Open Bank 1 Sensor 1 P01D2 - Cylinder 4 Injection Timing	Range/Performance Bank 1 Sensor t P2A00 - O2 Sensor Circuit					
P0131 - HO2S Bank 1 Sensor 1 citizal low P0122 - HO2S Bank 1 Sensor 1 citizal high P0133 - O2 Sensor Chicut Slow Response Bank 1 Sensor 1 P0171 - System Too Lean Bank 1 P0172 - System Too Rich Bank 1 P0172 - System Too Rich Bank 1 P0172 - System Too Rich Bank 1 P0173 - Fut Temperature Sensor 1 Circual Low P0183 - Fut Temperature Sensor	Dropped Below Diagnosti: Monitorin Tensporture P0122 - H0228 Bank 1 Sereor 1 carcut high P0131 - H0228 Bank 1 Sereor 1 circuit low P0202 - Desed Patriculade Filter (IPP) Low Efficiency P11CB - H02 Sereor Peteromance- Signal High Bank 1 Sereor 1 P11CB - Conduct 1 Sereor Tenson Signal Fight Bank 1 Sereor 1 P01CB - Conduct 1 Sereor Tenson P01CB - Conduct 1 Sereor Tenson P01CB - Conduct 1 Sereor	P013 - 02 Sensor Circuit Slow Response Bank 1 Sensor 1 P110C - NON Sensor Performance Signal Low Bank 1 Sensor P110C - NON Sensor Performance Signal Low Bank 1 Sensor P010C - Ciphanet 1 Ingeston Timing Advanced	High During Moderate Load Senser 1 P1164 - H025 Performance - Signa High During Moderate Load Senser 1 P2002 - Diesel Particulate Filter (DPF) Loav Efficiency P2002 - Diese Particulate Filter (DPF) Loav Efficiency P1020 - Oyted Particulate Filter (DPF) Loav Efficiency P1020 - Oyted z Injection Timing Retarded P1020 - Oyted z Z Injection Timing	Bank 1 Senact 1 P1140 - C2 Senace Petromano- Signal Low During Moderate Load Bank 1 Senacr 1 P01CE - Cylinder 2 Injection Timing Advanced P01CE - Cylinder 2 Injection Timing	(DPF) Low Efficiency P2002 - Diesel Particulate Filter (DPF) Low Efficiency P01CF - Cylinder 3 Injection Timing Retarded P01CF - Cylinder 3 Injection Timing	P2237 - 02 Server Context Current Control Circuit/Open Bank 1 Sensor 1 P01D0 - Cylinder 3 Injection Timing Advanced P01D0 - Cylinder 3 Injection Timing	P243 - 02 Senor Reference Voltage Circuit/Open Bank 1 Senor 1 P01D1 - Cylinder 4 Injection Timin Retarded P01D1 - Cylinder 4 Injection Timin	Control Circuit/Open Bank 1 Sensor 1 P2251 - 02 Sensor Negative Curren Control Circuit/Open Bank 1 Sensor 1 P0102 - Cylinder 4 Injection 1/Iming Advanced P0102 - Cylinder 4 Injection 1/Iming Advanced P0102 - Cylinder 4 Injection 1/Iming	Range/Performance Bank 1 Sensor t P2A00 - O2 Sensor Circuit]				
P0131 - HC25 Bark 1 Sensor 1 crcuit low crcuit low P0132 - HC25 Bark 1 Sensor 1 crcuit high P0133 - C2 Sensor Ciccuit Silve Response Bark 1 Sensor 1 P0172 - System Too Rich Bark 1 P0172 - System Too Rich Bark 1 P0172 - System Too Rich Bark 1 P0172 - Fuid Temperature Sensor - Ciccuit Jow	Dropped Below Diagnosti: Monitorin Temperature P0132 - H0258 Bark 15 Serror 1 circuit high P0131 - H0258 Bark 15 Serror 1 circuit low P2002 - Diesel Particulate Filter P2002 - Diesel Particulate Filter P2002 - Diesel Particulate Filter P2002 - Diesel Particulate Filter P2002 - Diesel Particulate Filter P2003 - Diese Filter P2003 - Optimiser 1 Series Timing P2003 - Optimiser 1 Series Timing	P013 - 02 Sensor Circuit Slow Response Bank 1 Sensor 1 P11CC - NOL Sensor Performance Signal Low Bank 1 Sensor 1 P11CC - NOL Sensor Performance Signal Low Bank 1 Sensor 1 P01CC - Ophical Pipeton 1 P01CC - Ophican 1 Injection Timing Advanced P01CC - Ophican 1 Injection Timing	High During Moderate Laad Sensor 1 P11A6 - HO2S Performance - Signal High During Moderate Laad Sensor 1 High During Moderate Laad Sensor 1 (DPF) Loss Efficiency P2002 - Diesel Particulate Filter (DPF) Loss Efficiency P1020 - Cylinder 2 Injection Timorg P1020 - Cylinder 2 Injection Timorg Relarded P1020 - Cylinder 2 Lingection Timorg Relarded P1020 - Cylinder 2 Lingection Timorg	Bank 1 Sensor 1 P1140 - C2 Sensor Petermane- Signal Low During Moderate Load Bank 1 Sensor 1 P01CE - Cylinder 2 Injection 1 Iming <u>Monroed</u> <u>Advanced</u> <u>Advanced</u> P01CE - Cylinder 2 Injection 1 Iming <u>Advanced</u>	(DPF) Low Efficiency P2002 - Dresel Particulate Filter (DPF) Low Efficiency P01CF - Cylinder 3 Injection Timing Retarded P01CF - Optimized Structure Timing Retarded P01CF - Optimized Structure Timing	P227 - 02 Smooth Postive Current Control Circuit/Open Bank 1 Sensor 1 1 19100 - Cjarder 3 Injecton Timing Advanced 19100 - Cifedre 3 Injecton Timing Advanced 19100 - Cifedre 3 Injecton Timing	P2243 - 02 Sensor Reference Voltage Circuit/Open Bank 1 Senso 1 P0101 - Cylinder 4 Injaction Yiming Retarded P0101 - Circuit 4 Injaction Timin Retarded P0101 - Other 4 Injaction Timing	Control Circue/Open Bark 1 Sensor P2251 - 02 Sensor Negative Curren Centrol Circue/Open Bark 1 Sensor P0102 - Cylinder 4 Injection Timing P0102 - Cylinder 4 Injection Timing Advanced Hotors 4 Injection Timing Advanced P0102 - Cylinder 4 Injection Timing P0102 - Cylin	RangePerformance Bank 1 Sensor 1 P2A00 - O2 Sensor Circuit RangePerformance Bank 1 Sensor P2002 - Diesel Particulate Filter]				
P0131-HC25 Bask 1 Smort 1 cruck low P0132-HC32 Bask 1 Smort 1 cruck low P0132-HC32 Bask 1 Smort 1 P0171 - System Too Lean Bask 1 P0171 - System Too Lean Bask 1 P0172 - Foot Temporation Sensor P0185 - Foot Temporation Sensor P0185 - Foot Temporation Sensor 1 Cruck High P0192 - Foot Reh Pessare Sensor 90193 - Foot Reh Pessare Sensor 90193 - Foot Reh Pessare Sensor	Droppet Below Daground: Monitory P0152-1012 - Standard St	P0133 - 02 Sensor Circuit Slow Response Bank 1 Sensor 1 P11CC - NOx Sensor Performance Senard Low Bank 1 Sensor 1 Senard Low Bank 1 Sensor 1 P01CC - Cylinder 1 Injection Timing P01CC - Cylinder 1 Injection Timing	High During Moderate Laad Sensor 1 High During Moderate Laad Sensor 1 High During Moderate Laad Sensor 1 P2002 - Dised Particulate Filter (DF) Lase Efficiency P2002 - Dised Particulate Filter (DF) Lase Efficiency P2002 - Dised Particulate Filter P2002 - Dised P2 Dised Particulate Filter P2002 - Dised P2 Dised Particulate Filter P2002 - Dised P2 Dised	Bank 1 Sensor 1 P1140 - C28 Sensor Petromance - Signal Low During Moderate Load Bank 1 Sensor 1 P01CE - Cylinder 2 Injection Timing Advanced P01CE - Cylinder 2 Injection Timing P01CE - Cylinder 2 Injection Timing P01CE - Cylinder 2 Injection Timing P01CE - Cylinder 2 Injection Timing	(DPF) Low Elficiency P2002 - Desel Particulate Filter (DPF) Low Elficiency Retarded P01CF - Cylinder 3 Injection Timing P01CF - Cylinder 3 Injection Timing Retarded P01CF - Cylinder 3 Injection Timing Retarded P01CF - Cylinder 3 Injection Timing Retarded P01CF - Cylinder 3 Injection Timing	P227 - 02 Snap Positive Current Control Circuit/Open Bank 1 Sensor 1 P0100 - Cylinder 3 Injection Timing Advanced P0100 - Cylinder 3 Injection Timing Advanced P0100 - Cylinder 3 Injection Timing Advanced P0100 - Cylinder 3 Injection Timing Advanced	P2243 - 02 Sancar Reference Vidtage Circuit/Open Bank 1 Senso 1 P01D1 - Cylinder 4 Injection Timin Retarded P01D1 - Cylinder 4 Injection Timin Retarded P01D1 - Cylinder 4 Injection Timin Retarded P01D1 - Cylinder 4 Injection Timin	Control Circual/Open Bark 1 Sensor P2251 - 02 Sensor Negative Curren Centrol Circual/Open Bark 1 Sensor P0102 - Cylinder 4 Injection Timing P0102 - Cylinder 4 Injection Timing Advanced P0102 - Cylinder 4 Injection Timing Advanced P0102 - Cylinder 4 Injection Timing Advanced 4 Injection Timing	RangePerformance Bank 1 Sensor 1 P2A00 - O2 Sensor Circuit RangePerformance Bank 1 Sensor P2002 - Deset Particulate Filter (DPF) Low Efficiency P2002 - Deset Particulate Filter (DPF) Low Efficiency]				
P0131-HC25 Bask 1 Sensor 1 P0132 - HC25 Bask 1 Sensor 1 P0132 - HC26 Bask 1 Sensor 1 P0132 - HC26 Bask 1 Sensor 1 P0137 - System Too Lean Bask 1 P0171 - System Too Rich Bask 1 P0172 - System Too Rich Bask 1 P0182 - Full Temperature Sensor 1 Circuit Low P0183 - Full Temperature Sensor P0183 - Full Temperature Sensor P0185 - Full Temperature Sensor P0	Dropped Below Dagrotic Monitori Terropartic Pattern P0122-10025 Bank 1 Sereon 1 cricital Mark 1 P0131-10025 Bank 1 Sereon 1 cricital Bank 1 Sereon 1 cricital Bank 1 Sereon 1 P0102 - Children 1 Sereon 1 Sereon Hall Mark 1 Sereon 1 P0102 - Children 1 Sereon 1 Rearded P0102 - Children 1 Sereon 1 Rearded P0102 - Children 1 Sereon 1 Rearded P0103 - Children 1 Sereon 1 Rearded 1 P0103 - Children 1 Sereon 1 Reard 1 P0103 - Children 1 Sereon 1 Reard 1 P0103 - Children 1 Sereon 1 Reard 1 P0103 - Schildren 1 P0103 -	P0133 - 02 Sensor Circuit Slow Response Bank 1 Sensor 1 P11CC - NOX Sensor Performance Signal Low Bank 1 Sensor 1 P11CC - NOX Sensor Performance Signal Low Bank 1 Sensor 1 P01CC - Cylinder 1 Injecton Timing Advanced P01CC - Cylinder 1 Injecton Timing Advanced	High During Moderate Laad Sensor 1 P11A6 - H025 Reformance - Signal High During Moderate Laad Sensor 1 P2022 - Desci Particulate Filter (DPF) Lare Efficiency P2022 - Desci Particulate Filter (DPF) Lare Efficiency P3102 - Optical Particulate Filter (DPF) Low Efficiency P3102 - Optical 2 Injection Timing Retarded	Bank 1 Sensor 1 P1149 - C2 Sensor Performance Signal Low During Moderate Load Bank 1 Sensor 1 P01CE - Cylinder 2 Injection Timing P01CE - Cylinder 2 Injection Timing Advanced P01CE - Cylinder 2 Injection Timing Advanced	(DPF) Low Efficiency P2002 - Diesel Particulate Fitter (DPF) Low Efficiency Retarded P01CF - Cylinder 3 Injection Timing P01CF - Cylinder 3 Injection Timing P01CF - Cylinder 3 Injection Timing P01CF - Cylinder 3 Injection Timing	P227 - 02 Small Peaklyke Current Control Circuit/Open Bank 1 Sensor 1 P0100 - Cylinder 3 Injection Timing P0100 - Cylinder 3 Injection Timing Advanced P0100 - Cylinder 3 Injection Timing Advanced P0100 - Cylinder 3 Injection Timing Advanced	P2243 - 02 Sensor Reference Voltage Circuit/Open Bank 1 Sensor 1 P01D1 - Cylinder 4 Injection Timin P01D1 - Cylinder 4 Injection Timin	Control Circuid/Open Bank 1 Sensor P2251 - O2 Sensor Negative Curren Control Circuid/Open Bank 1 Sensor P0152 - Cylinder 4 Injection 11ming Advanced P0152 - Cylinder 4 Injection 11ming Advanced P0152 - Cylinder 4 Injection 11ming Advanced P0152 - Cylinder 4 Injection 11ming Advanced	RangePerformance Bank 1 Sensor 1 P2A00-02 Sensor Circuit RangePerformance Bank 1 Sensor P2002-Deset Particulate Filter (DPF) Low Efficiency]				
P0131-H025 Bask 1 Smort 1 p0132-H025 Bask 1 Smort 1 p0132-H025 Bask 1 Smort 1 p0132-H025 Bask 1 Smort 1 P0137-G Smort Cecut Star Regrome Bask 1 Semort 1 P0171 - System Too Lean Bask 1 P0172 - Faid Tangenarian Semort P0182 -	Dropot Balevi Dagoratic Monitori P0122 - Constraint S-samo T creat high P011-1026 Baler's Samo T creat high P011-1026 Baler's Samo T P020-1026 Telescolar Sine P020-1026 Telescolar Sine P01128 - NG Samo Telescolar P0128 - Vice Benchmann Balerica P0128 - Vice Benchmann Restrated P0128 - P0128 - Telescolar Timory Restrated P0128 - P0128 - Telescolar Timory Restrated	P0133 - 02 Sensor Circuit Slow Response Bank 1 Sensor 1 P11CC - NOx Sensor Performance Senard Low Bank 1 Sensor 1 Signal Date Mark 1 Sensor 1 P01CC - Cylinder 1 Injection Timing P01CC - Cylinder 1 Injection Timing	High During Moderate Laad Sensor 1 High During Moderate Laad Sensor 1 High During Moderate Laad Sensor 1 P2002 - Dised Particulate Filter (DF) Lase Efficiency P2002 - Dised Particulate Filter (DF) Lase Efficiency P2002 - Dised Particulate Filter P2002 - Dised P2 Dised Particulate Filter P2002 - Dised P2 Dised Particulate Filter P2002 - Dised P2 Dised	Bank 1 Sensor 1 P1140 - C28 Sensor Petromance - Signal Low During Moderate Load Bank 1 Sensor 1 P01CE - Cylinder 2 Injection Timing Advanced P01CE - Cylinder 2 Injection Timing P01CE - Cylinder 2 Injection Timing P01CE - Cylinder 2 Injection Timing P01CE - Cylinder 2 Injection Timing	(DPF) Low Elficiency P2002 - Desel Particulate Filter (DPF) Low Elficiency Retarded P01CF - Cylinder 3 Injection Timing P01CF - Cylinder 3 Injection Timing Retarded P01CF - Cylinder 3 Injection Timing Retarded P01CF - Cylinder 3 Injection Timing Retarded P01CF - Cylinder 3 Injection Timing	P227 - 02 Snap Positive Current Control Circuit/Open Bank 1 Sensor 1 P0100 - Cylinder 3 Injection Timing Advanced P0100 - Cylinder 3 Injection Timing Advanced P0100 - Cylinder 3 Injection Timing Advanced P0100 - Cylinder 3 Injection Timing Advanced	P2243 - 02 Sancar Reference Vidtage Circuit/Open Bank 1 Senso 1 P01D1 - Cylinder 4 Injection Timin Retarded P01D1 - Cylinder 4 Injection Timin Retarded P01D1 - Cylinder 4 Injection Timin Retarded P01D1 - Cylinder 4 Injection Timin	Control Circual/Open Bark 1 Sensor P2251 - 02 Sensor Negative Curren Centrol Circual/Open Bark 1 Sensor P0102 - Cylinder 4 Injection Timing P0102 - Cylinder 4 Injection Timing Advanced P0102 - Cylinder 4 Injection Timing Advanced P0102 - Cylinder 4 Injection Timing Advanced 4 Injection Timing	RangePerformance Bank 1 Sensor 1 P2A00 - O2 Sensor Circuit RangePerformance Bank 1 Sensor P2002 - Deset Particulate Filter (DPF) Low Efficiency P2002 - Deset Particulate Filter (DDF) Low Efficiency]				
P0131-HC25 Bask 1 Sense 1 P0132-HC25 Bask 1 Sense 1 P0132-HC25 Bask 1 Sense 1 P0132-HC25 Bask 1 Sense 1 P0137-System Too Rich Bask 1 P0171 - System Too Rich Bask 1 P0172 - Sut Sense 1 P0182 - Fut Ran Pressure Sense 1 Circuit Low P0183 - Fut Ran Pressure Sense Carol Hoth P0183 - Fut Ran Pressure Sense Carol Hoth P0185 - Fut Ran Pressure Sense Carol Hoth P0186 - Sense 1 P0187 - Sense Too Rich P0187 - Fut Ran Pressure Sense Carol Hoth P0186 - Monte Top Rich P0187 - Karon Ran Pressure Sense Carol Hoth P0187 - Karon Ran Pressure Sense P0187 - Karon Ran Pressure Sense P0187 - Fut Ran Pressure Sense P0187 -	Dropost Baleon Dagrossic Monitori PRISE-VICES Baleon Tagrossic Torreson PRISE-VICES Balen 1 Sensor 1 Concell High PRISE-VICES Balen 1 Sensor 1 Concell Baleon PRISE-VICES Balen 1 Sensor 1 PRISE-VICES Baleon PRISE-VICES Professional Particular Filter PRISE VICES Profesional Particular Filter PRISE VICES PRISE PRISE PRISE	P0133 - 02 Sensor Circuit Slow Response Bank 1 Sensor 1 P11CC - NOx Sensor Performance Senard Low Bank 1 Sensor 1 Signal Date Mark 1 Sensor 1 P01CC - Cylinder 1 Injection Timing P01CC - Cylinder 1 Injection Timing	High During Moderate Laad Sensor 1 High During Moderate Laad Sensor 1 High During Moderate Laad Sensor 1 P2002 - Dised Particulate Filter (DF) Lase Efficiency P2002 - Dised Particulate Filter (DF) Lase Efficiency P2002 - Dised Particulate Filter P2002 - Dised P2 Dised Particulate Filter P2002 - Dised P2 Dised Particulate Filter P2002 - Dised P2 Dised	Bank 1 Sensor 1 P1140 - C28 Sensor Petromance - Signal Low During Moderate Load Bank 1 Sensor 1 P01CE - Cylinder 2 Injection Timing Advanced P01CE - Cylinder 2 Injection Timing P01CE - Cylinder 2 Injection Timing P01CE - Cylinder 2 Injection Timing P01CE - Cylinder 2 Injection Timing	(DPF) Low Elficiency P2002 - Desel Particulate Filter (DPF) Low Elficiency Retarded P01CF - Cylinder 3 Injection Timing P01CF - Cylinder 3 Injection Timing Retarded P01CF - Cylinder 3 Injection Timing Retarded P01CF - Cylinder 3 Injection Timing Retarded P01CF - Cylinder 3 Injection Timing	P227 - 02 Snap Positive Current Control Circuit/Open Bank 1 Sensor 1 P0100 - Cylinder 3 Injection Timing Advanced P0100 - Cylinder 3 Injection Timing Advanced P0100 - Cylinder 3 Injection Timing Advanced P0100 - Cylinder 3 Injection Timing Advanced	P2243 - 02 Sancar Reference Vidtage Circuit/Open Bank 1 Senso 1 P01D1 - Cylinder 4 Injection Timin Retarded P01D1 - Cylinder 4 Injection Timin Retarded P01D1 - Cylinder 4 Injection Timin Retarded P01D1 - Cylinder 4 Injection Timin	Control Circuid/Open Bark 1 Sensor P2251 - 02 Sensor Negative Curren Centrol Circuid/Open Bark 1 Sensor P0102 - Cylinder 4 Injection Timing P0102 - Cylinder 4 Injection Timing Advanced P0102 - Cylinder 4 Injection Timing Advanced P0102 - Cylinder 4 Injection Timing Advanced 4 Injection Timing	RangePerformance Bank 1 Sensor 1 P2A00 - O2 Sensor Circuit RangePerformance Bank 1 Sensor P2002 - Deset Particulate Filter (DPF) Low Efficiency P2002 - Deset Particulate Filter (DDF) Low Efficiency]				
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P0131-H023 Bark 1 Sensor 1 croat low P0132 - H023 Bark 1 Sensor 1 croat high P0133 - Of Sensor Croat Slow Response Bark 1 Sensor 1 P0173 - System Too Rich Bark 1 P0173 - Polit Temperature Sensor Concel Light P0183 - Full Temperature Sensor Concel Light P0182 - Full Rail Pressure Sensor District Light Politics Politics P0182 - Full Rail Pressure Sensor District Light Politics P0182 - Full Rail Pressure Sensor District Light Politics P0182 - Concel Light P0182 - Concel Light P0182 - Concel Telepton Timong Advanced P0182 - Concel a Signation	Dropost Balevin Dagrossis: Monitorius Post2 - Constant Page Post2 - Post2 - Post2 - Post2 Post2 - Post2 - Post2 - Post2 Post2 - Post2 - Post2 - Post2 Post2 Post2 Post2 - Post2	P0133 - 02 Sensor Circuit Slow Response Bank 1 Sensor 1 P11CC - NOx Sensor Performance Senard Low Bank 1 Sensor 1 Senard Low Bank 1 Sensor 1 P01CC - Cylinder 1 Injection Timing Advanced P01CC - Cylinder 1 Injection Timing P01CC - Cylinder 1 Injection Timing	High During Moderate Laad Sensor 1 High During Moderate Laad Sensor 1 High During Moderate Laad Sensor 1 P2002 - Dised Particulate Filter (DF) Lase Efficiency P2002 - Dised Particulate Filter (DF) Lase Efficiency P2002 - Dised Particulate Filter P2002 - Dised P2 Dised Particulate Filter P2002 - Dised P2 Dised Particulate Filter P2002 - Dised P2 Dised	Bank 1 Sensor 1 P1140 - C28 Sensor Petromance - Signal Low During Moderate Load Bank 1 Sensor 1 P01CE - Cylinder 2 Injection Timing Advanced P01CE - Cylinder 2 Injection Timing P01CE - Cylinder 2 Injection Timing P01CE - Cylinder 2 Injection Timing P01CE - Cylinder 2 Injection Timing	(DPF) Low Elficiency P2002 - Dresel Particulate Filter (DPF) Low Elficiency Retarded P01CF - Cylinder 3 Injection Timing P01CF - Cylinder 3 Injection Timing Retarded P01CF - Cylinder 3 Injection Timing Retarded P01CF - Cylinder 3 Injection Timing Retarded P01CF - Cylinder 3 Injection Timing	P227 - 02 Snap Positive Current Control Circuit/Open Bank 1 Sensor 1 P0100 - Cylinder 3 Injection Timing Advanced P0100 - Cylinder 3 Injection Timing Advanced P0100 - Cylinder 3 Injection Timing Advanced P0100 - Cylinder 3 Injection Timing Advanced	P2243 - 02 Sancar Reference Vidtage Circuit/Open Bank 1 Senso 1 P01D1 - Cylinder 4 Injection Timin Retarded P01D1 - Cylinder 4 Injection Timin Retarded P01D1 - Cylinder 4 Injection Timin Retarded P01D1 - Cylinder 4 Injection Timin	Control Circuid/Open Bark 1 Sensor P2251 - 02 Sensor Negative Curren Centrol Circuid/Open Bark 1 Sensor P0102 - Cylinder 4 Injection Timing P0102 - Cylinder 4 Injection Timing Advanced P0102 - Cylinder 4 Injection Timing Advanced P0102 - Cylinder 4 Injection Timing Advanced 4 Injection Timing	RangePerformance Bank 1 Sensor 1 P2A00 - O2 Sensor Circuit RangePerformance Bank 1 Sensor P2002 - Deset Particulate Filter (DPF) Low Efficiency P2002 - Deset Particulate Filter (DDF) Low Efficiency					
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P0131 - HC25 Bask 1 Smort 1 P0132 - HC25 Bask 1 Smort 1 P0132 - HC25 Bask 1 Smort 1 P0132 - HC25 Bask 1 Smort 1 P0137 - Smort C-courd Sour Response Bask 1 Sensor 1 P0171 - System Too Itaan Bask 1 P0172 - Sutt Smort Too Rich Bask 1 P0173 - System Too Rich Bask 1 P0173 - Singer Too Rich Bask 1 P0173 - HC Smort Host P0183 - HC26 Host Host P0183 - HC26 Host Host P0183 - HC26 Host	Dropost Baleon Cagorosis: Monitoria Protection Control Control Control Control Protection Control Control Control Protection Control Control Control Protection Control Control Control Control Control Control Control Control Control Control Control Control Control Control Control Control Control Control Protection Control Control Protection Control Control Protection Control Control Protection Control Control Control Control Control Control Control Control Protection Control Control Protection Control Control Protection Control Control Protection Control Control Control Control Control Protection Control Con	P0133 - 02 Sense Circuit Silv Reporte Bask 1 Sensor 1 P1102 - No Sensor Performance Signal Can Water Performance Signal Can Water Sensor 1 P1102 - Soluti 1 Sensor 1 P1102 - Soluti 1 Sensor 1 P1102 - Soluti 1 Sensor 1 P0102 - S	High Jump Motimate Load Serior 1 1911a - HCGS Betwinners- Signal High Dump Motimate Load Serior 1 P2002 - Diesel Perioculate Filter (DPF) Lee Efficiency P2002 - Diesel Perioculate Filter (DPF) Lee Efficience Filter (DPC) Lee Efficience Filter P2002 - Optimate 2 Spectro Timog Retarded P2012 - Optimate 1 Spectro Timog Retarded	PILLA CE Band Herman Lo Signit L Petron State Bank 1 Sensor 1 Bank 1 Sensor 1 Pillo CE - Cylinder 2 Injection Timing Advanced Pillo - Cylinder 2 Injection Timing Pillo - Cylinder 2 Injection Timing Pillo - Cylinder 2 Injection Timing Advanced	(DP) Los Eliciency (DP) Los Eliciency P202-Doeb Proceedar Filer (DP) Los Eliciency P102- Cophrad T Singetion Timing P102- Cophrade T Singetion Timing Peter-bol P102- Cophrade T Singetion Timing Peter-bol P102- Cophrade T Singetion Timing P102- Cophrade T Singetion P102- Cophrade T Singetion	P2227 - 02 Send Stable Control Control Circuit/Qvin Basis 1 Sensor P2100 - Cyfrider 3 Ingestein Timing Addenoid P2100 - Cyfrider 3 Ingestein Timing Addenoid P2100 - Cyfrider 3 Ingestein Timing Advanced	P3241-02 Sano Reference Votage Circuit Que Bank 1 Sense 1 P3101 - Cyledder 4 Injection Trium Reacted P3101 - Cyledder 4 Injection Trium Reacted P3101 - Cyledder 4 Injection Trium Reacted P3101 - Cyledder 3 Injection Trium Reacted	Control Circuit/Open Bank 1 Sensor 12251-02 Sensor Control Circuit/Open Bank 1 Sensor 1 190102 - Cylinder 4 Injection Timing Advanced 190102 - Cylinder 4 Injection Timing Advanced 190102 - Cylinder 4 Injection Timing Advanced	RangoPerformance Bark 1 Bernson P2420 - 02 Sense Creat RangsPerformance Bark 1 Sensor P2002 - Deest Particulate Filter (DPP) Leve Eliciency P2002 - Deest P2004 - Dee	Fotte - Opinde 4 legistica Titorig Advanced	P326C - Injection Quertity Too Low	P026D - Injection Quantity Too High	1	
P0131-H023 Bark 1 Sensor 1 cnruit Not P0132 - H025 Bark 1 Sensor 1 cnruit Ngh P0133 - O2 Sensor 2 Carl Slow Response Bark 1 Sensor 1 P0137 - System To Lan Bark 1 P0137 - System To Rich Bark 1 P0132 - System To Rich Bark 1 P0138 - Full Franzenstare Sensor Chroid Hoge P0139 - Full Fall Pressare Sensor Chronid Low P0139 - Full Rail Pressare P0130 - Chronol High P0130 - Chronol High P0130 - Chrone High Restrict Timing Advanced P0130 - Chrone & Jinetson	Dropost Baleon Dagrossic Monitori PRISE - Viscal Hay A PRISE - V	P0133 - 02 Sensor Circuit Slow Response Bank 1 Sensor 1 P11CC 1005 Sensor Podomanos Signal Loo Bank 1 Sensor 1 P11CC 1005 Sensor Podomanos Signal Loo Bank 1 Sensor 1 P01CC - Cydnod 1 Sensor 1 Advanced	High Dung Motina Load Senor 1 1974 - HO25 Personance - Sign High Dung Motinate Load Senor 1 P2022 - Dese Particulate Filter (DPF) Load Efficiency Filter (DPF) Load Efficiency P31CD - Opende 2 Spectron Timing Restand P31CD - Opende 2 Spectron Timing Restand	PILLA CE Band Herman Lo Signit L Petron State Bank 1 Sensor 1 Bank 1 Sensor 1 Pillo CE - Cylinder 2 Injection Timing Advanced Pillo - Cylinder 2 Injection Timing Pillo - Cylinder 2 Injection Timing Pillo - Cylinder 2 Injection Timing Advanced	(DP) Los Eliciency (DP) Los Eliciency P202-Doeb Proceedar Filer (DP) Los Eliciency P102- Cophrad T Singetion Timing P102- Cophrade T Singetion Timing Peter-bol P102- Cophrade T Singetion Timing Peter-bol P102- Cophrade T Singetion Timing P102- Cophrade T Singetion P102- Cophrade T Singetion	P2337 - 02 Sense Ploative Current Control Circuit Cyan Bark 1 Sensor Brittion - Cylinder 3 Ingestion Timing Advanced P0100 - Cylinder 3 Ingestion Timing Advanced P0100 - Cylinder 3 Ingestion Timing Advanced P0100 - Cylinder 3 Ingestion Timing Advanced	P2201-02 than Reference Vetage Censel/Open Bank 1 Sense 1 P2101- Cylinder 4 Injection Timm Retarded P2101- Cylinder 4 Injection Timm P2101- Cylinder 4 Injection Timm	Control Circuit/Open Bank 1 Sensor 12251-02 Sensor Control Circuit/Open Bank 1 Sensor 1 190102 - Cylinder 4 Injection Timing Advanced 190102 - Cylinder 4 Injection Timing Advanced 190102 - Cylinder 4 Injection Timing Advanced	RangoPerformance Bark 1 Bernson P2420 - 02 Sense Creat RangsPerformance Bark 1 Sensor P2002 - Deest Particulate Filter (DPP) Leve Eliciency P2002 - Deest P2004 - Dee		P026C - Hystelion Quantity Teo Low P026C - Hystelion Quantity Teo Low	,		

15 OBDG04 ECM Diagnostic Inhibit Tables

a DTC													
	P0171 - System Too Lean Bank 1	P0172 - System Too Rich Bank 1	P01CB - Cylinder 1 Injection Timing	Inhibited DTCs P01CC - Cylinder 1 Injection Timing	P01CD - Cylinder 2 Injection Timing	g P01CE - Cylinder 2 Injection Timing	P01CF - Cylinder 3 Injection Timing	g P01D0 - Cylinder 3 Injection Timing	P01D1 - Cylinder 4 Injection Timing	P01D2 - Cylinder 4 Injection Timin	g P026C - Injection Quantity Too Low	P026D - Injection Quantity Too High	h
	P0171 - System Too Lean Bank 1	P0172 - System Too Rich Rank 1	Retarded P01CB - Cylinder 1 Injection Timing	Advanced P01CC - Cylinder 1 Injection Timing	Retarded P01CD - Cylinder 2 Injection Timing	Advanced a P01CE - Cylinder 2 Injection Timing	Retarded P01CF - Cylinder 3 Injection Timing	Advanced a P01D0 - Cylinder 3 Injection Timing	Retarded P01D1 - Cylinder 4 Injection Timing	Advanced P01D2 - Cvlinder 4 Injection Timin	a P026C - Injection Quantity Too Low	P026D - Injection Quantity Too High	h
4 Control Circuit	P0133 - O2 Sensor Circuit Slow	P0171 - System Too Lean Bank 1	Retarded P0172 - System Too Rich Bank 1	Advanced P026C - Injection Quantity Too Low	Retarded P026D - Injection Quantity Too High	Advanced h P11A6 - HO2S Performance - Signa	Retarded P11A9 - O2 Sensor Performance -	Advanced - P11CB - NOx Sensor Performance -	Retarded P11CC - NOx Sensor Performance	Advanced - P2002 - Diesel Particulate Filter	· · · · · · · · · · · · · · · · · · ·	P2459 - Diesel Particulate Filter	P2A00 - O2 Sensor Circuit
charger Engine boost	Response Bank 1 Sensor 1			r ozoc * injection quantity 100 Edw	· ozoo · nijecion quanny 100 Higi	High During Moderate Load Sensor 1	Signal Low During Moderate Load Bank 1 Sensor 1	Signal High Bank 1 Sensor 1	Signal Low Bank 1 Sensor 1	(DPF) Low Efficiency	P2237 - O2 Sensor Positive Current Control Circuit/Open Bank 1 Sensor 1	Regeneration Frequency	Range/Performance Bank 1 Sensor
on Quantity Too	P11CB - NOx Sensor Performance - Signal High Bank 1 Sensor 1	P11CC - NOx Sensor Performance Signal Low Bank 1 Sensor 1	 P2002 - Diesel Particulate Filter (DPF) Low Efficiency 										
on Quantity Too	P11CB - NOx Sensor Performance - Signal High Back 1 Sensor 1	P11CC - NOx Sensor Performance Signal Low Back 1 Sensor 1	 P2002 - Diesel Particulate Filter (DPF) Low Efficiency 	1									
charger Engine	P0133 - 02 Sensor Circuit Slow	P0171 - System Too Lean Bank 1	P0172 - System Too Rich Bank 1	P026C - Injection Quantity Too Low	P026D - Injection Quantity Too High	h P11A6 - HO2S Performance - Signa	P11A9 - O2 Sensor Performance - Signal Low During Moderate Load	P11CB - NOx Sensor Performance - Signal High Bank 1 Sensor 1	P11CC - NOx Sensor Performance	P2002 - Diesel Particulate Filter	P2237 - O2 Sensor Positive Current	P2459 - Diesel Particulate Filter Regeneration Frequency	P2A00 - O2 Sensor Circuit
boost	Response Bank 1 Sensor 1					High During Moderate Load Sensor 1	Bank 1 Sensor 1	Signal High Bank 1 Sensor 1	Signal Low Bank 1 Sensor 1	(DPF) Low Efficiency	Control Circuit/Open Bank 1 Sensor 1	Regeneration Frequency	Range/Performance Bank 1 Sensor
Intake Air Flow r Circuit Range mance	P0401 - Exhaust Gas Recirculation Flow Insufficient	P0402 - Exhaust Gas Recirculation Flow Excessive	n										÷
Intake Air Flow	P0171 - System Too Lean Bank 1	P0172 - System Too Rich Bank 1	P01CB - Cylinder 1 Injection Timing Retarded	P01CC - Cylinder 1 Injection Timing Advanced	P01CD - Cylinder 2 Injection Timing Retarded	g P01CE - Cylinder 2 Injection Timing Advanced	P01CF - Cylinder 3 Injection Timing Retarded	g P01D0 - Cylinder 3 Injection Timing Advanced	P01D1 - Cylinder 4 Injection Timing Retarded	P01D2 - Cylinder 4 Injection Timin Advanced	g P0234 - Turbocharger Engine Overboost	P026C - Injection Quantity Too Low	v P026D - Injection Quantity Too Hig
or Circuit Low	P0171 - System Too Lean Bank 1	P0172 - System Too Rich Bank 1	P01CB - Cylinder 1 Injection Timing Retarded	P01CC - Cylinder 1 Injection Timing	P01CD - Cylinder 2 Injection Timing	g P01CE - Cylinder 2 Injection Timing	P01CF - Cylinder 3 Injection Timing	g P01D0 - Cylinder 3 Injection Timing Advanced	P01D1 - Cylinder 4 Injection Timing	P01D2 - Cylinder 4 Injection Timin	g P0234 - Turbocharger Engine Overboost	P026C - Injection Quantity Too Low	v P026D - Injection Quantity Too Hig
or Circuit High		P0299 - Turbocharger Engine	P0401 - Exhaust Gas Recirculation	Advanced P0402 - Exhaust Gas Recirculation	Retarded	Advanced	Retarded	Advanced	Retarded	Advanced	Overboost		
		Underboost P0299 - Turbocharger Engine	Flow Insufficient P0401 - Exhaust Gas Recirculation	Flow Excessive P0402 - Exhaust Gas Recirculation	-								
		Underboost	Flow Insufficient	Flow Excessive									
Air Flow Valve rent Performance	P0234 - Turbocharger Engine Overboost	P0299 - Turbocharger Engine Underboost	P0401 - Exhaust Gas Recirculation Flow Insufficient	P0402 - Exhaust Gas Recirculation Flow Excessive									
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er 4 Misfire ed	P2002 - Diesel Particulate Filter (DPF) Low Efficiency												
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ust Gas w Excessive	Response Bank 1 Sensor 1	Retarded	Advanced	Retarded	Advanced	Retarded	Advanced	Retarded	P01D2 - Cylinder 4 Injection Timing Advanced	High During Moderate Load Sensor	1 Signal Low During Moderate Load	Signal High Bank 1 Sensor 1	Signal Low Bank 1 Sensor 1
											Bank 1 Sensor 1		
		P2002 - Diesel Particulate Filter	P2237 - O2 Sensor Positive Current Control Circuit/Open Bank 1 Sensor	P2459 - Diesel Particulate Filter	P249D - Closed Loop Reductant Injection Control At Limit - Flow To	P249E - Closed Loop Reductant	P24B4 - Particulate Matter Sensor Heater Control Circuit	P2A00 - O2 Sensor Circuit Range/Performance Bank 1 Sensor 1			Bank 1 Sensor 1		
		(DPF) Low Efficiency	Control Circuit/Open Bank 1 Sensor 1	Regeneration Frequency	Injection Control At Limit - Flow To Low	o Injection Control At Limit - Flow Too High	Heater Control Circuit Range/Performance	Range/Performance Bank 1 Sensor 1			Bank 1 Sensor 1	1	
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tosition Sensor Low haust Gas coition Sensor High haust Gas R) Temperature it Low Voltage haust Gas R) Temperature t High Voltage atalyst Efficiency hold Bank 1 Gas Temperature	Peer trautiseine Peer trautis	(IDP) Low Efficiency PO320 - Deel Periodae Fater PO320 - Deel Periodae Fater PO320 - Estand Cale Restoration Post Scassion PO422 - Estand Cale Restoration PO422 - Estand Cale Restoration PO424 - Estandia Cale Restoration PO425 - Colored Licop Reduction PO425 - Deel Periodae Fater (DP) Low Efficiency PO320 - Note Name To Restore PO320 - Note Name To PO320 - Note Name To	Oriel Orical Open Bark 1 Seven Control Orical Open Bark 1 Seven (DPT) Law Efficiency P2000: - Onean Pariculate Filter (P010)	Regeneration Preparety P3409 - Ceed Parcelater Faler Regeneration Preparety P2484 - Poetro Central Faler RegelPerformance P2484 - Periodate Matter Smoor Hall Central Central RegelPerformance P2484 - Eshaudt Gae High Tomperature P2485 - Eshaudt Gae High P2187 - Advanced P2182 - Eshaudt Gae Hightom P2182 - Advanced P2182 - Advanced P218	Injestion Control AL Limit - Floor 10 P2400 - Course Relativity Injestion Control AL Limit - Pices To Loss P2401 - Pastolaton Matter Sensor P2441 - Pastolaton Matter Sensor Range Offer Manager P2442 - Pastolaton Matter Sensor Range Offer Manager P2442 - Pastolaton Matter Sensor Range Offer Manager P2442 - Pastolaton Matter Sensor Range Pastonence P2443 - Pastolaton Matter Sensor Range Pastonence P2444 - Pastolatonence P2444 - Pastolatonence P2444 - Pastolatonence P2444 - Pastolatonence P2445 - Pastolatonence P245 - P	pieto Control A Limin - Pour To Poter C - role Marco - Pour To presence - To - T	Pater Control Circuit RangePertomence P284: Pare Late 3 Ginse RangePerformance RangePerformance P1011 - Cylinder 4 Injection Timory Rearded P284: Disce Pariculate Filer Devention Law Vetage P0105 - Cylinder 4 Injection Timory Rearded P284: Disce Pariculate Filer Devention Law Vetage P0105 - Cylinder 4 Injection Timory Rearded P20105 - Cylinder 4 Injection Timory Rearded P20105 - Cylinder 4 Injection Timory	Parge-Parlamance Bark 1 Sensor 1 P2020 - Objector Training P20102 - Objector Training P20102 - Objector Training P20102 - Objector Training P20102 - Objector Training P20400 - Darke Parlament P20400 - Objector Training P20400 - Objector Training P20400 - Objector Training P20100 - Objector Train	Overboost P01D1 - Cylinder 4 Injection Timing Retarded P01D1 - Cylinder 4 Injection Timing	Advanced P01D2 - Cylinder 4 Injection Timin	P020 - Injecton Guardity Too High P020 - Topicton Guardity Too High P020 - Topicon Guardity Too High P020 - Topicon Guardity Too High P020 - Topicon Guardity Too High	Underboost	Low
vition Sensor vition	Peer trautiseine Peer trautis	(DPP) Low Efficiency (DPP) Low Efficiency Pod2: - See Provider Fater (DPP) Low Efficiency Pod2: - Eshauti Gas Rescituation Pod2: - See Particulate Fater (DPP) Low Efficiency Pod2: - Astro-Confidency P	Control Cincuit-Open Bank 1 Server Control Cincuit-Open Bank 1 Server Control Cincuit-Open Bank 1 Server Control Cincuit-Open Bank 1 Server (OPT) Law Efficiency (OPT) Law	Regeneration Frequency P340 - Ceer Monitor Faller P340 - Network and Faller P340 - Network and Faller P340 - Particular Band Reage Particular Matter Sensor P348 - Particular Matter Sensor Heater Control Canal Bang/Particular Matter Sensor P340 - Estauatt Gas High Temperature P340 - Control Control Control P340 - Control Control Control P340 - Control Control P340 - Control Control P340 - Control P340 - Control P340 - Control Control P340 -	Injestion Control AL Limits - Revio TO 20180 - Current AL Limits - Point Control Al Injestion Control AL Limits - Fices To Low P2408 - Persculate Matter Sensor Hester Control Cincul Resuppliedemance P2408 - Persculate Matter Sensor Hester Control Cincul Resuppliedemance P2408 - Control Cincul Resuppliedemance P2408 - Control Cincul Resuppliedemance P2408 - Control Cincul Resuppliedemance P2408 - Control Cincul Results P2408 - Cincul Res	pieto Control A Limin - Pour To Poter C - role Marco - Pour To presence - To - T	Pater Control Circuit RangePertomence P284: Pare Late 3 Ginse RangePerformance RangePerformance P1011 - Cylinder 4 Injection Timory Rearded P284: Disce Pariculate Filer Devention Law Vetage P0105 - Cylinder 4 Injection Timory Rearded P284: Disce Pariculate Filer Devention Law Vetage P0105 - Cylinder 4 Injection Timory Rearded P20105 - Cylinder 4 Injection Timory Rearded P20105 - Cylinder 4 Injection Timory	Parge-Parlamance Bark 1 Sensor 1 P2020 - Objector Training P20102 - Objector Training P20102 - Objector Training P20102 - Objector Training P20102 - Objector Training P20400 - Darke Parlament P20400 - Objector Training P20400 - Objector Training P20400 - Objector Training P20100 - Objector Train	Overboost P01D1 - Cylinder 4 Injection Timing Retarded P01D1 - Cylinder 4 Injection Timing	Advanced P01D2 - Cylinder 4 Injection Timin	P020 - Injecton Guardity Too High P020 - Topicton Guardity Too High P020 - Topicon Guardity Too High P020 - Topicon Guardity Too High P020 - Topicon Guardity Too High	Underboost	Low
on Sensor er Case er Case er Case er Case of Case er Case of C	Peer trautiseine Peer trautis	(IDP) Low Efficiency PO32 - Sear Periodae Fater PO32 - Sear Advances PO42 - Estand Case Restoration PO42 - Desde Pariculate Fater (DP) Low Efficiency PO42 - Desde Pariculate Fater (DP) Low Efficiency PO42 - Restoration Case Po42 - Restoration Restoration PO42 - Restoration Restoration PO42 - Restoration Restoration PO42 - Restoration PO42 - Restoration PO42 - Restoration PO42 - Restoration Restoration PO42 - Restoration	Oriel Orical Open Bark 1 Seven Control Orical Open Bark 1 Seven (DPT) Law Efficiency P2000: - Onean Pariculate Filter (P010)	Regeneration Preparety P3409 - Ceed Parcelater Faler Regeneration Preparety P2484 - Poetro Central Faler RegelPerformance P2484 - Periodate Matter Smoor Hall Central Central RegelPerformance P2484 - Eshaudt Gae High Tomperature P2485 - Eshaudt Gae High P2187 - Advanced P2182 - Eshaudt Gae Hightom P2182 - Advanced P2182 - Advanced P218	Injestion Control AL Limit - Floor 10 P2400 - Curros Realizant Injestion Control AL Limit - Pices To Loss P2401 - Pastolatas Matter Sensor Real Control Control Real P2401 - Pastolatas Matter Sensor Real Control Control Real P2402 - Pastolatas Matter Sensor Real Control Control Real P2403 - Pastolatas Matter Sensor Real Control Control Real Pastolatas Matter Sensor Real Control Control Real Pastolatas Matter Sensor P2404 - Pastolatas Matter Sensor Real Control Control Real Pastolatas Control Real Pastolatas Control Real Pastolatas Control P2404 - Pastolatas Matter Sensor Real Pastolatas Control Real Pastolatas Control Real Pastolatas Control P2405 - Cylinder 3 Injection Timing Real Pastolatas Control Real Paston Real Pastolatas Control Real Paston Real Pastolatas Control Real Paston Real Pastolatas Pastolatas Control P2404 - Pastolatas Control Real Paston Real Pastolatas Control Real Paston Real Pastolatas Paston Real Pastolatas Paston Real Pastolatas Paston Real Paston Paston Real Paston	pieto Control A Limin - Pour To Poter C - role Marco - Pour To presence - To - T	Pater Control Circuit RangePertomence P284: Pare Late 3 Ginse RangePerformance RangePerformance P1011 - Cylinder 4 Injection Timory Rearded P284: Disce Pariculate Filer Devention Law Vetage P0105 - Cylinder 4 Injection Timory Rearded P284: Disce Pariculate Filer Devention Law Vetage P0105 - Cylinder 4 Injection Timory Rearded P20105 - Cylinder 4 Injection Timory Rearded P20105 - Cylinder 4 Injection Timory	Parge-Parlamance Bark 1 Sensor 1 P2020 - Objector Training P20102 - Objector Training P20102 - Objector Training P20102 - Objector Training P20102 - Objector Training P20400 - Darke Parlament P20400 - Objector Training P20400 - Objector Training P20400 - Objector Training P20100 - Objector Train	Overboost P01D1 - Cylinder 4 Injection Timing Retarded P01D1 - Cylinder 4 Injection Timing	Advanced P01D2 - Cylinder 4 Injection Timin	P020 - Injecton Guardity Too High P020 - Topicton Guardity Too High P020 - Topicon Guardity Too High P020 - Topicon Guardity Too High P020 - Topicon Guardity Too High	Underboost	Low

Active DTC		-		Inhibited DTCs										
P0852 - Park/Neutral Position (PNP) Switch Circuit High Voltage	P0851 - Park/Neutral Position (PNP) Switch Circuit Low Voltage													
P11D3 - Nox Sensor Offset Learning at Min Limit - 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												
P11D4 - Nox Sensor Offset Learning at Max Limit - 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												
P11DB - NOx Sensor Current 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												
P11DC - NOx Sensor Current Performance Bank 1 Sensor 2	P249D - Closed Loop Reductant Injection Control At Limit - Flow Too	High P249E - Closed Loop Reductant Injection Control At Limit - Flow Too												
P12B0 - Intake Manifold Runner Actuator Feedback Signal Circuit	Low P2002 - Diesel Particulate Filter (DPF) Low Efficiency	High	1											
Low P12B1 - Intake Manifold Runner Actuator Feedback Signal Circuit	P2002 - Diesel Particulate Filter (DPF) Low Efficiency													
High P140B - Exhaust Gas Recirculation Slow Response-	P11CB - NOx Sensor Performance - Signal High Bank 1 Sensor 1	P11CC - NOx Sensor Performance - Signal Low Bank 1 Sensor 1	P249D - Closed Loop Reductant Injection Control At Limit - Flow Too	P249E - Closed Loop Reductant Injection Control At Limit - Flow Too]									
Increasing Flow P140C - Exhaust Gas Recirculation Slow Response-	P11CB - NOx Sensor Performance - Signal High Bank 1 Sensor 1	P11CC - NOx Sensor Performance - Signal Low Bank 1 Sensor 1	Low P249D - Closed Loop Reductant Injection Control At Limit - Flow Too	High P249E - Closed Loop Reductant Injection Control At Limit - Flow Too	-									
Decreasing Flow P140F - Exhaust Gas	P0234 - Turbocharger Engine	P0299 - Turbocharger Engine	Low P0401 - Exhaust Gas Recirculation	High P0402 - Exhaust Gas Recirculation	P2002 - Diesel Particulate Filter									
Recirculation (EGR) Motor Current Performance P147F - Particulate Matter Sensor	Overboost P2002 - Diesel Particulate Filter	Underboost	Flow Insufficient	Flow Excessive	(DPF) Low Efficiency									
Compensation Value Missing/Not Received P163C - Glow Plug Control	(DPF) Low Efficiency P11DB - NOx Sensor Current	D2200 M/m Hanter Devfermence	1											
Module Primary Circuit P2009 - Intake Manifold Runner	Performance Bank 1 Sensor 1 P0133 - O2 Sensor Circuit Slow	P2209 - N0x Heater Performance Bank 1 Sensor 1 P0171 - System Too Lean Bank 1	P0172 - System Too Rich Bank 1	P0234 - Turbocharger Engine	P026C - Injection Quantity Too Low	P026D - Injection Quantity Too High	P0299 - Turbocharger Engine	P0401 - Exhaust Gas Recirculation	P0402 - Exhaust Gas Recirculation	P11A6 - HO2S Performance - Signal High During Moderate Load Sensor 1	P11A9 - O2 Sensor Performance -	P2002 - Diesel Particulate Filter	P2459 - Diesel Particulate Filter	P2A00 - O2 Sensor Circuit
Control Circuit Low Bank 1 P2010 - Intake Manifold Runner	Response Bank 1 Sensor 1 P0133 - O2 Sensor Circuit Slow	P0171 - System Too Lean Bank 1	P0172 - System Too Rich Bank 1	Overboost P0234 - Turbocharger Engine	P026C - Injection Quantity Too Low	P026D - Injection Quantity Too High	Underboost P0299 - Turbocharger Engine	Flow Insufficient P0401 - Exhaust Gas Recirculation	Flow Excessive P0402 - Exhaust Gas Recirculation	P11A6 - HO2S Performance - Signal	Bank 1 Sensor 1 P11A9 - O2 Sensor Performance -	(DPF) Low Efficiency P2002 - Diesel Particulate Filter	Regeneration Frequency P2459 - Diesel Particulate Filter	Range/Performance Bank 1 Sensor 1 P2A00 - O2 Sensor Circuit
P2010 - Intake Manifold Runner Control Circuit High Bank 1 P2032 - Exhaust Gas Temperature	Response Bank 1 Sensor 1 P0420 - NMHC Catalyst Efficiency	P2002 - Diesel Particulate Filter	P20E2 - Exhaust Gas Temperature	Overboost P2428 - Exhaust Gas High			Underboost	Flow Insufficient	Flow Excessive	High During Moderate Load Sensor 1	Signal Low During Moderate Load Bank 1 Sensor 1	(DPF) Low Efficiency	Regeneration Frequency	Range/Performance Bank 1 Sensor 1
(EGT) Sensor 2 Circuit Low Voltage P2033 - Exhaust Gas Temperature	Below Threshold Bank 1 P0420 - NMHC Catalyst Efficiency	(DPF) Low Efficiency P2002 - Diesel Particulate Filter	(EGT) Sensors 1-2 not plausible P20E2 - Exhaust Gas Temperature	Temperature P2428 - Exhaust Gas High										
(EGT) Sensor 2 Circuit High Voltage P2048 - Reductant Injector Control	Below Threshold Bank 1 P1048 - Reductant Injector High	(DPF) Low Efficiency	(EGT) Sensors 1-2 not plausible	Temperature	J									
Circuit Low Voltage P2049 - Reductant Injector Control	P1049 - Reductant Injector High Control Circuit Low Voltage P1049 - Reductant Injector High Control Circuit High Voltage													
Circuit High Voltage P204B - Reductant Pump Pressure Sensor Performance	P204F - Reductant System Performance Bank 1 (cannot build	P20E8 - Reductant Pressure Too Low	1											
P204C - Reductant Pump Pressure Sensor Circuit Low	P204B - Reductant Pump Pressure Sensor Performance	P20A1 - Reductant Purge Valve Performance	-											
P204D - Reductant Pump Pressure Sensor Circuit High	P204B - Reductant Pump Pressure Sensor Performance	P20A1 - Reductant Purge Valve Performance												
P205C - Reductant Tank Temperature Sensor Circuit Low P208D - Reductant Pump Control	P214F - Reductant Heater 1 Current Too High P204F - Reductant System	P21DD - Reductant Heater 1 Current Too Low P20A1 - Reductant Purge Valve	P20E8 - Reductant Pressure Too	I										
Circuit High Voltage	Performance Bank 1 (cannot build pump pressure) P204F - Reductant System	Performance P20A1 - Reductant Purge Valve	Low P20E8 - Reductant Pressure Too											
P20A0 - Reductant Purge Valve Control Circuit	Performance Bank 1 (cannot build pump pressure) P204F - Reductant System	Performance P20A1 - Reductant Purge Valve	Low P20E8 - Reductant Pressure Too											
P20A2 - Reductant Purge Valve Control Circuit Low Voltage	Performance Bank 1 (cannot build pump pressure)	Performance	Low											
P20A3 - Reductant Purge Valve Control Circuit High Voltage	P204F - Reductant System Performance Bank 1 (cannot build pump pressure)	P20A1 - Reductant Purge Valve Performance	P20E8 - Reductant Pressure Too Low											
P20B9 - Reductant Heater 1 Control Circuit P20BB - Reductant Heater 1	P214F - Reductant Heater 1 Current Too High P214F - Reductant Heater 1 Current	P21DD - Reductant Heater 1 Current Too Low P21DD - Reductant Heater 1 Current	-											
Control Circuit Low P20BC - Reductant Heater 1 Control Circuit High	Too High P214F - Reductant Heater 1 Current	Too Low P21DD - Reductant Heater 1 Current	-											
P20C0 - Reductant Heater 2 Control Circuit High	Too High P214F - Reductant Heater 1 Current Too High	Too Low P21DD - Reductant Heater 1 Current Too Low												
P20E2 - Exhaust Gas Temperature (EGT) Sensors 1-2 not plausible	P0420 - NMHC Catalyst Efficiency Below Threshold Bank 1	P2002 - Diesel Particulate Filter (DPF) Low Efficiency												
P2122 - Accelerator Pedal Position Sensor 1 Circuit Low	P0128 - Engine Coolant Temperature Below Thermostat Regulating Temperature	P2138 - Accelerator Pedal Position (APP) Sensor 1-2 Correlation	1											
P2123 - Accelerator Pedal Position Sensor 1 Circuit High	P0128 - Engine Coolant Temperature Below Thermostat Regulating	P2138 - Accelerator Pedal Position (APP) Sensor 1-2 Correlation	1											
P2127 - Accelerator Pedal Position Sensor 2 Circuit Low	Temperature P0128 - Engine Coolant Temperature Below Thermostat Regulating	P2138 - Accelerator Pedal Position (APP) Sensor 1-2 Correlation	1											
P2128 - Accelerator Pedal Position (APP) Sensor 2 Circuit High	Temperature P0128 - Engine Coolant Temperature Below Thermostat Regulating	P2138 - Accelerator Pedal Position (APP) Sensor 1-2 Correlation	1											
Voltage P2138 - Accelerator Pedal Position	Temperature P0128 - Engine Coolant Temperature Below Thermostat Regulating		1											
(APP) Sensor 1-2 Correlation P2146 - Injector Positive Voltage	Temperature P01CB - Cylinder 1 Injection Timing	P01CC - Cylinder 1 Injection Timing	P01CD - Cylinder 2 Injection Timing	P01CE - Cylinder 2 Injection Timing	P01CF - Cylinder 3 Injection Timing	P01D0 - Cylinder 3 Injection Timing	P01D1 - Cylinder 4 Injection Timing	P01D2 - Cylinder 4 Injection Timing	1					
Control Circuit Group 1 P2149 - Injector Positive Voltage Control Circuit Group 2	Retarded P01CB - Cylinder 1 Injection Timing Retarded	Advanced P01CC - Cylinder 1 Injection Timing Advanced	Retarded P01CD - Cylinder 2 Injection Timing Retarded	Advanced	Retarded	Advanced P01D0 - Cylinder 3 Injection Timing Advanced	Retarded P01D1 - Cylinder 4 Injection Timing Retarded	Advanced P01D2 - Cylinder 4 Injection Timing Advanced	P2148 - Injector Positive Voltage Control Circuit Group 1	1				
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Active DTC				Inhibited DTCs								
P2199 - Intake Air Temperature Sensor 1/2 Correlation	P0128 - Engine Coolant Temperature Below Thermostat Regulating	P0420 - NMHC Catalyst Efficiency Below Threshold Bank 1										
P2200 - N0x Sensor Circuit Bank	Temperature P11DB - NOx Sensor Current	P2209 - N0x Heater Performance	-									
1 Sensor 1	Performance Bank 1 Sensor 1 P249D - Closed Loop Reductant	Bank 1 Sensor 1 P249E - Closed Loop Reductant	-									
P2202 - N0x Sensor Circuit Low Bank 1 Sensor 1	Injection Control At Limit - Flow Too	Injection Control At Limit - Flow Too High										
P2203 - N0x Sensor Circuit High	Low P249D - Closed Loop Reductant Injection Control At Limit - Flow Too	High P249E - Closed Loop Reductant Injection Control At Limit - Flow Too										
Bank 1 Sensor 1 P2205 - N0x Heater Control Circuit	P11DB - NOx Sensor Current	High P2209 - N0x Heater Performance										
Bank 1 Sensor 1	Performance Bank 1 Sensor 1 P249D - Closed Loop Reductant	Bank 1 Sensor 1 P249E - Closed Loop Reductant	-									
P2209 - N0x Heater Performance Bank 1 Sensor 1	Injection Control At Limit - Flow Too Low	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										
Sensor 1 P220B - N0x Sensor Supply Voltage Out Of Range Bank 1 Sensor 2	P11DB - NOx Sensor Current Performance Bank 1 Sensor 1	P2209 - N0x Heater Performance Bank 1 Sensor 1										
P2228 - Barometric Pressure Sensor Circuit Low	P0234 - Turbocharger Engine Overboost	P0299 - Turbocharger Engine Underboost	P0401 - Exhaust Gas Recirculation Flow Insufficient	P0402 - Exhaust Gas Recirculation Flow Excessive	P11A6 - HO2S Performance - Signa High During Moderate Load Sensor 1	Signal Low During Moderate Load Bank 1 Sensor 1	P11CB - NOx Sensor Performance - Signal High Bank 1 Sensor 1	P11CC - NOx Sensor Performance - Signal Low Bank 1 Sensor 1	P2002 - Diesel Particulate Filter (DPF) Low Efficiency	P2237 - O2 Sensor Positive Current Control Circuit/Open Bank 1 Sensor 1	P2459 - Diesel Particulate Filter Regeneration Frequency	P2A00 - O2 Sensor Circuit Range/Performance Bank 1 Sensor 1
P2229 - Barometric Pressure Sensor Circuit High	P0234 - Turbocharger Engine Overboost	P0299 - Turbocharger Engine Underboost	P0401 - Exhaust Gas Recirculation Flow Insufficient	P0402 - Exhaust Gas Recirculation Flow Excessive	P11A6 - HO2S Performance - Signa High During Moderate Load Sensor 1	I Signal Low During Moderate Load Bank 1 Sensor 1	P11CB - NOx Sensor Performance - Signal High Bank 1 Sensor 1	P11CC - NOx Sensor Performance - Signal Low Bank 1 Sensor 1	P2002 - Diesel Particulate Filter (DPF) Low Efficiency	P2237 - O2 Sensor Positive Current Control Circuit/Open Bank 1 Sensor 1	P2459 - Diesel Particulate Filter Regeneration Frequency	P2A00 - O2 Sensor Circuit Range/Performance Bank 1 Sensor 1
P2237 - O2 Sensor Positive Current Control Circuit/Open Bank 1 Sensor 1	P0133 - O2 Sensor Circuit Slow Response Bank 1 Sensor 1	P11A6 - HO2S Performance - Signal High During Moderate Load Sensor 1	P11A9 - O2 Sensor Performance - Signal Low During Moderate Load Bank 1 Sensor 1	P2002 - Diesel Particulate Filter (DPF) Low Efficiency	P2243 - O2 Sensor Reference Voltage Circuit/Open Bank 1 Sensor 1	1	-					
P2243 - O2 Sensor Reference Voltage Circuit/Open Bank 1 Sensor 1	P0131 - HO2S Bank 1 Sensor 1 circuit low	P0132 - HO2S Bank 1 Sensor 1 circuit high	P0133 - O2 Sensor Circuit Slow Response Bank 1 Sensor 1	P11A6 - HO2S Performance - Signa High During Moderate Load Sensor 1	I P11A9 - O2 Sensor Performance - Signal Low During Moderate Load Bank 1 Sensor 1	P2237 - O2 Sensor Positive Current Control Circuit/Open Bank 1 Sensor	P2251 - O2 Sensor Negative Current Control Circuit/Open Bank 1 Sensor	P2A00 - O2 Sensor Circuit Range/Performance Bank 1 Sensor 1				
P2251 - O2 Sensor Negative Current Control Circuit/Open Bank 1 Sensor 1	P0131 - HO2S Bank 1 Sensor 1 circuit low	P0132 - HO2S Bank 1 Sensor 1 circuit high	P0133 - O2 Sensor Circuit Slow Response Bank 1 Sensor 1	P11A6 - HO2S Performance - Signa High During Moderate Load Sensor 1		P2237 - O2 Sensor Positive Current Control Circuit/Open Bank 1 Sensor 1		P2A00 - O2 Sensor Circuit Range/Performance Bank 1 Sensor 1				
P2263 - Turbo Boost System Performance	P0234 - Turbocharger Engine Overboost	P0299 - Turbocharger Engine Underboost	P2459 - Diesel Particulate Filter Regeneration Frequency	1								
P2295 - Fuel Pressure Regulator 2 Control Circuit Low Voltage	P01CB - Cylinder 1 Injection Timing Retarded	P01CC - Cylinder 1 Injection Timing	P01CD - Cylinder 2 Injection Timing	P01CE - Cylinder 2 Injection Timing Advanced	P01CF - Cylinder 3 Injection Timing Retarded	P01D0 - Cylinder 3 Injection Timing	P01D1 - Cylinder 4 Injection Timing Retarded	P01D2 - Cylinder 4 Injection Timing Advanced				
P229E - NOx Sensor Performance	P20A1 - Reductant Purge Valve	Advanced P249D - Closed Loop Reductant	Retarded P249E - Closed Loop Reductant	Advanced	Retarded	Advanced	Retarded	Advanced				
Bank 1 Sensor 2	Performance P249D - Closed Loop Reductant	Injection Control At Limit - Flow Too Low P249E - Closed Loop Reductant	Injection Control At Limit - Flow Too High									
P22A7 - NOx Heater Performance Bank 1 Sensor 2	P249D - Closed Loop Reductant Injection Control At Limit - Flow Too Low P2428 - Exhaust Gas High	Injection Control At Limit - Flow Too High										
P242C - Exhaust Gas Temperature (EGT) Sensor 3	Temperature	P24B4 - Particulate Matter Sensor Heater Control Circuit										
Circuit Low Voltage P242D - Exhaust Gas	P2428 - Exhaust Gas High	Range/Performance P24B4 - Particulate Matter Sensor										
Temperature (EGT) Sensor 3 Circuit High Voltage	Temperature	Heater Control Circuit Range/Performance										
P2454 - Diesel Particulate Filter Differential Pressure Sensor Circuit Low Voltage	P2455 - Diesel Particulate Filter Differential Pressure Sensor Circuit High Voltage	P2459 - Diesel Particulate Filter Regeneration Frequency										
P2455 - Diesel Particulate Filter Differential Pressure Sensor Circuit	P2454 - Diesel Particulate Filter Differential Pressure Sensor Circuit	P2459 - Diesel Particulate Filter Receneration Frequency										
High Voltage P2459 - Diesel Particulate Filter	Low Voltage P2002 - Diesel Particulate Filter		J									
Regeneration Frequency P245C - Exhaust Gas	(DPF) Low Efficiency P0171 - System Too Lean Bank 1	Doutro 0				P0402 - Exhaust Gas Recirculation	P2002 - Diesel Particulate Filter	•				
Recirculation (EGR) Cooler Bypass Valve Control Circuit 1 Low Voltage			P026C - Injection Quantity Too Low		Flow Insufficient	Flow Excessive	(DPF) Low Efficiency					
P245D - Exhaust Gas Recirculation (EGR) Cooler Bypass Valve Control Circuit 1 High Voltage	P0171 - System Too Lean Bank 1	P0172 - System Too Rich Bank 1	P026C - Injection Quantity Too Low	P026D - Injection Quantity Too High	P0401 - Exhaust Gas Recirculation Flow Insufficient	P0402 - Exhaust Gas Recirculation Flow Excessive	P2002 - Diesel Particulate Filter (DPF) Low Efficiency					
P2463 - Diesel Particulate Filter - Soot Accumulation	P0420 - NMHC Catalyst Efficiency Below Threshold Bank 1	P2002 - Diesel Particulate Filter (DPE) Low Efficiency						•				
P24AF - Particulate Matter Sensor Circuit Range/Performance	P2002 - Diesel Particulate Filter (DPF) Low Efficiency	(=)	1									
P24B3 - Particulate Matter Sensor Heater Control Circuit/Open	P2002 - Diesel Particulate Filter (DPF) Low Efficiency											
P24B4 - Particulate Matter Sensor Heater Control Circuit Range/Performance	P2002 - Diesel Particulate Filter (DPF) Low Efficiency											
P24B6 - Particulate Matter Sensor Heater Control Circuit High	P2002 - Diesel Particulate Filter (DPF) Low Efficiency											
P24B7 - Particulate Matter Sensor Heater Resistance	P2002 - Diesel Particulate Filter (DPF) Low Efficiency											
P24C6 - Particulate Matter Sensor Temperature Circuit	P2002 - Diesel Particulate Filter (DPF) Low Efficiency											
P2564 - Turbocharger Boost Control Position Sensor Circuit Low	P0234 - Turbocharger Engine Overboost	P0299 - Turbocharger Engine Underboost	P0401 - Exhaust Gas Recirculation Flow Insufficient	P0402 - Exhaust Gas Recirculation Flow Excessive	P2002 - Diesel Particulate Filter (DPF) Low Efficiency]						
P2565 - Turbocharger Boost Control Position Sensor Circuit High	P0234 - Turbocharger Engine Overboost	P0299 - Turbocharger Engine Underboost	P0401 - Exhaust Gas Recirculation Flow Insufficient	P0402 - Exhaust Gas Recirculation Flow Excessive	P2002 - Diesel Particulate Filter (DPF) Low Efficiency	-						
P2598 - Turbocharger Boost Control Position Sensor "A" Circuit Range/Performance - Stuck Low	P0420 - NMHC Catalyst Efficiency Below Threshold Bank 1	P2459 - Diesel Particulate Filter Regeneration Frequency				-						
P2599 - Turbocharger Boost Control Position Sensor "A" Circuit Range/Performance - Stuck High	P0234 - Turbocharger Engine Overboost	P0299 - Turbocharger Engine Underboost	P0420 - NMHC Catalyst Efficiency Below Threshold Bank 1	P2459 - Diesel Particulate Filter Regeneration Frequency]							
P2A00 - O2 Sensor Circuit Range/Performance Bank 1 Sensor 1	P0133 - O2 Sensor Circuit Slow Response Bank 1 Sensor 1	P11A6 - HO2S Performance - Signal High During Moderate Load Sensor 1	P11A9 - O2 Sensor Performance - Signal Low During Moderate Load Bank 1 Sensor 1	P2237 - O2 Sensor Positive Current Control Circuit/Open Bank 1 Sensor 1		P2251 - O2 Sensor Negative Curren Control Circuit/Open Bank 1 Sensor 1	E .					
							-					

15 OBDG04 ECM Diagnostic Inhibit Tables

Active DTC		Inhit	bited DTCs								
U0073 - CAN A BUS OFF	P0851 - Park/Neutral Position (PNP) Switch Circuit Low Voltage Switch Circuit High Voltage										
U0101 - Lost Communications With Transmission Control System	P0851 - Park/Neutral Position (PNP) Switch Circuit Low Voltage Switch Circuit High Voltage	7									
Fuel Level less than 10%	P0087 - Fuel Rail Pressure Too Low P0088 - Fuel Rail Pressure Too Hig	P0191 - Fuel Rail Pressure Sensor P0263 - Cly	1 Balance System P0266 - Cly 2 Balance System	P0269 - Cly 3 Balance System	P0272 - Cly 4 Balance System	P0300 - Engine Misfire Detected	P0301 - Cylinder 1 Misfire Detected	P0302 - Cylinder 2 Misfire Detected	P0303 - Cylinder 3 Misfire Detected P0304 - Cylinder 4 Misfire Detected	P128E - Fuel Rail Pressure Performance	P2263 - Turbo Boost System

DTC			Additional Basic Enable Conditions				
P0016 - Crankshaft to Camshaft Correlation	engine not in afterrun mode (defined as engine speed greater than 0 rpm)		engine is running which means the engine speed is greater than 600 to 850 rpm	engine is not in ready state (which is active when the ignition is on or following a stall of the engine)	I		
P0030 - HO2S Heater Control Circuit Bank 1 Sensor 1	Engine not in cranking mode (defined as engine speed greater than 90 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				
P0031 - HO2S Heater Control Circuit Low Bank 1 Sensor 1	Engine not in cranking mode (defined as engine speed greater than 90 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				
P0032 - HO2S Heater Control Circuit High Bank 1 Sensor 1	Engine not in cranking mode (defined as engine speed greater than 90 rpm)		battery voltage is above 11 V for at least 3s				
P0045 - Turbocharger Boost Control Circuit	engine not in afterrun mode (defined as engine speed greater than 0 rpm)		battery voltage is above 11 V for at least 3s	engine is running which means the engine speed is greater than 600 to 850 rpm			
P0047 - Turbocharger Boost Control Circuit Low Voltage	engine not in afterrun mode (defined as engine speed greater than 0 rpm)		battery voltage is above 11 V for at least 3s	engine is running which means the engine speed is greater than 600 to 850 rpm			
P0048 - Turbocharger Boost Control Circuit High Voltage	engine not in afterrun mode (defined as engine speed greater than 0 rpm)	engine is not in standby state (standby state occurs after ECM initialization or following after-run)	battery voltage is above 11 V for at least 3s	engine is running which means the engine speed is greater than 600 to 850 rpm			
P0053 - HO2S Heater Resistance Bank 1 Sensor 1							
P007C - CAC Temperature Sensor Circuit Low Voltage	engine not in afterrun mode (defined as engine speed greater than 0 rpm)	Engine not in cranking mode (defined as engine speed greater than 90 rpm)	engine is not in standby state (standby state occurs after ECM initialization or following after-run)	battery voltage is above 11 V for at least 3s	engine Run Time is greater than 10 seconds (Engine not in cranking mode (defined as engine speed greater than 90 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 cranking mode (defined as engine speed greater than 90 rpm)		battery voltage is above 11 V for at least 3s	engine Run Time is greater than 10 seconds (Engine not in cranking mode (defined as engine speed greater than 90 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/System Pressure - Too Low Bank 1	ambient air temperature is above -7 deg C	ambient pressure is above 74.8kPa	engine is not in ready state (which is active when the ignition is on or following a stall of the engine)				
P0088 - Fuel Rail Pressure Too High	ambient air temperature is above -7 deg C	ambient pressure is above 74.8kPa	engine is not in ready state (which is active when the ignition is on or following a stall of the engine)		_		
P0090 - Fuel Pressure Regulator 1 Control Circuit/Open	engine not in afterrun mode (defined as engine speed greater than 0 rpm)		battery voltage is above 11 V for at least 3s	engine is running which means the engine speed is greater than 600 to 850 rpm			
P0091 - Fuel Pressure Regulator 1 Control Circuit Low	engine not in afterrun mode (defined as engine speed greater than 0 rpm)		battery voltage is above 11 V for at least 3s	engine is running which means the engine speed is greater than 600 to 850 rpm			
P0092 - Fuel Pressure Regulator 1 Control Circuit High	engine not in afterrun mode (defined as engine speed greater than 0 rpm)		battery voltage is above 11 V for at least 3s	engine is running which means the engine speed is greater than 600 to 850 rpm			
P0097 - Intake Air Temperature Sensor 2 Circuit Low		Engine not in cranking mode (defined as engine speed greater than 90 rpm)		battery voltage is above 11 V for at least 3s	engine Run Time is greater than 10 seconds (Engine not in cranking mode (defined as engine speed greater than 90 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				
P0098 - Intake Air Temperature Sensor 2 Circuit High	engine not in afterrun mode (defined as engine speed greater than 0 rpm)	Engine not in cranking mode (defined as engine speed greater than 90 rpm)	engine is not in standby state (standby state occurs after ECM initialization or following after-run)	battery voltage is above 11 V for at least 3s	engine Run Time is greater than 10 seconds (Engine not in cranking mode (defined as engine speed greater than 90 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 Solenoid Supply Voltage Control Circuit Low	engine not in afterrun mode (defined as engine speed greater than 0 rpm)	engine is not in standby state (standby state occurs after ECM initialization or following after-run)	battery voltage is above 11 V for at least 3s	engine is running which means the engine speed is greater than 600 to 850 rpm			
P00CA - Fuel Pressure Regulator Solenoid Supply Voltage Control Circuit High	engine not in afterrun mode (defined as engine speed greater than 0 rpm)	engine is not in standby state (standby state occurs after ECM initialization or following after-run)	battery voltage is above 11 V for at least 3s	engine is running which means the engine speed is greater than 600 to 850 rpm			
P00EA - Intake Air Temperature (IAT) Sensor 3 Circuit Low Voltage	engine not in afterrun mode (defined as engine speed greater than 0 rpm)	Engine not in cranking mode (defined as engine speed greater than 90 rpm)	engine is not in standby state (standby state occurs after ECM initialization or following after-run)	battery voltage is above 11 V for at least 3s	engine Run Time is greater than 10 seconds (Engine not in cranking mode (defined as engine speed greater than 90 rpm) to indicate the engine is running)	engine is running which means the engine speed is greater than 600 to 850 rpm	engine is not in ready state (which is active when the ignition is on or following a stall of the engine)
P00EB - Intake Air Temperature (IAT) Sensor 3 Circuit High Voltage	engine not in afterrun mode (defined as engine speed greater than 0 rpm)	Engine not in cranking mode (defined as engine speed greater than 90 rpm)	engine is not in standby state (standby state occurs after ECM initialization or following after-run)	battery voltage is above 11 V for at least 3s	engine Run Time is greater than 10 seconds (Engine not in cranking mode (defined as engine speed greater than 90 rpm) to indicate the engine is running)	engine is running which means the engine speed is greater than 600 to 850 rpm	engine is not in ready state (which is active when the ignition is on or following a stall of the engine)
P00F4 - Humidity Sensor Circuit Low	engine not in afterrun mode (defined as engine speed greater than 0 rpm)	Engine not in cranking mode (defined as engine speed greater than 90 rpm)	engine is not in standby state (standby state occurs after ECM initialization or following after-run)	battery voltage is above 11 V for at least 3s	engine Run Time is greater than 10 seconds (Engine not in cranking mode (defined as engine speed greater than 90 rpm) to indicate the engine is running)	engine is running which means the engine speed is greater than 600 to 850 rpm	engine is not in ready state (which is active when the ignition is on or following a stall of the engine)
P00F5 - Humidity Sensor Circuit High	engine not in afterrun mode (defined as engine speed greater than 0 rpm)	Engine not in cranking mode (defined as engine speed greater than 90 rpm)	engine is not in standby state (standby state occurs after ECM initialization or following after-run)	battery voltage is above 11 V for at least 3s	engine Run Time is greater than 10 seconds (Engine not in cranking mode (defined as engine speed greater than 90 rpm) to indicate the engine is running)	engine is running which means the engine speed is greater than 600 to 850 rpm	engine is not in ready state (which is active when the ignition is on or following a stall of the engine)
P00F6 - Humidity Sensor Circuit Intermittent/Erratic	engine not in afterrun mode (defined as engine speed greater than 0 rpm)	Engine not in cranking mode (defined as engine speed greater than 90 rpm)	engine is not in standby state (standby state occurs after ECM initialization or following after-run)	battery voltage is above 11 V for at least 3s	engine Run Time is greater than 10 seconds (Engine not in cranking mode (defined as engine speed greater than 90 rpm) to indicate the engine is running)	engine is running which means the engine speed is greater than 600 to 850 rpm	engine is not in ready state (which is active when the ignition is on or following a stall of the engine)
P0101 - Mass Air Flow Sensor Performance	engine not in afterrun mode (defined as engine speed greater than 0 rpm)	Engine not in cranking mode (defined as engine speed greater than 90 rpm)	engine is not in standby state (standby state occurs after ECM initialization or following after-run)	battery voltage is above 11 V for at least 3s	engine Run Time is greater than 10 seconds (Engine not in cranking mode (defined as engine speed greater than 90 rpm) to indicate the engine is running)	engine is running which means the engine speed is greater than 600 to 850 rpm	engine is not in ready state (which is active when the ignition is on or following a stall of the engine)
P0102 - Mass Air Flow Sensor Circuit Low	engine not in afterrun mode (defined as engine speed greater than 0 rpm)	Engine not in cranking mode (defined as engine speed greater than 90 rpm)	engine is not in standby state (standby state occurs after ECM initialization or following after-run)	battery voltage is above 11 V for at least 3s	engine Run Time is greater than 10 seconds (Engine not in cranking mode (defined as engine speed greater than 90 rpm) to indicate the engine is running)	engine is running which means the engine speed is greater than 600 to 850 rpm	engine is not in ready state (which is active when the ignition is on or following a stall of the engine)
P0103 - Mass Air Flow Sensor Circuit High	engine not in afterrun mode (defined as engine speed greater than 0 rpm)	Engine not in cranking mode (defined as engine speed greater than 90 rpm)	engine is not in standby state (standby state occurs after ECM initialization or following after-run)	battery voltage is above 11 V for at least 3s	engine Run Time is greater than 10 seconds (Engine not in cranking mode (defined as engine speed greater than 90 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)
P0107 - Manifold Absolute Pressure (MAP) Sensor Circuit Low Voltage	engine not in afterrun mode (defined as engine speed greater than 0 rpm)	Engine not in cranking mode (defined as engine speed greater than 90 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)	
P0108 - Manifold Absolute Pressure (MAP) Sensor Circuit High Voltage	engine not in afterrun mode (defined as engine speed greater than 0 rpm)	Engine not in cranking mode (defined as engine speed greater than 90 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)	
P0112 - Intake Air Temperature Sensor 1 Circuit Low	engine not in afterrun mode (defined as engine speed greater than 0 rpm)	Engine not in cranking mode (defined as engine speed greater than 90 rpm)	engine is not in standby state (standby state occurs after ECM initialization or following after-run)	battery voltage is above 11 V for at least 3s	engine Run Time is greater than 10 seconds (Engine not in cranking mode (defined as engine speed greater than 90 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 not in cranking mode (defined as engine speed greater than 90 rpm)	engine is not in standby state (standby state occurs after ECM initialization or following after-run)	battery voltage is above 11 V for at least 3s	engine Run Time is greater than 10 seconds (Engine not in cranking mode (defined as engine speed greater than 90 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	engine is not in standby state (standby state occurs after ECM						

Low (standby state occurs after ECM initialization or following after-run)

DTC Additional Basic Enable Conditions P0119 - Engine Coolant Temperature Sensor Circuit High engine is not in standby state (standby state occurs after ECM initialization or following after-run)
Temperature Sensor Circuit (standby state occurs after ECM High initialization or following after-run)
Poil 18 - Engine Coolant Temperature/Inska Air Temperature Correlation Temperature Correlation
P0128 - Engine Coolant Temperature Below Thermostat Regulating Temperature
P0131 - H025 Bank 1 Sensor 1 circuit low Engine not in cranking mode (defined as engine speed greater than 90 rpm) engine is not in standby state (standby state occurs after ECM initialization or following after-run)
P0132 - HO2S Bank 1 Sensor 1 Engine not in cranking mode (defined as engine speed greater than 90 rpm) engine is not in standby state occurs after ECM initialization or following after-run)
P0133 - 02 Sensor Circuit Slow Response Bank 1 Sensor 1 Bengine not in afterrun mode (defined as engine speed greater than 0 prm) in dicate the Bengine speed greater than 90 prm in bindicate the Bengine speed greater than 90 prm in bindic
P0171 - System Too Lean Bank System is not in active regeneration mode
P0172 - System Too Rich Bank 1 mode
P0182 - Fuel Temperature Sensor 1 Circuit Low as engine speed greater than 0 pm) in indicate the engine since in cranking mode (defined as engine speed greater than 0 pm) in indicate the engine since in the sense of the sense
P0183 - Fuel Temperature Sensor 1 Circuit High as engine speed greater than 0 pm) in indicate the engine speed greater than 90 pm) in the speed greater than 90 pm in the speed g
P0191 - Fuel Rail Pressure Sensor Performance engine is not in standby state initialization or following after-run) battery voltage is above 11 V for at least 3s
P0192 - Fuel Rail Pressure Sensor Circuit Low initialization or following after-run) battery voltage is above 11 V for at Initialization or following after-run)
P0193 - Fuel Rail Pressure Sensor Circuit High initialization or following after-run) battery voltage is above 11 V for at least 3s
PD1CB - Cylinder 1 Injection Timing Retarded de C ambient air temperature is above -7 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 deg C 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 state of the engine)
P01CD - Cylinder 2 Injection Timing Retarded deg C 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 state of the engine)

DTC			Additional Basic Enable Conditions						
P01CE - Cylinder 2 Injection Timing Advanced	ambient air temperature is above -7 deg C	ambient pressure is above 74.8kPa	engine is not in ready state (which is active when the ignition is on or following a stall of the engine)						
P01CF - Cylinder 3 Injection Timing Retarded	ambient air temperature is above -7 deg C	ambient pressure is above 74.8kPa	engine is not in ready state (which is active when the ignition is on or following a stall of the engine)						
P01D0 - Cylinder 3 Injection Timing Advanced	ambient air temperature is above -7 deg C	ambient pressure is above 74.8kPa	engine is not in ready state (which is active when the ignition is on or following a stall of the engine)						
P01D1 - Cylinder 4 Injection Timing Retarded	ambient air temperature is above -7 deg C	ambient pressure is above 74.8kPa	engine is not in ready state (which is active when the ignition is on or following 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)						
P01F0 - Coolant Temperature Dropped Below Diagnostic Monitoring Temperature	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	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 not in cranking mode (defined as engine speed greater than 90 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 is greater than 10 seconds (Engine not in cranking mode (defined as engine speed greater than 90 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)
P026A - CAC Efficcientcy Below Threshold	engine not in afterrun mode (defined as engine speed greater than 0 rpm)	Engine not in cranking mode (defined as engine speed greater than 90 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 is greater than 10 seconds (Engine not in cranking mode (defined as engine speed greater than 90 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	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	System is not in active regeneration mode						
P0299 - Turbocharger Engine Underboost	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)	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 is greater than 10 seconds (Engine not in cranking mode (defined as engine speed greater than 90 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)
P02E2 - Intake Air Flow Valve Control Circuit 1 Low Voltage	engine is not in standby state (standby state occurs after ECM initialization or following after-run)	battery voltage is above 11 V for at least 3s							
P02E3 - Intake Air Flow Valve Control Circuit 1 High Voltage	engine is not in standby state (standby state occurs after ECM initialization or following after-run)	battery voltage is above 11 V for at least 3s							
P02E7 - Diesel Intake Air Flow Position Sensor Circuit Range Performance	engine not in afterrun mode (defined as engine speed greater than 0 rpm)	Engine not in cranking mode (defined as engine speed greater than 90 rpm)	engine is not in standby state (standby state occurs after ECM initialization or following after-run)	battery voltage is above 11 V for at least 3s	engine Run Time is greater than 10 seconds (Engine not in cranking mode (defined as engine speed greater than 90 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 not in cranking mode (defined as engine speed greater than 90 rpm)	engine is not in standby state (standby state occurs after ECM initialization or following after-run)	battery voltage is above 11 V for at least 3s	engine Run Time is greater than 10 seconds (Engine not in cranking mode (defined as engine speed greater than 90 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 not in cranking mode (defined as engine speed greater than 90 rpm)	engine is not in standby state (standby state occurs after ECM initialization or following after-run)	battery voltage is above 11 V for at least 3s	engine Run Time is greater than 10 seconds (Engine not in cranking mode (defined as engine speed greater than 90 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								
P02EB - Intake Air Flow Valve Control Motor Current Performance	engine is not in standby state (standby state occurs after ECM initialization or following after-run)	battery voltage is above 11 V for at least 3s									
P0300 - Engine Misfire Detected	engine is not in ready state (which is active when the ignition is on or following a stall of the engine)		'								
P0301 - Cylinder 1 Misfire Detected	engine is not in ready state (which is active when the ignition is on or following a stall of the engine)										
P0302 - Cylinder 2 Misfire Detected	engine is not in ready state (which is active when the ignition is on or following a stall of the engine)										
P0303 - Cylinder 3 Misfire Detected	engine is not in ready state (which is active when the ignition is on or following a stall of the engine)										
P0304 - Cylinder 4 Misfire Detected	engine is not in ready state (which is active when the ignition is on or following a stall of the engine)										
P0335 - Crankshaft Position Sensor 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)	engine is running which means the engine speed is greater than 600 to 850 rpm	battery voltage is above 11 V for at least 3s	j						
P0336 - Crankshaft Position Sensor Performance	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								
P0340 - Camshaft Position Sensor 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)	engine is running which means the engine speed is greater than 600 to 850 rpm								
P0341 - Camshaft Position Sensor Performance	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								
P037A - Glow Plug/Heater Indicator Control Circuit Low	engine not in afterrun mode (defined as engine speed greater than 0 rpm)	engine is not in standby state (standby state occurs after ECM initialization or following after-run)	battery voltage is above 11 V for at least 3s	engine is running which means the engine speed is greater than 600 to 850 rpm							
P037B - Glow Plug/Heater ndicator Control Circuit High	engine not in afterrun mode (defined as engine speed greater than 0 rpm)	engine is not in standby state (standby state occurs after ECM initialization or following after-run)	battery voltage is above 11 V for at least 3s	engine is running which means the engine speed is greater than 600 to 850 rpm							
P0401 - Exhaust Gas ecirculation Flow Insufficient		Engine not in cranking mode (defined as engine speed greater than 90 rpm)		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 is greater than 10 seconds (Engine not in cranking mode (defined as engine speed greater than 90 rpm) to indicate the engine is running)	System is not in active regeneration mode	engine is running which means the engine speed is greater than 600 to 850 rpm	engine is not in ready state (which is active when the ignition is on or following a stall of the engine)	
P0402 - Exhaust Gas Recirculation Flow Excessive		Engine not in cranking mode (defined as engine speed greater than 90 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 is greater than 10 seconds (Engine not in cranking mode (defined as engine speed greater than 90 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)	
P0405 - Exhaust Gas Recirculation Position Sensor Circuit Low		Engine not in cranking mode (defined as engine speed greater than 90 rpm)	engine is not in standby state (standby state occurs after ECM initialization or following after-run)	battery voltage is above 11 V for at least 3s	engine Run Time is greater than 10 seconds (Engine not in cranking mode (defined as engine speed greater than 90 rpm) to indicate the engine is running)	engine is running which means the engine speed is greater than 600 to 850 rpm	engine is not in ready state (which is active when the ignition is on or following a stall of the engine)				
P0406 - Exhaust Gas Recirculation Position Sensor Circuit High	engine not in afterrun mode (defined as engine speed greater than 0 rpm)	Engine not in cranking mode (defined as engine speed greater than 90 rpm)	engine is not in standby state (standby state occurs after ECM initialization or following after-run)	battery voltage is above 11 V for at least 3s	engine Run Time is greater than 10 seconds (Engine not in cranking mode (defined as engine speed greater than 90 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							
		1		1	engine Run Time is greater than 10	1	1	1		
P040C - Exhaust Gas Recirculation (EGR) Temperature Sensor 2 Circuit Low Voltage		Engine not in cranking mode (defined as engine speed greater than 90 rpm)	engine is not in standby state (standby state occurs after ECM initialization or following after-run)	battery voltage is above 11 V for at least 3s	seconds (Engine not in cranking mode (defined as engine speed greater than 90 rpm) to indicate the engine is running)	engine is running which means the engine speed is greater than 600 to 850 rpm	engine is not in ready state (which is active when the ignition is on or following a stall of the engine)			
P040D - Exhaust Gas Recirculation (EGR) Temperature Sensor 2 Circuit High Voltage		Engine not in cranking mode (defined as engine speed greater than 90 rpm)	engine is not in standby state (standby state occurs after ECM initialization or following after-run)	battery voltage is above 11 V for at least 3s	engine Run Time is greater than 10 seconds (Engine not in cranking mode (defined as engine speed greater than 90 rpm) to indicate the engine is running)	engine is running which means the engine speed is greater than 600 to 850 rpm	engine is not in ready state (which is active when the ignition is on or following a stall of the engine)			
P040F - Exhaust Gas Recirculation (EGR) Temperature Sensor 1-2 Correlation	engine not in afterrun mode (defined as engine speed greater than 0 rpm)	Engine not in cranking mode (defined as engine speed greater than 90 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)			_		
P041C - Exhaust Gas Recirculation (EGR) Temperature Sensor 1 Circuit Low Voltage		Engine not in cranking mode (defined as engine speed greater than 90 rpm)	engine is not in standby state (standby state occurs after ECM initialization or following after-run)	battery voltage is above 11 V for at least 3s	engine Run Time is greater than 10 seconds (Engine not in cranking mode (defined as engine speed greater than 90 rpm) to indicate the engine is running)	engine is running which means the engine speed is greater than 600 to 850 rpm	engine is not in ready state (which is active when the ignition is on or following a stall of the engine)			
P041D - Exhaust Gas Recirculation (EGR) Temperature Sensor 1 Circuit High Voltage	engine not in afterrun mode (defined as engine speed greater than 0 rpm)	Engine not in cranking mode (defined as engine speed greater than 90 rpm)	engine is not in standby state (standby state occurs after ECM initialization or following after-run)	battery voltage is above 11 V for at least 3s	engine Run Time is greater than 10 seconds (Engine not in cranking mode (defined as engine speed greater than 90 rpm) to indicate the engine is running)	engine is running which means the engine speed is greater than 600 to 850 rpm	engine is not in ready state (which is active when the ignition is on or following a stall of the engine)			
P0420 - NMHC Catalyst Efficiency Below Threshold Bank 1	engine not in afterrun mode (defined as engine speed greater than 0 rpm)	Engine not in cranking mode (defined as engine speed greater than 90 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 is greater than 10 seconds (Engine not in cranking mode (defined as engine speed greater than 90 rpm) to indicate the engine is running)	engine is running which means the engine speed is greater than 600 to 850 rpm	engine is not in ready state (which is active when the ignition is on or following a stall of the engine)
P0461 - Fuel Level Sensor Performance	engine not in afterrun mode (defined as engine speed greater than 0 rpm)	Engine not in cranking mode (defined as engine speed greater than 90 rpm)	engine is not in standby state (standby state occurs after ECM initialization or following after-run)	battery voltage is above 11 V for at least 3s	engine Run Time is greater than 10 seconds (Engine not in cranking mode (defined as engine speed greater than 90 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 cranking mode (defined as engine speed greater than 90 rpm)	engine is not in standby state (standby state occurs after ECM initialization or following after-run)	battery voltage is above 11 V for at least 3s	engine Run Time is greater than 10 seconds (Engine not in cranking mode (defined as engine speed greater than 90 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 not in cranking mode (defined as engine speed greater than 90 rpm)	engine is not in standby state (standby state occurs after ECM initialization or following after-run)	battery voltage is above 11 V for at least 3s	engine Run Time is greater than 10 seconds (Engine not in cranking mode (defined as engine speed greater than 90 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	engine is not in standby state (standby state occurs after ECM initialization or following 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								
P0506 - Idle Speed Low	engine Run Time is greater than 10 seconds (Engine not in cranking mode (defined as engine speed greater than 90 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 is greater than 10 seconds (Engine not in cranking mode (defined as engine speed greater than 90 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)				_				
P0545 - Exhaust Gas Temperature (EGT) Sensor 1 Circuit Low Voltage		Engine not in cranking mode (defined as engine speed greater than 90 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 cranking mode (defined as engine speed greater than 90 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					
P054E - Idle Control System - Fuel Quantity Lower Than Expected		Engine not in cranking mode (defined as engine speed greater than 90 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	engine is running which means the engine speed is greater than 600 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					
P054F - Idle Control System - Fuel Quantity Higher Than Expected	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)	ambient air temperature is above -7 deg C	engine is running which means the engine speed is greater than 600 to 850 rpm	engine is not in ready state (which is active when the ignition is on or following a stall of the engine)		
P0564 - Cruise Control Multi- Function Input "A" Circuit		Engine not in cranking mode (defined as engine speed greater than 90 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 not in cranking mode (defined as engine speed greater than 90 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)
P0567 - Cruise Control Resume Switch Circuit	engine not in afterrun mode (defined as engine speed greater than 0 rpm)	Engine not in cranking mode (defined as engine speed greater than 90 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 not in cranking mode (defined as engine speed greater than 90 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 cranking mode (defined as engine speed greater than 90 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 not in cranking mode (defined as engine speed greater than 90 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 not in cranking mode (defined as engine speed greater than 90 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)							
P0627 - Fuel Pump Relay Control Circuit	engine not in afterrun mode (defined as engine speed greater than 0 rpm)	battery voltage is above 11 V for at least 3s	engine is running which means the engine speed is greater than 600 to 850 rpm					
P0628 - Fuel Pump Relay Control Circuit Low	engine not in afterrun mode (defined as engine speed greater than 0 rpm)	battery voltage is above 11 V for at least 3s	engine is running which means the engine speed is greater than 600 to 850 rpm					
P0629 - Fuel Pump Relay Control Circuit High	battery voltage is above 11 V for at least 3s			-				
P064C - Glow Plug Control Module Performance	engine is not in standby state (standby state occurs after ECM initialization or following after-run)	battery voltage is above 11 V for at least 3s						
P0671 - Glow Plug 1 Control Circuit	engine is not in standby state (standby state occurs after ECM initialization or following after-run)	battery voltage is above 11 V for at least 3s						
P0672 - Glow Plug 2 Control Circuit	engine is not in standby state (standby state occurs after ECM initialization or following after-run)	battery voltage is above 11 V for at least 3s						
P0673 - Glow Plug 3 Control Circuit	engine is not in standby state (standby state occurs after ECM initialization or following after-run)	battery voltage is above 11 V for at least 3s						
P0674 - Glow Plug 4 Control Circuit	engine is not in standby state (standby state occurs after ECM initialization or following after-run)	battery voltage is above 11 V for at least 3s						
P0691 - Fan 1 Control Circuit Low	battery voltage is above 11 V for at least 3s							

DTC		-	Additional Basic Enable Conditions								
P0692 - Fan 1 Control Circuit High	battery voltage is above 11 V for at least 3s										
P069E - Fuel Pump Control Module Requested MIL Illumination	engine is not in standby state (standby state occurs after ECM initialization or following after-run)										
P0700 - Transmission Control Module Requested Malfunction Indicator Lamp Illumination	engine is not in standby state (standby state occurs after ECM initialization or following after-run)										
P0851 - Park/Neutral Position (PNP) Switch Circuit Low Voltage	engine is not in standby state (standby state occurs after ECM initialization or following after-run)										
P0852 - Park/Neutral Position (PNP) Switch Circuit High Voltage	engine is not in standby state (standby state occurs after ECM initialization or following after-run)										
P1043 - Reductant Pump High Control Circuit Low Voltage	engine not in afterrun mode (defined as engine speed greater than 0 rpm)	Engine not in cranking mode (defined as engine speed greater than 90 rpm)	engine is not in standby state (standby state occurs after ECM initialization or following after-run)	engine Run Time is greater than 10 seconds (Engine not in cranking mode (defined as engine speed greater than 90 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)					
P1046 - Reductant Purge Valve High Control Circuit High Voltage		Engine not in cranking mode (defined as engine speed greater than 90 rpm)	engine is not in standby state (standby state occurs after ECM initialization or following after-run)	engine Run Time is greater than 10 seconds (Engine not in cranking mode (defined as engine speed greater than 90 rpm) to indicate the engine is running)	engine is running which means the engine speed is greater than 600 to 850 rpm	engine is not in ready state (which is active when the ignition is on or following a stall of the engine)		_			
P1048 - Reductant Injector High Control Circuit Low Voltage		Engine not in cranking mode (defined as engine speed greater than 90 rpm)	engine is not in standby state (standby state occurs after ECM initialization or following after-run)	battery voltage is above 11 V for at least 3s	engine Run Time is greater than 10 seconds (Engine not in cranking mode (defined as engine speed greater than 90 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 not in cranking mode (defined as engine speed greater than 90 rpm)	engine is not in standby state (standby state occurs after ECM initialization or following after-run)	battery voltage is above 11 V for at least 3s	engine Run Time is greater than 10 seconds (Engine not in cranking mode (defined as engine speed greater than 90 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)				
P10CF - Charge Air Cooler Temperature - Intake Air Temperature (IAT) Sensor 3 Correlation	engine not in afterrun mode (defined as engine speed greater than 0 rpm)	Engine not in cranking mode (defined as engine speed greater than 90 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)						
P10D0 - Reductant Injector Temperature - Exhaust Gas Temperature 2 Correlation	engine not in afterrun mode (defined as engine speed greater than 0 rpm)	engine is running which means the engine speed is greater than 600 to 850 rpm				-					
P11A6 - HO2S Performance - Signal High During Moderate Load Sensor 1	engine not in afterrun mode (defined as engine speed greater than 0 rpm)	Engine not in cranking mode (defined as engine speed greater than 90 rpm)	engine is not in standby state (standby state occurs after ECM initialization or following after-run)	battery voltage is above 11 V for at least 3s	engine Run Time is greater than 10 seconds (Engine not in cranking mode (defined as engine speed greater than 90 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)				
P11A9 - O2 Sensor Performance - Signal Low During Moderate Load Bank 1 Sensor 1	engine not in afterrun mode (defined as engine speed greater than 0 rpm)	Engine not in cranking mode (defined as engine speed greater than 90 rpm)	engine is not in standby state (standby state occurs after ECM initialization or following after-run)	battery voltage is above 11 V for at least 3s	engine Run Time is greater than 10 seconds (Engine not in cranking mode (defined as engine speed greater than 90 rpm) to indicate the engine is running)	engine is running which means the engine speed is greater than 600 to 850 rpm	engine is not in ready state (which is active when the ignition is on or following a stall of the engine)				
P11CB - NOx Sensor Performance - Signal High Bank 1 Sensor 1		Engine not in cranking mode (defined as engine speed greater than 90 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 is greater than 10 seconds (Engine not in cranking mode (defined as engine speed greater than 90 rpm) to indicate the engine is running)	System is not in active regeneration mode	engine is running which means the engine speed is greater than 600 to 850 rpm	engine is not in ready state (which is active when the ignition is on or following a stall of the engine)
P11CC - NOx Sensor Performance - Signal Low Bank 1 Sensor 1	engine not in afterrun mode (defined as engine speed greater than 0 rpm)	Engine not in cranking mode (defined as engine speed greater than 90 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 is greater than 10 seconds (Engine not in cranking mode (defined as engine speed greater than 90 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)
P11D3 - Nox Sensor Offset Learning at Min Limit - Bank 1 Sensor 1	battery voltage is above 11 V for at least 3s										

Sensor 1

DTC		-	Additional Basic Enable Conditions	•						
P11D4 - Nox Sensor Offset Learning at Max Limit - Bank 1 Sensor 1	battery voltage is above 11 V for at least 3s									
P11D7 - Nox Sensor Performance - Sensing Element Status Signal Bank 1 Sensor 2	Manufacturer Enable Counter is zero (value of 0 means ECM is locked and out of assembly plant mode)		ambient pressure is above 74.8kPa	battery voltage is above 11 V for at least 3s	engine Run Time is greater than 10 seconds (Engine not in cranking mode (defined as engine speed greater than 90 rpm) to indicate the engine is running)	System is not in active regeneration mode				
P11DB - NOx Sensor Current Performance Bank 1 Sensor 1	engine not in afterrun mode (defined as engine speed greater than 0 rpm)	Engine not in cranking mode (defined as engine speed greater than 90 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)	hotton unlines is shows 11 V for at	engine Run Time is greater than 10 seconds (Engine not in cranking mode (defined as engine speed greater than 90 rpm) to indicate the engine is running)	System is not in active regeneration mode	engine is running which means the engine speed is greater than 600 to 850 rpm	engine is not in ready state (which is active when the ignition is on or following a stall of the engine)	
P11DC - NOx Sensor Current Performance Bank 1 Sensor 2		Engine not in cranking mode (defined as engine speed greater than 90 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 not in cranking mode (defined as engine speed greater than 90 rpm) to indicate the engine is running)	System is not in active regeneration mode	engine is running which means the engine speed is greater than 600 to 850 rpm	engine is not in ready state (which is active when the ignition is on or following a stall of the engine)	
P122C - Intake Air Flow Valve Control Circuit Shorted	engine is 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 occurs after ECM initialization or following after-run)	battery voltage is above 11 V for at least 3s								
P125A - Fuel Pressure Regulator 2 High Control Circuit Low Voltage	engine not in afterrun mode (defined as engine speed greater than 0 rpm)	engine is not in standby state (standby state occurs after ECM initialization or following after-run)	battery voltage is above 11 V for at least 3s	engine is running which means the engine speed is greater than 600 to 850 rpm						
P12B0 - Intake Manifold Runner Actuator Feedback Signal Circuit Low	Engine not in cranking mode (defined as engine speed greater than 90 rpm)		battery voltage is above 11 V for at least 3s							
P12B1 - Intake Manifold Runner Actuator Feedback Signal Circuit High	Engine not in cranking mode (defined as engine speed greater than 90 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							
P1407 - Exhaust Gas Recirculation (EGR) Motor Control Circuit Shorted	engine is not in standby state (standby state occurs after ECM initialization or following after-run)	battery voltage is above 11 V for at least 3s		-						
P140B - Exhaust Gas Recirculation Slow Response- Increasing Flow		Engine not in cranking mode (defined as engine speed greater than 90 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 is greater than 10 seconds (Engine not in cranking mode (defined as engine speed greater than 90 rpm) to indicate the engine is running)	System is not in active regeneration mode	engine is running which means the engine speed is greater than 600 to 850 rpm	engine is not in ready state (which is active when the ignition is on or following a stall of the engine)
P140C - Exhaust Gas Recirculation Slow Response- Decreasing Flow	engine not in afterrun mode (defined as engine speed greater than 0 rpm)	Engine not in cranking mode (defined as engine speed greater than 90 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 is greater than 10 seconds (Engine not in cranking mode (defined as engine speed greater than 90 rpm) to indicate the engine is running)	System is not in active regeneration mode	engine is running which means the engine speed is greater than 600 to 850 rpm	engine is not in ready state (which is active when the ignition is on or following a stall of the engine)
P140D - Exhaust Gas Recirculation (EGR) Motor Control Circuit 2 Low Voltage	engine is not in standby state (standby state occurs after ECM initialization or following after-run)	battery voltage is above 11 V for at least 3s								
P140E - Exhaust Gas Recirculation (EGR) Motor Control Circuit 2 High Voltage	engine is not in standby state (standby state occurs after ECM initialization or following after-run)	battery voltage is above 11 V for at least 3s								
P140F - Exhaust Gas Recirculation (EGR) Motor Current Performance	engine is not in standby state (standby state occurs after ECM initialization or following after-run)	battery voltage is above 11 V for at least 3s								

DTC			Additional Basic Enable Conditions					_
P144E - Closed Loop Diesel Particulate Filter (DPF) Regeneration Control At Limit - Stage 2 Low Temperature	engine not in afterrun mode (defined as engine speed greater than 0 rpm)	Engine not in cranking mode (defined as engine speed greater than 90 rpm)	engine is not in standby state (standby state occurs after ECM initialization or following after-run)	engine Run Time is greater than 10 seconds (Engine not in cranking mode (defined as engine speed greater than 90 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)		
P144F - Closed Loop Diesel Particulate Filter (DPF) Regeneration Control At Limit - Stage 2 High Temperature		Engine not in cranking mode (defined as engine speed greater than 90 rpm)	engine is not in standby state (standby state occurs after ECM initialization or following after-run)	engine Run Time is greater than 10 seconds (Engine not in cranking mode (defined as engine speed greater than 90 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)]	
P150C - TCM Engine Speed Request Signal Message Counter Incorrect	engine is not in standby state (standby state occurs after ECM initialization or following after-run)							
P155A - Cruise Control Switch State Undetermined		Engine not in cranking mode (defined as engine speed greater than 90 rpm)	engine is not in standby state (standby state occurs after ECM initialization or following after-run)	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	System is not in active regeneration mode			
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						
P163C - Glow Plug Control Module Primary Circuit	engine is not in standby state (standby state occurs after ECM initialization or following after-run)	battery voltage is above 11 V for at least 3s						
P163D - Glow Plug Control Module Secondary Circuit	engine not in afterrun mode (defined as engine speed greater than 0 rpm)	engine is not in standby state (standby state occurs after ECM initialization or following after-run)	battery voltage is above 11 V for at least 3s					
P167C - Glow Plug Control Iodule Temperature / Intake Air Temperature Sensor 1 Correlation	engine is not in standby state (standby state occurs after ECM initialization or following after-run)	battery voltage is above 11 V for at least 3s						
P16AD - Glow Plug Control Module Temperature Sensor Circuit 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						
P16AE - Glow Plug Control Module Temperature Sensor Circuit 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						
2008 - Intake Manifold Runner Control Circuit/Open Bank 1	battery voltage is above 11 V for at least 3s							
P2009 - Intake Manifold Runner Control Circuit Low Bank 1	battery voltage is above 11 V for at least 3s							
2010 - Intake Manifold Runner Control Circuit High Bank 1	battery voltage is above 11 V for at least 3s							
P2032 - Exhaust Gas Temperature (EGT) Sensor 2 Circuit Low Voltage		Engine not in cranking mode (defined as engine speed greater than 90 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 cranking mode (defined as engine speed greater than 90 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 cranking mode (defined as engine speed greater than 90 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 not in cranking mode (defingine as engine speed greater than 90 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 i active wher following a

DTC			Additional Basic Enable Conditions					
P203C - Reductant Level Sensor 1 Circuit Low	engine not in afterrun mode (defined as engine speed greater than 0 rpm)	Engine not in cranking mode (defined as engine speed greater than 90 rpm)	engine is not in standby state (standby state occurs after ECM initialization or following after-run)	battery voltage is above 11 V for at least 3s	engine Run Time is greater than 10 seconds (Engine not in cranking mode (defined as engine speed greater than 90 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 not in cranking mode (defined as engine speed greater than 90 rpm)	engine is not in standby state (standby state occurs after ECM initialization or following after-run)	battery voltage is above 11 V for at least 3s	engine Run Time is greater than 10 seconds (Engine not in cranking mode (defined as engine speed greater than 90 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 not in cranking mode (defined as engine speed greater than 90 rpm)	engine is not in standby state (standby state occurs after ECM initialization or following after-run)	battery voltage is above 11 V for at least 3s	engine Run Time is greater than 10 seconds (Engine not in cranking mode (defined as engine speed greater than 90 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 not in cranking mode (defined as engine speed greater than 90 rpm)	engine is not in standby state (standby state occurs after ECM initialization or following after-run)	battery voltage is above 11 V for at least 3s	engine Run Time is greater than 10 seconds (Engine not in cranking mode (defined as engine speed greater than 90 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 not in cranking mode (defined as engine speed greater than 90 rpm)	engine is not in standby state (standby state occurs after ECM initialization or following after-run)	battery voltage is above 11 V for at least 3s	engine Run Time is greater than 10 seconds (Engine not in cranking mode (defined as engine speed greater than 90 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 cranking mode (defined as engine speed greater than 90 rpm)	engine is not in standby state (standby state occurs after ECM initialization or following after-run)	battery voltage is above 11 V for at least 3s	engine Run Time is greater than 10 seconds (Engine not in cranking mode (defined as engine speed greater than 90 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 parameter definitions for reductant level warning definition)	engine not in afterrun mode (defined as engine speed greater than 0 rpm)	Engine not in cranking mode (defined as engine speed greater than 90 rpm)	engine is not in standby state (standby state occurs after ECM initialization or following after-run)	battery voltage is above 11 V for at least 3s	engine Run Time is greater than 10 seconds (Engine not in cranking mode (defined as engine speed greater than 90 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 not in cranking mode (defined as engine speed greater than 90 rpm)	engine is not in standby state (standby state occurs after ECM initialization or following after-run)	battery voltage is above 11 V for at least 3s	engine Run Time is greater than 10 seconds (Engine not in cranking mode (defined as engine speed greater than 90 pm) 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)	
P205C - Reductant Tank Temperature Sensor Circuit Low	engine not in afterrun mode (defined as engine speed greater than 0 rpm)	Engine not in cranking mode (defined as engine speed greater than 90 rpm)	engine is not in standby state (standby state occurs after ECM initialization or following after-run)	battery voltage is above 11 V for at least 3s	engine Run Time is greater than 10 seconds (Engine not in cranking mode (defined as engine speed greater than 90 rpm) to indicate the engine is running)	engine is running which means the engine speed is greater than 600 to 850 rpm	engine is not in ready state (which is active when the ignition is on or following a stall of the engine)	
P205D - Reductant Tank Temperature Sensor Circuit High	engine not in afterrun mode (defined as engine speed greater than 0 rpm)	Engine not in cranking mode (defined as engine speed greater than 90 rpm)	engine is not in standby state (standby state occurs after ECM initialization or following after-run)	battery voltage is above 11 V for at least 3s	engine Run Time is greater than 10 seconds (Engine not in cranking mode (defined as engine speed greater than 90 pm) 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 not in afterrun mode (defined as engine speed greater than 0 rpm)	Engine not in cranking mode (defined as engine speed greater than 90 rpm)	engine is not in standby state (standby state occurs after ECM initialization or following after-run)	battery voltage is above 11 V for at least 3s	engine Run Time is greater than 10 seconds (Engine not in cranking mode (defined as engine speed greater than 90 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 not in afterrun mode (defined as engine speed greater than 0 rpm)	Engine not in cranking mode (defined as engine speed greater than 90 rpm)	engine is not in standby state (standby state occurs after ECM initialization or following after-run)	battery voltage is above 11 V for at least 3s	engine Run Time is greater than 10 seconds (Engine not in cranking mode (defined as engine speed greater than 90 pm) 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 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 the ambient air temperature is >= -7°C and the reductant tank temperature is >= -7°C				
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 the ambient air temperature is >= -7°C and the reductant tank temperature is >= -7°C				

DTC			Additional Basic Enable Conditions			
P208D - Reductant Pump Control Circuit High Voltage		Engine not in cranking mode (defined as engine speed greater than 90 rpm)	engine is not in standby state (standby state occurs after ECM initialization or following after-run)	engine Run Time is greater than 10 seconds (Engine not in cranking mode (defined as engine speed greater than 90 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 cranking mode (defined as engine speed greater than 90 rpm)	engine is not in standby state (standby state occurs after ECM initialization or following after-run)	engine Run Time is greater than 10 seconds (Engine not in cranking mode (defined as engine speed greater than 90 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	battery voltage is above 11 V for at least 3s					
P20A2 - Reductant Purge Valve Control Circuit Low Voltage		Engine not in cranking mode (defined as engine speed greater than 90 rpm)	engine is not in standby state (standby state occurs after ECM initialization or following after-run)	engine Run Time is greater than 10 seconds (Engine not in cranking mode (defined as engine speed greater than 90 rpm) to indicate the engine is running)	engine is running which means the engine speed is greater than 600 to 850 rpm	engine is not in ready state (which is active when the ignition is on or following a stall of the engine)
P20A3 - Reductant Purge Valve Control Circuit High Voltage	engine not in afterrun mode (defined as engine speed greater than 0 rpm)	Engine not in cranking mode (defined as engine speed greater than 90 rpm)	engine is not in standby state (standby state occurs after ECM initialization or following after-run)	engine is running which means the engine speed is greater than 600 to 850 rpm	engine is not in ready state (which is active when the ignition is on or following a stall of the engine)	
P20B9 - Reductant Heater 1 Control Circuit	engine is not in standby state (standby state occurs after ECM initialization or following after-run)	battery voltage is above 11 V for at least 3s				
P20BB - Reductant Heater 1 Control Circuit Low	engine is not in standby state (standby state occurs after ECM initialization or following after-run)	battery voltage is above 11 V for at least 3s				
P20BC - Reductant Heater 1 Control Circuit High	engine is not in standby state (standby state occurs after ECM initialization or following after-run)	battery voltage is above 11 V for at least 3s				
P20BD - Reductant Heater 2 Control Circuit	engine is not in standby state (standby state occurs after ECM initialization or following after-run)	battery voltage is above 11 V for at least 3s				
P20BF - Reductant Heater 2 Control Circuit Low	engine is not in standby state (standby state occurs after ECM initialization or following after-run)	battery voltage is above 11 V for at least 3s				
P20C0 - Reductant Heater 2 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				
P20C1 - Reductant Heater 3 Control Circuit	engine is not in standby state (standby state occurs after ECM initialization or following after-run)	battery voltage is above 11 V for at least 3s				
P20C3 - Reductant Heater 3 Control Circuit Low	engine is not in standby state (standby state occurs after ECM initialization or following after-run)	battery voltage is above 11 V for at least 3s				
P20C4 - Reductant Heater 3 Control Circuit High	engine is not in standby state (standby state occurs after ECM initialization or following after-run)	battery voltage is above 11 V for at least 3s				
P20E2 - Exhaust Gas Temperature (EGT) Sensors 1- 2 not plausible	engine not in afterrun mode (defined as engine speed greater than 0 rpm)	Engine not in cranking mode (defined as engine speed greater than 90 rpm)	engine is not in standby state (standby state occurs after ECM initialization or following after-run)	engine is not in ready state (which is active when the ignition is on or following a stall of the engine)		
P20E4 - Exhaust Gas Temperature Sensor 2/3 Correlation Bank 1	engine not in afterrun mode (defined as engine speed greater than 0 rpm)	Engine not in cranking mode (defined as engine speed greater than 90 rpm)	engine is not in standby state (standby state occurs after ECM initialization or following after-run)	engine is not in ready state (which is active when the ignition is on or following a stall of the engine)		

DTĆ			Additional Basic Enable Conditions					
P20E8 - Reductant Pressure Too Low	SCR Reductant Level not in restriction or empty level state (see parameter definitions for reductant level warning definition)		Engine not in cranking mode (defined as engine speed greater than 90 rpm)	engine is not in standby state (standby state occurs after ECM initialization or following after-run)	battery voltage is above 11 V for at least 3s	engine Run Time is greater than 10 seconds (Engine not in cranking mode (defined as engine speed greater than 90 rpm) to indicate the engine is running)	engine is running which means the engine speed is greater than 600 to 850 rpm	engine is not in ready state (which is active when the ignition is on or following a stall of the engine)
P20E9 - Reductant Pressure Too High	SCR Reductant Level not in restriction or empty level state (see parameter definitions for reductant level warning definition)		Engine not in cranking mode (defined as engine speed greater than 90 rpm)	engine is not in standby state (standby state occurs after ECM initialization or following after-run)	battery voltage is above 11 V for at least 3s	Engine Run Time is greater than 10 seconds (Engine not in cranking mode (defined as engine speed greater than 90 rpm) to indicate the engine is running)	Engine is running which means the engine speed is greater than 600 to 850 rpm	engine is not in ready state (which is active when the ignition is on or following a stall of the engine)
P20EE - SCR Nox Catalyst Efficiency Below Threshold Bank 1		Engine not in cranking mode (defined as engine speed greater than 90 rpm)	engine is not in standby state (standby state occurs after ECM initialization or following after-run)	battery voltage is above 11 V for at least 3s	engine Run Time is greater than 10 seconds (Engine not in cranking mode (defined as engine speed greater than 90 rpm) to indicate the engine is running)	engine is running which means the engine speed is greater than 600 to 850 rpm	engine is not in ready state (which is active when the ignition is on or following a stall of the engine)	
P214F - Reductant Heater 1 Current Too High	SCR Reductant Level not in restriction or empty level state (see parameter definitions for reductant level warning definition)	engine not in afterrun mode (defined as engine speed greater than 0 rpm)	Engine not in cranking mode (defined as engine speed greater than 90 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)	
P2199 - Intake Air Temperature Sensor 1/2 Correlation	engine not in afterrun mode (defined as engine speed greater than 0 rpm)	Engine not in cranking mode (defined as engine speed greater than 90 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				
P21AA - Reductant Level Sensor 2 Circuit Low	engine not in afterrun mode (defined as engine speed greater than 0 rpm)	Engine not in cranking mode (defined as engine speed greater than 90 rpm)	engine is not in standby state (standby state occurs after ECM initialization or following after-run)	battery voltage is above 11 V for at least 3s	engine Run Time is greater than 10 seconds (Engine not in cranking mode (defined as engine speed greater than 90 rpm) to indicate the engine is running)	engine is running which means the engine speed is greater than 600 to 850 rpm	engine is not in ready state (which is active when the ignition is on or following a stall of the engine)	
P21AB - Reductant Level Sensor 2 Circuit High	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 not in cranking mode (defined as engine speed greater than 90 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)	
P21AF - Reductant Level Sensor 3 Circuit Low	engine not in afterrun mode (defined as engine speed greater than 0 rpm)	Engine not in cranking mode (defined as engine speed greater than 90 rpm)	engine is not in standby state (standby state occurs after ECM initialization or following after-run)	battery voltage is above 11 V for at least 3s	engine Run Time is greater than 10 seconds (Engine not in cranking mode (defined as engine speed greater than 90 rpm) to indicate the engine is running)	engine is running which means the engine speed is greater than 600 to 850 rpm	engine is not in ready state (which is active when the ignition is on or following a stall of the engine)	
P21B0 - Reductant Level Sensor 3 Circuit High	SCR Reductant Level not in restriction or empty level state (see parameter definitions for reductant level warning definition)		Engine not in cranking mode (defined as engine speed greater than 90 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)	
P21DD - Reductant Heater 1 Current Too Low	SCR Reductant Level not in restriction or empty level state (see parameter definitions for reductant level warning definition)		Engine not in cranking mode (defined as engine speed greater than 90 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)	
P2200 - N0x Sensor Circuit Bank 1 Sensor 1	engine not in afterrun mode (defined as engine speed greater than 0 rpm)	Engine not in cranking mode (defined as engine speed greater than 90 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 not in cranking mode (defined as engine speed greater than 90 rpm) to indicate the engine is running)	engine is running which means the engine speed is greater than 600 to 850 rpm	engine is not in ready state (which is active when the ignition is on or following a stall of the engine)
P2202 - N0x Sensor Circuit Low Bank 1 Sensor 1	engine not in afterrun mode (defined as engine speed greater than 0 rpm)	Engine not in cranking mode (defined as engine speed greater than 90 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 not in cranking mode (defined as engine speed greater than 90 rpm) to indicate the engine is running)	engine is running which means the engine speed is greater than 600 to 850 rpm	engine is not in ready state (which is active when the ignition is on or following a stall of the engine)
P2203 - N0x Sensor Circuit High Bank 1 Sensor 1	engine not in afterrun mode (defined as engine speed greater than 0 rpm)	Engine not in cranking mode (defined as engine speed greater than 90 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 not in cranking mode (defined as engine speed greater than 90 rpm) to indicate the engine is running)	engine is running which means the engine speed is greater than 600 to 850 rpm	engine is not in ready state (which is active when the ignition is on or following a stall of the engine)
P2205 - N0x Heater Control Circuit Bank 1 Sensor 1	engine not in afterrun mode (defined as engine speed greater than 0 rpm)	Engine not in cranking mode (defined as engine speed greater than 90 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 not in cranking mode (defined as engine speed greater than 90 rpm) to indicate the engine is running)	engine is running which means the engine speed is greater than 600 to 850 rpm	engine is not in ready state (which is active when the ignition is on or following a stall of the engine)
P2209 - N0x Heater Performance Bank 1 Sensor 1	engine not in afterrun mode (defined as engine speed greater than 0 rpm)	Engine not in cranking mode (defined as engine speed greater than 90 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 not in cranking mode (defined as engine speed greater than 90 rpm) to indicate the engine is running)	engine is running which means the engine speed is greater than 600 to 850 rpm	engine is not in ready state (which is active when the ignition is on or following a stall of the engine)
P220A - N0x Sensor Supply Voltage Out Of Range Bank 1 Sensor 1	engine is not in standby state (standby state occurs after ECM initialization or following after-run)	battery voltage is above 11 V for at least 3s						

DTC			Additional Basic Enable Conditions					
P220B - N0x Sensor Supply Voltage Out Of Range Bank 1 Sensor 2	engine is not in standby state (standby state occurs after ECM initialization or following after-run)	battery voltage is above 11 V for at least 3s						_
P221C - Reductant Heater 2 Current Too Low	SCR Reductant Level not in restriction or empty level state (see parameter definitions for reductant level warning definition)	engine not in afterrun mode (defined as engine speed greater than 0 rpm)	Engine not in cranking mode (defined as engine speed greater than 90 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)	
P221D - Reductant Heater 2 Current Too High	SCR Reductant Level not in restriction or empty level state (see parameter definitions for reductant level warning definition)	engine not in afterrun mode (defined as engine speed greater than 0 rpm)		engine is 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)	
P221E - Reductant Heater 3 Current Too Low	SCR Reductant Level not in restriction or empty level state (see parameter definitions for reductant level warning definition)	engine not in afterrun mode (defined as engine speed greater than 0 rpm)	Engine not in cranking mode (defined as engine speed greater than 90 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)	
P221F - Reductant Heater 3 Current Too High	SCR Reductant Level not in restriction or empty level state (see parameter definitions for reductant level warning definition)	engine not in afterrun mode (defined as engine speed greater than 0 rpm)	Engine not in cranking mode (defined as engine speed greater than 90 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)	
P2228 - Barometric Pressure Sensor Circuit Low	engine not in afterrun mode (defined as engine speed greater than 0 rpm)	Engine not in cranking mode (defined as engine speed greater than 90 rpm)	engine is not in standby state (standby state occurs after ECM initialization or following after-run)	battery voltage is above 11 V for at least 3s	engine Run Time is greater than 10 seconds (Engine not in cranking mode (defined as engine speed greater than 90 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)	
P2229 - Barometric Pressure Sensor Circuit High	engine not in afterrun mode (defined as engine speed greater than 0 rpm)	Engine not in cranking mode (defined as engine speed greater than 90 rpm)	engine is not in standby state (standby state occurs after ECM initialization or following after-run)	battery voltage is above 11 V for at least 3s	engine Run Time is greater than 10 seconds (Engine not in cranking mode (defined as engine speed greater than 90 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)	
P2237 - O2 Sensor Positive Current Control Circuit/Open Bank 1 Sensor 1	Engine not in cranking mode (defined as engine speed greater than 90 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					
P2243 - O2 Sensor Reference Voltage Circuit/Open Bank 1 Sensor 1	Engine not in cranking mode (defined as engine speed greater than 90 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					
P2251 - O2 Sensor Negative Current Control Circuit/Open Bank 1 Sensor 1	Engine not in cranking mode (defined as engine speed greater than 90 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					
P2263 - Turbo Boost System Performance	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				
P2294 - Fuel Pressure Regulator 2 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				
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				
P2297 - O2 Sensor Out of Range During Deceleration Bank 1 Sensor 1	engine not in afterrun mode (defined as engine speed greater than 0 rpm)	Engine not in cranking mode (defined as engine speed greater than 90 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 not in cranking mode (defined as engine speed greater than 90 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)
P229E - NOx Sensor Circuit Bank 1 Sensor 2	engine not in afterrun mode (defined as engine speed greater than 0 rpm)	Engine not in cranking mode (defined as engine speed greater than 90 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 not in cranking mode (defined as engine speed greater than 90 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	;						
P229F - NOx Sensor Performance Bank 1 Sensor 2	engine not in afterrun mode (defined as engine speed greater than 0 rpm)	Engine not in cranking mode (defined as engine speed greater than 90 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 is greater than 10 seconds (Engine not in cranking mode (defined as engine speed greater than 90 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 cranking mode (defined as engine speed greater than 90 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 is greater than 10 seconds (Engine not in cranking mode (defined as engine speed greater than 90 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 not in cranking mode (defined as engine speed greater than 90 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 not in cranking mode (defined as engine speed greater than 90 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 not in cranking mode (defined as engine speed greater than 90 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 not in cranking mode (defined as engine speed greater than 90 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 cranking mode (defined as engine speed greater than 90 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 not in cranking mode (defined as engine speed greater than 90 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 cranking mode (defined as engine speed greater than 90 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 not in cranking mode (defined as engine speed greater than 90 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)	
P22FE - NOx Sensor Performance - Sensing Element Bank 1 Sensor 2	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 is greater than 10 seconds (Engine not in cranking mode (defined as engine speed greater than 90 rpm) to indicate the engine is running)	System is not in active regeneration mode				
P2428 - Exhaust Gas High Temperature	engine not in afterrun mode (defined as engine speed greater than 0 rpm)	Engine not in cranking mode (defined as engine speed greater than 90 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 not in afterrun mode (defined as engine speed greater than 0 rpm)	Engine not in cranking mode (defined as engine speed greater than 90 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					
P242C - Exhaust Gas Temperature (EGT) Sensor 3 Circuit Low Voltage	engine not in afterrun mode (defined as engine speed greater than 0 rpm)	Engine not in cranking mode (defined as engine speed greater than 90 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 cranking mode (defined as engine speed greater than 90 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					
P2453 - Diesel Particulate Filter Differential Pressure Sensor Performance	engine not in afterrun mode (defined as engine speed greater than 0 rpm)	Engine not in cranking mode (defined as engine speed greater than 90 rpm)	engine is not in standby state (standby state occurs after ECM initialization or following after-run)	battery voltage is above 11 V for at least 3s	engine Run Time is greater than 10 seconds (Engine not in cranking mode (defingine as engine speed greater than 90 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 cranking mode (defined as engine speed greater than 90 rpm)	engine is not in standby state (standby state occurs after ECM initialization or following after-run)	battery voltage is above 11 V for at least 3s	engine Run Time is greater than 10 seconds (Engine not in cranking mode (defined as engine speed greater than 90 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 not in cranking mode (defined as engine speed greater than 90 rpm)	engine is not in standby state (standby state occurs after ECM initialization or following after-run)	battery voltage is above 11 V for at least 3s	engine Run Time is greater than 10 seconds (Engine not in cranking mode (defingine as engine speed greater than 90 rpm) to indicate the engine is running)	engine is running which means the engine speed is greater than 600 to 850 rpm	engine is not in ready state (which is active when the ignition is on or following a stall of the engine)]		
P2457 - Exhaust Gas (EGR) Cooler Performance	engine is not in standby state (standby state occurs after ECM initialization or following after-run)	ambient pressure is above 74.8kPa	battery voltage is above 11 V for at least 3s	engine Run Time is greater than 10 seconds (Engine not in cranking mode (defined as engine speed greater than 90 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 pressure is above 74.8kPa									

DTC			Additional Basic Enable Conditions	5				
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 occurs after ECM initialization or following after-run)	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						
P2463 - Diesel Particulate Filter Soot Accumulation		Engine not in cranking mode (defined as engine speed greater than 90 rpm)	engine is not in standby state (standby state occurs after ECM initialization or following after-run)	engine Run Time is greater than 10 seconds (Engine not in cranking mode (defined as engine speed greater than 90 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)		
P249D - Closed Loop Reductant Injection Control At Limit - Flow Too Low	engine not in afterrun mode (defined as engine speed greater than 0 rpm)	Engine not in cranking mode (defined as engine speed greater than 90 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 not in cranking mode (defined as engine speed greater than 90 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		Engine not in cranking mode (defined as engine speed greater than 90 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 not in cranking mode (defined as engine speed greater than 90 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)
P24A5 - EGR Cooler Bypass Control Stuck Bank 1		Engine not in cranking mode (defined as engine speed greater than 90 rpm)	engine is not in standby state (standby state occurs after ECM initialization or following after-run)	battery voltage is above 11 V for at least 3s	engine Run Time is greater than 10 seconds (Engine not in cranking mode (defined as engine speed greater than 90 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)	
P24B3 - Particulate Matter Sensor Heater Control Circuit/Open	battery voltage is above 11 V for at least 3s							
P24B6 - Particulate Matter Sensor Heater Control Circuit High	battery voltage is above 11 V for at least 3s							
P2564 - Turbocharger Boost Control Position Sensor Circuit Low		Engine not in cranking mode (defined as engine speed greater than 90 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)		
P2565 - Turbocharger Boost Control Position Sensor Circuit High	engine not in afterrun mode (defined as engine speed greater than 0 rpm)	Engine not in cranking mode (defined as engine speed greater than 90 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)		
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 not in cranking mode (defined as engine speed greater than 90 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 not in cranking mode (defined as engine speed greater than 90 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)		
P262B - Control Module Power Off Timer Performance	engine is not in standby state (standby state occurs after ECM initialization or following after-run)	battery voltage is above 11 V for at least 3s					-	
P263A - MIL Control Circuit Low	engine not in afterrun mode (defined as engine speed greater than 0 rpm)	engine is not in standby state (standby state occurs after ECM initialization or following after-run)	battery voltage is above 11 V for at least 3s	engine is running which means the engine speed is greater than 600 to 850 rpm				
P263B - MIL Control Circuit High	engine not in afterrun mode (defined as engine speed greater than 0 rpm)	engine is not in standby state (standby state occurs after ECM initialization or following after-run)	battery voltage is above 11 V for at least 3s	engine is running which means the engine speed is greater than 600 to 850 rpm				

DTC			Additional Basic Enable Conditions							
2687 - Fuel Supply Heater Control Circuit/Open	battery voltage is above 11 V for at least 3s									
2688 - Fuel Supply Heater Control Circuit Low	battery voltage is above 11 V for at least 3s									
2689 - Fuel Supply Heater Control Circuit High	battery voltage is above 11 V for at least 3s									
268C - Cylinder 1 Injector Data Incorrect	engine Run Time is greater than 10 seconds (Engine not in cranking mode (defined as engine speed greater than 90 rpm) to indicate the engine is running)									
268D - Cylinder 2 Injector Data Incorrect	engine Run Time is greater than 10 seconds (Engine not in cranking mode (defined as engine speed greater than 90 rpm) to indicate the engine is running)									
268E - Cylinder 3 Injector Data Incorrect	engine Run Time is greater than 10 seconds (Engine not in cranking mode (defined as engine speed greater than 90 rpm) to indicate the engine is running)									
8F - Cylinder 4 Injector Data Incorrect	engine Run Time is greater than 10 seconds (Engine not in cranking mode (defined as engine speed greater than 90 rpm) to indicate the engine is running)									
2A00 - O2 Sensor Circuit Inge/Performance Bank 1 Sensor 1	Engine not in cranking mode (defined as engine speed greater than 90 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							
BAA - NOx Exceedence - w Reagent Consumption	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 not in cranking mode (defined as engine speed greater than 90 rpm)	engine is not in standby state (standby state occurs after ECM initialization or following after-run)	battery voltage is above 11 V for at least 3s	engine Run Time is greater than 10 seconds (Engine not in cranking mode (defingine das engine speed greater than 90 rpm) to indicate the engine is running)	engine is running which means the engine speed is greater than 600 to	engine is not in ready state (which is active when the ignition is on or following a stall of the engine)		
0073 - CAN A BUS OFF	engine not in afterrun mode (defined as engine speed greater than 0 rpm)	engine is not in standby state (standby state occurs after ECM initialization or following after-run)	battery voltage is above 11 V for at least 3s							
0074 - CAN B BUS OFF	engine not in afterrun mode (defined as engine speed greater than 0 rpm)	engine is not in standby state (standby state occurs after ECM initialization or following after-run)	battery voltage is above 11 V for at least 3s							
01 - Lost Communications ith Transmission Control System	engine not in afterrun mode (defined as engine speed greater than 0 rpm)	engine is not in standby state (standby state occurs after ECM initialization or following after-run)	battery voltage is above 11 V for at least 3s							
1109 - Lost Communication n Fuel Pump Control Module "A"	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							

Component/	Fault	Monitor Strategy	Malfunction	Threshold	Secondary	Enable	Time	MIL
System	Code	Description	Criteria	Value	Parameters	Conditions	Required	Illumination
Mechanical Actuator Performance (Functionality)	P059F	Compare commanded shutter position to sensed position	Failure to achieve commanded position	intrusive tests fail to achieve commanded position.	1. Power mode	1. Run/Crank		DTC Type B 2 trips
		position		Intrusive tests are triggered immediately following any failure to achieve a commanded position.			Intrusive test requested if shutter movement is commanded and position feedback differs after 19.5 seconds; otherwise report pass. Duration of intrusive	
							test is shutter movement related (40 to 120 seconds)	
					2. Shutter Control 3. Ignition Run/Crank Voltage	2. Enabled 3. 11V < voltage < 32V		
Control Module Read Only Memory (ROM)	P0601	This DTC will be stored if any software or calibration check sum is incorrect	Calculated Checksum (CRC16)	≠ stored checksum for any of the parts (boot, software, application calibration, system calibration)			1 failure if it occurs during the first ROM test of the ignition cycle, otherwise 5 failures	DTC Type A 1 trip
					Ignition OR	Run or Crank	Frequency:	
					HS Comm		Runs continuously in the background	
Control Module Not Programmed	P0602	Indicates that the FSCM needs to be programmed	This DTC is set via calibration, when KeMEMD_b_NoStartCal	= TRUE			Runs once at power up	DTC Type A 1 trip
					Ignition OR Ign1 Accessory mode	Run or Crank enabled		
	I	I	I		Ign Accessory mode		1	I

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illumination
Control Module Long Term Memory Reset	P0603	Non-volatile memory checksum error at controller	Checksum at power-up	≠ checksum at power-down			1 failure	DTC Type A 1 trip
		power-up			Ignition OR	Run or Crank	Frequency: Once at power-up	
					Ign1 Accessory mode	enabled		
Control Module Random Access Memory (RAM)		Indicates that control module is unable to correctly write and read data to and from RAM	Data read	≠ Data written			1 failure if it occurs during the first RAM test of the ignition cycle, otherwise 5 failures	DTC Type A 1 trip
					Ignition OR	Run or Crank	Frequency:	
					Ign1 Accessory mode	enabled	Runs continuously in the background.	
Internal Performance 1. Main	P0606	This DTC indicates the ECU has detected an internal					Tests 1 and 2 1 failure Frequency: Continuously (12.5ms)	DTC Type A 1 trip
Processor Configuration Register Test		processor fault or external watchdog fault						
Register Test		(PID 2032 discriminates the	1. Register contents - All I/O configuration register					
		source of the fault)	faults -	 <> correct value. 	1. Ignition OR	1. Run or Crank		
			2 Processor clock fault - a. EE latch flag set in	2. a. == 0x5A5A	 Ign1 Accessory mode For all I/O configuration register faults: 	2. enabled	Test 3 3 failures out of 15	
2. Processor clock			EEPROM OR		•KeMEMD_b_ProcFltCfgRegEnbl	3. TRUE	samples	
test			b. RAM latch flag.	b. == 0x5A	4 . For Processor Clock Fault:		1 sample/12.5 ms	
					•KeMEMD_b_ProcFltCLKDiagEnb	4. TRUE		

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL
3. External watchdog test	0000	Description	3 External Watchdog Fault - Software control of fuel pump driver	3. = Control Lost	5. For External Watchdog Fault: •KeFRPD_b_FPExtWDogDiagEnb I		rioquiiou	
					6. For External Watchdog Fault:•Control Module ROM(P0601)	5. TRUE		
					7. For External Watchdog Fault: •Control Module RAM(P0604)	6. not active		
						7. not active		
Control Module Long Term Memory (EEPROM)	P062F	Indicates that the NVM Error flag has not been cleared	Last EEPROM write	Did not complete				DTC Type B 2 trips
Performance					Ignition OR	Run or Crank		
					Ign1 Accessory mode	enabled		
Active Grille Air Shutter Actuator 1 Signal Message Counter Incorrect	P151E	Detects loss of communication condition has occurred between ECU and Active Grill Air Shutter 1 actuator	PWM Message	Undetected	1. Power mode	1. Run/Crank		DTC Type B 2 trips
					2. Ignition Run/Crank Voltage	2. 11V < voltage < 32V		
Ignition 1 Switch Circuit Low Voltage	P2534	This DTC detects if the Ignition1 Switch circuit is shorted to low or open	Ignition 1 voltage	<= 6 V	Engine	Running	180 failures out of 200 samples 1 sample/25.0 ms	DTC Type A 1 trip

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illumination
Ignition 1 Switch Circuit High Voltage		Detects if the Ignition1 Switch circuit is shorted to vehicle supply voltage	Ignition 1 voltage	> 11.7 V	Ignition Run_Crank terminal	Off	180 failures out of 200 samples 1 sample/25.0 ms	DTC Type A 1 trip
Control Module Communication Bus "A" Off		Detects that a CAN serial data bus shorted condition has occurred to force the CAN device driver to enter a bus-off state	Bus Status	Off	Power mode	Run/Crank	5 failures out of 5 samples (5 seconds)	DTC Type B 2 trips
Lost Communication With ECM/PCM "A"		Detects that CAN serial data communication has been lost with the ECM	Message \$0C9	Undetected	 Power mode Ignition Run/Crank Voltage U0073 	 Run/Crank 1. Run/Crank 2. 11V<voltage<32v< li=""> 3. not active </voltage<32v<>	12 failures out of 12 samples (12 seconds)	DTC Type B 2 trips

Component / System	Fault Code	Monitor Strategy Description	Primary Malfunction Criteria		Threshold Logic and Value		Secondary Parameters		Enable Conditions	Time Required	MIL Illum.
Glow Plug Control Module Performance	P064C	Electronic circuitry determines fault with GP switch	Glow Plug Current and Glow plug is commanded and voltage at glow plug		6.6 On 0	amps volts	glow plugs are commanded on DTCs P163C, P0671-P0678	=	True Not set	fail conditions exists for 3 seconds. monitor run with 0.5 s rate whenever enable conditions are met.	1 1
		Checksum error between calculated and stored values are compared	ROM error: Checksums match	=	NO		Module power		On	fail conditions exists for 4. s. monitor run with 1.5 s rate whenever enable conditions are met	1 1
		Compariarson of read write values	RAM error: Read write values match	=	NO		Module power		On	fail conditions exists for 3 seconds. monitor run with 0.2 s rate whenever enable conditions are met.	1 1
		Checksum error between calculated and stored values	EEPROM error: Checksums match	=	NO		Module power		On	fail conditions exists for 3 seconds. monitor run with 0.2 s rate whenever enable conditions are met.	1 1

Component /	Fault	Monitor Strategy	Primary Malfunction		Threshold		Secondary		Enable		Time	MIL
System	Code	Description	Criteria		Logic and Value		Parameters		Conditions		Required	Illum.
		measured voltage of charge pump is determined to be out of tolerance	Charge Pump Under voltage	<=	Battery voltage at GPCM + 7	volts	Battery voltage at GPCM	>	6	volts	fail conditions exists for 3.13 seconds. monitor runs with 0.13 s rate whenever enable conditions are met	
		measured voltage of charge pump is determined to be out of tolerance	Charge Pump Over voltage	>=	Battery voltage at GPCM + 18	volts	Battery	<	19.9	volts	fail conditions exists for 3.16 seconds. monitor runs with 0.16 s rate whenever enable conditions are met	
		Elecrtonic circuitry determines that the reverse polarity protection voltage drop is in range	GPCM reverse polarity switch "high voltage drop" 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 pu	~ <	2.3	volts	glow plugs are commanded Battery voltage at GPCM GP current P0671,P0672, P0675, P0676 Battery voltage at GPCM stable for 30ms	= > > < = <	On 6 60 Not set 2	volts amps amps volts	Path1: fail conditions exists for 9 seconds. monitor runs with 6 s rate whenever enable conditions are met. Path2: fail conditions exists for 13 seconds. monitor runs with 10 s rate whenever enable conditions are met.	
		Internal and external Watchdogs are monitored for interuption Monitor for undefined instruction code interupt Monitor for osolation stop detection	GPCM running reset: number of running resets or undefined instruction code detected or Osolation stop detection	>	9 events in a row		none				fail conditions exists for 5 seconds. monitor runs with 2 s rate whenever enable conditions are met.	

Commonant I	nent / Fault Monitor Strategy Primary Malfunction Threshold						Secondary Enable				Time	MIL
Component / System	Code		Primary Malfunction Criteria								Time	MIL Illum.
System	Code	Description			Logic and Value		Parameters		Conditions	1	Required	illum.
		GMLAN Battery voltage from	difference between internal and external		0		glow plugs are commanded	=	On		fail	
		ECM is compared to GPCM	value of battery voltage too high	'>	3	volts	GMLAN battery signal	=	valid		conditions	
		internal measured battery	abs[GPCM internal measured battery				glow command message	=	valid		exists for	
		voltage	voltage - GMLAN Battery voltage]				Battery voltage at GPCM	>	6	volts	3.19	
							RPM	<=	10		seconds.	
							RPM	>=	400		monitor runs	
											with 0.19 s	
											rate	
											whenever	
											enable	
											conditions	
			aveter hasis ship (CDC) aver		155	den C	Internal GPCM temperature		100	dee C	are met	
		measure temperature of the SBC	system basic chip (SBC) over	>	100	deg C	Internal GPCM temperature	<	100	deg C		
		SBC	temperature: temperature of the high								conditions	
			side switch inside the SBC								exists for	
											3.13	
											seconds.	
											monitor runs	
											with 0.13 s	
											rate	
											whenever	
											enable	
											conditions	
		Electronic circuitry detects a	NOx sensor power supply fault:	>	25	amps	Battery voltage at the GPCM	>	6	volts	are met fail	
		failure in the NOx sensor	Path1: DC/DC booster current.	>	640	msec	Ballory voltage at the er own	-	Ű	VOILO	conditions	
		power supply	For	>	60 (by hardware	amps					exists for 9	
		ponol oupply	Path 2: DC/DC booster current.	-	protection (time	umpo					seconds.	
					varies with						monitor runs	
					temperature))	volts					with 6 s rate	
					tompolataro))	Volico					whenever	
					0						enable	
			Path 3: voltage at main switch	=	Ŭ	volts	Battery voltage at the GPCM	=	8 to 14	volts	conditions	
			i all of foldage at main officer			10110			0.011		are met.	
			Path 4: (DC/DC Booster voltage - GPCM		± 3						aro mot.	
			battery voltage)	=	10							
			ballory voltago)	_								
		Checksum error between	DEF heater current not calibrated .:	=	No		Ignition on				fail	
		calculated and stored values	Checksums match								conditions	
											exists for 3.2	
											seconds.	
											monitor runs	
											with 0.2 s	
											rate	
											whenever	
											enable	
											conditions	
											are met.	
	I	L										

Component / System	Fault Code	Monitor Strategy Description	Primary Malfunction Criteria		Threshold Logic and Value	e	Secondary Parameters		Enable Conditions		Time Required	MIL Illum.
		DEF heater power switch is commanded on. Output voltage feedback signal is missing.	DEF output voltage feedback signal	×	2.5	volts	DEF heater is commanded Battery voltage at GPCM over temperature condition	= > =	on 7.0 false	volts	fail conditions exists for 6.3 seconds. monitor runs with 3.3 s rate whenever enable conditions are met.	
Glow Plug 1 through 4 Circuit Fault	P0671- P0674	glow plug open: electronic circuitry determines a fault exists on GP circuit	Glow Plug Current and voltage at glow plug pin	< ,	4.00 and 6.0	amps volt	Ignition - glow plugs are commanded on P163D,P163C Supply voltage	= > >	On 5 not set 6	secs volts	fail conditions exists for 1.13 seconds. monitor runs with 0.13 s rate whenever enable conditions are met	В
		glow plug short: electronic circuitry determines a fault exists on GP circuit	Path 1: Glow Plug Current Path 2: Hardware over current		60 80	amps amps	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	Path 1: fail conditions exists for 1.13 seconds. monitor runs with 0.13 s rate whenever enable conditions are met. Path2: fail conditions exists for 1.26 seconds. monitor runs with 0.26 s rate whenever enable conditions	

Commencent	Fault	Manifan Ofratania					Secondary Enable				Time	MU
Component /	Fault	Monitor Strategy	Primary Malfunction		Threshold	_		Conditions			Time	MIL
System	Code	Description	Criteria		Logic and Value		Parameters		1	-	Required	Illum.
		glow plug high resistance: electronic circuitry determines a fault exists on GP circuit	Glow Plug Resistance AND Glow Plug Current	>	1.83	ohm amps	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	fail conditions exists for 1.16 seconds. monitor runs with 0.16 s rate whenever enable conditions	
		Glow plug low resistance: electronic circuitry determines a fault exists on GP circuit	Path 1: Glow Plug Resistance Path 2: 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] glow plugs "on" duration glow plugs are commanded on over temperature condition- over voltage condition- abs[Battery supply at GPCM - IGN voltage at GPCM] glow plugs "on" duration		on false false 7.0 glow plugs "on" for more then500 ms on false false 7.0 glow plugs "on" for more then 20 sec	volts	are met fail conditions exists for 1.16 seconds. monitor runs with 0.16 s rate whenever enable conditions are met.	
Lost Communication With Glow Plug Control Module	U0106	GMLAN Communication ECM -> GPCM: ECM monitors serial data from GPCM for U0106. Error Message indicating GPCM is not receiving major GMLAN signals.	Timeout of message \$C9 or Timeout of message \$4C1 or Timeout of message \$4F1	> > >	0.100 0.200 0.300	sec sec sec	Ignition 1 battery voltage at GPCM	>	3.9 7.0	volts	fail conditions exists for 11 seconds. monitor runs with 10 s rate whenever enable conditions are met.	В
Glow Plug Control Module Not Programed	P161A	ECM monitors serial data from GPCM for P161A. GPCM is configured as service part by calibration parameter	Glow Plug Control Module determines settings of configuration parameter located in calibration data set				IGNITION	=	ON		fail conditions exists for 3.2 seconds. monitor runs with 0.2 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.
Glow Plug Module Primary Circuit	P163C	Electronic GPCM circuitry determines the voltage supply to GPCM is out of range	PATH 1: voltage supply to GPCM or		6.0	volt	GPCM Ignition voltage or	> <	9.0 16	volt volt	fail conditions exists for 4 seconds.	В
			PATH 2: (IGN - voltage supply to GPCM) or	>	+/-5	volt	GPCM voltage supply GPCM Ignition voltage or	> <	6.0 4.0	volt volt	monitor runs with 1 s rate whenever enable conditions are met.	
			PATH 3: (ECM reported voltage via CAN - voltage supply to GPCM)	>	+/-3	volt	GPCM supply voltage Engine speed	> >	6 10< rpm >400	volt rpm	are met.	
Glow Plug Module Secondary Circuit	P163D	Electronic GPCM circuitry determines serveral signal voltage levels to GPCM are out of range	Path 1: Key state (Ign 1) or	=	OFF		Path 1 glow plug activation request from ECM or	=	ON or		fail conditions exists for 4 seconds.	В
			Path 2: Electronic circuitry determines voltage at glow plug pin or	>	6.0	volt	Path 2 GP commanded or	=	Off or		monitor runs with 1 s rate whenever enable conditions are met.	
			Path 3: [GPCM ground - GP ground]	>	1.5	volts	Path 3 GP commanded DTCs not set IAH dutycycle	=	ON P0671,P0675 0 or 100	%	are met.	
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	reductant heater current and voltage at heater pin	<	0.2 and 3.0	amp volt	DTCs not set: reductan heater commanded: GPCM temperature GPCM battery supply voltage	= < >	P20BB ON 123 7.0	°C volt	fail conditions exists for 3.94 seconds. monitor runs with 3.44 s rate whenever enable conditions are met	A
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: Reductant Heater Plug Current	>	21 or	amp	reductan heater commanded: GPCM temperature GPCM supply voltage KL30 or	= < > or	ON 123 7.0 or	°C volt volt	fail conditions exists for 1.5 seconds. monitor runs with 1 s rate whenever enable	A
			Path 2: load at output (detected by hardware) Path 3: hardware over current Path 4: hardware over temperature condition		0.047 27 175	ohm amp °C	reductan heater commanded: GPCM temperature GPCM supply voltage KL30	= < >	ON 123 7.0	°C volt	conditions are met.	

Component /	nponent / Fault Monitor Strategy Primary Malfunction					innar y	Secondary	Enable			Time	MIL
System	Code	Description	Criteria		Threshold Logic and Value	e	Parameters		Conditions		Required	Illum.
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	hardware (power stage) determines voltage at reductant heater output pin	>	V _{batt} - 0.8	volt	reductan heater commanded:	=	OFF		fail conditions exists for 2.5 seconds. monitor runs with 2 s rate whenever enable conditions are met.	A
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	reductant heater current and voltage at heater pin	~	0.2 3.0	amp volt	DTCs not set: reductan heater commanded: GPCM temperature GPCM battery supply voltage	= < >	P20BF ON 123 7.0	°C volt	fail conditions exists for 3.94 seconds. monitor runs with 3.44 s rate whenever enable conditions are met	A
Reductant Heater 2 Control Circuit Low voltage	P20BF	ECM monitors serial data from GPCM for P20BF Error Message indicating GPCM detects reductant heater output shorted to ground or an overload condition	Path 1: Reductant Heater Plug Current or Path 2: load at output (detected by hardware) Path 3: hardware over current Path 4: hardware over temperature condition		21 or 0.047 27 175	amp ohm amp ℃	reductan heater commanded: GPCM temperature GPCM supply voltage KL30 or reductan heater commanded: GPCM temperature GPCM supply voltage KL30	= < or = < >	ON 123 7.0 or ON 123 7.0	°C volt or °C volt	fail conditions exists for 1.5 seconds. monitor runs with 1 s rate whenever enable conditions are met.	A
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	hardware (power stage) determines voltage at reductant heater output pin	>	V _{batt} - 0.8	volts	reductan heater commanded:	=	OFF		fail conditions exists for 2.5 seconds. monitor runs with 2 s rate whenever enable conditions are met.	A

Commonwetl	Fault	Moniton Chrotomy	iiiiiai y	Secondary Enable					MIL			
Component / System	Code	Monitor Strategy Description	Primary Malfunction Criteria		Threshold Logic and Value		Parameters		Conditions		Time Required	Illum.
Reductant Heater 3 Control Circuit	P20C1	ECM monitors serial data from GPCM for P20C1 Error Message indicating GPCM detects reductant heater not connected to GPCM or an interruption	reductant heater current and voltage at heater pin	~ >	0.2 and 3.0	amp volt	GPCM battery supply voltage	= < >	P20C3 ON 123 7.0	°C volt	required fail conditions exists for 3.94 seconds. monitor runs with 3.44 s rate whenever enable	A
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: Reductant Heater Plug Current	>	21 or	amp	reductan heater commanded: GPCM temperature GPCM supply voltage KL30 or	= < > or	ON 123 7.0 or	°C volt volt	are met fail conditions exists for 1.5 seconds. monitor runs with 1 s rate whenever enable	A
			Path 2: load at output (detected by hardware) Path 3: hardware over current Path 4: hardware over temperature	V	0.047 27 175	ohm amp °C	reductan heater commanded: GPCM temperature GPCM supply voltage KL30	= < >	ON 123 7.0	°C volt	conditions are met.	
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	hardware (power stage) determines voltage at reductant heater output pin	>	V _{batt} - 0.8	volts	reductan heater commanded:	=	OFF		fail conditions exists for 2.5 seconds. monitor runs with 2 s rate whenever enable conditions are met.	A
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	~	5.0	volt	status DC/DC booster	=	OFF, power up procedure has started after reset		fail conditions exists for 5.5 seconds. monitor runs with 5 s rate	В
			PATH 2: DC/DC booster output current duration or	> >	5.0 0.010	amp sec	status DC/DC booster	=	ON		whenever enable conditions are met.	
			PATH 3: DC/DC booster output current duration	> >	37.5 0.000020	amp sec	status Dc/DC booster	=	ON			

Component /	Fault	Monitor Strategy	Primary Malfunction		Threshold		Secondary		Enable		Time	MIL
System	Code	Description	Criteria		Logic and Value	e	Parameters		Conditions		Required	Illum.
Nox Sensor Supply voltage Circuit Bank 1 Sensor 2	P220B	ECM monitors serial data from GPCM for P220B Error Message indicating GPCM detects DC/DC booster output shorted to ground or shorted to battery	PATH 1:Electronic circuitry determines voltage at DC/DC booster output pin or	>	5.0	volt	status DC/DC booster	=	OFF, power up procedure has started after reset or		fail conditions exists for 5.5 seconds. monitor runs with 5 s rate whenever	В
			PATH 2: DC/DC booster output current duration or	>	5.0 0.010	amp sec	status DC/DC booster	=	ON or		enable conditions are met.	
			PATH 3: DC/DC booster output current duration	~ ~	37.5 0.000020	amp sec	status Dc/DC booster	=	ON			
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	v	0.210	volts	Engine Off Timer (GMLAN) and Intake Air Temperature (GMLAN) or Engine Coolant Temperature (GMLAN) and Intake Air Temperature (GMLAN)	>= >= >	28800 -7 70 -10	sec °C °C °C	fail conditions exists for 1.81 seconds. monitor runs with 1.31 s rate whenever enable conditions	В
			PATH 2: GPCM temperature sensor voltage	<	0.615	volts	(Engine Off Timer (GMLAN) or Intake Air Temperature (GMLAN)) and (Engine Coolant Temperature (GMLAN) or	< < <= <=	28800 -7 60 -10	sec ℃ ℃ ℃	are met.	
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	volts	Engine Off Timer (GMLAN) and Intake Air Temperature (GMLAN) or Engine Coolant Temperature (GMLAN) and Intake Air Temperature (GMLAN)	>= >= > >	28800 -7 70 -10	sec ℃ ℃ ℃	fail conditions exists for 1.81 seconds. monitor runs with 1.31 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.
Glow Plug Control Module Temperature- Engine Intake Air Temperature Not Plausible	P16A8	ECM monitors serial data from GPCM for P16A8 Error Message indicating GPCM detects GPCM temperature and engine intake air temperature (GMLAN) are not plausible	Tenperature difference between internal temperature of GPCM and engine intake air temperature (GMLAN)	>	absolute 20	°C	Engine Off Timer (GMLAN) and Intake Air Temperature (GMLAN) and	>= >	28800 -7		fail conditions exists for 2.5 seconds. monitor runs with 2 s rate whenever enable conditions are met.	В