Component / System	Fault Code	Monitor Strategy Description	Primary Malfunction Criteria		L	Threshold Logic and Value)	Secondary Parameters		Enable Conditions		Time Required	MIL Illum.
Crankshaft to Camshaft Correlation	P0016	Detects a shift of the camshaft angle by monitoring the average offset angle.	average value of camshaft offset OR average value of camshaft offset	~		-25.00	degrees	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)	=	20 in b	Dpen Circuit:≥ 00 K Ω npedance etween ECU in 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)	=	≤ in bi ai	Short to ground: 0.5 Ω mpedance etween signal ind controller iround	-	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	Fault Code	Monitor Strategy Description	Primary Malfunction Criteria		Threshold Logic and Value		Secondary Parameters		Enable Conditions		Time Required	MIL Illum.
HO2S Heater Control Circuit Bank 1 Sensor 1 Circuit High	P0032	Monitoring the HO2S heater 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	-	HO2S heater control commanded on Ignition on basic enable conditions met:	=	TRUE TRUE TRUE	:	fault exists for more than 5 sec; monitor runs at 0.1 s when enable conditions are met	В
Turbocharger Boost Control Position Not Learned	P003A	Detects in range vane position errors during a vane sweep initiated to learn minimum and maximum vane position values.	Path 1:				injection quantity	>=	0.00	mm^3/r ev	fail conditions exists for 0.01 s monitor runs once per trip	В
			mean offset learned value at fully closed valve position or mean offset learned value at fully closed	< >	70.00	%	and injection quantity and	<=	24	mm^3/r ev	with 0.01 s rate whenever enable conditions	
			valve position				acceleration pedal sensor	<=	1.00	%	are met	
							and Engine Speed	>=	575.00	rpm		
							and Engine Speed	<=	1075.00	rpm		
							and Vehicle speed	>=	0.00	mph		
							and Vehicle speed and	<=	3.11	mph		
							Battery voltage and	>=	11.00	V		
							engine coolant temperature and	>=	59.96	°C		
							engine coolant temperature and	<=	127.96	°C		
							Barometric pressure and	>=	65.00	kPa		
							Barometric pressure and	<=	105.00	kPa		
							time since start and	>	10.08	sec		

Component /	Fault	Monitor Strategy	Primary Malfunction	Threshold	Secondary		Enable		Time	MIL
System	Code	Description	Criteria	Logic and Value	Parameters Rich idle regeneration		Conditions inactive		Required	Illum.
					and	=	inactive	-		
					Adaption is finished for this driving cycle	=	inactive	-		
					Adaption is missied for this driving cycle	_	inactive			
					and					
					valve closed	=	TRUE	-		
					and					
					turbocharger offset adaption timer	>=	0.50	sec		
					and					
					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	
								ev	conditions	
			time taken to learn the mean offset	> 30.00 sec	and				exists for	
			learned value at fully closed valve						0.01 s	
			position						monitor runs	
					injection quantity	<=	24	mm^3/r		
								ev	with 0.01 s	
					and		1.00	0/	rate	
					Value acceleration pedal sensor 1 and	<=	1.00	%	whenever	
					Engine Speed	>=	575.00	rpm	enable conditions	
					and	/-	575.00	ipin	are met	
					Engine Speed	<=	1075.00	rpm	are mer	
					and					
					Vehicle speed	>=	0.00	mph		
					and					
					Vehicle speed	<=	3.11	mph		
					and					
					Battery voltage	>=	11.00	V		
					and engine coolant temperature		59.96	°C		
					and	>=	59.90	C		
					engine coolant temperature	<=	127.96	°C		
					and	~-	121.50	0		
					Barometric pressure	>=	65.00	kPa		
					and					
					Barometric pressure	<=	105.00	kPa		
					and					
					time since start	>	10.08	sec		
					and					
					Rich idle regeneration	=	inactive	-		
					and Adaption is finished for this driving cycle		inactive	-		
					Adaption is infistied for this driving cycle	=	mactive	-		
					and					
i I		1	1	I	and	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.
					valve closed and turbocharger offset adaption timer and No Pending or Confirmed DTCs: and basic enable conditions met:	= _= =	TRUE 0.50 see sheet inhibit tables see sheet enable tables	- sec -		
Turbocharger Boost Control Circuit		Diagnoses the Turbocharger Boost Control low side driver circuit for circuit faults.	Voltage low during driver off state (indicates open circuit)	 Open Circuit:≥ 200 K Ω impedance between ECU pin and load 	battery voltage for time and starter is active cranking 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	В
		Diagnoses the Turbocharger Boost Control low side driver circuit for driver over temperature faults.	The ECM detects that the commanded state of the driver and the actual state of the control circuit do not match and the IC maximum temperature has been exceeded		battery voltage for time and starter is active cranking and basic enable conditions met:	>	11.00 3.00 FALSE see sheet enable tables	V sec -	fail conditions exists for 0.5 s monitor runs with 0.01 s rate whenever enable conditions are met	
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	В

Component / System	Fault Code	Monitor Strategy Description	Primary Malfunction Criteria	Threshold Logic and Value	Secondary Parameters for time and starter is active cranking and basic enable conditions met:	> = =	Enable Conditions 3.00 FALSE see sheet enable tables	sec - -	Time Required whenever enable conditions are met	MIL Illum.
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 time and starter is active cranking and basic enable conditions met:	л л II II	11.00 3.00 FALSE see sheet enable tables	V sec -	fail conditions exists for 1.0 s monitor runs with 0.01 s rate whenever enable conditions are met	В
HO2S Heater Resistance Bank1 Sensor 1	P0053	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, exceeds a threshold a fault is detected	Temperature of A/F sensor (based on sensor internal resistance)	> 823.96 °C	Engine is running (please see the definition) Decel fuel cut-off (DFCO) for time (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)	=	TRUE FALSE 5.00 90.25 19.50 804.96 TRUE	- sec % sec °C -	fault exists for more than 30 sec; monitor runs at 0.1 s when 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.
System	Code	Description	Gitteria		ogic allu valuë		Status bit for heater control disabled (False = heater control active, True = heater control not active) A/F sensor error status bit (see parameter	=	FALSE	-	Required	mum.
							definition table) NO Pending or Confirmed DTCs:	=	see sheet inhibit	-		
							basic enable conditions met:	=	tables see sheet enable tables	-		
		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 sensor internal resistance)	v	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	
							Decel fuel cut-off (DFCO) for time	= >=	FALSE 5.00	- sec		
							(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	-		
) 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)	=	FALSE	-		
							NO Pending or Confirmed DTCs:	=	see sheet inhibit tables	-		
							basic enable conditions met:	=	see sheet enable tables	-		
CAC Temperature Sensor Circuit Low Voltage	P007C	Detects a CAC temperature sensor circuit short to ground.	CAC downstream temperature sensor voltage	<	0.11	V	ignition on	=	TRUE	-	fail conditions exists for 5 s	В
			same as				and				test performed	

Component / System	Fault Code	Monitor Strategy Description	Primary Malfunction Criteria		Threshold Logic and Value		Secondary Parameters		Enable Conditions		Time Required	MIL Illum.
			downstream CAC temperature	>	199.96	°C	basic enable conditions met: and NO Pending or Confirmed DTCs:	=	see sheet enable tables see sheet inhibit tables	-	continuously 0.1 s rate	L
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	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
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 basic enable conditions met: and	=	TRUE TRUE see sheet enable tables	-	fail conditions exists for 8 s monitor runs with 0.02 s rate whenever enable conditions are met	

Component / System	Fault Code	Monitor Strategy Description	Primary Malfunction Criteria	Threshold Logic and Value	Secondary Parameters metering unit actuator test active and	=	Enable Conditions FALSE	-	Time Required	MIL Illum.
					NO Pending or Confirmed DTCs:		see sheet inhibit tables	-		
Fuel Rail Pressure [FRP] Too High	P0088	Measured rail pressure is checked against desired rail pressure to detect high rail pressure conditions.	rail pressure deviation from setpoint calculated out of difference between desired and actual value (see Look-Up- Table #64)	< -80000 to - kPa 18000	current injection quantity 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 -40.04 TRUE see sheet enable tables FALSE see sheet inhibit tables	mm^3/r ev - - -	fail conditions exists for 8 s monitor runs with 0.02 s rate whenever enable conditions are met	В
			rail pressure deviation from setpoint calculated out of difference between desired and actual value	< -18000.00 kPa	(state machine rail pressure control equal to pressure control valve or state machine rail pressure control equal coupled pressure control (rail pressure is controlled by metering unit and pressure control valve)) and basic enable conditions met: and NO Pending or Confirmed DTCs:	=	TRUE TRUE see sheet enable tables see sheet inhibit tables	-	fail conditions exists for 8 s monitor runs with 0.02 s rate whenever enable conditions are met	
Fuel Pressure Regulator 1 Control Circuit/Open	P0090	Diagnoses the Fuel Pressure Regulator 1 low side driver circuit for circuit faults.	Voltage low during driver off state (indicates open circuit)	 Open Circuit:≥ 200 K Ω impedance between ECU pin and load 	battery voltage	>	11.00	V	fail conditions exists for 0.22 s monitor runs	A

Component / System	Fault Code	Monitor Strategy Description	Primary Malfunction Criteria	Threshold Logic and Value	Secondary Parameters for time and ignition on and basic enable conditions met: NO Pending or Confirmed DTCs:	Enable Conditions	Sec - -	Time Required with 0.01 s rate whenever enable conditions are met	MIL Illum.
		Diagnoses the Fuel Pressure Regulator 1 low side driver circuit for circuit faults.	The ECM detects that the commanded state of the driver and the actual state of the control circuit do not match.		battery voltage for time and 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 0.2 s monitor runs with 0.01 s rate whenever enable conditions are met	
Fuel Pressure Regulator 1 Control Circuit Low	P0091	Diagnoses the Fuel Pressure Regulator 1 low side driver circuit for circuit faults.	Voltage low during driver off state (indicates short-to-ground)	 Short to ground: - ≤ 0.5 Ω impedance between signal and controller ground 	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 0.28 s monitor runs with 0.01 s rate whenever enable conditions are met	A

Component / System Fuel Pressure Regulator 1 Control Circuit High	Fault Code P0092	Monitor Strategy Description Diagnoses the Fuel Pressure Regulator 1 low side driver circuit for circuit faults.	Primary Malfunction Criteria Voltage high during driver on state (indicates short to power)	= S ir b a	Threshold Logic and Value Short to power: ≤ 0.5 Ω mpedance letween signal ind controller iower	-	Secondary Parameters battery voltage for time and ignition on and basic enable conditions met: NO Pending or Confirmed DTCs:	>	Enable Conditions 11.00 3.00 TRUE see sheet enable tables see sheet inhibit tables	V sec - -	Time Required fail conditions exists for 0.22 s monitor runs with 0.01 s rate whenever enable conditions are met	MIL Illum. A
Intake Air Temperature Sensor 2 Circuit Low	P0097	Detects a low PWM frequency from the humidity temperature sensor, indicating an OOR low condition on the humidity temperature sensor circuit	Humidity Temperature sensor frequency (Intake air temperature sensor 2) same as humidity temperature	<	28.03	Hz degC	Engine Running (please see the definition) and following conditions for time: battery voltage battery voltage and basic enable conditions met: and no pending or confirmed DTCs	= >>< =	1.00 11.00 655.34 see sheet enable tables see sheet inhibit tables	sec V V -	fail conditions exists for 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 low condition on the humidity sensor circuit.	Internal ECM PWM circuit low voltage and ECM PWM circuit maximum period detected or	=	TRUE	-	Engine Running (please see the definition) and following conditions for time: battery voltage	= > >	TRUE 1.00 11.00	- sec V	fail conditions exists for 3.0 s test performed continuously with 0.1 s rate	

Component / System	Fault Code	Monitor Strategy Description	Primary Malfunction Criteria		Threshold Logic and Value		Secondary Parameters		Enable Conditions		Time Required	MIL Illum.
			Internal ECM PWM period not received	H	TRUE	-	battery voltage and basic enable conditions met: and no pending or confirmed DTCs	< = =	655.34 see sheet enable tables see sheet inhibit tables	V - -		
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) same as humidity temperature	>	353.76 129.96	Hz degC	Engine Running (please see the definition) and following conditions for time: battery voltage battery voltage and	=	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
							basic enable conditions met: and no pending or confirmed DTCs	=	see sheet enable tables see sheet inhibit tables	-		
		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	=	TRUE	-	Engine Running (please see the definition)	=	TRUE	-	fail conditions exists for 3.0 s test performed continuously with 0.1 s	
			and ECM PWM circuit maximum period detected or	=	TRUE	-	and following conditions for time: battery voltage	>	1.00 11.00	sec V	rate	
			Internal ECM PWM period not received	=	TRUE	-	battery voltage and basic enable conditions met:	< =	655.34 see sheet enable tables	V -		
							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.
Fuel Pressure Regulator 1 High Control Circuit Low Voltage	P00C9	Diagnoses the Fuel Pressure Regulator 1 high side driver circuit for circuit faults.	Voltage low during driver on state (indicates short to ground)	=	Short to ground: ≤ 0.5 Ω impedance between signal and controller ground	ignition on and basic enable conditions met:	=	TRUE see sheet enable tables	-	fail conditions exists for 0.3s monitor runs with 0.01 s rate whenever enable conditions are met	A
Fuel Rail Pressure Regulator 1 High Control Circuit High Voltage	Pooca	Diagnoses the Fuel Pressure Regulator 1 high side driver circuit for circuit faults.	Voltage high during driver off state (indicates short to power)	=	Short to power: ≤ 0.5 Ω impedance between signal and controller power	(engine speed or engine post drive/ afterun) and NO Pending or Confirmed DTCs: for time and basic enable conditions met:		0 TRUE see sheet inhibit tables 7.00 see sheet enable tables	rpm - - sec -	fail conditions exists for 0.1 s monitor runs with 0.1 s rate whenever enable conditions are met	A
Intake Air Temperature Sensor 3 Circuit Low Voltage	P00EA	Detects low voltage readings on the intake air temperature sensor 3 circuit, indicating an OOR low condition.		<	0.05 V	ignition on	=	TRUE	-	fail conditions exists for 5 s test performed continuously	В
			temperature of intake air temperature sensor 3	>	249.96 °C	and conditions met:	=	see sheet enable tables	-	0.1 s rate	

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 Air Temperature Sensor 3 Circuit High Voltage	POOEB	Detects high voltage readings on the intake air temperature sensor 3 circuit, indicating an OOR high condition.	intake air temperature sensor 3 voltage same as temperature of intake air temperature sensor 3	~	4.94	∨ °C	ignition on and basic enable conditions met: and NO Pending or Confirmed DTCs:	=	TRUE see sheet enable tables see sheet inhibit tables	-	fail conditions exists for 5 s test performed continuously 0.1 s rate	В
Humidity Sensor Circuit Low	P00F4	Detects a low duty cycle signal from the humidity sensor, indicating an OOR low condition on the humidity sensor circuit	Humidity Sensor Duty Cycle same as relative humidity	<	5.00	%	Engine Running (please see the definition) and following conditions for time: battery voltage battery voltage and basic enable conditions met: and no pending or confirmed DTCs	= ^ > < = =	TRUE 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
		The internal ECM PWM circuit driver detects either a duty cycle which has not been received or the maximum period has been exceeded, indicating short low condition on the humidity sensor circuit.	Internal ECM PWM circuit low voltage and ECM PWM circuit maximum period detected or Internal ECM PWM period not received	=	TRUE TRUE TRUE	-	Engine Running (please see the definition) and following conditions for time: battery voltage battery voltage and	=	TRUE 1.00 11.00 655.34	- sec V V	fail conditions exists for 3.0 s test performed continuously with 0.1 s rate	

Component / System	Fault Code	Monitor Strategy Description	Primary Malfunction Criteria	L	Threshold ogic and Value		Secondary Parameters		Enable Conditions		Time Required	MIL Illum.
							basic enable conditions met: and no pending or confirmed DTCs	=	see sheet enable tables see sheet inhibit tables	-		
Humidity Sensor Circuit High	P00F5	Detects a high duty cycle signal from the humidity sensor, indicating an OOR high condition on the humidity sensor circuit	Humidity Sensor Duty Cycle same as relative humidity	>	95.00	%	Engine Running (please see the definition) and following conditions for time: battery voltage battery voltage and	= ^ > <	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
							basic enable conditions met: and no pending or confirmed DTCs	=	see sheet enable tables see sheet inhibit tables	-		
		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	=	TRUE	-	Engine Running (please see the definition)	=	TRUE	-	fail conditions exists for 3.0 s test performed continuously with 0.1 s rate	
			ECM PWM circuit maximum period detected or Internal ECM PWM period not received	=	TRUE	-	following conditions for time: battery voltage battery voltage	> > <	1.00 11.00 655.34	sec V V		
							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.
Humidity Sensor Circuit Intermittent / Erratic	P00F6	The humidity signal performance monitor monitors the humidity signal delta in a defined time interval. The sum of these signal delta's over a number of time intervals is compared to a threshold.		>=	50.00	%	Engine Running (please see the definition)	=	TRUE	-	fail conditions exists for 4 out of 5 windows (x out of y), test is performed	В
			accumulated over a defined time interval same as	>	5.00		and no pending or confirmed DTCs	=	see sheet inhibit tables	-	continuously with 0.1 s rate	
			accumulated over time	>	0.10		and basic enable conditions met:	=	see sheet enable tables	-		
Mass Air Flow (MAF) Sensor Performance	P0101	Detects skewed MAF sensor by comparing measured MAF to calculated expected MAF based on volumetric efficiency of the engine	Path 1:								fail conditions exists for 10 s monitor runs	В
			ratio of measured air flow / desired air flow where	<	[(a) - (b)] * (c) * (d)		ambient pressure and	>	74.80	kPa	with 0.01 s rate whenever enable	
			(a) Engine load dependent MAP for calculating lower threshold (see Look-Up-Table #1)	=	0.8 to 0.85	-	engine coolant temperature	>=	69.96	°C	conditions are met	
			(b) Air temperature dependent correction factor curve	=	0	-	and					
			(c) Engine temperature based correction factor curve (d) Barometric pressure based	=	1	-	engine coolant temperature	<=	125.96	°C		
			correction factor curve	=	1		and					
			or				gradient of the charge-air temperature and	>=	-2.00	°C/sec		
			Path 2: ratio of measured air flow / desired air				gradient of the charge-air temperature and	<=	2.00	°C/sec		
			flow	>	(e) + (f)	-	(
			where				Engine Running (please see the defintion)	=	TRUE	-		
			(e) Engine load dependent MAP for calculating higher threshold	=	1.20	-	for					
			(f) Air temperature dependent correction factor curve	=	0	-	time since start	>	90.00	sec		
							and control value of the throttle valve and	>=	-400.00	%		

Component / System	Fault Code	Monitor Strategy Description	Primary Malfunction Criteria	Threshold Logic and Value	Secondary Parameters		Enable Conditions		Time Required	MIL Illum.
					control value of the throttle valve and	<=	5.00	%		
					setpoint value of Variable swirl actuator	>=	-400.00	%		
					and					
					setpoint value of Variable swirl actuator	<=	399.99	%		
					and					
					t 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	>=	-400.00	%		
					and actual valve position of exhaust-gas recirculation	<=	2.00	%		
					for time)	>	3.00	sec		
					and			10/		
					injection quantity	>=	-20.00	mm^3/r ev		
					and		450.00	mm^3/r		
					injection quantity	<=	150.00	ev		
					and air pressure in the induction volume and	>=	74.80	kPa		
					air pressure in the induction volume and	<=	280.00	kPa		
					engine speed	>=	575	rpm		
					and engine speed	<=	1200	rpm		
					and intake air temperature	>=	-7.04	°C		
					and intake air temperature	<=	79.96	°C		
					and					

Component / System	Fault Code	Monitor Strategy Description	Primary Malfunction Criteria		Threshold Logic and Value	e	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	>	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	В
Manifold Absolute Pressure (MAP) Sensor Performance	P0106	Detects a skewed MAP or BARO sensor by comparing MAP readings to the BARO sensor	Path 1: (a) - (b) or Path 2: (a) - (b) where (a) MAP sensor measured pressure and (b) BARO sensor measured pressure	< >	-15.00 15.00 measured parameter measured parameter	kPa kPa -	measured coolant engine downstream temperature and current injection quantity and actuator position of throttle valve and turbo charger (VNT) wiping is active and (engine speed and engine speed	> < < < = < < < < < < < < < < < < < < <	-3549.94 654.00 327.67 FALSE 0.00 100.00	°C mm^3/r ev % - rpm	fail conditions exists for 5 s monitor runs with 0.01 s rate whenever enable conditions are met	В

Component / System	Fault Code	Monitor Strategy Description	Primary Malfunction Criteria	Ŀ	Threshold ogic and Value)	Secondary Parameters		Enable Conditions		Time Required	MIL Illum.
) and vehicle speed and ambient air temperature and basic enable conditions met: and NO Pending or Confirmed DTCs:	< > =	3.11 -30.04 see sheet enable tables see sheet inhibit tables	mph °C -		
Manifold Absolute Pressure (MAP) Sensor Circuit Low Voltage	P0107	Detects low voltage readings on the MAP circuit, indicating an OOR low condition on the MAP circuit	Path 1:				engine synchronization completed	=	TRUE	-	fail conditions exists for 5 s test performed	В
			(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 %	and basic enable conditions met:	=	see sheet enable tables	-	continuously 0.01 s rate	
) or Path 2: (0.00							
			sensor voltage of manifold absolute pressure same as manifold absolute pressure and	<	0.20 20.00	V kPa						
			actuator position of throttle valve)	>	20.00	%						
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	-	>	4.80	V	NO Pending or Confirmed DTCs:	=	see sheet inhibit tables	-	fail conditions exists for 5 s test performed	В
			same as manifold absolute pressure	>	300.00	kPa	and engine synchronization completed and basic enable conditions met:	=	TRUE see sheet enable tables	-	continuously 0.01 s rate	

Component / System	Fault Code	Monitor Strategy Description	Primary Malfunction Criteria		Threshold Logic and Value		Secondary Parameters		Enable Conditions		Time Required	MIL Illum.
Intake Air Temperature Sensor 1 Circuit Low Bank 1	P0112	Detects low voltage readings on the MAF IAT circuit, indicating an OOR low condition on the MAF IAT circuit (IAT #1)	MAF intake air temperature sensor voltage same as intake air temperature	~	0.16 129.96	∨ °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	Detects high voltage readings on the MAF IAT circuit, indicating an OOR high condition on the MAF IAT circuit (IAT#1)	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
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		~	0.80	v °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 (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	>	4.75	V	ignition on	=	TRUE	-	fail conditions exists for 2.0 s test performed	В

Component / System	Fault Code	Monitor Strategy Description	Primary Malfunction Criteria engine coolant temperature	<	Threshold Logic and Value -50.04	°C	Secondary Parameters basic enable conditions met:	=	Enable Conditions see sheet enable tables		Time Required continuously 0.2 s rate	MIL Illum.
Engine Coolant Temperature / Intake Air Temperature Correlation	P011B	Detects a biased ECT or IAT1 by comparing start-up temperatures between the two sensors.	Path 1: (a) - (b) (see Look-Up-Table #15) where ((a) captured engine coolant temperature at start and (b) captured intake air 1 temperature at start)	> = =	20 to 999 measured parameter measured parameter	°C -	minimum engine-off time and ambient temperature and Engine Running (please see the definition) for time and engine post drive/ afterun and diagnostic performed in current dc and basic enable conditions met: and NO Pending or Confirmed DTCs:	>=	28800.00 -60.04 TRUE 0.00 FALSE FALSE see sheet enable tables see sheet inhibit tables	sec •C - sec -	once per drive cycle	В
Engine Coolant Temperature (ECT) Below Thermostat Regulating Temperature	P0128	Detects a stuck open thermostat by comparing actual engine coolant heat up profile to an expected modeled heat up profile.	modeled coolant temperature (model derived from injection quantity, coolant temperature at start, and ambient temperature) and measured engine coolant temperature	>=	87.96	°C ℃	engine pre drive and time since start and measured engine coolant temperature and captured value of coolant temperature during start and (ambient temperature	= < <= >	FALSE 1440.00 -40.04 57.96 -7.04	- sec °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 Valu	e	Secondary Parameters		Enable Conditions		Time Required	MIL Illum.
							and ambient temperature) and ambient temperature (used for high	V >	59.96 -30.04	°C °C		
							region determination) and engine idle time ratio which is defined by (idle time divided by time since start) where idle time is incremented	<	0.50	%		
							when: (accelerator pedal value and vehicle speed	<=	10.00 9.94	% mph		
							and engine speed)	<=	1000.00	rpm		
							and diagnostic performed in current dc and	=	FALSE	-		
							basic enable conditions met: and NO Pending or Confirmed DTCs:	=	see sheet enable tables see sheet inhibit	-		
								_	tables			
HO2S Bank 1 Sensor 1 circuit low		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) or	<	0.90	V	Ignition on A/F sensor pumping current control active for time (only for VM & UN	= <=	TRUE 3.00	- sec	fault exists for more than 2 sec; monitor runs at 0.1 s when enable	В
			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	circuits) or				conditions are met	
			or				Activation status of open load test at UN and VM	=	TRUE	-		

Component / System	Fault Code	Monitor Strategy Description	Primary Malfunction Criteria		Threshold Logic and Value		Secondary Parameters		Enable Conditions		Time Required	MIL Illum
			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))	>	649.96	°C		
							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		
							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	-		
							No Pending or Confirmed DTCs:	=	see sheet inhibit tables	-		
							basic enable conditions met:	=	see sheet enable tables	-		
O2S Bank 1 ensor 1 circuit gh	P0132	Monitoring the A/F sensor 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)	>	7.50	V	Ignition on	=	TRUE	-	fault exists for more than 2 sec; monitor runs	В
			or				A/F sensor pumping current control active for time (only for VM & UN circuits)	<=	3.00	sec	at 0.1 s when enable conditions	
			A/F sensor -> UN circuit voltage / Vvcc (UN Voltage = A/F sensor nernst cell voltage) (Vvcc = system supply voltage varies	>	0.80	%V	or				are met	
			between -0.3v to 5.5v) 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)	>	0.60	%V	and					

Component /	Fault	Monitor Strategy	Primary Malfunction Criteria		Threshold	Seconda Paramete			Enable Conditions		Time	MIL
System	Code	Description	Criteria	Lo	ogic and Value		rs			*0	Required	Illum.
						A/F sensor temperature (only for IP circuit)) and		>	649.96	°C		
						A/F sensor error status b definition table) and	it (see parameter	=	FALSE	-		
						A/F sensor heater control reset conditions		=	FALSE	-		
						duty cycle value during s for time or	ensor heat-up	>= >=	90.25 19.50	% sec		
						Temperature of A/F sens sensor internal resistance and		>	804.96	°C		
						Status bit for valid A/F Resistance (see parar table)		=	TRUE	-		
						No Pending or Confirmed	d DTCs:	=	see sheet inhibit tables	-		
						basic enable conditions r	net:	=	see sheet enable tables	-		
O2 Sensor Circuit Slow Response Bank 1 Sensor 1	P0133	signal monitoring at transition from load to fuel	Time to reach 30 % of expected rise in O2 concentration	>	3 se	Status: Inactive to Chee	ck OpPoint				fault exists for more than 2 fuel	В
		cut-off mode	OR			Influence of InjSys_qT injection quantity) on k known		=	TRUE	-	cut-off events; monitor runs at 0.1 s	
			Time to reach 60% expected rise from 30% expected rise in O2 concentration	>	1.8 se	Status bit which indica raw value is valid for A			TRUE	-	when enable conditions	
						diagnostic modules Test not inhibited thro conditions in the Inhib		=	TRUE	-	are met	
						Table		=	see sheet enable			
						basic enable condition	is met:					
							is met:	=	tables			
						Engine speed	is met:	>	tables 1100.00	rpm		
						Engine speed Injection quantity	is met:	> >	tables 1100.00 20.00	mm^3/r ev		
						Engine speed Injection quantity Battery voltage		> > >	tables 1100.00 20.00 11.00	mm^3/r ev V		
						Engine speed Injection quantity Battery voltage DPF regeneration is n	ot active	> > =	tables 1100.00 20.00 11.00 TRUE	mm^3/r ev		
						Engine speed Injection quantity Battery voltage DPF regeneration is n Calculated O2 (lambd	ot active a) signal	> > > = <	tables 1100.00 20.00 11.00 TRUE 0.10	mm^3/r ev V		
						Engine speed Injection quantity Battery voltage DPF regeneration is n Calculated O2 (lambd A/F sensor error statu parameter definition ta	ot active a) signal s bit (see able)	> > =	tables 1100.00 20.00 11.00 TRUE	mm^3/r ev V		
						Engine speed Injection quantity Battery voltage DPF regeneration is n Calculated O2 (lambd A/F sensor error statu parameter definition ta Status: Check OpPoint	ot active a) signal s bit (see able)	> > > = <	tables 1100.00 20.00 11.00 TRUE 0.10	mm^3/r ev V		
						Engine speed Injection quantity Battery voltage DPF regeneration is n Calculated O2 (lambd A/F sensor error statu parameter definition ta	ot active a) signal s bit (see able) to Wait for	> > > = <	tables 1100.00 20.00 11.00 TRUE 0.10	mm^3/r ev V		

Component / System	Fault Code	Monitor Strategy Description	Primary Malfunction Criteria	Threshold Logic and Value	Secondary Parameters		Enable Conditions		Time Required	MIL Illum.
					for time Injection quantity deviation (calculated for dynamic response rate monitoring)	>= >	1 -6.00	sec mm^3/r 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	P0171	Monitors the fuel mass observer correction quantity. Detects if the correction quantity exceeds the feedback limit.	Fuel mass observer emission correction quantity	<= -12.00 mm^3/re v	(Status of the Observer function's lambda- signal	=	TRUE	-	fail conditions exists for 12 s monitor runs	В
					means (with 0.02 s rate whenever	
					lambda signal from A/F sensor ready (see parameter definition)	=	TRUE	-	enable	
					fuel system is in fuel cut off (see parameter definition)	=	FALSE	-	are met	
					Particulate Filter Regeneration Mode	=	FALSE	-		
					((component of combusted fuel in the engine or	>=	1	-		
					calculated EGR rate))	>=	0	-		
) for time) AND	>	1.00	sec		
					Controller status of the observer means	=	TRUE	-		
					Load dependent release state (see Look-Up-Table #40)	=	0 to 1	-		
					, engine coolant temperature	<=	199.96	°C		
					engine coolant temperature	>=	64.96	°C		
					Normal Injection Mode Barometric pressure	= >=	TRUE 74.80	kPa		
			l	l	Ambient temperature	>=	-7.04	°C		

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

Component / System	Fault Code	Monitor Strategy Description	Primary Malfunction Criteria		Threshold Logic and Value		Secondary Parameters		Enable Conditions		Time Required	MIL Illum.
Fuel Temperature Sensor 1 Circuit Low	P0182	Detects low voltage readings in the fuel pump temperature sensor 1 circuit, indicating an OOR low condition on the fuel pump temperature sensor 1 circuit	voltage of fuel temperature sensor 1 same as fuel temperature	< ^	1.07 119.96	v °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	P0183	Detects high voltage readings in the fuel pump temperature sensor 1 circuit, indicating an OOR high condition on the fuel pump temperature sensor 1 circuit	voltage of fuel temperature sensor 1 same as fuel temperature	>	4.75 -50.04	v °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 Rail Pressure [FRP] Sensor Performance	P0191	Detects a drifted fuel rail pressure sensor by determining the adaptation factor of the fuel rail pressure regulator 2.	fuel pressure regulator 2 adaptation factor or fuel pressure regulator 2 adaptation factor		1.21	factor	fuel pressure regulator 2 in closed loop control (please see the definition) and adaptation for fuel pressure regulator 2 active means (counter for successful adaptation or counter for the successful calculation of the adaptation and (engine speed	= > >	TRUE TRUE 0 10.00 0.00	- counts counts rpm	fail conditions exists for 0.01 s monitor runs with 0.01 s rate whenever enable conditions are met	A

Component / System	Fault Code	Monitor Strategy Description	Primary Malfunction Criteria		Threshold gic and Value		Secondary Parameters		Enable Conditions		Time Required	MIL Illum.
							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	-		
										_		
		Detects a biased sensor by determining the FRP sensor voltage to be in the correct range for atmospheric pressure at engine off and with sufficient pressure bleed off time.	rail pressure sensor voltage	<	0.42	V	(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	=	TRUE	-	with 0.01 s rate	
							fuel temperature and	>	-40.04	°C	whenever enable	
							engine has already run in this driving cycle and	=	TRUE	-	conditions are 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	-		

Component / System	Fault Code	Monitor Strategy Description	Primary Malfunction Criteria		Threshold Logic and Value	1	Secondary Parameters		Enable Conditions		Time Required	MIL Illum.
Fuel Rail Pressure [FRP] Sensor Circuit High	P0193	Detects high voltage readings on the FRP circuit, indicating an OOR high condition on the FRP circuit	rail pressure sensor voltage same as	>	4.81	V	ignition on	=	TRUE		fail conditions exists for 0.2 s monitor runs with 0.01 s	A
			rail pressure	>	220000.00	kPa	and basic enable conditions met: and NO Pending or Confirmed DTCs:	=	see sheet enable tables see sheet inhibit tables	-	whenever enable conditions are met	
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		<	0.19	V	ignition on	=	TRUE	-	fail conditions exists for 0.2 s	A
			same as rail pressure	<	0	kPa	and basic enable conditions met: and NO Pending or Confirmed DTCs:	ш	see sheet enable tables see sheet inhibit tables		monitor runs with 0.01 s rate whenever enable conditions are met	
					_	-			_			
Cylinder 1 Injection Timing Retarded	P01CB	Monitors the correction values for the energizing time of each cylinder. A correction value for the energizing time is learned for each cylinder at a calibrated rail pressure operating point.	(environmental temperature	>	-7.04	°C	fail conditions exists for more than 0.01 s monitor runs with 0.01 s rate	В
		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)	-	and				whenever enable conditions are met	
			with (a) maximum injection energizing time		304.4	µsec	fuel temperature and	>=	-0.04	°C	die met	
			and with				fuel temperature	<=	79.96	°C		

Component / System	Fault Code	Monitor Strategy Description	Primary Malfunction Criteria	Threshold Logic and Value		Secondary Parameters		Enable Conditions		Time Required	MIL Illum.
			(b) offset of the maximum filtered	32.8	µsec)					
			energizing time			and					
)								
			for			engine coolant temperature	>	59.96	°C		
			rail pressure point	80000.00	kPa	and battery voltage		11.00	V		
						and	>	11.00	v		
						combustion chamber is not cooled off					
						means					
						time since last combustion (see Look- Up-Table #83)	>=	7 to 20	sec		
						and					
						and					
						intake manifold pressure	>	75.00	kPa		
						and intake manifold pressure	<	150.00	kPa		
						and		100.00	iu u		
						accelerator pedal position	<	0.05	%		
						and		Fuel cut off			
						Fuel system status for	=	Fuel cut off	-		
						time	>	0.00	sec		
						and					
						(engine speed	>	(b) - (a)	-		
						and	-	(b) - (a)	-		
						engine speed	<	(a) + (c)	-		
						with		00.00			
						 (a) value of engine speed and with 	=	30.00	rpm		
						(b) gear specific minimum engine	=	1170	rpm		
						speed					
						and with (c) gear specific maximum	=	2030			
						engine speed	=	2030	rpm		
)					
						and		0.1-1			
						current gear (see Look-Up-Table #82) and	=	0 to 1	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					
						no gear change is occurred and	=	TRUE	-		
						basic enable conditions met:	=	see sheet enable	-		
								tables			
I			l			and					l

Component / System	Fault Code	Monitor Strategy Description	Primary Malfunction Criteria	Threshold Logic and Valu	le	Secondary Parameters NO Pending or Confirmed DTCs:	=	Enable Conditions see sheet enable tables	-	Time Required	MIL Illum.
Cylinder 3 Injection Timing Retarded	P01CF	Monitors the correction values for the energizing time of each cylinder. A correction value for the energizing time is learned for each cylinder at a calibrated rail pressure operating point. Detects a fault when the corrected energizing time	(corrected energizing time for the rail pressure calibration points and cylinder 2	> (a) - (b)		environmental temperature and	>	-7.04	°C	fail conditions exists for more than 0.01 s monitor runs with 0.01 s rate whenever enable	В
		exceeds the allowed limit.	(with	204.4	11000	(fuel temperature	>=	-0.04	°C	conditions are met	
			 (a) maximum injection energizing time and with (b) offset of the maximum filtered energizing time 	304.4 32.8	µsec µsec	and fuel temperature)	<=	79.96	°C		
) for rail pressure point	80000.00	kPa	and engine coolant temperature and	>	59.96	°C		
						battery voltage and combustion chamber is not cooled off means time since last combustion (see Look- Up-Table #83)	>	11.00 7 to 20	V sec		
						and and intake manifold pressure and	>	75.00	kPa		
						intake manifold pressure and accelerator pedal position and	<	150.00 0.05	kPa %		
						Fuel system status for time and	=	Fuel cut off 0.00	- sec		
						(engine speed and	>	(b) - (a)	-		
						engine speed with (a) value of engine speed and with	< =	(a) + (c) 30.00	- rpm		

Component / System	Fault Code	Monitor Strategy Description	Primary Malfunction Criteria		Threshold Logic and Value	e	Secondary Parameters		Enable Conditions		Time Required	MIL Illum.
oyotom	0000	Decemption	C. Norma			•	(b) gear specific minimum engine speed and with	=	1170	rpm	rioquilou	mann
							(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 4 Injection Timing Retarded	P01D1	Monitors the correction values for the energizing time of each cylinder. A correction value for the energizing time is learned for each cylinder at a calibrated rail pressure operating point. Detects a fault when the	corrected energizing time for the rail	~	(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	В
		corrected energizing time exceeds the allowed limit.	pressure calibration points and cylinder 3				(enable conditions are met	
			with (a) maximum injection energizing time		304.4	µsec	fuel temperature and	>=	-0.04	°C		
			and with (b) offset of the maximum filtered energizing time		32.8	µsec	fuel temperature)	<=	79.96	°C		
))				and		50.00	*0		
			for rail pressure point		80000.00	kPa	engine coolant temperature and battery voltage	>	59.96 11.00	°C V		
							and combustion chamber is not cooled off means		11.00	v		

Component /	Fault	Monitor Strategy	Primary Malfunction	Threshold	Secondary		Enable		Time	MIL
System	Code	Description	Criteria	Logic and Value	Parameters		Conditions		Required	Illum.
					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		
					accelerator pedal position and	<	0.05	%		
					Fuel system status for	=	Fuel cut off	-		
					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)	=	0 to 1	gear		
					and 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 /	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 Retarded	P01CD	Monitors the correction values for the energizing time of each cylinder. A correction value for the energizing time is learned for	(environmental temperature	>	-7.04	°C	fail conditions exists for more than 0.01 s	В
		each cylinder at a calibrated rail pressure operating point. Detects a fault when the	corrected energizing time for the rail	> (a) - (b)	-	and				monitor runs with 0.01 s rate whenever	
		corrected energizing time exceeds the allowed limit.	pressure calibration points and cylinder 4	> (a) - (b)	-	(enable conditions are met	
			with (a) maximum injection energizing time	304.4	µsec	fuel temperature and	>=	-0.04	°C		
			and with			fuel temperature	<=	79.96	°C		
			(b) offset of the maximum filtered energizing time	32.8	µsec)					
)			and					
			for rail pressure point	80000.00		engine coolant temperature and	>	59.96	°C		
						battery voltage and combustion chamber is not cooled off	>	11.00	V		
						means time since last combustion (see Look- Up-Table #83) and	>=	7 to 20	sec		
						and intake manifold pressure and	>	75.00	kPa		
						intake manifold pressure and	<	150.00	kPa		
						accelerator pedal position and	<	0.05	%		
						Fuel system status for	=	Fuel cut off	-		
						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		

Component / System	Fault Code	Monitor Strategy Description	Primary Malfunction Criteria	Threshold Logic and Valu	e	Secondary Parameters		Enable Conditions		Time Required	MIL Illum.
						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	-		
Cylinder 1 Injection Timing Advanced	P01CC	Monitors the correction values for the energizing time of each cylinder. A correction value for the energizing time is learned for each cylinder at a calibrated rail pressure operating point.				environmental temperature	>	-7.04	°C	fail conditions exists for more than 0.01 s monitor runs with 0.01 s rate	В
		Detects a fault when the corrected energizing time falls below the allowed limit.	corrected energizing time for the rail pressure calibration points and cylinder 1	< (a) + (b)	-	and				whenever enable conditions are met	
			(with			(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			engine coolant temperature	>	59.96	°C		
			rail pressure point	80000.00	kPa	and		11.00	v		
						battery voltage and combustion chamber is not cooled off	>	11.00	v		
						means time since last combustion (see Look- Up-Table #83) and and	>=	7 to 20	sec		
						intake manifold pressure and	>	75.00	kPa		

Component /	Fault	Monitor Strategy	Primary Malfunction	Threshold	Secondary		Enable		Time	MIL
System	Code	Description	Criteria	Logic and Value	Parameters		Conditions		Required	Illum.
					intake manifold pressure	<	150.00	kPa		
					and		0.05	0/		
					accelerator pedal position and	<	0.05	%		
					Fuel system status	=	Fuel cut off	-		
					for		r dor out on			
					time	>	0.00	sec		
					and					
					(
					engine speed	>	(b) - (a)	-		
					and					
					engine speed with	<	(a) + (c)	-		
					(a) value of engine speed	=	30.00	rom		
					and with	-	30.00	rpm		
					(b) gear specific minimum engine	=	1170	rpm		
					speed					
					and with					
					(c) gear specific maximum	=	2030	rpm		
					engine speed					
)					
					and					
					current gear (see Look-Up-Table #82)	=	0 to 1	gear		
					and vehicle speed		0	mph		
					and	>	0	трп		
					rail pressure deviation from setpoint	<	2500.00	kPa		
					calculated out of difference between	-	2000.00			
					desired and actual value					
					for time	>	0.20	sec		
					and					
					no gear change is occurred	=	TRUE	-		
					and					
					basic enable conditions met:	=	see sheet enable	-		
					and		tables			
					NO Pending or Confirmed DTCs:	=	see sheet enable	-		
					rte i chaing of commod 2 red.		tables			
	Dates						7.04		6.11	
Cylinder 3 Injection	P01D0	Monitors the correction	(environmental temperature	>	-7.04	°C	fail conditions	В
Timing Advanced		values for the energizing time of each cylinder. A							exists for	
		correction value for the							more than	
		energizing time is learned for							0.01 s	
		each cylinder at a calibrated							monitor runs	
		rail pressure operating point.							with 0.01 s	
1									rate	

Component /	Fault	Monitor Strategy	Primary Malfunction	Threshold		Secondary		Enable		Time	MIL
System	Code	Description	Criteria	Logic and Val		Parameters		Conditions		Required	Illum.
		Detects a fault when the	corrected energizing time for the rail	< (a) + (b)	-	and				whenever	
		corrected energizing time	pressure calibration points and cylinder 2							enable	
		falls below the allowed limit.								conditions	
										are met	
			((
			with			fuel temperature	>=	-0.04	°C		
			(a) minimum injection energizing time	107.2	µsec	and					
			and with			fuel temperature	<=	79.96	°C		
			(b) offset of the minimum filtered	47.2	µsec)					
			energizing time		•	,					
)			and					
)								
			for			engine coolant temperature	>	59.96	°C		
			rail pressure point	80000.00	kPa	and	-	00.00	Ũ		
				00000.00	AT U	battery voltage	>	11.00	V		
						and	Ĺ.	11.00	•		
						combustion chamber is not cooled off					
						means					
						time since last combustion (see Look-	>=	7 to 20	sec		
						Up-Table #83)	>=	7 10 20	560		
						and					
						and		75.00			
						intake manifold pressure	>	75.00	kPa		
						and		150.00			
						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					
						(
						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					
						(c) gear specific maximum	=	2030	rpm		
						engine speed		_,,,,			
)					
						and					
						current gear (see Look-Up-Table #82)	=	0 to 1	gear		
						and	-	0.01	year		
						vehicle speed	>	0	mph		
						and		U	тірп		
		1	1	l		anu					

Component / System	Fault Code	Monitor Strategy Description	Primary Malfunction Criteria	Threshold Logic and Valu	e	Secondary Parameters		Enable Conditions	kPa	Time Required	MIL Illum.
						rail pressure deviation from setpoint calculated out of difference between desired and actual value for time and no gear change is occurred and basic enable conditions met:	<	2500.00 0.20 TRUE see sheet enable	sec -		
						and NO Pending or Confirmed DTCs:	=	tables 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. Detects a fault when the corrected energizing time falls below the allowed limit.	(corrected energizing time for the rail pressure calibration points and cylinder 3	< (a) + (b)	-	environmental temperature and	>	-7.04	°C	fail conditions exists for more than 0.01 s monitor runs with 0.01 s rate whenever enable conditions are met	В
			(with			(fuel temperature	>=	-0.04	°C		
			 (a) minimum injection energizing time and with (b) offset of the minimum filtered 	107.2 47.2	µsec µsec	and fuel temperature)	<=	79.96	°C		
			energizing time)			and					
) for			engine coolant temperature	>	59.96	°C		
			rail pressure point	80000.00	kPa	and battery voltage and combustion chamber is not cooled off	>	11.00	V		
						means time since last combustion (see Look- Up-Table #83) and	>=	7 to 20	sec		
						and intake manifold pressure and	>	75.00	kPa		
						intake manifold pressure and	<	150.00	kPa		
						accelerator pedal position and	<	0.05	%		
1 1		l				Fuel system status	=	Fuel cut off	-		ļ

Component / System	Fault Code	Monitor Strategy Description	Primary Malfunction Criteria	Le	Threshold ogic and Value	e	Secondary Parameters		Enable Conditions		Time Required	MIL Illum.
							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: and	=	see sheet enable tables	-		
							NO Pending or Confirmed DTCs:	=	see sheet enable tables	-		
												_
Cylinder 2 Injection Timing Advanced	P01CE	Monitors the correction values for the energizing time of each cylinder. A correction value for the energizing time is learned for each cylinder at a calibrated rail pressure operating point.	(environmental temperature	>	-7.04	°C	fail conditions exists for more than 0.01 s monitor runs with 0.01 s rate	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 4	<	(a) + (b)	-	and				whenever enable conditions are met	
			(with (a) minimum injection energizing time		107.2	11005	(fuel temperature and	>=	-0.04	°C		
		l	(a) minimum injection energizing time and with		107.2	µsec	and fuel temperature	<=	79.96	°C		

Component / System	Fault Code	Monitor Strategy Description	Primary Malfunction Criteria	Threshold Logic and Value		Secondary Parameters		Enable Conditions		Time Required	MIL Illum.
-,			(b) offset of the minimum filtered	47.2	µsec)					
			energizing time								
						and					
			for			engine coolant temperature	>	59.96	°C		
			rail pressure point	80000.00	kPa	and					
						battery voltage 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		150.00	kDe.		
						intake manifold pressure and	<	150.00	kPa		
						accelerator pedal position	<	0.05	%		
						and					
						Fuel system status for	=	Fuel cut off	-		
						time	>	0.00	sec		
						and					
						(
						engine speed and	>	(b) - (a)	-		
						engine speed	<	(a) + (c)	-		
						with					
						(a) value of engine speed	=	30.00	rpm		
						and with (b) gear specific minimum engine	=	1170	rpm		
						speed	_	1110	ipiii		
						and with					
						(c) gear specific maximum	=	2030	rpm		
						engine speed					
						and					
						current gear (see Look-Up-Table #82)	=	0 to 1	gear		
						and vehicle speed	>	0	mph		
						and	-	0	mpn		
						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	-		
							-	tables	-		
				l		and					

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 enable tables	-	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	В
			for fault counter which is equivalent to fault time	>= 400.00 >= 80.00	counts sec	and ambient temperature and engine coolant temperature at least once	>= >=	-7.04 69.96	°C °C	enable conditions are met	
						in a drive cycle and instantaneous fuel consumption (low- pass filtered)	>=	2.00	l/h		
						and basic enable conditions met: and	=	see sheet enable tables	-		
						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
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:≥ 200 K Ω impedance between ECU pin and load 	-	Engine Running (see parameter definition)	=	TRUE	-	fail conditions exists for more than 0.04 s	A

Component / System	Fault Code	Monitor Strategy Description	Primary Malfunction Criteria		Threshold Logic and Value		Secondary Parameters		Enable Conditions		Time Required monitor runs with 0.01 s rate whenever enable conditions are met	MIL Illum.
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:≥ 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	A
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 exists for more than 0.04 s monitor runs with 0.01 s rate whenever enable	A
Turbochager Overboost	P0234	Detects an permanent negative control deviation of the boost pressure	control deviation of the boost pressure calculated out of difference between desired and actual value with (d) The lower threshold pressure (see Look-Up-Table #58) (e) correction factor (f) ECB valve based lower limit correction factor	<	(d) * (e) * (f) -40 to -10 1.00 1.00	- kPa - -	following conditions for time (VNT turbo charger offset adaptation active and turbo charger (VNT) wiping is active and	> = =	0.50 FALSE FALSE FALSE	sec - -	fail conditions exists for 10 s monitor runs with 0.02 s rate whenever enable conditions	В

Component / System	Fault Code	Monitor Strategy Description	Primary Malfunction Criteria	Lo	Threshold gic and Valu	ıe	Secondary Parameters		Enable Conditions		Time Required	MIL Illum.
							absolute filtered gradient of boost pressure setpoint, PCR_pDesVal , calculated over a time dT constitutes the third condition for detecting the steady state and	V	7.50	kPa	are met	
							injection Quantity	>=	100.00	mm^3/r ev		
							injection Quantity	<=	150.00	ev mm^3/r ev		
							and			ev		
							engine Speed	>=	2000.00	rpm		
							engine Speed and	<=	3500.00	rpm		
							turbocharger control deviation	>=	-10.00	%		
							turbocharger control deviation	<=	10.00	%		
							and commanded turbocharger position and	<	75.00	%		
							particulate filter regeneration and	=	FALSE	-		
							NO Pending or Confirmed DTCs:		see sheet inhibit tables	-		
) and					
							basic enable conditions met:	=	see sheet enable tables	-		
									_			_
Cylinder 1 Balance System	P0263	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	В
			or				and				with 0.01 s rate	
			fuel balance correction quantity	>	(c) * (b)	-	current injection quantity	>	6.00	mm^3/r ev	whenever enable	
			with				current injection quantity	<	190.00	mm^3/r ev	conditions are met	
			(a) lower limitation (see Look-Up-Table #37)	=	-24 to 0	mm^3/re v	engine coolant temperature	>=	39.96	°C		
			and with				ambient pressure	>=	0.00	kPa		
			and with (b) factor for correction quantity	=	0.95	factor	engine speed engine speed	> <	590.00 4000.00	rpm rpm		
			and with				vehicle speed	<=	186.45	mph		
			(c) upper limitation (see Look-Up- Table #38)	=	0 to 24	mm^3/re v			and about stable			
							basic enable conditions met:	=	see sheet enable tables	-		
							and					

Component / System	Fault Code	Monitor Strategy Description	Primary Malfunction Criteria	I	Threshold Logic and Valu	Je	Secondary Parameters NO Pending or Confirmed DTCs:	=	Enable Conditions see sheet inhibit tables	-	Time Required	MIL Illum.
Cylinder 2 Balance	P0266		fuel balance correction quantity	<	(a) * (b)	-	fuel balance control in closed loop (see	=	TRUE		fail	В
System		injection compensation is at the control limit as determined by Fuel Balance Control (FBC)	er.				closed loop conditions document for details)				conditions exists for 10 s monitor runs with 0.01 s rate	
			fuel balance correction quantity	>	(c) * (b)	-	current injection quantity	>	6.00	mm^3/r ev	whenever enable	
		with				current injection quantity	<	190.00	mm^3/r ev	conditions are met		
			(a) lower limitation (see Look-Up-Table #37)	=	-24 to 0	mm^3/re v	engine coolant temperature	>=	39.96	°C	are met	
			- ,				ambient pressure	>=	0.00	kPa		
			and with				engine speed	>	590.00	rpm		
			(b) factor for correction quantity	=	0.95	factor	engine speed	<	4000.00	rpm		
			and with (c) upper limitation (see Look-Up-	=	0 to 24	mm^3/re	vehicle speed and	<=	186.45	mph		
			Table #38)			v	basic enable conditions met:	=	see sheet enable tables	-		
							and NO Pending or Confirmed DTCs:	=	see sheet inhibit tables	-		
Culinder 2 Polonee	D0260	Detects if the amount of fuel	fuel belonce correction quantity		(c) * (b)		fuel balance control in closed loop (see	=	TRUE		fail	В
System	ystem inje the det	injection compensation is at the control limit as determined by Fuel Balance Control (FBC)	fuel balance correction quantity	<	(a) * (b)	-	closed loop conditions document for details)	=	INUE	-	conditions exists for 10 s monitor runs with 0.01 s	D
			or				and				rate	
			fuel balance correction quantity	>	(c) * (b)	-	current injection quantity	>	6.00	mm^3/r ev	whenever enable	
			with				current injection quantity	<	190.00	mm^3/r ev	conditions are met	
			(a) lower limitation (see Look-Up-Table #37)	=	-24 to 0	mm^3/re v	engine coolant temperature	>=	39.96	°C		
							ambient pressure	>=	0.00	kPa		
			and with				engine speed	>	590.00	rpm		
			(b) factor for correction quantity and with	=	0.95	factor	engine speed vehicle speed	< <=	4000.00 186.45	rpm mph		
			(c) upper limitation (see Look-Up-	=	0 to 24	mm^3/re	and					
1		I	Table #38)			V	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.
					basic enable conditions met: and NO Pending or Confirmed DTCs:	=	see sheet enable tables see sheet inhibit tables	-		
Cylinder 4 Balance System	P0272	Detects if the amount of fuel injection compensation is at the control limit as determined by Fuel Balance Control (FBC)	fuel balance correction quantity or fuel balance correction quantity with (a) lower limitation (see Look-Up-Table #37) and with (b) factor for correction quantity and with (c) upper limitation (see Look-Up- Table #38)	 > (c) * (b) - = -24 to 0 mm^3/re v = 0.95 factor = 0 to 24 mm^3/re v 	fuel balance control in closed loop (see closed loop conditions document for details) and current injection quantity current injection quantity engine coolant temperature ambient pressure engine speed engine speed vehicle speed and basic enable conditions met: and NO Pending or Confirmed DTCs:	= ^ < ;; ; ; , < ;; = =		- ev mm^3/r ev °C kPa rpm rpm mph -	fail conditions exists for 10 S monitor runs with 0.01 s rate whenever enable conditions are met	В
CAC Efficiency Below Threshold	P026A	Detects insufficient charge- air cooler efficiency. The efficiency is calculated from the temperature upstream of the charge air cooler, temperature downstream of the charge air cooler, and modeled ambient air temperature	filtered charge-air cooler efficiency		and air mass flow air mass flow (see Look-Up-Table #14) and engine coolant temperature	>= >= <= >=	31.08 27.78 55.56 to 277.8 69.96	g/sec g/sec °C	fail conditions exists for 900 s monitor runs once per driving cycle with 0.1 s rate whenever enable conditions are met	В

Component / System	Fault Code	Monitor Strategy Description	Primary Malfunction Criteria	Threshold Logic and Valu	10	Secondary Parameters		Enable Conditions		Time Required	MIL Illum.
System	Code	Description	Criteria	Logic and valu		engine coolant temperature	<=	125.96	°C	Requirea	mum.
						and boost pressure ratio (maximum value of (a) and (b)) the maximum value is then divided by (b)	>=	1.22	ratio		
						with (a) boost pressure downstream compressor and with	=	calculated parameter	-		
						(b) ambient pressure and	=	measured parameter	-		
						control value of the throttle valve	>=	-400.00	%		
						control value of the throttle valve	<=	5.00	%		
						and diagnostic performed in current Drive Cycle	=	FALSE	-		
						and (a) - (b) with	>=	40.00	°C		
						(a) upstream charge air cooler temperature and with	=	measured parameter	-		
						(b) ambient air temperature	=	measured parameter	-		
						and 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. Detects if the correction quantity exceeds the emissions limit.	Unlimited fuel mass observer correction quantity - emission control correction quantity	<= -7.00		(Status of the Observer function's lambda- signal	=	TRUE		fail conditions exists for 10 s monitor runs	В
						means (with 0.02 s rate whenever	
						lambda signal from A/F sensor ready (see parameter definition)	=	TRUE	-	enable conditions	

Component / System	Fault Code	Monitor Strategy Description	Primary Malfunction Criteria	Threshold Logic and Value	Secondary Parameters		Enable Conditions		Time Required	MIL Illum.
Gystem	0000	Description	Unterta	Logic and Falac	fuel system is in fuel cut off (see parameter definition)	=	FALSE	-	are met	indin.
					Particulate Filter Regeneration Mode	=	FALSE	-		
					((component of combusted fuel in the engine or	>=	1	-		
					calculated EGR rate	>=	0	-		
) AND	>	1.00	sec		
					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 Normal Injection Mode	>= =	64.96 TRUE	°C		
					Barometric pressure	>=	74.80	kPa		
					Ambient temperature	>=	-7.04	°C		
					Vehicle speed and (<	1.86	mph		
					Engine speed Engine speed	>= <=	575 1075	rpm rpm		
) NO Pending or Confirmed DTCs:	=	see sheet inhibit tables	-		
					basic enable conditions met:	=	see sheet enable tables	-		
							_			
Injection Quantity Too High	P026D	Monitors the fuel mass observer correction quantity. Detects if the correction quantity exceeds the emissions limit.	Unlimited fuel mass observer correction quantity - emission control correction quantity (see Look-Up-Table #39)	>= -0.6 to 2 mm^3/hu b	(Status of the Observer function's lambda- signal	=	TRUE	-	fail conditions exists for 10 s monitor runs with 0.02 s	В
					means				rate	
					(lambda signal from A/F sensor ready (see parameter definition)	=	TRUE	-	whenever enable	
					fuel system is in fuel cut off (see	=	FALSE	-	conditions are met	
					parameter definition) Particulate Filter Regeneration Mode	=	FALSE	-		

Component / System	Fault Code	Monitor Strategy Description	Primary Malfunction Criteria		Threshold Logic and Value)	Secondary Parameters		Enable Conditions		Time Required	MIL Illum.
							((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	-		
							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	°C		
							Normal Injection Mode	=	TRUE			
							Barometric pressure	>=	74.80	kPa °C		
							Ambient temperature Vehicle speed	>= <	-7.04 1.86	°C mph		
							and	<	1.00	трп		
							(Engine speed	>=	575	rpm		
							Engine speed	<=	1075	rpm		
							NO Pending or Confirmed DTCs:	=	see sheet inhibit tables	-		
							basic enable conditions met:	=	see sheet enable tables	-		
Turk a sh a na n	Dagaa	Datasta en esterat			(-) + (1-) + (-)		fellowing and there for these		0.50		fail	В
Turbochager Underboost	P0299	Detects an permanent positive control deviation of the boost pressure	control deviation of the boost pressure calculated out of difference between desired and actual value	>	(a) * (b) * (c)		following conditions for time	>	0.50	sec	conditions exists for 7.5	в
											s monitor runs	
											with 0.02 s	
											rate	
											whenever	
											enable	
											conditions	
			with				1		FALSE	-	are met	
			(a) the upper limit (see Look-Up-Table	=	20 to 55	kPa	(VNT turbo charger offset adaptation	=	FALSE	-		
			#57)	-	20.000	in u	active	-	TALOL			
			(b) Correction factor	=	1.00	factor	and					
			(c) ECB valve based upper limit	=	1.00	factor	turbo charger (VNT) wiping is active	=	FALSE	-		
			correction factor				and					

Component / System	Fault Code	Monitor Strategy Description	Primary Malfunction Criteria		Threshold	2	Secondary Parameters		Enable Conditions		Time Required	MIL Illum.
System	Code	Description	Griteria		Logic and value	U	absolute filtered gradient of boost pressure setpoint calculated over a time dT constitutes the third condition for detecting the steady state	<	7.50	kPa	requirea	num.
							and injection Quantity	>=	60.00	mm^3/r ev		
							injection Quantity	<=	150.00	mm^3/r ev		
							and engine Speed engine Speed	>= <=	1500.00 3500.00	rpm rpm		
							and particulate filter regeneration and	=	FALSE	-		
							NO Pending or Confirmed DTCs:	=	see sheet inhibit tables	-		
							and basic enable conditions met:	=	see sheet enable tables	-		
Cylinder 1 Injection	P02CD	Monitors the correction					environmental temperature	>	-7.04	°C	fail	В
Feedback Limit	FUZCD	values for the energizing time of each cylinder. A correction value for the energizing time is learned for each cylinder at three different rail pressure operating point. Detects a fault when the corrected energizing time exceeds the feedback control limit.	corrected energizing time for the rail pressure calibration points and cylinder 1 (>	(a) - (b)	-	and	>	-7.04	0	conditions exists for more than 0.5 s monitor runs with 0.01 s rate whenever enable conditions are met	В
			with (a) maximum injection energizing time (see Look-Up-Table #20)		0 to 547.2	µsec	fuel temperature and	>=	-0.04	°C		
			and with (b) offset of the maximum filtered energizing time (see Look-Up-Table #22)		0 to 16	µsec	fuel temperature)	<=	79.96	°C		
)				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		

Component / System	Fault Code	Monitor Strategy Description	Primary Malfunction Criteria	Threshold Logic and Value		Secondary Parameters		Enable Conditions		Time Required	MIL Illum.
oystom	0040	Description	(with (a) minimum injection energizing	0 to 137.2	µsec	and combustion chamber is not cooled off means		Johanona		Required	indin.
			time (see Look-Up-Table #21) and with	010137.2	µsec	time since last combustion (see Look- Up-Table #83)	>=	7 to 20	sec		
			(b) offset of the minimum filtered energizing time (see Look-Up-Table #23)	0 to 16	µsec	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 and	<	0.05	%		
						Fuel system status for	=	Fuel cut off	-		
						time and (>	0.00	sec		
						engine speed and	>	(b) - (a)	-		
						engine speed with	<	(a) + (c)	-		
						(a) value of engine speed and with (b) gear specific minimum engine	=	30.00 1170	rpm rpm		
						speed and with	-	1170	ipin		
						(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 desired and actual value	<	2500.00	kPa		
						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	-		

Component / System	Fault Code	Monitor Strategy Description	Primary Malfunction Criteria		Threshold Logic and Value)	Secondary Parameters		Enable Conditions		Time Required	MIL 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	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				whenever enable conditions are met	
			(with (a) maximum injection energizing time (see Look-Up-Table #20)		0 to 547.2	µsec	(fuel temperature and	>=	-0.04	°C		
			and with (b) offset of the maximum filtered energizing time (see Look-Up-Table #22)		0 to 16	µsec	fuel temperature)	<=	79.96	°C		
)				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 (see Look-Up-Table #21) and with		0 to 137.2	µsec	and combustion chamber is not cooled off means 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 and	<	0.05	%		
							Fuel system status for	=	Fuel cut off	-		
							time and (>	0.00	sec		
		1					engine speed	>	(b) - (a)	-		

Component / System	Fault Code	Monitor Strategy Description	Primary Malfunction Criteria		Threshold Logic and Value	e	Secondary Parameters		Enable Conditions		Time Required	MIL Illum.
							and 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 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	-		
Ordinator Orbitantian	DooD4	Maniferra de a como dicar	·	-					7.04	*0	6-11	
Cylinder 3 Injection Timing Reached Feedback Limit	P02D1	Monitors the correction values for the energizing time of each cylinder. A correction value for the energizing time is learned for each cylinder at three different rail pressure operating point. Detects a fault when the corrected energizing time exceeds the feedback control limit.	corrected energizing time for the rail pressure calibration points and cylinder 1	>	(a) - (b)	-	environmental temperature and	>	-7.04	°C	fail conditions exists for more than 0.5 s monitor runs with 0.01 s rate whenever enable conditions are met	В
			(with (a) maximum injection energizing time (see Look-Up-Table #20)		0 to 547.2	µsec	(fuel temperature and	>=	-0.04	°C		
			and with (b) offset of the maximum filtered energizing time (see Look-Up-Table #22)		0 to 16	µsec	fuel temperature)	<=	79.96	°C		
)				and					

Component / System	Fault Code	Monitor Strategy Description	Primary Malfunction Criteria	Threshold Logic and Value	1	Secondary Parameters		Enable Conditions		Time Required	MIL Illum.
) 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 (see Look-Up-Table #21) and with	0 to 137.2	µsec	and combustion chamber is not cooled off means time since last combustion (see Look-	>=	7 to 20	sec		
			(b) offset of the minimum filtered energizing time (see Look-Up-Table	0 to 16	µsec	Up-Table #83) and	>=	7 10 20	Sec		
			#23))) 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 and	<	0.05	%		
						Fuel system status for time	=	Fuel cut off 0.00	- sec		
						and (
						engine speed and engine speed	> <	(b) - (a) (a) + (c)	-		
						with (a) value of engine speed and with	=	30.00	rpm		
						(b) gear specific minimum engine speed and with	=	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	9	Secondary Parameters basic enable conditions met:	=	Enable Conditions see sheet enable	-	Time Required	MIL Illum.
						and NO Pending or Confirmed DTCs:	=	tables see sheet enable tables	-		
Cylinder 4 Injection Timing Reached Feedback Limit	P02D3	Monitors the correction values for the energizing time of each cylinder. A correction value for the energizing time is learned for each cylinder at three different rail pressure operating point. Detects a fault when the corrected energizing time exceeds the feedback control limit.	<pre>(corrected energizing time for the rail pressure calibration points and cylinder 1 (with (a) maximum injection energizing time (see Look-Up-Table #20) and with (b) offset of the maximum filtered energizing time (see Look-Up-Table #22))</pre>	 (a) - (b) 0 to 547.2 0 to 16 (a) + (b) 0 to 137.2 0 to 16 0 to 80000 		environmental temperature and (fuel temperature and fuel temperature and fuel temperature) and engine coolant temperature and battery voltage and combustion chamber is not cooled off means time since last combustion (see Look- Up-Table #83) and intake manifold pressure and intake manifold pressure and and accelerator pedal position	> >= == > > > > > < <	-7.04 -0.04 79.96 11.00 7 to 20 75.00 150.00 0.05	°C °C °C V sec kPa kPa %	fail conditions exists for more than 0.5 s monitor runs with 0.01 s rate whenever enable conditions are met	В
		l				and	<	0.00	/0		

Component / System	Fault Code	Monitor Strategy Description	Primary Malfunction Criteria	Threshold Logic and Value	Secondary Parameters		Enable Conditions		Time Required	MIL Illum.
Gystem	oouc	Description	Unicita -		Fuel system status for time and	=	Fuel cut off 0.00	- sec	nequireu	indin.
					(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 basic enable conditions met:	=	TRUE see sheet enable	-		
					and		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 for	>	11.00	V	fail conditions exists for 1,1s monitor runs with 0.005 s	В
					time and	>	3.00	sec	rate whenever	
					starter is active cranking for	=	FALSE	-	enable conditions	
					time and	>	3.00	sec	are met	
					basic enable conditions met:	=	see sheet enable tables	-		

Component / System	Fault Code	Monitor Strategy Description	Primary Malfunction Criteria	Threshold Logic and Value	Secondary Parameters		Enable Conditions		Time Required	MI Illu
					Throttle Valve Actuator Solenoid Control Circuit and	=	ACTIVE	-		
					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	
					for time and	>	3.00	sec	monitor runs with 0.005 s rate	
					starter is active cranking for time	= >	FALSE 3.00	- sec	whenever enable conditions	
					and basic enable conditions met:	=	see sheet enable tables	-	are met	
					and Throttle Valve Actuator Solenoid Control Circuit and	=	ACTIVE	-		
					Open Load Diagnosis active NO Pending or Confirmed DTCs	=	FALSE see sheet inhibit tables	-		
			The ECM detects that the commanded state of the driver and the actual state of		battery voltage	>	11.00	V	fail conditions	
			the control circuit do not match.		for				exists for 0,5 s monitor runs	
					time and starter is active cranking	>	3.00 FALSE	sec -	with 0.005 s rate whenever	
					for time and	>	3.00	sec	enable conditions	
					basic enable conditions met:	=	see sheet enable tables	-	are met	
					and Throttle Valve Actuator Solenoid Control Circuit	=	ACTIVE	-		
					and 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 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 for time and starter is active cranking for time and basic enable conditions met: and Throttle Valve Actuator Solenoid Control Circuit and Open Load Diagnosis active NO Pending or Confirmed DTCs	=	11.00 3.00 FALSE 3.00 see sheet enable tables ACTIVE FALSE see sheet inhibit tables	V sec - sec - -	fail conditions exists for 0,5 s monitor runs with 0.005 s rate whenever enable conditions are met	В
Intake Air Flow Valve Control Circuit 1 High Voltage	P02E3	Diagnoses the Throttle Valve low side driver circuit for circuit faults.	Voltage high during driver on state (indicates short to power)	Short to power: - ≤ 0.5 Ω impedance between signal and controller power	battery voltage for time and starter is active cranking for time and basic enable conditions met: and Throttle Valve Actuator Solenoid Control Circuit and Open Load Diagnosis active NO Pending or Confirmed DTCs	=	11.00 3.00 FALSE 3.00 see sheet enable tables ACTIVE FALSE see sheet inhibit tables	V sec - sec - - - -	fail conditions exists for 0,5 s monitor runs with 0.005 s rate whenever enable conditions are met	В

Component / System	Fault Code	Monitor Strategy Description	Primary Malfunction Criteria		Threshold Logic and Value		Secondary Parameters		Enable Conditions		Time Required	MIL Illum.
Throttle Valve Actuator (TVA) Position Sensor Performance	P02E7	Detects in range TVA position errors by comparing the difference between desired and actual TVA position.	throttle valve control deviation calculated out of difference between desired and actual value or throttle valve control deviation calculated out of difference between desired and actual value	~ ~	10.00	%	throttle valve controller bypass is active and throttle valve is driven to a mechanical stop and Throttle Governor is active and Throttle Valve Permanent Control Deviation and throttle valve is detected as frozen means Engine Coolant Temperature and engine speed (see Look-Up-Table #81) and (Offset learning done on previous driving cycle OR Offset learning on going) and basic enable conditions met and		FALSE FALSE TRUE FALSE TRUE 198.96 850 to 1100 TRUE TRUE See sheet enable tables	- - - C rpm - -	fail conditions exists for 10 s monitor runs with 0.005 s rate whenever enable conditions are met	В
Diesel Intake Air Flow Position Sensor Circuit Low Voltage	P02E8	Detects low voltage readings on the throttle valve position sensor circuit, indicating an OOR low condition on the throttle valve position sensor circuit	measured throttle valve position voltage same as throttle position	<	0.41 -10	V %	And NO Pending or Confirmed DTCs: ignition on and basic enable conditions met and No Pending or Confirmed DTCs:	-	see sheet inhibit tables TRUE see sheet enable tables see sheet inhibit	-	fail conditions exists for 5.0 s; test performed continuously 0.005 s rate	В

Component / System	Fault Code	Monitor Strategy Description	Primary Malfunction Criteria		Threshold Logic and Valu	e	Secondary Parameters		Enable Conditions		Time Required	MIL Illum.
Diesel Intake Air Flow Position Sensor Circuit High Voltage	P02E9	Detects high voltage readings on the throttle valve position sensor circuit, indicating an OOR high condition on the throttle valve position sensor circuit	measured throttle valve position voltage same as	>	4.61	mV	ignition on	=	TRUE	-	fail conditions exists for 5.0 s; test performed continuously 0.005 s rate	В
			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	DOOED	Electronic out put driver	The ECM detects that the commanded				h attan walta za		11.00	V	fail	В
Valve Control Motor Current Performance	P02EB	Electronic out-put driver circuitry determines circuit integrity on the intake air flow valve.	state of the driver and the actual state of the control circuit do not match.				battery voltage	>	11.00	v	conditions exists for 2.0 s	В
							for time and	>	3.00	sec	monitor runs with 0.005 s rate	
							starter is active cranking for time	=	FALSE 3.00	- sec	whenever enable conditions	
							and basic enable conditions met:	=	see sheet enable tables	-	are met	
							and Throttle Valve Actuator Solenoid Control Circuit	=	ACTIVE	-		
							and 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	(see Look-Up-Table #52)	<	-12 to -2.5	sec^(2)	(fail conditions exists for 0.02 s monitor runs with 0.02 s	В
			and number of detected misfires	>=	200.00	counts	Engine Running (see parameter definition) and	=	TRUE	-	rate whenever enable conditions	

Component /	Fault	Monitor Strategy	Primary Malfunction		Threshold		Secondary		Enable		Time	MIL
System	Code	Description	Criteria		Logic and Value		Parameters		Conditions		Required	Illum.
-			for		-		engine speed	>	400.00	rpm	are met	
			evaluated crankshaft revolutions	>=	(a) * (b)	-	and					
			with				engine speed	<	1300.00	rpm		
			(a) number of crankshaft revolutions	=	20.00	counts)					
			per block				,					
			and with				and					
			(b) number of test blocks	_	45.00	counts	(a) - (b)	<	250.00	rom		
				=	45.00	counts		~	250.00	rpm		
			and		TDUE		with		a a la colla da col			
			misfires exist on more than one cylinder	=	TRUE	-	(a) actual desired idle speed	=	calculated	-		
									parameter			
							and with					
							(b) engine speed	=	measured	-		
									parameter			
							and					
							(
							current injection quantity	>	6.00	mm^3/r		
							can one injoon on quantity	-	0.00	ev		
							and			ev		
							and		75.00			
							current injection quantity	<	75.00	mm^3/r		
										ev		
)					
							and					
							engine coolant temperature	>=	40.06	°C		
							and					
							vehicle speed	<=	1.86	mph		
							and					
							time since start	>=	10.00	sec		
							and	/-	10.00	360		
									TOUE			
							deletion of error memory (Mode\$4) not	=	TRUE	-		
							executed since last check of the					
							monitoring conditions					
							and					
							adaptation value for tooth wheel has been	=	TRUE	-		
							learned					
1												I
							and					
							current change in engine speed	<=	250.00	rpm		
							for	~-	200.00	.6		
							time	_	0.00	sec		
								=	0.00	Sec		
							and		00.00			
							current change in injection quantity	<=	60.00	mm^3/r		
										ev		
							for					
							time	=	0.00	sec		
							and					
							basic enable conditions met:	=	see sheet enable	-		
									tables			
							and					
							NO Pending or Confirmed DTCs:	=	see sheet inhibit	-		
							rectioning of commence bros.	-	tables	-		
									aules			
i I			1				I I					

Component / System	Fault Code	Monitor Strategy Description	Primary Malfunction Criteria		Threshold Logic and Value	e	Secondary Parameters		Enable Conditions		Time Required	MIL Illum.
					_	_		_	_			_
Cylinder 1 Misfire Detected	P0301	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 the engine speed	,	<	-12 to -2.5	sec^(2)	(fail conditions exists for 0.02 s monitor runs with 0.02 s	В
			and				Engine Running (see parameter definition)	=	TRUE	-	rate whenever enable	
			number of detected misfires for	>=	200.00		and engine speed	>	400.00	rpm	conditions are met	
			evaluated crankshaft revolutions with	>=	(a) * (b)	-	and engine speed	<	1300.00	rpm		
			(a) number of crankshaft revolutions per block	=	20.00	counts)					
			and with (b) number of test blocks	=	45.00	counts	and (a) - (b) with	<	250.00	rpm		
							(a) actual desired idle speed	=	calculated parameter	-		
							and with (b) engine speed	=	measured parameter	-		
							and (10/		
							current injection quantity and	>	6.00	mm^3/r ev		
							current injection quantity	<	75.00	mm^3/r ev		
) and					
							engine coolant temperature and vehicle speed	>=	40.06 1.86	°C mph		
							and time since start	<=	10.00	sec		
							and deletion of error memory (Mode\$4) not	=	TRUE	-		
							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	<=	250.00	rpm		
							time	=	0.00	sec		

Component / System	Fault Code	Monitor Strategy Description	Primary Malfunction Criteria	L	Threshold ogic and Value	1	Secondary Parameters		Enable Conditions		Time Required	MIL Illum.
							and current change in injection quantity	<=	60.00	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 the engine speed	angular acceleration of the crankshaft (see Look-Up-Table #52)	<	-12 to -2.5	sec^(2)	(fail conditions exists for 0.02 s monitor runs with 0.02 s rate	В
			and				Engine Running (see parameter definition)	=	TRUE	-	whenever enable	
			number of detected misfires for evaluated crankshaft revolutions	>=	200.00	counts	and engine speed and	>	400.00	rpm	conditions are met	
			(a) number of crankshaft revolutions per block and with	>=	(a) * (b) 20.00	counts	engine speed)	<	1300.00	rpm		
			(b) number of test blocks	=	45.00	counts	and (a) - (b) with	<	250.00	rpm		
							(a) actual desired idle speed	=	calculated parameter	-		
							and with (b) engine speed	=	measured parameter	-		
							and (6.00			
							current injection quantity and	>	6.00	mm^3/r ev		
							current injection quantity	<	75.00	mm^3/r ev		
							and engine coolant temperature	>=	40.06	°C		
							and vehicle speed and	<=	1.86	mph		
							time since start and	>=	10.00	sec		

Component / System	Fault Code	Monitor Strategy Description	Primary Malfunction Criteria		Threshold ogic and Valu	0	Secondary Parameters		Enable Conditions		Time Required	MIL Illum.
System	Code	Description	Gineria			e	deletion of error memory (Mode\$4) not executed since last check of the monitoring conditions and adaptation value for tooth wheel has been learned	=	TRUE	-	Kequireu	mum.
							and current change in engine speed for time and current change in injection quantity	<= = <=	250.00 0.00 60.00	rpm sec mm^3/r		
							for time and basic enable conditions met: and	=	0.00 see sheet enable tables	ev sec		
	Doool				40.10 0.5		NO Pending or Confirmed DTCs:	=	see sheet inhibit tables	-	(c))	
Cylinder 4 Misfire Detected	P0304	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 the engine speed		<	-12 to -2.5	sec^(2)	(fail conditions exists for 0.02 s monitor runs with 0.02 s	В
			and number of detected misfires	>=	200.00	counts	Engine Running (see parameter definition) and	=	TRUE	-	rate whenever enable conditions	
			for evaluated crankshaft revolutions with (a) number of crankshaft revolutions	>= =	(a) * (b) 20.00	- counts	engine speed and engine speed)	> <	400.00 1300.00	rpm rpm	are met	
			per block and with (b) number of test blocks	=	45.00	counts	, and (a) - (b) with	<	250.00	rpm		
							(a) actual desired idle speed and with	=	calculated parameter	-		
							(b) engine speed and (=	measured parameter	-		

Cylinder 2 Maline P032 Indicates that the origin has produce acceleration of the oranshaft to organize acceleration of the oranshaft to oranshaft acceleration acceleration acceleration acceleration	Component / System	Fault Code	Monitor Strategy Description	Primary Malfunction Criteria		Threshold Logic and Valu	e	Secondary Parameters		Enable Conditions		Time Required	MIL Illum.
Cylinder 2 Mattre P0007 Indicates that the engine tas and current change in injection quantify - 7.0.0 mm*or Cylinder 2 Mattre P0007 Indicates that the engine tas and current change in injection quantify - 7.0.0 mm*or Cylinder 2 Mattre P0007 Indicates that the engine tas and current change in injection quantify - TRUE - Cylinder 2 Mattre P0007 Indicates that the engine tas and current change in injection quantify - TRUE - Cylinder 2 Mattre P0007 Indicates that the engine tas and current change in injection quantify - - TRUE - Cylinder 2 Mattre P0007 Indicates that the engine tas and current change in injection quantify - - - - Performed - - - - - - - - - - Prove - <						3	-	current injection quantity	>				
Cylinder 2 Mistre P0002 Indiates that the senging tags and server consistent ample on the senging of tags and server consistent ample on the senging of tags and server consistent ample on the senging of tags and server consistent ample on tags and server consis								and			ev		
Vinder 2 Mattre P0302 Indicates that the engine has engine speed in the engine has engine color. Up-Table 452) mathematic math									<	75.00			
Vender 2 Metro P302 Indicates that the online fits and online descent the online fits and online descent the online descent on the crankshaft experienced a single divide on the online descent the online descent the online descent the online descent on the crankshaft experienced a single divide on the online descent the online descent on the crankshaft experienced a single divide descent desc											ev		
Vinices 2Median P0302 Indicates that the engine free and under coefference) and					
Vinder 2 Mafre P030 Indicates that the engine has experienced a single cylinder (see Look-Up-Table #52) s -12 to -2.5 scor(2) scor(>=	40.06	°C		
Cylinder 2 Medire P0302 Indicates that the engine has experimenda single acceleration of the crankshaft Detected misfires <									/-	1.86	mph		
Cylinder 2 Ms/m P0302 Indicates that the engine has cooleration of the cranshaht coordinating detected misfing. detected in a dispersion of the cranshaht coordinations and and parameter definition.								and	~-	1.00	mpn		
Cylinder 2 Msfire P0302 Indicates that the engine has leaved and acceleration of the crankshaft (see Look-Up-Table #52) c -12 to -2.5 sec^{(2)} sec^{(2)} - sec^{(2)} - fail constraints of the engine speed number of detected minifires - - fail constraints of the engine speed number of detected minifires - <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td>>=</td> <td>10.00</td> <td>sec</td> <td></td> <td></td>									>=	10.00	sec		
Cylinder 2 Misfire Detected P0302 Indicates that the engine has single cylinder transhaft angle detected by a nife speed in the engine speed in t									=	TRUE	-		
Optimizer 2 Mistire P0302 Indicates that the engine as equily acceleration of the cransshaft to opreat, caused by a drop in the engine speed <								executed since last check of the					
Cylinder 2 Misfire P0302 Indicates that the engine has experienced a single cylinder expendent in the engine speed in thenengine speed in the engine speed in the eng													
Cylinder 2 Mistire P0302 Indicates that the engine has experienced a single oplinder in the engine has to ogreed or engine speed in the engine speed of the engine speed and current change in number of detected mistires <									=	TRUE	-		
Cylinder 2 Misfire Detected P0302 Indicates that the engine has and and and angular acceleration of the crankshaft examples peed a single cylinder in the engine speed a langular acceleration of the crankshaft examples peed a single cylinder in the engine speed a langular acceleration of the crankshaft examples peed a langular acceleration of													
Cylinder 2 Misfire Detected P0302 Indicates that the engine has and and and angular acceleration of the crankshaft examples peed a single cylinder in the engine speed a langular acceleration of the crankshaft examples peed a single cylinder in the engine speed a langular acceleration of the crankshaft examples peed a langular acceleration of													
Cylinder 2 Misfire Detected P0302 and cranshaft angle delay that is to ogreat, caused by a drop in the engine speed and numer of detected misfires <								and					
Vinder 2 Misfire Detected P0302 in the engine speed and number of detected misfires Indicates that the engine has and and basic angular acceleration of the crankshaft and NO Pending or Confirmed DTCs: and and basic and basic and NO Pending or Confirmed DTCs: and basic and basic and basic and NO Pending or Confirmed DTCs: and basic									<=	250.00	rpm		
Image: See Sheet enable of the engine speed and current change in injection quantity <									=	0.00	sec		
Vinder 2 Misfire P0302 Indicates that the engine has experienced a single cylinder misfiring, detected by a crankshaft angle delay that is to orgrankshaft angle delay that is not organize caused by a drop in the engine speed <								and					
Vinder 2 Mistire P0302 Indicates that the engine has experienced a single cylinder mistiring, detected by a crankshaft angle delay that is to great, caused by a drop in the engine speed								current change in injection quantity	<=	60.00			
Vince P0302 Indicates that the engine has and experienced a single cylinder misfiring, detected by a crankshaft angle delay that is too great, caused by a drop in the engine speed <t< td=""><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td>for</td><td></td><td></td><td>ev</td><td></td><td></td></t<>								for			ev		
Cylinder 2 Misfire P0302 Indicates that the engine has experienced a single cylinder misfiring, detected by a crankshaft and edelay that is too great, caused by a drop in the engine speed -12 to -2.5 sec^/(2) (fail conditions exists for or exists for or exists for exists for or exists for exists for or exists for exists for exists for or exists for exists for exists								time	=	0.00	sec		
Image: Comparison of the comparison									_	soo shoot onablo			
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 the engine speed angular acceleration of the crankshaft (see Look-Up-Table #52) < -12 to -2.5								basic enable conditions met.	-		-		
Cylinder 2 Misfire Detected P0302 Indicates that the engine has experienced a single cylinder misfiring, detected by a crankshaft angle delay that is to great, caused by a drop in the engine speed and -12 to -2.5 sec^{2} (
Cylinder 2 Misfire 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 the engine speed fail conditions exists for 0.02 ms monitor runs with 0.02 s rate whenever enable conditions								NO Pending or Confirmed DTCs:	=		-		
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: Conditions exists for 0.02 ms monitor runs with 0.02 s rate and Image: Conditions exists for 0.02 ms monitor runs rate Image: Conditions exists for 0.02 ms monitor runs rate Image: Conditions exists for 0.02 ms monitor runs rate Image: Conditions exists for 0.02 ms monitor runs rate Image: Conditions exists for 0.02 ms monitor runs rate Image: Conditions exists for 0.02 ms monitor runs rate Image: Conditions exists for 0.02 ms monitor runs rate Image: Conditions exists for 0.02 ms monitor runs rate Image: Conditions exists for 0.02 ms monitor runs rate Image: Conditions exists for 0.02 ms monitor runs rate Image: Conditions exists for 0.02 ms monitor runs rate Image: Conditions exists for 0.02 ms monitor runs rate Image: Conditions exists for 0.02 ms Image: Conditions exists for 0.02 ms Image: Conditions exists for 0.02 ms Image: Conditions exists for 0.02 ms Image: Conditions exists for 0.02 ms Image: Conditions exists for 0.02 ms										tables			
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: Conditions exists for 0.02 ms monitor runs with 0.02 s rate and Image: Conditions exists for 0.02 ms monitor runs rate Image: Conditions exists for 0.02 ms monitor runs rate Image: Conditions exists for 0.02 ms monitor runs rate Image: Conditions exists for 0.02 ms monitor runs rate Image: Conditions exists for 0.02 ms monitor runs rate Image: Conditions exists for 0.02 ms monitor runs rate Image: Conditions exists for 0.02 ms monitor runs rate Image: Conditions exists for 0.02 ms monitor runs rate Image: Conditions exists for 0.02 ms monitor runs rate Image: Conditions exists for 0.02 ms monitor runs rate Image: Conditions exists for 0.02 ms monitor runs rate Image: Conditions exists for 0.02 ms monitor runs rate Image: Conditions exists for 0.02 ms Image: Conditions exists for 0.02 ms Image: Conditions exists for 0.02 ms Image: Conditions exists for 0.02 ms Image: Conditions exists for 0.02 ms Image: Conditions exists for 0.02 ms							_		_		_		
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: Conditions exists for 0.02 ms monitor runs with 0.02 s rate and Image: Conditions of the engine speed Image: Conditions of the engine speed Image: Conditions of the engine speed in umber of detected misfires >= 200.00 counts Image: Conditions of the engine speed	Cylinder 2 Misfire	P0302	Indicates that the engine has	angular acceleration of the crankshaft	<	-12 to -2.5	sec^(2)	(fail	В
crankshaft angle delay that is too great, caused by a drop in the engine speed and Image: Comparison of the compa			experienced a single cylinder				()	x .					
too great, caused by a drop in the engine speed and number of detected misfires >= 200.00 counts and too great, caused by a drop Engine Running (see parameter definition) and too great, caused by a drop with 0.02 s rate enable conditions													
and and how provided the set of t													
and Engine Running (see parameter definition) = TRUE - whenever enable conditions number of detected misfires >= 200.00 counts and conditions			in the engine speed										
number of detected misfires >= 200.00 counts and enable				and				Engine Running (see parameter	=	TRUF	-		
								definition)	-	into E		enable	
					>=	200.00	counts			400.00			
for engine speed > 400.00 rpm are met evaluated crankshaft revolutions >= (a) * (b) - and >					>=	(a) * (b)	-		>	400.00	rpm	are met	
with engine speed < 1300.00 rpm	1								<	1300.00	rpm		

Component / System	Fault Code	Monitor Strategy Description	Primary Malfunction Criteria		Threshold Logic and Value		Secondary Parameters		Enable Conditions		Time Required	MIL Illum.
			(a) number of crankshaft revolutions per block	=	20.00	counts)					
			and with (b) number of test blocks	=	45.00	counts	and (a) - (b) with	<	250.00	rpm		
							(a) actual desired idle speed	=	calculated parameter	-		
							and with (b) engine speed and	=	measured parameter	-		
							(current injection quantity	>	6.00	mm^3/r		
							and			ev		
							current injection quantity	<	75.00	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	=	TRUE	-		
							and adaptation value for tooth wheel has been learned	=	TRUE	-		
							and current change in engine speed	<=	250.00	rpm		
							for time and	=	0.00	sec		
							current change in injection quantity	<=	60.00	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	-		
					_				_			

Component /	Fault	Monitor Strategy	Primary Malfunction	Threshold	Secondary		Enable		Time	MIL
System Crankshaft Position System Variation Not Learned	Code P0315	Description Wheel Learn - Fuel Balance System - Tooth Wheel Variation and Crankshaft Dynamics not learned quickly enough	Criteria fuel balance wheel learn complete	Logic and Value = FALSE -	Parameters fuel system is in fuel cut off and engine speed engine speed and NO Pending or Confirmed DTCs:	= > < =	Conditions TRUE 1000 3500 see sheet inhibit tables	- rpm rpm	Required fail conditions exists for 5000 s cumulative time monitor runs with 1 s rate whenever enable conditions are met	Illum. B
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 -	Ignition ON and Engine backward rotation detected and ((engine speed and synchronization completed) or starter is active cranking) and (vehicle speed or vehicle speed and engine speed) and basic enable conditions met: and NO Pending or Confirmed DTCs:	=	TRUE FALSE 550.00 TRUE TRUE 0 16 200.00 see sheet enable tables see sheet inhibit	- rpm - mph mph rpm -	fail conditions exists for more than 6 events monitor runs with 0.1 s rate whenever enable conditions are met	A

Component / System	Fault Code	Monitor Strategy Description	Primary Malfunction Criteria		Threshold Logic and Value		Secondary Parameters		Enable Conditions		Time Required	MIL Illum.
Crankshaft Position Sensor Performance	P0336	Detects implausible crankshaft sensor operation by detecting incorrect crank sensor signal patterns.	number of disturbances in crankshaft signal	>=	3.00		Engine Running (see parameter definition)	=	TRUE	-	fail conditions exists for 0.1 s monitor runs	A
			crankshaft signal disturbance detected under the following conditions:				and				with 0.1 s rate whenever	
			Current tooth time period	>	200000.00	µsec	ECM has detected reference mark on the crankshaft	=	FALSE	-	enable conditions	
			or Crankshaft tooth counts between detected gaps or	>	68.00	counts	and basic enable conditions met:	=	see sheet enable tables	-	are met	
			If gap not expected, ratio of current tooth time to previous tooth time (see Look-Up-Table #18)	>	1.5 to 2	ratio						
			or If gap expected, ratio of current tooth time to previous tooth time (see Look- Up-Table #17)	>	3.38 to 8	ratio						
Camshaft Position	P0340	Detects camshaft sensor	number of crankshaft revolutions during		2.50	e e unte	NO peopling or confirmed DTCo		aaa ahaat inhihit	-	fail	В
[CMP] Sensor Circuit	P0340	circuit failure by monitoring for valid signals from CMP sensor while CKP sensor is also sending valid signals	missed camshaft signal	>=	2.30	counts	NO pending or confirmed DTCs	=	see sheet inhibit tables	-	conditions exists for more than 3 events test performed	D
							ECM has detected reference mark on the crankshaft and	=	TRUE	-	continuously 0.01 s rate	
							Ignition ON and	=	TRUE	-		
							engine synchronization operation is not finished and	=	TRUE	-		
							basic enable conditions met:	=	see sheet enable tables	-		
		-										
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	=	see sheet inhibit tables	-	fail conditions exists for more than 6	В
							and ECM has detected reference mark on the crankshaft and	=	TRUE	-	events test performed continuously	

Component / System	Fault Code	Monitor Strategy Description	Primary Malfunction Criteria	Threshold Logic and Value	Secondary Parameters Ignition ON and engine synchronization operation is not finished	=	Enable Conditions TRUE TRUE	-	Time Required 0.01 s rate	MIL Illum.
					and basic enable conditions met:	=	see sheet enable tables	-		
Glow Plug/Heater Indicator Control Circuit Low	P037A	Diagnoses the Glow Lamp Circuit high side driver circuit for circuit faults.	Voltage low during driver on state (indicates short-to-ground)	Short to ground: - ≤ 0.5 Ω impedance between signal and controller ground	lamp is commanded on and battery voltage for time and basic enable conditions met:	> >	TRUE 11.00 3.00 see sheet enable tables	- V sec -	fail conditions exists for 3 s monitor runs with 0.01 s rate whenever enable conditions are met	В
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	В
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)	 = Open Circuit: ≥ - 200 K Ω impedance between ECU pin and load signal and controller ground 	circuit active at low current	=	TRUE		fail conditions exists for 0.2 s monitor runs with 0.01 s rate whenever enable	В

Component / System	Fault Code	Monitor Strategy Description	Primary Malfunction Criteria		Threshold Logic and Value		Secondary Parameters		Enable Conditions		Time Required	MIL Illum.
							and battery voltage for	>	11.00	V	conditions are met	
							time and	>	3.00	sec		
							basic enable conditions met:	=	see sheet enable tables	-		
						_		-	_	-		
Exhaust Gas Recirculation(EGR)	P0401	Detects insufficient EGR flow. Actual MAF readings	controller deviation of the exhaust gas recirculation (EGR) - calculated out of	>	(a)*(b)		(fail conditions	В
Flow Insufficient		are compared to desired MAF values as an indication	desired and actual value								exists for 10 s	
		of how much EGR is flowing.									monitor runs 0.02 s rate	
			with (a) Minimum Controller Deviation	=	-0.15 to -0.04	g/rev	EGR controller is active and	=	TRUE		whenever enable	
			(see Look-Up-Table #11) (b) Environmental Pressure	=	0.75 to 1	factor	The maximum possible air-mass flow	=	TRUE	-	conditions are met	
			correction factor (see Look-Up-Table #8)				> The air-mass setpoint					
							and change of injection quantity between	<	25.00	(mm^3/		
							actual and last received value			rev)/se c		
							for time and	=	0.25	sec		
							change of engine speed between actual and last received value	<	150.00	rpm/se c		
							for time and	=	0.50	sec		
							VGT offset learning is active	=	FALSE	-		
							maximum setpoint for EGR mass flow (see Look-Up-Table #9) and	>	0.40 to 0.1	g/rev		
							Engine speed	>=	1200.00	rpm		
							Engine speed and	<=	3000.00	rpm		
							Torque generating engine fuel injection quantity	>=	2.00	mm^3/r ev		
							Torque generating engine fuel injection quantity	<=	40.00	mm^3/r ev		
							and		0.00			
							setpoint valve position of exhaust-gas recirculation	>	2.00	%		
							and throttle position	<	5.00	%		
							and basic enable conditions met:	=	see sheet enable	-		
1		I					I		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) Flow Excessive	P0402	Detects excessive EGR flow. Actual MAF readings are compared to desired MAF values as an indication of how much EGR is flowing.	controller deviation of the 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	В
			with (a) Maximum Controller Deviation (see Look-Up-Table #10)	=	0.033 to 0.075	g/rev	EGR controller is active and	=	TRUE	-	whenever enable conditions are met	
			(b) Environmental Pressure correction factor	=	1	factor	The maximum possible air-mass flow > The air-mass setpoint and	=	TRUE	-		
							change of injection quantity between actual and last received value	<	25.00	(mm^3/ rev)/se c		
							for time and	=	0.25	sec		
							change of engine speed between actual and last received value	<	150.00	rpm/se c		
							for time and	=	0.50	sec		
							VGT offset learning is active and	=	FALSE	-		
							maximum setpoint for EGR mass flow	<=	0.10	g/rev		
							and maximum setpoint for EGR mass flow	>=	-0.03	g/rev		
							and Engine speed	<=	3000.00	rpm		
							Engine speed and	>=	1200.00	rpm		
							Torque generating engine fuel injection quantity	<=	120.00	mm^3/r ev		
							Torque generating engine fuel injection quantity	>=	40.00	mm^3/r ev		
							and basic enable conditions met:	=	see sheet enable tables	-		
							and NO Pending or Confirmed DTCs:	=	see sheet inhibit tables	-		
		l) for time	>=	0.50	sec		

Component / System	Fault Code	Monitor Strategy Description	Primary Malfunction Criteria	Threshold Logic and Value	Secondary Parameters		Enable Conditions		Time Required	MIL Illum.
Exhaust Gas	P0403	Diagnoses the EGR Valve	Voltage low during driver off state	= Short to ground: -	EGR Solenoid Control Circuit	=	ACTIVE		fail	В
Recirculation (EGR) Motor Control Circuit		low side driver circuit for circuit faults.	(indicates short-to-ground)	≤ 0.5 Ω impedance between signal and controller ground	and				conditions exists for 7 s monitor runs with 0.005 s rate whenever enable	
					offset learning for EGR valve is completed and	=	TRUE	-	conditions are met	
					battery voltage for	>	11.00	V		
	state o			time and starter is active cranking	>	3.00 FALSE	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	-		
			The ECM detects that the commanded state of the driver and the actual state of the control circuit do not match.		EGR Solenoid Control Circuit	=	ACTIVE	-	fail conditions exists for 3 s monitor runs	
					and offset learning for EGR valve is completed and	=	TRUE	-	with 0.005 s rate whenever enable	
					battery voltage for	>	11.00	V	conditions are met	
					time and	>	3.00	sec		
					starter is active cranking for	=	FALSE	-		
					time and basic enable conditions met:	> =	3.00 see sheet enable	sec -		
					and NO Pending or Confirmed DTCs	=	tables 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 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	<	0.25	V %	ignition on and basic enable conditions met: and NO Pending or Confirmed DTCs:	=	TRUE see sheet enable tables see sheet inhibit tables	-	fail conditions exists for 5 s test performed continuously 0.005 s rate	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	V %	ignition on and basic enable conditions met: and NO Pending or Confirmed DTCs:	=	TRUE see sheet enable tables see sheet inhibit tables	-	fail conditions exists for 5 s test performed continuously 0.005 s rate	В
Exhaust Gas Recirculation(EGR) Temperature Sensor A Circuit Low Voltage	P040C	Detects low voltage readings on the EGR cooler temperature circuit, indicating an OOR low condition on the EGR cooler temperature 2 circuit	EGR temperature sensor 2 voltage same as EGR sensor 2 temperature	<	0.14	∨ °C	(time since engine start and engine coolant temperature and ambient temperature and ambient pressure and (setpoint valve position of exhaust-gas recirculation and	> < > >	0.00 199.96 -60.04 20.00 -100.00	sec ℃ ℃ 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 gic and Value		Secondary Parameters		Enable Conditions	0/	Time Required	MIL Illum.
							setpoint valve position of exhaust-gas recirculation) and Engine Running (see parameter definition)	< =	200.00 TRUE	%		
							and (400.00			
							valve position of EGR cooler bypass and valve position of EGR cooler bypass	> <	-100.00 200.00	% %		
							and basic enable conditions met:	=	see sheet enable tables	-		
							and NO Pending or Confirmed DTCs:	=	see sheet inhibit tables	-		
					_							
Exhaust Gas Recirculation(EGR) Temperature Sensor 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	
							or time since engine start	>	100.00	sec		
							and engine coolant temperature and	>	-60.04	°C		
							ambient pressure and	>	20.00	kPa		
							(setpoint valve position of exhaust-gas recirculation	>	-100.00	%		
							and setpoint valve position of exhaust-gas recirculation	<	200.00	%		
) and Engine Running (see parameter definition) and	=	TRUE	-		
							current injection quantity and	>	0.00	mm^3/r ev		

Component / System	Fault Code	Monitor Strategy Description	Primary Malfunction Criteria	Threshold Logic and Value	Secondary Parameters		Enable Conditions		Time Required	MIL Illum.
					(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 see sheet enable tables see sheet inhibit tables	% - -		
Exhaust Gas Recirculation(EGR) Temperature Sensor Correlation (EGR 1/ EGR 2)	P040F	Detects biased EGR temperature sensors by comparing the two EGR cooler temp sensor after an engine off soak time	Path 1: ((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 °C = measured - parameter = measured - parameter	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	sec °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	< 0.13 V	(time since engine start	>	0.00	sec	fail conditions exists for 5 s monitor runs 0.05 s rate whenever enable conditions	В

Component / System	Fault Code	Monitor Strategy Description	Primary Malfunction Criteria		Threshold Logic and Value		Secondary Parameters		Enable Conditions		Time Required	MIL Illum.
			EGR sensor 1 temperature	>	1000	°C	and engine coolant temperature and	<	199.96	°C	are met	
							ambient temperature and	>	-60.04	°C		
							ambient pressure and /	>	20.00	kPa		
							setpoint valve position of exhaust-gas recirculation and	>	-100.00	%		
							setpoint valve position of exhaust-gas recirculation	<	200.00	%		
) and Engine Running (see parameter definition) and	=	TRUE	-		
							(valve position of EGR cooler bypass and	>	-100.00	%		
							valve position of EGR cooler bypass	<	200.00	%		
) and basic enable conditions met:	=	see sheet enable tables	-		
							and NO Pending or Confirmed DTCs:	=	see sheet inhibit tables	-		
Exhaust Gas Recirculation(EGR) Temperature Sensor B Circuit High Voltage	P041D	Detects high voltage readings on the EGR cooler temperature circuit, indicating an OOR high condition on the EGR cooler temperature 1 circuit	voltage of EGR temperature sensor 1	>	4.98	mV					fail conditions exists for 5 s monitor runs 0.05 s rate whenever enable	В
			same as EGR sensor 1 temperature	<	-45	°C	time since engine start	>	4.96	sec	conditions are met	
							ambient temperature	>	-10.04	°C		
							and engine coolant temperature ambient pressure and	> >	-60.04 20.00	°C kPa		
							(setpoint valve position of exhaust-gas recirculation	>	-100.00	%		

Component / System	Fault Code	Monitor Strategy Description	Primary Malfunction Criteria	Threshold Logic and Value	Secondary Parameters		Enable Conditions		Time Required	MIL Illum.
					and setpoint valve position of exhaust-gas recirculation)	<	200.00	%		
					and Engine Running (see parameter definition) and	=	TRUE	-		
					and 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	P0420	Detects insufficient	Calculated HC conversion rate	< 0.25 -	Stage 2 Rapid Heat-up Injection Mode	=	TRUE		fail	В
Efficiency Below Threshold Bank 1	F0420	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.		< 0.25 -	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		INUE	-	conditions exists for more than 0.1 seconds monitor runs once per driving cycle with 0.1 s	Б
					and monitor already enabled this drive cycle (i.e. once per trip) and (=	FALSE	-	rate whenever enable conditions are met	
					engine speed and	>	0.00	rpm	aremet	
					engine speed)	<=	6000.00	rpm		
					and absolute value of modeled temperature downstream of DOC minus modeled temperature without heat of exotherm downstream of DOC and	>	2.00	°C		

Component / System	Fault Code	Monitor Strategy Description	Primary Malfunction Criteria		Threshold Logic and Value	e	Secondary Parameters		Enable Conditions		Time Required	MIL Illum.
							(Coolant temperature at engine start and	>	-7.04	°C		
							Coolant temperature at engine start	<=	35.96	°C		
							and time with DOC monitor released and	<	200	sec		
							integrated modeled combusted fuel mass flow into DOC and	>	4.50	g		
							NO Pending or Confirmed DTCs:	=	see sheet inhibit tables	-		
							and basic enable conditions met:	=	see sheet enable tables	-		
Fuel Level Sensor "A" Circuit Range/Performanc e	P0461	Detects an error in the fuel tank sensor performance by comparing the decrease of the fuel level for a certain driven mileage to a	(a) - (b)	>=	149.13	miles	Engine Running (see parameter definition)	=	TRUE	-	fail conditions exists for 0.02 s monitor runs	В
		threshold.	with (a) total vehicle distance	=	measured parameter	-	for time	>	60.00	sec	0.02 s rate whenever enable	
			and with (b) saved value of total vehicle distance at start of test	=	measured parameter	-	and fuel volume in tank	<	100.00	%	conditions are met	
			and				and basic enable conditions met:		see sheet enable tables	-		
			(c) - (d) with	<	3.00	L	and NO Pending or Confirmed DTCs:		see sheet inhibit tables	-		
			(c) maximum volume of fuel reached in tank during test and with	=	measured parameter	-						
			(d) minimum volume of fuel reached in tank during test	=	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	<	0.48	V	ignition on	=	TRUE	-	fail conditions exists for 8 s test performed	В
			same as				and				continuously	

Component / System	Fault Code	Monitor Strategy Description	Primary Malfunction Criteria fuel level	>	Threshold Logic and Value 59.05	L	Secondary Parameters basic enable conditions met:	=	Enable Conditions see sheet enable tables	-	Time Required 0.01 s rate	MIL Illum.
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	V	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	Detects in range EGR valve position errors by comparing desired EGR position to actual EGR valve position	controller deviation of EGR valve calculated out of difference between desired and actual value or controller deviation of EGR valve calculated out of difference between desired and actual value	>=	5.00	%	offset learning of EGR actuator active and offset learning in the previous driving cycle was complete and Engine is in the normal state and duty cycle of the Intake Air Heater output and battery voltage and The position control is active and EGR Valve Jammed and EGR Valve Jammed and NO Pending or Confirmed DTCs: basic enable conditions met:		FALSE TRUE TRUE 327.67 11.00 FALSE FALSE TRUE see sheet inhibit tables see sheet enable tables	- - % V - - -	fail conditions exists for 8 s monitor runs with 0.02 s rate whenever enable conditions are met	В

Component / System	Fault Code	Monitor Strategy Description	Primary Malfunction Criteria	Threshold Logic and Value	Secondary Parameters		Enable Conditions		Time Required	MIL Illum.
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 starter is active cranking	> =	3.00 FALSE	sec -		
					for 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	P0489	Diagnoses the EGR Valve	Voltage low during driver off state	= Short to ground: -	EGR Solenoid Control Circuit	=	ACTIVE	_	fail	В
Recirculation (EGR) Motor Control Circuit 1 Low Voltage		low side driver circuit for circuit faults.	(indicates short-to-ground)	≤ 0.5 Ω impedance between signal and controller ground			, en le		conditions exists for 3 s monitor runs with 0.005 s rate whenever	2
					and battery voltage for	>	11.00	V	enable conditions are met	
					time and	>	3.00	sec		
					starter is active cranking for time	=	FALSE 3.00	- sec		
					and ignition on	=	TRUE	-		
					and basic enable conditions met:	=	see sheet enable tables	-		
					NO Pending or Confirmed DTCs:	=	see sheet inhibit tables	-		
	_							-		_

Component / System	Fault Code	Monitor Strategy Description	Primary Malfunction Criteria		Threshold Logic and Value		Secondary Parameters		Enable Conditions		Time Required	MIL Illum.
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	В
							and battery voltage for	>	11.00	V	enable conditions are met	
							time and	>	3.00	sec		
							starter is active cranking for time	=	FALSE 3.00	- sec		
							and ignition on and	=	TRUE	-		
							basic enable conditions met:	=	see sheet enable tables	-		
							NO Pending or Confirmed DTCs:	=	see sheet inhibit tables	-		
					_	-			_	-		-
Exhaust Gas Recirculation (EGR) Control Position Not Learned	P049D	Detects adaptation values of EGR valve are not plausible. Compares the difference between the maximum and minimum adaptation values to a threshold.	Path 1:				offset learning finished	=	FALSE	-	fail conditions exists for 0.005 s monitor runs with 0.005 s rate	В
			the difference between the maximum value of the read position (a) and the minimum value of the read position (b)	>	5.00	%	and				whenever enable conditions	
			with (a) maximum learned offset value for EGR valve	=	measured parameter	-	(engine coolant temperature	>=	84.96	°C	are met	
			and with (b) minimum learned offset value for EGR valve	=	measured parameter	-	and engine coolant temperature	<=	127.96	°C		
			or Path 2:) and					
			(learned offset value for EGR valve in the present driving cycle	>	10.00	%	(battery voltage	>=	11.00	V		
			or learned offset value for EGR valve in the present driving cycle	<	-10.00	%	and battery voltage	<=	655.34	V		

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

Component / System	Fault Code	Monitor Strategy Description	Primary Malfunction Criteria		Threshold Logic and Value		Secondary Parameters		Enable Conditions		Time Required	MIL Illum.
			<pre>(b) factor for EGR valve close position) and (</pre>	= = = >	0.20 100.00 measured parameter calculated parameter 5.00	factor % - - sec						
Idle Speed Too Low	P0506	Detects an idle speed governor that is unable to achieve the desired idle speed and the idle speed is too low	engine speed with (a) minimum engine speed and with (b) minimum idle speed setpoint and with (c) factor for calculation of engine speed interval	<	maximum value of (a) OR (b - (b * c)) 300.00 calculated parameter 24.00	rpm - %	engine speed (see Look-Up-Table #81) and (engine coolant temperature and engine coolant temperature) and idle speed controller active and vehicle speed and no other torque demanding function active and setpoint torque of the speed controller and engine speed and basic enable conditions met: and NO Pending or Confirmed DTCs:	>= < < > = < = > > = =	850 to 1100 126.96 -7.04 TRUE 1.86 TRUE 0 300.00 see sheet enable tables	rpm °C °C - mph - NM rpm - -	fail conditions exists for 15 s monitor runs with 0.1 s rate whenever enable conditions are met	В

Component / System	Fault Code	Monitor Strategy Description	Primary Malfunction Criteria		Threshold Logic and Value		Secondary Parameters		Enable Conditions		Time Required	MIL Illum.
Idle Speed Too High	P0507	Detects an idle speed governor that is unable to achieve the desired idle speed and the idle speed is too high.	engine speed with (a) maximum engine speed	> =	minimum value of (a) OR (b + (b * c)) 2500.00	rpm	engine speed (see Look-Up-Table #81) and (>=	850 to 1100	rpm	fail conditions exists for 15 s monitor runs with 0.1 s rate	В
			and with (b) minimum idle speed setpoint and with	=	calculated parameter	-	engine coolant temperature and engine coolant temperature	<	-7.04	°C °C	whenever enable conditions are met	
			(c) factor for calculation of engine speed interval	=	24.00	%) and			0	are met	
							idle speed controller active and vehicle speed	= <	TRUE 1.86	- mph		
							and no other torque demanding function active and	=	TRUE	-		
							setpoint torque of the speed controller and	>	0	NM		
							engine speed and basic enable conditions met:	>	300.00 see sheet enable tables	rpm -		
							and NO Pending or Confirmed DTCs:	=	see sheet inhibit tables	-		
Exhaust Gas Temperature (EGT) Sensor 1 Circuit Low Voltage	P0545	Detects low voltage readings on the EGT 1 circuit, indicating an OOR low condition on the EGT circuit	voltage of the temperature sensor upstream of oxidation catalyst	<	0.55	mV	NO Pending or Confirmed DTCs:	=	see sheet inhibit tables	-	fail conditions exists for 5 s monitor runs 0.050 s rate	В
			same as temperature upstream of oxidation catalyst	<	-50	°C	for time and	>	0.00	sec	whenever enable conditions	
							ignition on and basic enable conditions met:	=	TRUE see sheet enable	-	are met	
									tables	_		

Component / System	Fault Code	Monitor Strategy Description	Primary Malfunction Criteria		Threshold Logic and Value		Secondary Parameters		Enable Conditions		Time Required	MIL Illum.
Exhaust Gas Temperature (EGT) Sensor 1 Circuit High Voltage	P0546	Detects high voltage readings on the EGT 1 circuit, indicating an OOR high condition on the EGT 1 circuit	voltage of the temperature sensor upstream of oxidation catalyst same as	>	2.33	mV	NO Pending or Confirmed DTCs:	=	see sheet inhibit tables	-	fail conditions exists for 5 s monitor runs 0.050 s rate whenever	В
			temperature upstream of oxidation catalyst	>	1000	°C	time	>	0.00	sec	enable conditions are met	
							ignition on and	=	TRUE	-	aremet	
							basic enable conditions met:	=	see sheet enable tables	-		
Idle Control System - Fuel Quantity Lower Than Expected	P054E	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 less than a calibrated threshold, a fault will be set.		<	minimum expected injection quantity (map) * factor for calculating the minimum threshold out of the reference map TRUE 8.2 to 26.6 1.00 minimum expected injection quantity (map) * factor for calculating the minimum threshold out of the reference map	- mm^3/re v factor mm^3/re	following conditions for time: Current gear unchanged and Vehicle speed and Engine operation mode and Engine speed and Engine speed and Engine coolant temperature	> = <= <= >= >= >	5.00 TRUE 1.86 Normal 1300.00 400.00 -20.04	- mph - rpm °C	fail conditions exists for 1.5 s monitor runs with 0.02 s rate whenever enable conditions are met	В
			with				Ambient air temperature	>	-7.04	°C		

Component / System	Fault Code	Monitor Strategy Description	Primary Malfunction Criteria		Threshold Logic and Value	e	Secondary Parameters		Enable Conditions		Time Required	MIL Illum.
			(Current gear in park/neutral and minimum expected injection quantity (see Look-Up Table #44) and factor for calculating the minimum threshold out of the reference map)	-	FALSE 10.8 to 40.4 1.00	v factor	and Idle speed controller active and Fluctuation range of engine speed and NO Pending or Confirmed DTCs: and basic enable conditions met:	= <	TRUE 16383.50 see sheet inhibit tables see sheet enable tables	- rpm -		
Idle Control System	P054F	This diagnostic monitors the	Current injection quantity	>	maximum		following conditions for time:	>	5.00	sec	fail	В
- Fuel Quantity Higher Than Expected		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.			expected injection quantity (map) * factor for calculating the maximum threshold out of the reference map	v					conditions exists for 1.5 s monitor runs with 0.02 s rate whenever enable conditions are met	
			with (Current gear unchanged and	=	TRUE	-		
			Current gear in park/neutral and maximum expected injection quantity	=	TRUE 61.8 to 117	- mm^3/re	Vehicle speed and Engine operation mode	<=	1.86 TRUE	mph -		
			(see Look-Up-Table #42) and			v	and					
			factor for calculating the maximum threshold out of the reference map	=	1.00	factor	Engine speed and	<=	1300.00	rpm		
			OR				Engine speed and	>=	400.00	rpm		
			Current injection quantity	>	maximum expected injection quantity (map) factor for calculating the maximum threshold out of the reference map	mm^3/re v	Engine coolant temperature	>	-20.04	°C		
			with (and Ambient air temperature	>	-7.04	°C		

Component / System	Fault Code	Monitor Strategy Description	Primary Malfunction Criteria		Threshold Logic and Value	1	Secondary Parameters		Enable Conditions		Time Required	MIL Illum.
			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)	=	FALSE 78 to 166.6 1.00	- mm^3/re v factor	and Idle speed controller active and Fluctuation range of engine speed and NO Pending or Confirmed DTCs: and basic enable conditions met:	= = =	TRUE 16383.50 see sheet inhibit tables see sheet enable tables	- rpm -		
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	=	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	Special C
Cruise Control Resume Switch Circuit	P0567	Resume switch state indicates problem with the circuit	Resume Switch CAN message in high / active state	-	TRUE		ignition on and input circuit active and basic enable conditions met and NO Pending or Confirmed DTCs:	=	TRUE TRUE see sheet enable tables see sheet inhibit tables	-	fail conditions exists for 90 s monitor runs with 0.005 s rate whenever enable conditions are met	Special C
Cruise Control Set Switch Circuit	P0568	Set switch state indicates problem with the circuit	Set Switch CAN message in high / active state	=	TRUE	-	ignition on and input circuit active and basic enable conditions met and	=	TRUE TRUE see sheet enable tables	-	fail conditions exists for 90 s monitor runs with 0.005 s rate whenever	Special C

Component / System	Fault Code	Monitor Strategy Description	Primary Malfunction Criteria		Threshold Logic and Valu	e	Secondary Parameters		Enable Conditions		Time Required	MIL Illum.
							NO Pending or Confirmed DTCs:	=	see sheet inhibit tables	-	enable conditions are met	
	Dosas				0.00				TOULS		6.11	0
Cruise Control Input Circuit	P0575	Cruise control CAN communication monitoring	amount of errors in consecutive frames with number of consecutive frames	=	3.00	counts	ignition on and input circuit active and basic enable conditions met and NO Pending or Confirmed DTCs:	=	TRUE TRUE see sheet enable tables see sheet inhibit tables	-	fail conditions exists for 0.005 s monitor runs with 0.005 s rate whenever enable conditions are met	Special C
Brake Pedal Position Sensor "A" Circuit Range/Performanc	P057B	Compare maximum delta of analog brake pedal sensor with a threshold	EWMA filtered test result based on the difference of (a) - (b)	<=	0.40	factor	following conditions for time:	>	4	sec	monitor runs 0.02 s rate whenever enable	A
е			where				(conditions are met	
			(a) maximum analog brake sensor raw voltage during test(b) minimum analog brake sensor raw	=	calculated parameter calculated	v v	ignition on and	=	TRUE	-		
			voltage during test where difference of the brake sensor voltage corresponds to a corrected value of (see Look-Up-Table #13)	=	parameter 0 to 1	factor	starter is active cranking for	=	FALSE	-		
							time and	>	3.00	sec		
							battery voltage for	>	11.00	V		
							time) and	>	3.00	sec		
							gear has been in Park during this driving cycle	=	TRUE	-		
							full test has not been completed this driving cycle	=	TRUE	-		
							gear selector currently not in Park	=	TRUE			
							vehicle speed	>=	4.35 5.00	mph %		
							accelerator pedal position 1 and No Pending or Confirmed DTCs:	<	5.00 see sheet inhibit	%		
							and	=	tables	-		

Component / System	Fault Code	Monitor Strategy Description	Primary Malfunction Criteria	Ŀ	Threshold ogic and Value		Secondary Parameters basic enable conditions met:	=	Enable Conditions see sheet enable tables	-	Time Required	MIL Illum.
Brake Pedal Position Sensor "A" Circuit Low	P057C	Brake pedal position sensor voltage below a threshold for a calibrated period of time indicating an OOR low	Brake pedal position sensor voltage	<	0.25	V	ignition on and No Pending or Confirmed DTCs: and basic enable conditions met:	=	TRUE see sheet inhibit tables see sheet enable tables	-	fail conditions exists for 0.5 s monitor runs 0.01 s rate whenever enable conditions are met	A
Brake Pedal Position Sensor "A" Circuit High	P057D	Brake pedal position sensor voltage above a threshold for a calibrated period of time indicating an OOR high	Brake pedal position sensor voltage	>	4.75	V	ignition on and No Pending or Confirmed DTCs: and basic enable conditions met:	-	TRUE see sheet inhibit tables see sheet enable tables	-	fail conditions exists for 0.5 s monitor runs 0.01 s rate whenever enable conditions are met	A
ROM Memory Fault	P0601	Detects a fault in the ROM memory	ECM detects multiple errors in the ROM- memory by comparing a calculated checksum with a check word	=	TRUE	-	engine post drive/ afterun	=	TRUE	-	fail conditions exists for 0.01 s test performed once per drive cycle during afterrun	A
Control Module Not Programmed	P0602	Detects if the ECM is programmed.	ECM not programmed	=	TRUE	-	ignition on and engine pre drive	=	TRUE	-	fail conditions exists for 0.01 s test performed	A

Component / System	Fault Code	Monitor Strategy Description	Primary Malfunction Criteria	Threshold Logic and Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
							test performed once per driving cycle during ECU initialization	
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	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	A
		Monitors and detects the improper operation of the ECM. This is accomplished	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	
		Monitors and detects the improper operation of the ECM. This is accomplished by monitoring the output of	internal injector driver chip error	= TRUE -	Engine running and basic enable condition met:	= TRUE - = see sheet enable - tables	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 Valu	le	Secondary Parameters		Enable Conditions		Time Required	MIL Illum.
			faults detected in the SPI communication	>	485.00	counts	ignition on and NO Pending or Confirmed DTCs:	=	TRUE see sheet inhibit tables	-	fail conditions exists for at least 0.64 s monitor runs once per trip during pre drive at least twice every 0.08s rate whenever enable conditions are met	
			internal supply voltage or internal supply voltage	< >	4.2 5.25	V V	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 drive at least twice every 0.08s rate whenever enable conditions are 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 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	= >= =	TRUE 0 TRUE	•	fail conditions exists for at least 0.05 s monitor runs with 0.01 s rate whenever enable conditions	

Component / System	Fault Code	Monitor Strategy Description	Primary Malfunction Criteria	I	Threshold Logic and Val	ue	Secondary Parameters		Enable Conditions		Time Required	MIL Illum.
							measured energizing time for fuel injection and	>=	0	-	are met	
							engine speed and	>	1200.00	rpm		
							rail pressure and	>	20000.00	kPa		
							engine test active via diagnosis tester and	=	FALSE	-		
					_	_				_		
			Path 1:				engine speed and	>	1200.00	rpm	fail conditions	
			v parallel redundant calculation of angle for pilot injection 1 quantity or	<	-37.99	degrees	engine test active via diagnosis tester	=	FALSE		exists for at least 0.05 s monitor runs	
			parallel redundant calculation of angle for pilot injection 1 quantity)	>	44.98	degrees					with 0.01 s rate whenever	
			or Path 2:								enable conditions are met	
			verties of a second transformed and the second transformation of a second t	<	-37.99	degrees						
			parallel redundant calculation of angle for main injection quantity)	>	32.98	degrees						
			or Path 3:									
			(parallel redundant calculation of angle for post injection quantity 1 or	<	-360.00	degrees						
			for post injection quantity 1	>	-67.00	degrees						
			or Path 4:									
			(parallel redundant calculation of angle for post injection quantity 2	<	-183.00	degrees						
			or parallel redundant calculation of angle for post injection quantity 2)	>	32.98	degrees						
			or Path 5: /									
			(parallel redundant calculation of angle for post injection quantity 3	<	-183.00	degrees						

Component / System	Fault Code	Monitor Strategy Description	Primary Malfunction Criteria		Threshold Logic and Value	•	Secondary Parameters		Enable Conditions		Time Required	MIL Illum.
			or parallel redundant calculation of angle for post injection quantity 3)	^	0.00	degrees						
			(parallel redundant calculation of energizing times of the correction value for pilot injection quantity (see Look-Up- Table #54)	<	-500 to -50	µsec	redundant engine speed calculation and	>=	1200.00	rpm	fail conditions exists for at least 0.2 s monitor runs	
			or parallel redundant calculation of energizing times of the correction value for pilot injection quantity (see Look-Up- Table #53))	>	50 to 500	µsec	engine test active via diagnosis tester	=	FALSE	-	with 0.04 s rate whenever enable conditions are met	
			parallel redundant calculation of post injection 2 quantity	>	120.00	mm^3	engine test active via diagnosis tester and change in injection operation mode requested	=	FALSE	-	fail conditions exists for at least 0.4 s monitor runs with 0.04 s rate whenever enable conditions are met	
			parallel redundant calculation of averaged torque creating energizing time per cylinder (see Look-Up-Table #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 activation counter (intervention) of the surge damper	>=	107.00	counts	for time and	>	1.00	Sec	monitor runs with 0.04 s rate whenever	
							redundant engine speed calculation and	>	2120.00	rpm	enable conditions	
							general engine speed demand (see parameter definition line #213) and	=	FALSE	-	are met	
							external torque demand from stability ECU via CAN and	=	FALSE	-		

Component / System	Fault Code	Monitor Strategy Description	Primary Malfunction Criteria	La	Threshold ogic and Value		Secondary Parameters		Enable Conditions		Time Required	MIL Illum.
- Oyotom	0000	Decemption	U.I.O.I.				external torque demand from transmission ECU via CAN and	=	FALSE	-	noquirou	mann
							((cruise control active or	=	FALSE	-		
							(brake pedal status	=	TRUE	-		
							or redundant brake pedal status)	=	TRUE	-		
							for time)	>	0.04	sec		
							and (
							pedal position or	=	0	%		
							redundant calculation of pedal position for time)	= >	0 0.02	% sec		
							and (
							redundant engine speed calculation after start detected and	>	200.00	rpm		
							redundant engine speed calculation at start	>	1360	rpm		
) and engine test active via diagnosis tester	=	FALSE	-		
					_				_			
			parallel redundant calculation of averaged wave correction quantity for pilot injection	>=	7.50	mm^3	redundant engine speed calculation	>=	1200.00	rpm	fail conditions exists for at	
			or 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	-	least 0.2 s monitor runs with 0.04 s rate	
			parallel redundant calculation of averaged wave correction quantity for post injection 2	>=	7.50	mm^3					whenever enable conditions are met	
			or parallel redundant calculation of averaged wave correction quantity for post injection 3	>=	7.50	mm^3						
				_	_				_			

Component / System	Fault Code	Monitor Strategy Description	Primary Malfunction Criteria		Threshold Logic and Value		Secondary Parameters		Enable Conditions		Time Required	MIL Illum.
			(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	1
)	>=	164800.00	kPa	parallel redundant calculation of voltage of rail pressure sensor)	>	4.18	V	monitor runs with 0.01 s rate	1
							and delay time and	>	0.21	sec	whenever enable conditions	1
							parallel redundant calculation of injections active and	=	TRUE	-	are met	1
							redundant engine speed calculation and	>	1000.00	rpm		1
							engine test active via diagnosis tester and	=	FALSE	-		1
							conditions for level one signal range check fault detection are met	=	TRUE	-		1
			internal supply voltage	<	4.2	V	ignition on	=	TRUE		fail	1
			or internal supply voltage	>	5.25	V					conditions exists for 0.5 s test performed continuously with 0.01 s rate	1
			WDA (watch dog) shut off due to undervoltage	=	TRUE	-	shut off path test active	=	FALSE	-	fail conditions	1
			means internal supply voltage	<	4.2	V	and battery voltage	>	8.00	V	exists for 0.01 s	1
							for time and	>	0.01	sec	monitor runs with 0.01 s rate	1
							WDA (watch dog) line active	=	TRUE	-	whenever enable conditions are met	
			WDA (watch dog) shut off due to overvoltage	=	TRUE	-	shut off path test active	=	FALSE	-	fail conditions	

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

Component / System	Fault Code	Monitor Strategy Description	Primary Malfunction Criteria		Threshold Logic and Value		Secondary Parameters		Enable Conditions		Time Required enable conditions are met	MIL Illum.
			redundant, independent algorithm for plausibility fault of accelerator pedal signal for safety reasons: Path 1:		0.20		ignition on and	=	TRUE	-	fail conditions exists for 0.29 s	
			(maximum (a) (b)) - 2 * (maximum (c) (b)) with	>	0.29	V	engine test active via diagnosis tester and	=	FALSE	-	monitor runs with 0.04 s rate	
			(a) voltage accelerator pedal 1 and with	=	measured parameter	-	Input signal fault present and	=	FALSE	-	whenever enable conditions	
			 (b) lower limit for accelerator pedal voltage and with (c) voltage accelerator pedal 2 	=	0.85 measured	V -	ADC fault present	=	FALSE	-	are met	
			and		parameter							
			voltage accelerator pedal 1 or voltage accelerator pedal 2	>	1.54 1.54	V V						
) or Path 2:](maximum (a) (b)) - 2 * (maximum (c)	>	0.41	v						
			(b)) (b)) (a) voltage accelerator pedal 1	=	measured	-						
			and with (b) lower limit for accelerator pedal		parameter 0.85	V						
			voltage 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						
			Error during positive test processor internal	=	TRUE	-	ignition on and	=	TRUE	•	fail conditions	

Component / System	Fault Code	Monitor Strategy Description	Primary Malfunction Criteria	Thres Logic an		Secondary Parameters NO Pending or Confirmed DTCs:	=	Enable Conditions see sheet inhibit tables		Time Required exists for more than 0.08 s monitor runs at least twice every 0.08 s rate whenever enable conditions are met	MIL Illum.
			no response to shut-off path test processor internal	= TRU	E -	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	= TRU	E -	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	

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

Component / System	Fault Code	Monitor Strategy Description	Primary Malfunction Criteria		Threshold Logic and Value	3	Secondary Parameters		Enable Conditions	Time Required at least twice every 0.08 s rate whenever enable conditions are met	MIL Illum.
			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 3.30	V V	main injection	=	ACTIVE	fail conditions exists for more than 0.1 s monitor runs with 0.01 s rate whenever enable conditions are met	
			Path 1: engine speed or Path 2: engine speed	>	1500.00 1600.00	rpm rpm	injection cut off demand from ECM internal monitoring	=	TRUE	fail conditions exists for 0.02 s test performed continuously with 0.02 s	

Component / System	Fault Code	Monitor Strategy Description	Primary Malfunction Criteria	Threshold Logic and Value	Secondary Parameters	Enable Conditions	Time MIL Required Illum.
			security torque limitation request due to implausible air system control requests	= TRUE -	ignition on	= TRUE -	fail conditions exists for more than 267 events test performed continuously with 0.01 s
			security torque limitation request due to implausible rail pressure request	= TRUE -	ignition on	= TRUE -	fail conditions exists for more than 267 events test performed continuously with 0.01 s
			security torque limitation request due to implausible quantity setpoint control requests	= TRUE -	ignition on	= TRUE -	fail conditions exists for more than 267 events test performed continuously with 0.01 s
			indicated torque with (a) modeled inner engine torque and with (b) torque tolerance offset	(d)	Engine Running and basic enable conditions met:	= TRUE - = see sheet enable - tables	fail conditions exists for more than 0.28 s monitor runs with 0.04 s

Component / System	Fault Code	Monitor Strategy Description	Primary Malfunction Criteria		Threshold Logic and Value		Secondary Parameters		Enable Conditions	Time Required	MIL Illum.
			and with (c) torque of engine speed controller and with (d) torque of surge damper control	=	calculated parameter calculated parameter	-				rate whenever enable conditions are met	
			voltage of charging switch or voltage of charging switch if buffer of a bank is not charged completely, or not at all	>	210.00 210.00	V	ECM is in startup before injections are released	=	TRUE	fail conditions exists for more than 4 events monitor runs with 0.01 s rate whenever enable conditions are met	
			error at startup of DC/DC converter of one bank	=	TRUE	-	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 	
			DC/DC converter cannot be switched off.	=	TRUE		ignition on	=	TRUE	enable - conditions are met	
		ECM Electronic out-put driver circuitry determines if short circuit faults exist on injector charging bank #0.	Path 1: Voltage high of injector bank #0 charging switch in case of loaded buffer capacitor or Path 2:	>	210.00	V	Engine pre drive	=	TRUE	- fail conditions exists for more than 0.04 s monitor runs with 0.01 s rate whenever enable	

Component / System	Fault Code	Monitor Strategy Description	Primary Malfunction Criteria		Threshold Logic and Value		Secondary Parameters		Enable Conditions	Time Required	MIL Illum.
			Voltage high of injector bank #0 charging switch in case of not loaded buffer capacitor	>	210.00	V				conditions are met	
		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	
Control Module Analog to Digital Performance	P060B	Electronic ECM circuitry determines if ADC is correctly converting signals within the correct time periods.	time for calibration of ADC	>=	0.30	sec	ignition on	=	TRUE -	fail conditions exists for 0.01 s test performed continuously 0.01 s	A
			voltage at ADC test voltage input or voltage at ADC test voltage input	< >	4.73 4.83	V V	ignition on	=	TRUE -	fail conditions exists for at least 0.15 s test performed continuously 0.01 s	

Component / System	Fault Code	Monitor Strategy Description	Primary Malfunction Criteria		Threshold Logic and Value	e	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)	V A	0.95 1.05	factor factor	ignition on	=	TRUE	-	fail conditions exists for at least 0.15 s test performed continuously	
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 /	Fault	Monitor Strategy	Primary Malfunction		Threshold	Secondary		Enable		Time	MIL
System Fuel Pre-supply Pump Control Circuit Open	Code P0627	Description Diagnoses the Fuel Pre- Supply Pump low side driver circuit for circuit faults.	Criteria Voltage low during driver off state (indicates open circuit)		Logic and Value Open Circuit:2 - 200 K Ω impedance between ECU pin and load	Parameters engine post drive/ afterun for time and battery voltage for time and ignition on and basic enable conditions met:	>	Conditions FALSE 1.00 11.00 3.00 TRUE see sheet enable tables	- V sec -	Required fail conditions exists for 0.27s monitor runs with 0.2 s rate whenever enable conditions are met	Illum. B
Fuel Pre-supply Pump Control Circuit Low Voltage	P0628	Diagnoses the Fuel Pre- Supply Pump low side driver circuit for circuit faults.	Voltage low during driver off state (indicates short-to-ground)		Short to ground: - ≤ 0.5 Ω impedance between signal and controller ground	engine post drive/ afterun for time and battery voltage for time and ignition on and basic enable conditions met:	> > > = =	FALSE 1.00 11.00 3.00 TRUE see sheet enable tables	- Sec V sec -	fail conditions exists for 0.5s monitor runs with 0.2 s rate whenever enable conditions are met	В
Fuel Pre-supply Pump Control Circuit High Voltage	P0629	Diagnoses the Fuel Pre- Supply Pump low side driver circuit for circuit faults.	Voltage high during driver on state (indicates short to power)	=	Short to power: ≤ 0.5 Ω impedance between signal and controller power	engine post drive/ afterun for time and battery voltage	=	FALSE 1.00 11.00	- sec V	fail conditions exists for 0.27 s monitor runs with 0.2 s rate whenever enable conditions are met	В

Component / System	Fault Code	Monitor Strategy Description	Primary Malfunction Criteria	Thresh Logic and		Secondary Parameters		Enable Conditions		Time Required	MIL Illum.
						for time and ignition on and basic enable conditions met:	> = =	3.00 TRUE see sheet enable tables	sec - -		
Control Module Long Term Memory Performance	P062F	Each data block of memory is read for a check sum error and flags if a fault is found.	EEPROM sector reports faults regarding: unable to erase or change whole EEPROM sector or read order is not successfully accomplished for more than amount of blocks or amount of write errors in current block	= TRUE = 3 = 3	- counts counts	ignition on and basic enable conditions met:	=	TRUE see sheet enable tables	-	fail conditions exists for 0.01 s test performed continuously at the 0.01 s rate	A
Sensor Reference Voltage "A" Circuit/Open	P0641	Sensor supply voltage 1 circuitry determines if faults related to maintaining the supply voltage level exists.	Reference supply voltage 1 or Reference supply voltage 1	≤ 4.70 ≥ 5.30	V	Ignition on and basic enable conditions met:	=	TRUE	-	fail conditions exists for 0.1 s test performed continuously 0.01s rate	А
Sensor Reference Voltage "B" Circuit/Open	P0651	Sensor supply voltage 2 circuitry determines if faults related to maintaining the supply voltage level exists.	Reference supply voltage 2 or Reference supply voltage 2	≤ 4.70 ≥ 5.30	V V	Ignition on and basic enable conditions met:	=	TRUE	-	fail conditions exists for 0.1 s test performed continuously 0.01s rate	A

Component / System	Fault Code	Monitor Strategy Description	Primary Malfunction Criteria		Threshold Logic and Value		Secondary Parameters		Enable Conditions		Time Required	MIL Illum.
Sensor Reference Voltage "C" Circuit/Open	P0697	Sensor supply voltage 3 circuitry determines if faults related to maintaining the supply voltage level exists.	Reference supply voltage 3	S	4.70	V	Ignition on	=	TRUE	-	fail conditions exists for 0.1 s test	A
			or Reference supply voltage 3	2	5.30	V	and basic enable conditions met:	=	TRUE	-	performed continuously 0.01s rate	
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	>=	0.20	V	following conditions met for time:	>=	0.26	sec	fault exists for more than 6 sec; monitor runs at 0.1 s	В
			within time period	=	0.10	sec	Common conditions:				when enable conditions	
							Engine is running for time Operation point 1:	= >	TRUE 8.00	- sec	are met	
							Injection quantity	>=	4.00	mm^3/r ev		
							Injection quantity	=<	180.00	mm^3/r ev		
							Engine speed	>=	500.00	rpm		
							Engine speed) or Operation point 2:	=<	4500.00	rpm		
							(Injection quantity	>=	60.00	mm^3/r		
							Injection quantity	=<	180.00	ev mm^3/r ev		
							Engine speed Engine speed	>= =<	3000.00 4500.00	rpm rpm		
) Battery voltage DPF regeneration is not active	> =	11.00 FALSE	V -		
							for time A/F sensor error status bit (see parameter definition table)	> =	0.50 FALSE	sec -		
							NO Pending or Confirmed DTCs:	=	see sheet inhibit tables	-		

Component / System	Fault Code	Monitor Strategy Description	Primary Malfunction Criteria		Threshold Logic and Valu	ie	Secondary Parameters basic enable conditions met:	=	Enable Conditions see sheet enable tables	-	Time Required	MIL Illum
		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	
			within time period	=	0.10	Sec	Common conditions: Engine is running for time Operation point 1: (= >	TRUE 8.00	- sec mm^3/r	runs at 0.1 s when enable conditions are met	
							Injection quantity Injection quantity	>=	4.00 180.00	ev mm^3/r ev		
							Engine speed Engine speed) or	>= =<	500.00 4500.00	rpm rpm		
							Operation point 2: (Injection quantity	>=	60.00	mm^3/r ev		
							Injection quantity Engine speed Engine speed	=< >= =<	180.00 3000.00 4500.00	mm^3/r ev rpm rpm		
) Battery voltage DPF regeneration is not active for time A/F sensor error status bit (see parameter definition table)	> = > =	11.00 FALSE 0.50 FALSE	V - sec -		
							basic enable conditions met:	=	see sheet inhibit tables 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	
		comparison to internal ECM calibration resistance	resistance raw value and internal resistance reference value								for more than 600 sec; monitor	
			within time	=	0.10	Sec	Common conditions: Engine is running for time Operation point 1:	= >	TRUE 8.00	- sec	runs at 0.1 s when enable conditions are met	

Component / Fault Monitor Strategy Primary Malfunction Threshold Secondary Enable		Time	MIL
System Code Description Criteria Logic and Value Parameters Conditio		Required	Illum.
Injection quantity >= 4.00	mm^3/r ev		
Injection quantity =< 180.00			
	ev		
Engine speed >= 500.00			
Engine speed =< 4500.00) rpm		
or			
Operation point 2:			
(Injection quantity >= 60.00	mm^3/r		
Injection quantity >= 60.00	ev		
Injection quantity =< 180.00			
	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 in	hibit -		
tables			
basic enable conditions met: = see sheet en	nable -		
tables tables			
A/F sensor resistance Filtered difference between Internal =< -0.20 V following conditions met for time: >= 0.26	sec	fault exists	
comparison to internal ECM resistance raw value and internal calibration resistance reference value		for more than 600	
		sec; monitor	
within time = 0.10 sec Common conditions:		runs at 0.1 s	
Engine is running = TRUE	-	when enable	
for time > 8.00	sec	conditions	
Operation point 1:		are met	
Injection quantity >= 4.00	mm^3/r		
Injection quantity =< 180.00	ev mm^3/r		
	ev		
Engine speed >= 500.00			
Engine speed =< 4500.00			
or			
Operation point 2:			
	mm^3/r		
	11111°-3/1		
Injection quantity >= 60.00	ev		
Injection quantity >= 60.00 Injection quantity =<	ev mm^3/r		

Component / System	Fault Code	Monitor Strategy Description	Primary Malfunction Criteria		Threshold Logic and Value		Secondary Parameters Engine speed Engine speed) 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:	>= =< > = > = = =	Enable Conditions 3000.00 4500.00 11.00 FALSE 0.50 FALSE see sheet inhibit tables see sheet enable tables	rpm rpm V - sec - -	Time Required	MIL Illum.
		A/F sensor internal ECM SPI 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		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 Battery voltage for time and Battery voltage	= = > = > > = > > = = = = = = = = = = =	TRUE TRUE FALSE 0.10 FALSE 1.00 10.50 3.00 see sheet enable tables	- sec - sec V sec -	fail conditions exists for 2 s monitor runs with 0.01 s rate whenever enable conditions are met	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.
Fan 1 Control Circuit Low	P0691	Diagnoses the Cooling Fan low side driver circuit for circuit faults.	Voltage low during driver off state (indicates short-to-ground)	=	Short to ground: $-$ $\leq 0.5 \Omega$ impedance between signal and controller ground	battery voltage	>	11.00	V	fail conditions exists for 3 s test performed continuously 0.02 s rate	В
						time and starter is active cranking	>	3.00 FALSE	sec		
						for time and	>	3.00	sec		
						ignition on and basic enable conditions met: and	=	TRUE see sheet enable tables	-		
						NO Pending or Confirmed DTCs:	=	see sheet inhibit tables	-		
Fan 1 Control Circuit High	P0692	Diagnoses the Cooling Fan low side driver circuit for circuit faults.	Voltage high during driver on state (indicates short to power)	=	Short to power: $-$ $\leq 0.5 \Omega$ impedance between signal and controller power	battery voltage	>	11.00	V	fail conditions exists for 1 s test performed continuously 0.02 s rate	В
						for time and starter is active cranking	>	3.00 FALSE	sec		
						for time and	>	3.00	sec		
						ignition on and basic enable conditions met:	=	TRUE see sheet enable	-		
						and 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.
Fuel Pump Control Module Requested MIL Illumination	P069E	Monitors Serial Data Communication for request from Fuel Pump Control Module to illuminate the MIL.	serial data communication from the Fuel Pump Control Module indicates the Fuel Pump Control Module has requested a MIL	= TRUE -	ignition on	= TRUE	conditions exists for 1 s monitor runs once per trip	3 (No MIL)
		Fuel Pump Control Module controls the active grille shutters on the vehicle			for		with 0.25 s rate whenever enable	
					time and		sec conditions are met	
					new message is received via CAN and	= TRUE	-	
					basic enable conditions met:	 see sheet enable tables 	-	
					NO Pending or Confirmed DTCs:	 see sheet inhibit tables 		
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	= TRUE	- fail conditions exists for 5 s test performed	С
					and NO Pending or Confirmed DTCs: and basic enable conditions are met:	 see sheet inhibit tables see sheet enable 	- 0.02 s	
						tables		
Engine Oil Pressure Control Circuit Low	P06DB	Detects a short-to-ground 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-ground: - ≤ 0.5 Ω impedance between signal and controller ground 	ignition is on or running	= TRUE	- fail conditions exists for 5 s test performed continuously 0.02 s	С
				and NO Pending or Confirmed DTCs: and	= see sheet inhibit tables	-		
					basic enable conditions are 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.
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 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	conditions exists for 1 s monitor runs once per trip	B (No MIL)
Brake Switch "B" Circuit	P0703	Rolling counter and protection value evaluation of message received from Body Control Module	number of messages with validation errors in the last number of messages (sliding window) received from body control module	>= 3.00 counts = 10.00 counts	ignition on for time and basic enable conditions met: and NO Pending or Confirmed DTCs:	= TRUE - >= 3.00 sec = see sheet enable - tables = see sheet inhibit - tables	fail conditions exists for 0.015 s test performed continuously 0.005 s rate	С

Component / System	Fault Code	Monitor Strategy Description	Primary Malfunction Criteria	Threshold Logic and Value	Secondary Parameters	Enable Conditions		Time Required	MIL Illum.
Park/Neutral Position (PNP) Switch Circuit High Voltage	P0851	Detects high voltage condition on the PNP circuit by comparing the ECM sensed input to the broadcasted state from the TCM over GMLAN serial data	ECM (on-board control unit) sensed position based on PNP switch inputs to ECM indicates park or neutral and the GMLAN message from the TCM disagrees	= TRUE -	(battery voltage and battery voltage) and engine speed and vehicle speed and engine torque and accelerator pedal position and (selected gear position is park or selected gear position is neutral) and basic enable conditions: and NO Pending or Confirmed DTCs:	>= 11.00 <= 655.34 >= 800.00 >= 14.92 >= 60.00 >= 0.00 = FALSE = FALSE = FALSE = see sheet enat tables		fail conditions exist for more than 3000 events monitor runs with 0.01 s rate whenever enable conditions are met	В
Park/Neutral Position (PNP) Switch Circuit Low Voltage	P0852	Detects low voltage condition on the PNP circuit by comparing the ECM sensed input to the broadcasted state from the TCM over GMLAN serial data	GMLAN Message for PNP position indicates park neutral and disagrees with ECM (on-board control unit) sensed position based on PNP switch inputs to ECM	= TRUE -	(battery voltage and battery voltage) and engine speed and (selected gear position is park or selected gear position is neutral	>= 11.00 <= 655.34 <= 7000.00 = TRUE = TRUE	V V rpm -	fail conditions exist for more than 3000 events monitor runs with 0.01 s rate whenever enable conditions are met	В

Component / 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	-		
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	number of messages with validation errors in the last number of messages (sliding window) received from traction	>= 8.00 = 10.00	counts	ignition on for time	= >=	TRUE 3.00	- Sec	test performed continuously 0.01 s rate	Special C
			control system			and basic enable conditions met: and NO Pending or Confirmed DTCs:	=	see sheet enable tables see sheet inhibit tables	-		
Reductant Pump High Control Circuit Low Voltage	P1043	Diagnoses the Ruductant Pump Motor high side driver circuit for circuit faults.	Voltage low during driver on state (indicates short to ground)	Short to ground: ≤ 0.5 Ω impedance between signal and controller ground		and 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 and 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
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 and 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 Injector High Control Circuit Low Voltage	P1048	Detects a short circuit to ground on the high side of 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 on state (indicates short to ground)	=	Short to ground: $\leq 0.5 \Omega$ impedance between signal and controller ground		ignition on	=	TRUE	-	fail conditions exists for 2 s monitor runs with 0.010 s rate whenever	В
							and ECU Initialization tasks in progress for	=	FALSE	-	enable conditions are met	
							time and	>	0.10 10.50	sec V		
							Battery voltage for time	>	3.00	v		
							and basic enable conditions met:	=	see sheet enable tables	-		
							AND NO Pending or Confirmed DTCs	=	see sheet inhibit tables	-		
									_	-		_
Reductant Injector High Control Circuit High Voltage	P1049	Detects a short circuit to battery on the high side of 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 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 2 s monitor runs with 0.010 s rate whenever	В
							ECU Initialization tasks in progress for	=	FALSE	-	enable	
							time and	>	0.10	sec	are met	
							Battery voltage for	>	10.50	V		
							time and basic enable conditions met:	>	3.00 see sheet enable tables	sec -		
							AND NO Pending or Confirmed DTCs	=	see sheet inhibit tables	-		
Fuel Rail Pressure	P1089	Measured rail pressure is	rail pressure deviation from setpoint	>	2500.00 kF	a	rail pressure control commanded during	=	TRUE		fail	В
Performance		checked against desired rail pressure to detect high rail pressure conditions in fuel cut-off	calculated as the absolute value of difference between desired and actual value				injection timing correction learning phase				conditions exists for 720 crank revolutions	

Component / System	Fault Code	Monitor Strategy Description	Primary Malfunction Criteria		Threshold Logic and Value		Secondary Parameters and NO Pending or Confirmed DTCs limiting rail pressure set point for time and basic enable conditions met:	= > =	Enable Conditions see sheet inhibit tables 2.00 see sheet enable tables	- sec -	Time Required monitor runs with 0.02 s rate whenever enable conditions are met	MIL Illum.
Charge Air Cooler Temperature Sensor Performance	P10CF	Detects a biased charge air cooler temperature sensor downstream or charge air cooler temperature sensor upstream by comparing the respective values at startup.	Path 1: [(a) - (b)] (see Look-Up-Table #3) with (a) captured charge air cooler downstream temperature at start and with (b) captured charge air cooler upstream temperature at start	> =	25 to 999 measured parameter measured parameter	°C - -	minimum engine-off time and engine-off time is valid and ambient temperature and engine speed (see Look-Up-Table #81) 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 TRUE -60.04 850 to 1100 0.01 FALSE FALSE see sheet enable tables see sheet inhibit	sec rpm sec - -	fail conditions exists for 0.1 s monitor runs once per trip with 0.1 s rate whenever enable conditions are met	В
Reductant Injector Temperature - Exhaust Gas Temperature 2 Correlation	P10D0	Detects an implausible SCR dosing valve coil temperature by comparing the temperature with a reference temperature	(a) - (b) (see Look-Up-Table #80) with	>	30 to 3276.7	°C	ignition on	=	TRUE	-	fail conditions exists for 0.1 s monitor with 0.1 s rate	В

Component / System	Fault Code	Monitor Strategy Description	Primary Malfunction Criteria		Threshold Logic and Value		Secondary Parameters		Enable Conditions		Time Required	MIL Illum.
			(a) dosing valve coil temperature	=	calculated parameter	°C	state of selective catalytic reduction system	=	STANDBY or NO PRESSURE CONTROL	-	whenever enable conditions	
			and with (b) oxidation catalyst downstream temperature	=	measured parameter	°C	and active heating phase for dosing valve and	=	FALSE	-	are met	
							valve already activated within this driving cycle and	=	FALSE	-		
							battery voltage and	>	11.00	V		
							ambient temperature and engine run time	>= <	-60.04 3.00	°C sec		
							and engine off time	>	28800.00	sec		
							and urea pump motor output duty cycle and	=	0.00	%		
							Max [(a), (b)] - Min [(a), (b)] where	<=	15.00	К		
							(a) ambient temperature	=	measured parameter	-		
							(b) oxidation catalyst downstream temperature and	=	measured parameter	-		
							urea dosing valve output duty cycle and	>	3.00	%		
							coil current measurement is valid (e.g. no dosing valve errors present)	=	TRUE	-		
							and basic enable conditions met:	=	see sheet enable tables	-		
							and NO Pending or Confirmed DTCs:	=	see sheet inhibit tables	-		
O2 Sensor	P11A6	A/Fsensor signal monitoring	difference between measured A/F sensor	>	0.04 to 0.07		following conditions met for Integrated air	>	80	g	fail	В
Performance - Signal High During Moderate Load Sensor 1		in part load mode, which monitors a deviation of the raw A/F sensor signal and calculated sensor signal	concentration and filtered calculated A/F concentration -> refer to Column 1 in the table (see Look-Up-Table #51)				mass:				conditions exists for 0.1 s monitor runs with 0.02 s	
			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)	<	2700 to 4500	rpm	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 Injection quantity -> refer to the Column 1 in the table (see Look-Up-	>	Conditions -1 to 16	mm^3/r ev	Required	Illum.
					Table #49) 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	=	TRUE	-		
					Post injection is not active (post injection only active during cold start catalyst heating or DPF regeneration)	=	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		
					Absolute change in actual calculated O2 concentration	<	0.02	-		
					for time Fuel volume in fuel tank	>= >=	1.50 0.00	sec L		
					Battery voltage	>=	11.00	L V		
					Decel Fuel Cut-Off (DFCO)	=	FALSE	-		
					NO Pending or Confirmed DTCs:	=	see sheet inhibit	-		
					basic enable conditions met:	=	tables see sheet enable			
						-	tables	-		
O2 Sensor Performance - Signal Low During Moderate Load Bank 1 Sensor 1	P11A9	A/Fsensor signal monitoring in part load mode, which monitors a deviation of the raw A/F sensor signal and calculated sensor signal	difference between filtered calculated A/F concentration and measured A/F sensor concentration -> refer to Column 1 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 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 (see Look-Up-Table #47)	<	2700 to 4500	rpm	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	210 1110	
					Injection quantity -> refer to the	<	0.4 to 44	mm^3/r		
					Column 1 in the table (see Look-Up- Table #48)			ev		

Component /	Fault	Monitor Strategy	Primary Malfunction		Threshold		Secondary		Enable		Time	MIL
System	Code	Description	Criteria		Logic and Value		Parameters		Conditions		Required	Illum.
							Air mass per cylinder ->refer to the Column 1 in the table (see Look-Up- Table #46) Air mass per cylinder ->refer to the Column 1 in the table (see Look-Up-	~ ~	0.09 to 0.25 0.253 to 0.45	g/rev g/.rev		
							Table #45) DPF regeneration not active	=	TRUE	-		
							Post injection only active during cold start catalyst heating or DPF regeneration)	=	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 0.02	°C		
							Absolute change in actual calculated 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) NO Pending or Confirmed DTCs:	=	FALSE see sheet inhibit	-		
							NO Pending of Committee DTCs.	=	tables	-		
							basic enable conditions met:	=	see sheet enable tables	-		
NOx Sensor Performance -	P11CB		EWMA filtered delta high upstream NOx	<	0.00	factor	Duration for averaging upstream NOx	>=	6.00	sec	fault exists	A
Signal High Bank 1 Sensor 1		the measured NOx sensor concentration from the modeled NOx concentration	monitor				sensor signal and NOx model				for more than 1 event; monitor runs at 0.1 s once	
			Threshold for high upstream NOx rationality check	=	(a) * (b) * (c) * (d) * (e)						per trip	
			(a) Base threshold for high upstream NOx rationality check (see Look-Up-Table #74)	=	0.410034 to 1.400024	factor	(
			(b) correction factor dependent on NOx model	=	1	factor	Status of NOx signal of upstream NOx sensor (please see the definition)	=	TRUE	-		
			(c) correction factor dependent on engine coolant temperature and transmission gear	=	1	factor	Normal Mode (Particulate Filter Regeneration not active)	=	TRUE	-		
			(d) correction factor dependent on ambient pressure	=	1	factor	for time		30.00	sec		
			(e) correction factor dependent on relative humidity	=	1	factor	ambient pressure	>=	74.80	kPa		
							ambient pressure ambient temperature ambient temperature	<= >= <=	106.00 -30.04 79.96	kPa ℃ ℃		
							(•		

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	<=	0.120117	factor		
					percent positive deviation					
					filtered modeled NOx concentration	>=	0.120117	factor		
					percent positive deviation					
					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		
						<= >0	0 to 1			
					Exhaust gas temperature range at	>0	0 10 1	factor		
					Upstream NOx sensor (see Look-Up-					
					Table #76)					
					Vehicle speed	>=	12.43	mph		
					Vehicle speed	<=	37.29	mph		
					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	>=	65.00	ppm		
					upstream of the SCR					
					filtered modeled NOx-concentration	<=	600.00	ppm		
					upstream of the SCR					
					for time	>	0.50	sec		
							0.00	000		
)					
					, Diagnostic has not completed this driving	=	FALSE	_		
					cycle	-	TALOL	-		
					NO Pending or Confirmed DTCs:	=	see sheet inhibit			
					NO Fending of Committee DTCs.	-	tables	-		
					hasis enable conditions mate					
					basic enable conditions met:	=	see sheet enable	-		
							tables			
					I					
					EWMA fast initialization mode:					
					filter coefficient for fast initialization	=	0.32	factor		
					number of high upstream NOx monitor	>=	1.00	counts		
					measurements for current driving cycle					
					of fast initialization mode					
					number of high upstream NOx monitor	>=	4.00	counts		
					measurements for fast initialization					
					mode					
					EWMA Rapid Response mode:					
					EWMA filtered delta high upstream	>	0.31	factor		
					NOx monitor	-	0.01	100101		
					(a) - (b)	<	0.00	factor		
							calculated	Tacilli		
					(a) threshold of high upstream NOx	=		-		
I	I	1	l	I	monitor		parameter	l	I	I

Component / System	Fault Code	Monitor Strategy Description	Primary Malfunction Criteria		Threshold Logic and Value		Secondary Parameters		Enable Conditions		Time Required	MIL Illum.
							(b) measured value of high	=	calculated	-		
							upstream NOx monitor filter coefficient for Rapid Response mode	=	parameter 0.38	factor		
							number of high upstream NOx monitor measurements for current driving cycle of Rapid Response mode	>=	1.00			
							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 measurements for stabilized mode	=	0.16 1	factor counts		
					_				_	_		_
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 once	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	-	per trip	
			(a) Base threshold for high upstream NOx rationality check (see Look-Up- Table #75)	=	-0.670044 to - 0.52002	factor	Normal Mode (Particulate Filter Regeneration not active)	=	TRUE	-		
			(b) correction factor dependent on NOx	=	1	factor	for time		30.00	sec		
			model (c) correction factor dependent on engine coolant temperature and transmission gear	=	1	factor	ambient pressure	>=	74.80	kPa		
			(d) correction factor dependent on ambient pressure	=	1	factor	ambient pressure	<=	106.00	kPa		
			 (e) correction factor dependent on relative humidity (see Look-Up-Table #69) 	=	1 to 1.2	factor	ambient temperature	>=	-30.04	°C		
			#09)				ambient temperature	<=	79.96	°C		
							filtered modeled NOx concentration	<=	0.120117	factor		
							filtered modeled NOx concentration percent negative deviation	>=	0.120117	factor		
							, for time	>=	2.00	sec		
							for time	>	2.00	sec		
1	l	I	I I				time since start	>	0.00	sec		

Conditions 59.96 °C 125.96 °C 0 to 1 factor 12.43 mph 37.29 mph 1.00 sec 0 to 1 factor	Required	IIIum.
125.96 °C 0 to 1 factor 12.43 mph 37.29 mph 1.00 sec 0 to 1 factor 1.00 sec		
0 to 1 factor 12.43 mph 37.29 mph 1.00 sec 0 to 1 factor 1.00 sec		
12.43 mph 37.29 mph 1.00 sec 0 to 1 factor 1.00 sec		
37.29 mph 1.00 sec 0 to 1 factor 1.00 sec		
37.29 mph 1.00 sec 0 to 1 factor 1.00 sec		
1.00 sec 0 to 1 factor 1.00 sec		ļ
0 to 1 factor		
1.00 sec		1
		1
		1
		1
		1
65.00 ppm		1
bb.bb ppm		1
600.00 ppm		1
0.50 sec		1
FALSE -		
see sheet inhibit -		
tables see sheet enable -		1
tables		
0.32 factor 1.00 counts		
4.00 counts		
0.21 factor		
		1
		1
		1
		1
		1
parameter		1
0.38 factor		
1.00		
	1.00counts4.00counts0.21factor0.00factorcalculated-parameter-calculated-parameter-0.38factor	1.00counts4.00counts0.21factor0.00factorcalculated-parameter-calculated-parameter-0.38factor

Component / System	Fault Code	Monitor Strategy Description	Primary Malfunction Criteria		Threshold _ogic and Valu	e	Secondary Parameters		Enable Conditions		Time Required	MIL Illum.
							Total number of low upstream NOx monitor measurements for Rapid Response mode EWMA stabilized mode: filter coefficient for stabilized mode number of low upstream NOx monitor measurements for stabilized mode	>=	6.00 0.16 1	counts factor counts		
NOx Sensor Offset Learning at Min Limit - Bank 1	P11D3	Detects NOx offset value min of the upstream NoX Sensor	average NOx offset value	<	-90.00	ppm	(fault exists for more than 2	В
Sensor 1			NOx sensor signal averaged over time	=	1.00	sec	battery voltage	>=	11.00	V	DFCO events; monitor runs	
							and battery voltage and	<=	655.34	V	at 0.02 s when enable conditions	
							Oxidation Catalyst upstream temperature and	>=	99.96	°C	are met	
							Oxidation Catalyst upstream temperature	<=	599.96	°C		
							and		TOUE			
							Engine running for time and	= >	TRUE 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	<=	100.00	%		
							NOx sensor measured lambda	>	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	rpm		
							integrated air mass flow (see Look-Up- Table #30)	>	100 to 500	g		

Component / System	Fault Code	Monitor Strategy Description	Primary Malfunction Criteria		Threshold Logic and Valu	e	Secondary Parameters		Enable Conditions		Time Required	MIL Illum.
NOx Sensor Offset Learning at Max Limit - Bank 1 Sensor 1	P11D4	Detects NOx Offset value max. of the upstream NoX Sensor	average NOx offset value	>	50.00	ppm	(fault exists for more than 2 DFCO	В
			NOx sensor signal averaged over time	=	1.00	sec	battery voltage and	>=	11.00	V	events; monitor runs at 0.02 s	
							battery voltage and	<=	655.34	V	when enable conditions	
							Oxidation Catalyst upstream temperature and	>=	99.96	°C	are met	
							Oxidation Catalyst upstream temperature and	<=	599.96	°C		
							Engine running	=	TRUE	-		
							for time	>	20.00	sec		
							and					
							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	>=	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	rpm		
							integrated air mass flow (see Look-Up- Table #30)	>	100 to 500	g		

Component / System	Fault Code	Monitor Strategy Description	Primary Malfunction Criteria		Threshold Logic and Value		Secondary Parameters		Enable Conditions		Time Required	MIL Illum.
NOx Sensor		During the NOx sensor self-	status NOx-self-diagnosis	-	2	-	General Conditions required before		Conditions		fault exists 3	B
Performance - Sensing Element		diagnostic test, the number of aborted self-diagnostics is			(NOx self diagnosis		Shutdown:				times per driving-cycle;	
Status Signal Bank		monitor. If the self-			aborted)						monitor run	
1 Sensor 2		diagnostic is aborted, by									at 0.1 s rate	
		NOx sensor indication, a									during ECM	
		calibrated number of times the fault is set									afterrun	
			for number of counts	>=	1.00	counts	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	<	200.00	ppm		
							temperature upstream of the SCR	>=	49.96	°C		
							catalyst					
							temperature upstream of the SCR catalyst	<=	499.96	°C		
							DPF regeneration active	=	FALSE	-		
							engine speed	>=	0.00	rpm		
							engine speed	<=	1000.00	rpm		
							battery voltage battery voltage	>= <=	11.00 655.34	V V		
							NO Pending or Confirmed DTCs:	<=	see sheet inhibit	v -		
									tables			
							NOx sensor heater status	=	TRUE	-		
							means NOx sensor has sent via CAN	=	TRUE			
							that heater temperature setpoint	=	IRUE	-		
							has been reached (i.e. dewpoint					
							achieved and no heater faults)					
							Afterrun Conditions:					
							NO Pending or Confirmed DTCs:	=	see sheet inhibit	-		
							Ĵ		tables			
							ECM operating in Afterrun (please see the definition)	=	TRUE	-		
							vehicle speed	=	0			
							measured downstream NOx DPF regeneration active	<=	200.00 FALSE	ppm -		
							engine speed	>=	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	sec		
							number of self-diagnostic attempts	>=	4.00	counts		
							status sensor reaction in afterrun	<	50.00	sec		
							(sensor is reheated as necessary prior to start of afterrun test execution)					
							to start of alterior lest execution)					
							means					

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

Component / System	Fault Code	Monitor Strategy Description	Primary Malfunction Criteria	hreshold c and Value	Secondary Parameters battery voltage SCR upstream temperature SCR upstream temperature Downstream Lambda signal is in steady state condition (see Look-Up- Table #27) for time Duration time for lambda steady state condition) NO Pending or Confirmed DTCs:	<= >= <= >= =	Enable Conditions 655.34 99.96 599.96 0 to 0.5 5.00 see sheet inhibit tables	V °C - sec	Time Required	MIL Illum.
Intake Air Flow Valve Control Circuit Shorted	P122C	Electronic out-put driver circuitry determines circuit integrity on the intake air flow valve.	The ECM detects that the commanded state of the driver and the actual state of the control circuit do not match.		battery voltage for time and starter is active cranking for time and basic enable conditions met: and Throttle Valve Actuator Solenoid Control Circuit and Open Load Diagnosis active NO Pending or Confirmed DTCs	> = = =	11.00 3.00 FALSE 3.00 see sheet enable tables ACTIVE FALSE see sheet inhibit tables	V sec - sec - -	fail conditions exists for 0.5 s monitor runs with 0.005 s rate whenever enable conditions are met	В
Diesel Intake Air Flow Position Sensor Exceeded Learning Limit	P122D	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 or throttle valve control deviation adaptation calculated out of difference between desired and actual value	-10.00 % 10.00 %	throttle valve controller bypass is active and throttle valve is driven to a mechanical stop and engine Coolant Temperature and	= = <	FALSE FALSE 199.96	- - °C	fail conditions exists for 10.05 s monitor runs once per drivingcycle with 0.005 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.
							offset learning for the throttle valve was successful in the previous driving cycle and	=	TRUE	-		
							engine post drive/ afterun and	=	TRUE	-		
							basic enable conditions met	=	see sheet enable tables	-		
							and NO Pending or Confirmed DTCs:	=	see sheet inhibit tables	-		
		Detects offset value which are not plausible at the open and closed throttle position	Path 1:				(fail conditions exists for 0.005 s	
			learned throttle valve offset position at open or closed position or	<	-20.00	%	engine coolant temperature and	>=	-30.04	°C	monitor runs once per drivingcycle	
			learned throttle valve offset position at open or closed position	>	20.00	%	engine coolant temperature	<=	127.96	°C	with 0.005 s rate	
			or Path 2: difference between the maximum and minimum positions learned at closed	>	30.00	%) and (whenever enable conditions are met	
			position or Path 3:				battery voltage	>=	11.00	V		
			difference between the maximum and minimum positions learned at open position	>	30.00	%	and					
							battery voltage)	<=	655.34	V		
							and Throttle Valve is not frozen consisting of:					
							(temperature downstream charge air cooler or	>=	6.06	°C		
							Engine coolant temperature for	>=	6.06	°C		
							time)	>	10.00	sec		
							and engine speed and	=	0	rpm		
							engine post drive/ afterun and	=	TRUE	-		
							NO Pending or Confirmed DTCs:		see sheet inhibit tables	-		

Component / System	Fault Code	Monitor Strategy Description	Primary Malfunction Criteria	Threshold Logic and Value	Secondary Parameters	Enable Conditions		Time Required	MIL Illum.
					and 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 for time	> 11.00	V	fail conditions exists for 0,5 s monitor runs with 0.005 s rate whenever enable	В
					and starter is active cranking for time and basic enable conditions met:	 FALSE 3.00 see sheet enable tables 	- sec	conditions are met	
					and Throttle Valve Actuator Solenoid Control Circuit and Open Load Diagnosis active NO Pending or Confirmed DTCs	 ACTIVE FALSE see sheet inhibit tables 			
Intake Air Flow Valve Control Circuit 2 High Voltage	P122F	Diagnoses the Throttle Valve high side driver circuit for circuit faults.	Voltage high during driver off state (indicates short to power)	= Short to power: - ≤ 0.5 Ω impedance between signal and controller power	battery voltage	> 11.00	V	fail conditions exists for 0,5 s monitor runs with 0.005 s rate	В
					time and starter is active cranking	> 3.00 = FALSE	sec -	whenever enable conditions	
					for time and	> 3.00	sec	are met	
					basic enable conditions met: and Throttle Valve Actuator Solenoid Control Circuit and	 see sheet enable tables ACTIVE 	-		
1	I	I	I	l	Open Load Diagnosis active	= FALSE	-		l

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.
Injector 1 Control Circuit Shorted	P1248	Diagnoses the Injector Cylinder #1 high side driver circuit for circuit faults.	Voltage low during driver on state (indicates short to ground)	=	Short to ground: ≤ 0.5 Ω impedance between signal and controller ground	Engine Running (see parameter definition)	=	TRUE -	fail conditions exists for more than 0.04 s monitor runs with 0.01 s rate whenever enable conditions are met	A
Injector 2 Control Circuit Shorted	P1249	Diagnoses the Injector Cylinder #4 high side driver circuit for circuit faults.	Voltage low during driver on state (indicates short to ground)	=	Short to ground: ≤ 0.5 Ω impedance between signal and controller ground	Engine Running (see parameter definition)	=	TRUE -	fail conditions exists for more than 0.04 s monitor runs with 0.01 s rate whenever enable conditions are met	A
Injector 3 Control Circuit Shorted	P124A	Diagnoses the Injector Cylinder #2 high side driver circuit for circuit faults.	Voltage low during driver on state (indicates short to ground)	=	Short to ground: $- \le 0.5 \Omega$ impedance between signal and controller ground	Engine Running (see parameter definition)	=	TRUE -	fail conditions exists for more than 0.04 s monitor runs with 0.01 s rate whenever enable conditions are met	A

Component / System	Fault Code	Monitor Strategy Description	Primary Malfunction Criteria		Threshold Logic and Value	Secondary Parameters		Enable Conditions		Time Required	MIL Illum.
Injector 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)	=	Short to ground: - ≤ 0.5 Ω impedance between signal and controller ground	Engine Running (see parameter definition)	=	TRUE	-	fail conditions exists for more than 0.04 s monitor runs with 0.01 s rate whenever enable conditions are met	A
Fuel Pressure Regulator 2 High Control Circuit Low Voltage	P125A	Diagnoses the Fuel Rail Pressure Regulator #2 high side driver circuit for circuit faults.	Voltage low during driver on state (indicates short to ground)	=	Short to ground: - ≤ 0.5 Ω impedance between signal and controller ground	for time and NO Pending or Confirmed DTCs: and ignition on and basic enable conditions met:	> = =	11.00 3.00 see sheet inhibit tables TRUE see sheet enable tables	V sec - -	fail conditions exists for 0.07 s monitor runs with 0.01 s rate whenever enable conditions are met	A
Fuel Pressure Regulator 2 High Control Circuit High Voltage	P125B	Diagnoses the Fuel Rail Pressure Regulator #2 high side driver circuit for circuit faults.	Voltage high during driver off state (indicates short to power)	=	Short to power: $-$ $\leq 0.5 \Omega$ impedance between signal and controller power	(engine speed or engine post drive/ afterun)	=	0 TRUE	rpm -	fail conditions exists for 0.1 s monitor runs with 0.1s rate whenever enable conditions	В

Component / System	Fault Code	Monitor Strategy Description	Primary Malfunction Criteria	Threshold Logic and Value	Secondary Parameters		Enable Conditions		Time Required	MIL Illum.
					and NO Pending or Confirmed DTCs:	=	see sheet inhibit tables	-	are met	
					for time and	>	6.00	sec		
					basic enable conditions met:	=	see sheet enable tables	-		
	B / 005								<i>.</i>	
Fuel Rail Pressure Performance	P128E	Actual rail pressure is compared to fixed absolute value to detect low or high rail pressure conditions.	rail pressure (see Look-Up-Table #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 or	=	TRUE	-	rate whenever enable conditions	
					state machine rail pressure control transitioning to coupled pressure control mode (rail pressure is controlled by metering unit and pressure control valve)	=	TRUE	-	are met	
					or state machine rail pressure control equal transitioning to metering unit pressure control mode)	=	TRUE	-		
					and basic enable conditions met:	=	see sheet enable tables	-		
					and NO Pending or Confirmed DTCs:	=	see sheet inhibit tables	-		
							_			
			rail pressure (see Look-Up-Table #67)	< 0 to 15000 kPa	(state machine rail pressure control equal to pressure control valve	=	TRUE	-		
					or state machine rail pressure control equal coupled pressure control (rail pressure is controlled by metering unit and pressure control valve)	=	TRUE	-		
					, 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 NO Pending or Confirmed DTCs:	=	Enable Conditions see sheet inhibit tables		Time Required	MIL Illum.
			rail pressure (see Look-Up-Table #65)	<	0 to 15000	kPa	state machine rail pressure control equal to metering unit control mode and basic enable conditions met: and NO Pending or Confirmed DTCs:	=	TRUE see sheet enable tables see sheet inhibit tables	-		
			rail pressure	>	175000.00	kPa	(state machine rail pressure control transitioning pressure control valve mode or state machine rail 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) and basic enable conditions met: and NO Pending or Confirmed DTCs:	=	TRUE TRUE TRUE see sheet enable tables see sheet inhibit tables	-	fail conditions exists for 1.01 s. monitor runs with 0.02 s rate whenever enable conditions are met	
			rail pressure	>	175000.00	kPa	(state machine rail pressure control equal to pressure control valve or state machine rail pressure control equal coupled pressure control (rail pressure is controlled by metering unit and pressure control valve)) and basic enable conditions met:	=	TRUE TRUE 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	-		
			rail pressure	>	175000.00	kPa	state machine rail pressure control equal to metering unit control mode and basic enable conditions met: and NO Pending or Confirmed DTCs:	=	TRUE see sheet enable tables see sheet inhibit tables	-		
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	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	%		1			0.1 s rate whenever enable conditions are met	
Cold Start Emission Reduction Control System	P1400	Detects problems resulting in improper delivery of fuel for catalyst light off and aftertreatment system preparation	Path 1: Pilot Injection 1 is prohibited due to exceeding the allowed number of injections (see general description for details) or	=	TRUE		engine operating mode which means: Cold Start Injection Monitoring	=	exhaust / SCR heat-up ENABLED	state bit mask	fail conditions exists for 20 revs test performed continuously	В
					_	-	and engine operating mode state transition	=	FALSE	-	0.01 s rate	
			Path 2: Pilot Injection 1 is prohibited due to collision (overlap) with Main Injection and Pilot Injection 2 (see general description	=	TRUE	-	and engine coolant temperature and engine coolant temperature	> <	-10.00 96.00	°C °C		
			or Path 3:		_	-						

Component / System	Fault Code	Monitor Strategy Description	Primary Malfunction Criteria	L	Threshold ogic and Value.		Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
			Injector circuit or activation errors (setpoint deviation) occurred when the injector was being energized for Pilot	=	TRUE	-				
			or							
			Path 4: Pilot Injection 2 is prohibited due to exceeding the allowed number of injections (see general description for details)	=	TRUE					
			or							
			Path 5: Pilot Injection 2 is prohibited due to collision (overlap) with Pilot Injection 1 (see general description for details)	=	TRUE	•				
			or							
			Path 6: Injector circuit or activation errors (setpoint deviation) occurred when the injector was being energized for Pilot	=	TRUE					
			or							
			Path 7: Injector circuit or activation errors (setpoint deviation) occurred when the injector was being energized for Main	=	TRUE					
			or							
			Path 8: Post Injection 2 is prohibited due to exceeding the allowed number of injections (see general description for details)	=	TRUE	-				
			or							
			Path 9: Post Injection 2 is prohibited due to collision (overlap) with Main Injection 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	Criteria Post Injection 1 (see general description or Path 10: Injector circuit or activation errors (setpoint deviation) occurred when the injector was being energized for Post or Path 11: Post Injection 1 is prohibited due to exceeding the allowed number of injections (see general description for details) or Path 12: Post Injection 2 is prohibited due to collision (overlap) with Post Injection 1 (see general description for details) or Path 13: Injector circuit or activation errors (setpoint deviation) occurred when the injector was being energized for Post	Eugic and Value	Parameters	Conditions	Required	Illum.
Exhaust Gas Recirculation (EGR) Motor Control Circuit Shorted	P1407	Electronic out-put driver circuitry determines circuit integrity on the EGR solenoid.	The ECM detects that the commanded state of the driver and the actual state of the control circuit do not match.		EGR Solenoid Control Circuit and battery voltage for time and starter is active cranking for	= ACTIVE - > 11.00 V > 3.00 sec = FALSE -	fail conditions exists for 3,5 s monitor runs with 0.005 s rate whenever enable conditions are met	В

Component / System	Fault Code	Monitor Strategy Description	Primary Malfunction Criteria	Threshold Logic and Value	Secondary Parameters		Enable Conditions		Time Required	MIL Illum.
					time and basic enable conditions met: and	> =	3.00 see sheet enable tables	sec -		
					NO Pending or Confirmed DTCs	=	see sheet inhibit tables	-		
Exhaust Gas Recirculation Slow Response- Increasing Flow	P140B	Detects a negative slow response by comparing expected system dynamics with actual value	average negative gradient of the air mass - calculated by accumulating control deviation (deviation between desired and actual value) over a sampling time and dividing result by sampling time	> 0.05 g/rev	(fail conditions exists for 15 s monitor runs with 0.1s	В
					Engine speed	>=	1400.00	rpm	rate	
					Engine speed	<=	2700.00	rpm	whenever	
					and injection quantity	>=	40.00	mm^3/r	enable conditions	
					injoonon quantity		10.00	ev	are met	
					injection quantity	<=	130.00	mm^3/r		
					and			ev		
					ambient pressure and	>	74.80	kPa		
					engine coolant temperature and	>	69.96	°C		
					EGR control is in closed loop	=	TRUE	-		
					for time and	>	1.50	sec		
					EGR control is active	=	TRUE	-		
					for time and	>	0.00	sec		
					exhaust gas system regeneration mode	=	FALSE	-		
					for time	>	5.00	sec		
					and		TOUE			
					Engine is running for time	= >	TRUE 0.00	- sec		
					and		0100	000		
					Actuator position EGR Valve	>	1.00	%		
					Actuator position EGR Valve and	<	51.00	%		
					Engine speed	>=	1500.00	rpm		
					Engine speed	<=	2600.00	rpm		
					and		50.00			
					injection quantity	>=	52.00	mm^3/r ev		
					injection quantity	<=	100.00	mm^3/r		
								ev		
1 I		I	l		and	I			I	

Component / System	Fault Code	Monitor Strategy Description	Primary Malfunction Criteria	Threshold Logic and Value	Secondary Parameters desired delta air mass flow desired delta air mass flow and difference of the air mass and NO Pending or Confirmed DTCs:) for time and basic enable conditions met:	> < < = > =	Enable Conditions -0.50 -0.03 0 see sheet inhibit tables 0.10 see sheet enable tables	g/sec g/sec g/rev - sec -	Time Required	MIL Illum.
Exhaust Gas Recirculation Slow Response- Decreasing Flow	P140C	Detects a positive slow response by comparing expected system dynamics with actual value	average positive gradient of the air mass - calculated by accumulating control deviation (deviation between desired and actual value) over a sampling time and dividing result by sampling time	>= 0.04 g/re	 (Engine speed Engine speed and injection quantity injection quantity injection quantity and ambient pressure and engine coolant temperature and EGR control is in closed loop for time and EGR control is active for time and exhaust gas system regeneration mode for time and Engine is running for time and Actuator position EGR Valve Actuator position EGR Valve and Engine speed Engine speed Engine speed and 		1400.00 2700.00 40.00 130.00 74.80 69.96 TRUE 1.50 TRUE 0.00 FALSE 5.00 TRUE 0.00 TRUE 0.00 1.00 51.00 1500.00 2600.00	rpm rpm mm^3/r ev kPa °C - sec - sec - sec - sec - sec - rpm rpm	fail conditions exists for 15 s monitor runs with 0.1s rate whenever enable conditions are met	В

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

Component / System	Fault Code	Monitor Strategy Description	Primary Malfunction Criteria	Threshold Logic and Value	Secondary Parameters for time and starter is active cranking for time and basic enable conditions met: and NO Pending or Confirmed DTCs	> = > =	Enable Conditions 3.00 FALSE 3.00 see sheet enable tables see sheet inhibit tables	sec - sec -	Time Required conditions are met	MIL IIIum.
Exhaust Gas Recirculation (EGR) Motor Current Performance	P140F	Diagnoses the EGR Valve low side driver circuit for circuit faults.	Voltage high during driver on state (indicates short to power)	 Short to power: - ≤ 0.5 Ω impedance between signal and controller power 	EGR Solenoid Control Circuit and battery voltage for time and starter is active cranking for time and basic enable conditions met: and NO Pending or Confirmed DTCs		ACTIVE 11.00 3.00 FALSE 3.00 see sheet enable tables see sheet inhibit tables	- Sec - Sec -	fail conditions exists for 2 s monitor runs with 0.005 s rate whenever enable conditions are met	В
Closed Loop Diesel Particulate Filter (DPF) Regeneration Control At Limit - Stage 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 and deviation from the temperature setpoint for outer control loop (>= 0.53 - > maximum of (a) °C or (b+(c-d))	controller deviation status is active depending on engine operation point out of (see Look-Up-Table #24) for time and	=	0 to 1 10.00	sec	fail conditions exists for 60 s monitor runs with 0.1 s rate whenever enable conditions are met	В

with active operation mode of the outer control = TRUE	Component /	Fault	Monitor Strategy	Primary Malfunction		Threshold		Secondary		Enable		Time	MIL
(a) limitation of the temperature threshold and xm - 7000 CC means (- (b) imitation of the temperature and xm = 700 CC immeans (- (c) immission of the temperature catalyst = 700 CC immeans (- (c) immission of the temperature catalyst = 700 CC immeans (- (- (c) immission of the temperature catalyst = (- (- (- (- (- (c) immission of the temperature catalyst = (- (- (- (- (- (d) immeans estimate the immeans = (- (- (- (- (- (d) immeans estimate the immeans = (- <th>System</th> <th>Code</th> <th>Description</th> <th></th> <th></th> <th>Logic and Value</th> <th></th> <th></th> <th></th> <th></th> <th></th> <th>Required</th> <th>Illum.</th>	System	Code	Description			Logic and Value						Required	Illum.
<pre> (a) minimized on the temperature triveletion of the constant of the</pre>				with				active operation mode of the outer control	=	TRUE	-		
<pre>interind and with threshold value for and with (b) temperature three value for antisyst and (c) desired temperature value of out catalyst and (c) desired temperature value of out catalyst and (c) desired temperature control and with (c) here year and (c) desired temperature control and (c) here year and (c) desired temperature control and (c) here year and (c) here</pre>								loop					
interind and with and with <td< td=""><td></td><td></td><td></td><td>(a) limitation of the temperature</td><td>=</td><td>70.00</td><td>°C</td><td>means</td><td></td><td></td><td></td><td></td><td></td></td<>				(a) limitation of the temperature	=	70.00	°C	means					
Image: control logo of the enhance of the enhance of the outdation of the enhance of the outdation and with (c) desired temperature extends and with (c) desired temperature extends to and with (c) desired temperature setpoint value of outer control logo of the enhance of enhance of enhance of enhance of enhance				threshold									
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Image: stand of the should gas important evolue of outer control op of the should gas important econtrol op of the should gas important econtrol op of the should gas temperature control = calculated - - temperature downstream of the vicities of the should gas temperature control > 219.96 "C) (d) temperature sequence of the should gas temperature control op of the should gas temperature control = calculated - - temperature downstream of the vicities of the should gas temperature control < 679.96				(b) temperature threshold value for	=	70	°C	temperature upstream of the oxidation	>	229.96	°C		
and with (c) close isolated temperature value of outer control loop of the exhaust gas temperature control (a) emperature scipit value of outer control loop of the exhaust gas temperature control (a) emperature control (b) emperature downstream of the outer control loop of the exhaust gas temperature control (c) emperature downstream of the outer control loop of the exhaust gas temperature control (c) emperature downstream of the outer control loop of the exhaust gas temperature control (c) emperature downstream of the outer control loop of the exhaust gas temperature control (c) emperature downstream of the outer control loop of the exhaust gas temperature control (c) emperature downstream of the outer control loop of the exhaust gas temperature control (c) emperature downstream of the outer control loop of the exhaust gas temperature control (c) emperature downstream of the outer control loop of the exhaust gas temperature control (c) emperature downstream of the outer control loop of the exhaust gas temperature control (c) emperature downstream of the outer control loop of the exhaust gas temperature control (c) emperature downstream of the outer control loop of the exhaust particulate first temperature emprised continemperature emprised control temperature emprised control temperature emprised control temperature emprised control temperature exhaust gas mass flow (c) emperature conditions emprised constitute control on exhaust emprised constitute co													
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(d) emperature sepont value of gas temperature control = calculated parameter and (temperature downstream of the and cultor control loop the exhaust gas temperature control (temperature downstream of the cultor catalyst and cultor catalyst and cultor catalyst and cultor catalyst and cultor control loop control <										210100	Ũ		
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gas temperature control <					_			und					
image: constraint of the constraint						Parameter							
oxidation catalyst and particulate filter temperature for activated post injection) and "C and = 74.90 *Pa environmental pressure environmental temperature >= 74.90 *Pa environmental temperature >= 49.96 "C environmental temperature >= 49.96 "C environmental temperature >= 74.80 mph environmental temperature >= 3.11 mph environmental temperature >= 3.11 mph vehicle speed <=								(
oxidation catalyst and particulate filter temperature for activated post injection) and "C and = 74.90 *Pa environmental pressure environmental temperature >= 74.90 *Pa environmental temperature >= 49.96 "C environmental temperature >= 49.96 "C environmental temperature >= 74.80 mph environmental temperature >= 3.11 mph environmental temperature >= 3.11 mph vehicle speed <=				,				temperature downstream of the	_	670.06	°C		
and particulare filter temperature for activated post injection 679.96 °C and environmental pressure >= 74.80 KPa environmental temperature >= 74.80 *C environmental temperature >= 74.80 *C environmental temperature >= 49.96 *C engine coolant temperature <=										073.30	U		
particulate filter temperature for activitivated positinjection) and * 679.96 *C and													
activated post injection and children c										670.06	°C		
Image: state of the state									<	679.90	·U		
environmental pressure >= 74.80 KPa environmental temperature >= 20.04 "C engine coolant temperature >= 49.96 "C engine coolant temperature <=								activated post injection					
environmental pressure >= 74.80 KPa c environmental temperature >= 20.04 "C engine coolant temperature >= 49.96 "C engine coolant temperature <=)					
environmental temperature >= -20.04 *C engine coolant temperature <=										74.00	kDe.		
engine coolant temperature >= 49.96 °C engine coolant temperature <=													
engine coolant temperature service DPF regeneration commanded (ide regen only commanded through GM tool) vehicle speed = FALSE - vehicle speed >= 3.11 mph vehicle speed <=													
service DPF regeneration commanded (idle regen only commanded through GM (idle regen only commanded through GM vehicle speed >= 3.11 mph vehicle speed >= 124.30 mph accelerator pedal position > 3.00 % for time > 10.0 sec exhaust gas mass flow <													
(idle regen only commanded through GM tool) >= 3.11 mph vehicle speed <=													
tool) >= 3.11 mph vehicle speed <=									=	FALSE	-		
vehicle speed >= 3.11 mph vehicle speed <=													
vehicle speed <=													
accelerator pedal position > 3.00 % for time > 1.00 sec exhaust gas mass flow <													
for time > 1.00 sec exhaust gas mass flow <								vehicle speed					
exhaust gas mass flow <													
for time >= 21474836.47 sec and stable temperature conditions = TRUE - means (temperature upstream of particulate > 500.00 °C filter for time > 0.00 sec) and and = see sheet enable - and basic enable condition met: = see sheet enable - and tables - tables -													
and = TRUE - stable temperature conditions = TRUE - means (- - (temperature upstream of particulate > 500.00 °C filter for time > 0.00 sec) and - - - and - - - -								exhaust gas mass flow					
stable temperature conditions = TRUE - means (+ - (+ - - temperature upstream of particulate > 500.00 °C filter - 0.00 sec) - - - and - - - basic enable condition met: = see sheet enable - - and - - - and - - -									>=	21474836.47	sec		
means ((temperature upstream of particulate > 500.00 °C filter for time > 0.00 sec) and = see sheet enable - and tables - tables -													
(temperature upstream of particulate filter > 500.00 °C filter for time and basic enable condition met: > 0.00 sec and basic enable condition met: = see sheet enable tables -									=	TRUE	-		
filter for time > 0.00 sec) and basic enable condition met: = see sheet enable - tables								means					
filter > 0.00 sec for time > 0.00 sec and = see sheet enable - tables and = tables								(
for time > 0.00 sec) and basic enable condition met: = see sheet enable - tables									>	500.00	°C		
and basic enable condition met: = see sheet enable - tables and													
basic enable condition met: = see sheet enable - tables								for time	>	0.00	sec		
basic enable condition met: = see sheet enable - tables)					
and tables													
and								basic enable condition met:	=	see sheet enable	-		
										tables			
NO Pending or Confirmed DTCs: = see sheet inhibit -								NO Pending or Confirmed DTCs:	=	see sheet inhibit	-		
tables										tables			

Component / System	Fault Code	Monitor Strategy Description	Primary Malfunction Criteria		Threshold Logic and Value		Secondary Parameters		Enable Conditions		Time Required	MIL Illum.
Closed Loop Diesel Particulate Filter (DPF) Regeneration	P144F	Detects insufficient exhaust temperature or control deviation during DPF regeneration. Temperature	commanded control value of the outer control loop of the temperature controller	<=	0.10	-	controller deviation status is active depending on engine operation point out of (see Look-Up-Table #25)	=	0 to 1	-	fail conditions exists for 60 s	В
Control At Limit - Stage 2 Temperature Too High		readings are compared to desired temperature values as an indication of an excessive exhaust gas temperature.									monitor runs with 0.1 s rate whenever enable	
			and			00	for		10.00		conditions	
			deviation from the temperature setpoint for outer control loop	<	minimum of (a) and (b-(c-d))	°C	time	>=	10.00	sec	are met	
			with				active operation mode of the outer control loop	=	TRUE	-		
			(a) limitation of the temperature threshold	=	-70.00	К	means					
			and with				(
			(b) temperature threshold value for minimum deviation	=	-70	К	temperature upstream of the oxidation catalyst	>	229.96	°C		
			and with (c) desired temperature value of	=	calculated	-	and (
			outer control loop of the exhaust gas temperature control		parameter							
			and with				temperature downstream of the oxidation catalyst	>	219.96	°C		
			 (d) temperature setpoint value of outer control loop of the exhaust gas temperature control 	=	calculated parameter	-	and					
)				(temperature downstream of the		679.96	°C		
							oxidation catalyst and	<	679.96	C		
							particulate filter temperature for activated post injection)	<	679.96	°C		
							and		74.00			
							environmental pressure environmental temperature	>= >=	74.80 -20.04	kPa °C		
							engine coolant temperature	>=	49.96	°C		
							engine coolant temperature	<=	199.96	°Č		
							service DPF regeneration commanded (idle regen only commanded through GM	=	FALSE	-		
							tool)	~_	2 4 4	mah		
							vehicle speed vehicle speed	>= <=	3.11 124.30	mph mph		
							accelerator pedal position	>	3.00	%		
							for time	>	1.00	sec		
							exhaust gas mass flow	<	910.27	g/sec		

Component / System	Fault Code	Monitor Strategy Description	Primary Malfunction Criteria	La	Threshold ogic and Value	•	Secondary Parameters		Enable Conditions		Time Required	MIL Illum.
					g		for time and stable temperature conditions means	>= =	21474836.47 TRUE	sec -		
							(temperature upstream of particulate filter	>	500.00	°C		
							for time)	>	0.00	sec		
							and basic enable condition met:	=	see sheet enable tables	-		
							and NO Pending or Confirmed DTCs:	=	see sheet inhibit tables	-		
	24420					-					6 h h	
Particulate Matter Sensor Signal Message Counter Incorrect	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)	>=	11.00	V	fault exists for more than 1.4 sec; monitor runs	В
							Ignition on for time	= >	TRUE 1.20	sec	at 0.1 s when enable conditions are met	
Particulate Matter Sensor Compensation Value Missing/Not Received	P147F	Range check of sensor sensitivity calibration factor (detected failures: calibration factor manipulated, wrong or not transmitted)	Path 1:				Ignition on	=	TRUE	-	fault exists for more than 0.1 sec; monitor runs at 0.1 s once	В
			Sensitivity Factor adjustment value sent from the sensor control unit (SCU) in the engine ECM has been transmitted	=	TRUE	-	SCU is in the state "ready"	=	TRUE	-	per trip	
			Sensor sensitivity calibration factor OR	<	0.75	factor	means Battery voltage (ECM)	>=	11.00	V		
			Sensor sensitivity calibration factor	>	1.25	factor						
			Path 2:									

Component / System	Fault Code	Monitor Strategy Description	Primary Malfunction Criteria		Threshold Logic and Value		Secondary Parameters		Enable Conditions		Time Required	MIL Illum.
			Sensitivity Factor adjustment value sent from the sensor control unit (SCU) in the engine ECM has been transmitted Time after SCU "ready" until sensor sensitivity calibration factor transmitted	=	FALSE 2.00	- sec						
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	>=	7.00	counts	basic enable conditions met:	=	see sheet enable tables	-	performed continuously	
			with number of consecutive frames) or	=	10.00	counts	and NO Pending or Confirmed DTCs:	=	see sheet inhibit tables	-	0.01 s	
			Path 2:									
			(internal calculated checksum value for transmission is not equal the received value and	=	TRUE	-						
			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	P155A	Set invalid data indicated problem on status of the	Switch state provided by Cruise Control frame	=	DATA INVALID	-	ignition on	=	TRUE		fail conditions	Special C
Integrity		cruise switch information					and input circuit active means:	=	TRUE	-	exists for 0.005 s monitor runs with 0.005 s	
							(Bus off or error passive on CAN and The rolling counter and protection value validation is enabled for this CAN frame	=	FALSE TRUE	-	rate whenever enable conditions are met	

Component / System	Fault Code	Monitor Strategy Description	Primary Malfunction Criteria	L	Threshold ogic and Valu	Ie	Secondary Parameters		Enable Conditions		Time Required	MIL Illum.
							and Frame enabled. The EMC is authorized to read the frame	=	TRUE	-		
							and Protection value error)	=	FALSE	-		
							and 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 runs	В
			measured and filtered interdigital electrode(IDE) current	>	12.00	uA	which means				at 0.1 s when enable	
			measured and filtered interdigital electrode(IDE) current	<	41.00	uA	Sensor regeneration complete	=	TRUE	-	conditions are met once	
			when integrated reciprocal of the predicted trigger time	< =	1.00	-	and PM sensor dewpoint achieved (please see the definition)	=	TRUE	-	per trip	
			or				DPF regeneration not active Calculated soot particles mass based on sensor flow resistance	>=	TRUE 0.00	- g		
							Calculated soot particles mass based on sensor flow resistance	<=	300.00	g		
			Path2: measured interdigital electrode(IDE)	>=	41.00	uA	(Exhaust gas velocity at particulate	>=	0.00	m/sec		
			current	~	41.00	uA	sensor position Exhaust gas velocity at particulate	<=	40.00	m/sec		
			then				sensor position for					
			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	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	<=	135.00	kPa		
							time) (>=	10.00	sec		

Component / System	Fault Code	Monitor Strategy Description	Primary Malfunction Criteria	Threshold Logic and Value	Secondary Parameters Exhaust gas temperature Exhaust gas temperature for time) (Engine running (NOx sensor downstream concentration temperature of particulate matter sensor) and NOx sensor downstream concentration	>= = > = > = > = < < <	Enable Conditions 64.96 399.96 5.00 TRUE 200.00 249.96 1500.00	°C °C sec - ppm °C	Time Required	MIL Illum.
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:2 - 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 conditions are met	В
Intake Manifold Runner Control Circuit Low Bank 1	P2009	Variable Swirl valve actuator short circuit to ground	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

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 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
Intake Manifold Runner Performance Bank 1	P200A	Monitors the commanded variable swirl valve position versus actual measured PWM position for a negative deviation	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	В
		Monitors the commanded variable swirl valve position versus actual measured PWM position for a positive deviation	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	

Component / System	Fault Code	Monitor Strategy Description	Primary Malfunction Criteria	L	Threshold .ogic and Value	•	Secondary Parameters		Enable Conditions		Time Required enable conditions are met	MIL 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 where variable swirl valve open position	~	2.00 33.20	sec %	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 2 s monitor runs 0.1 s rate whenever enable conditions are met	
		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 where variable swirl valve open position	>	2.00	sec %	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	Sec V -	fail conditions exists for more than 2 s monitor runs 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.
		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	variable swirl valve position or variable swirl valve position	v ,	80.40	%	engine off time battery voltage battery voltage basic enable conditions met: NO Pending or Confirmed DTCs	> = .	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	∨ °C	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	В
Exhaust Gas Temperature (EGT) Sensor 2 Circuit High Voltage	P2033	Detects high voltage readings on the EGT 2 circuit, indicating an OOR high condition on the EGT 2 circuit	temperature sensor voltage downstream of oxidation catalyst same as temperature downstream of oxidation catalyst	>	2.33	∨ °C	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	В

Component / System	Fault Code	Monitor Strategy Description	Primary Malfunction Criteria	Threshold Logic and Value		Secondary Parameters		Enable Conditions		Time Required	MIL Illum.	
Reductant Level Sensor	P203B	Reductant level plausibility check error from CAN	CAN message "Reductant Level Plausibility Check Error" from reductant tank level evaluation module which means (=	TRUE	-	ignition on and basic enable conditions met:	=	TRUE see sheet enable tables	•	fail conditions exists for 5 s test performed continuously	В
			(measured tank level sensor 2 voltage after 1.5 ms since a test impulse was applied)	=	(0.0 to 1.7)	V	and		lables		1 s rate whenever enable	
			(measured tank level sensor 1 voltage after 1.5 ms since a test impulse was applied)) or	=	(1.71 to 3.56)	V	NO Pending or Confirmed DTCs:	=	see sheet inhibit tables	-	conditions are met	
			((measured tank level sensor 3 voltage after 1.5 ms since a test impulse was	=	(0.0 to 1.7)	V						
			applied) (measured tank level sensor 1 voltage after 1.5 ms since a test impulse was applied)) or	=	(1.71 to 3.56)	V						
			((measured tank level sensor 3 voltage after 1.5 ms since a test impulse was applied)	=	(0.0 to 1.7)	V						
			(measured tank level sensor 2 voltage after 1.5 ms since a test impulse was applied))	=	(1.71 to 3.56)	V						
Reductant Level	P203C	CAN message: Discrete	Reductant Tank Level 1 Error Status	=	1	-	ignition on	=	TRUE	-	fail	В
Sensor 1 Circuit Low		level sensor level 1 short to ground error	(tank level sensor 1 voltage directly measured after a test impulse was applied)	<	(0.17)	V	battery voltage	>	8	V	conditions exists for more than 3 sec. monitor runs	
							basic enable conditions met:	=	see sheet enable tables	-	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.
Reductant Level Sensor 1 Circuit High	P203D	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)	e	= 3 > (3.56) < (4.74)	- V V	ignition on battery voltage basic enable conditions met:	= ~ =	TRUE 8 see sheet enable tables	- V -	fail conditions exists for more than 3 sec monitor runs with 1 s rate whenever enable conditions are met	A
		Path 2: CAN message: Discrete level sensor 1 short to battery error	Reductant Tank Level 1 Error Status (measured tank level sensor 1 voltage after 1.5 ms since a test impulse was applied)		= 2 > (4.74)	v	ignition on battery voltage basic enable conditions met:	= >	TRUE 8 see sheet enable tables	- V -	fail conditions exists for more than 3 sec monitor runs with 1 s rate whenever enable conditions are met	
Reductant Injector Control Circuit	P2047	Detects an open circuit or an overtemperature condition 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 open circuit)		= Open Circuit:≥ 200 K Ω impedance between ECU pin and load	-	ignition on and ECU Initialization tasks in progress for time and Battery voltage for time and basic enable conditions met: AND	= = > > =	TRUE FALSE 0.10 10.50 3.00 see sheet enable tables	- sec V sec	fail conditions exists for 5 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 NO Pending or Confirmed DTCs	=	Enable Conditions see sheet inhibit tables	-	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 and ECU Initialization tasks in progress for time and Battery voltage for	=	TRUE FALSE 0.10 10.50	- sec V	fail conditions exists for 2 s monitor runs with 0.010 s rate whenever enable conditions are met	В
						time and basic enable conditions met: AND NO Pending or Confirmed DTCs	> =	3.00 see sheet enable tables see sheet inhibit tables	sec - -		
Reductant Injector 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)	Ξ	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 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

Component / System	Fault Code	Monitor Strategy Description	Primary Malfunction Criteria	I	Threshold Logic and Value		Secondary Parameters		Enable Conditions		Time Required	MIL Illum.
Reductant Pressure Sensor Circuit Range/Performanc e	P204B	Unfiltered reductant pressure is compared to a threshold while the SCR system is in No Pressure Control state	Pressure sensor signal change during No Pressure Control state	~	50.00	kPa	Reductant filling state in the pressure line 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 74.80 -6.64 see sheet inhibit tables see sheet enable tables	% - - kPa ℃ -	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
Reductant Pressure Sensor Circuit High	P204D	Measured reductant pump pressure sensor signal high voltage	Reductant pump pressure sensor signal same as: reductant pump pressure	>	4.80 800.00	mV 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 5 sec. monitor runs with 0.01 s rate whenever enable conditions	В

Component / System	Fault Code	Monitor Strategy Description	Primary Malfunction Criteria		Threshold Logic and Value		Secondary Parameters		Enable Conditions		Time Required are met	MIL Illum.
Reductant System Performance Bank 1	P204F	Unsuccessful reductant pressure build up	Reductant Pump Module Pressure	<=	375.00	kPa	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 number of pressure build-up attempts in pressure buildup and ventilation states AND Dwell time in Pressure Build up substate AND Dwell time in ventilation substate AND Urea heater release reason AND NO Pending or Confirmed DTCs: AND basic enable conditions met:	= = > > = > = > = + = =	PRESSURE BUILDUP RUNNING 1.00 0.00 -30.04 20 15.00 0.30 COMPONENT PROTECTION see sheet inhibit tables see sheet enable tables	- kPa °C counts sec - -	fail conditions exists for 1 event monitor runs with 0.1 s rate whenever enable conditions are met	A
Reductant Tank Temperature Sensor Performance	P205B	Path 1: The temperature difference between reductant tank temperature and diesel fuel temperature are compared to an upper threshold after sufficient engine-off duration	(a) - (b)	>	35.06	°C	ignition on	=	TRUE	-	fail conditions exists for more than 0.5 sec monitor runs with 0.01 s rate whenever enable conditions are met	В

Component /	Fault	Monitor Strategy	Primary Malfunction		shold	Secondary		Enable		Time	MIL
System	Code	Description	Criteria	Logic a	nd Value	Parameters		Conditions		Required	Illun
			where			status of SCR control state (please see	=	No Pressure	-		
			(a) Da duatant tank tana anatura			the definition)		control			
			(a) Reductant tank temperature	= meas		Engine off Time	>	28800.00	sec		
			(b) fuel temperature	= meas		time since start	>	600.00	sec		
				paran			-	000.00	300		
				para		Max [(a), (b), (c)] - Min [(a), (b), (c)]	<=	14.96	°C		
						where					
						(a) Oxidation Catalyst upstream	=	measured	-		
						temperature		parameter			
						(b) Oxidation Catalyst downstream	=	measured	-		
						temperature		parameter			
						(c) Particulate filter downstream	=	measured	-		
						temperature		parameter			
						NO Pending or Confirmed DTCs:	=	see sheet inhibit tables	-		
						basic enable conditions met:	=	see sheet enable			
						basic chabic conditions met.	-	tables			
								100100			
									١		
		Path 2: OR								fail conditions	
		-		< -35.	04 °C	ignition on status of SCR control state (please see	=	TRUE No Pressure	-	exists for	
		between reductant tank	(a) - (b)	< -35.	04 C	the definition)	=	control	-	more than	
		temperature and diesel fuel						CONTION		0.5 sec	
		temperature are compared								monitor runs	
		to a lower threshold after								with 0.01 s	
		sufficient engine-off duration								rate	
										whenever	
										enable	
			where			Engine off Time	>	28800.00	sec	conditions	
			(a) Reductant tank temperature	= meas		time since start	>	600.00	sec	are met	
				paran				44.00			
			(b) fuel temperature	= meas		Max [(a), (b), (c)] - Min [(a), (b), (c)]	<=	14.96	°C		
				paran	leter	where					
						(a) Oxidation Catalyst upstream	=	measured			
						temperature	-	parameter			
						(b) Oxidation Catalyst downstream	=	measured	-		
						temperature		parameter			
						(c) Particulate filter downstream	=	measured	-		
						temperature		parameter			
						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.
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	<	1.00	hex	basic enable conditions met:	=	see sheet enable tables		fault exists for more than 6 sec; monitor runs at 1 s	A
			Corresponds to a temperature of Corresponds to a resistance of	<= >=	-55.0 1200		and No rolling count or protection value errors. (sliding window errors) in the CAN frame	=	TRUE	-	whenever enable conditions are met	
			Corresponds to a voltage of	>=	5.0	V						
Reductant Tank Temperature Sensor Circuit High	P205D	Detects an out of range high reading of the Reductant Tank Temperature Sensor via CAN Message or an invalid (initialization) value of the Reductant Tank Temperature CAN message	Raw value of the CAN message for the Reductant Tank Temperature	>	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	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	-	are met	
			Corresponds to a voltage of	<=	0.270	V						
			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	В
			or integrated heat quantity of exhaust gas temperature sensor 1 with (a) exhaust gas mass flow	>	(a) / (b) * (c) / (d) * (e) * (g) calculated		for time and time since start	>	120.00	sec	whenever enable conditions are met	
			(a) exhaust gas mass now and with (b) factor		parameter 3.60	g/sec	and (120.00	360		

Component /	Fault	Monitor Strategy	Primary Malfunction		Threshold		Secondary		Enable		Time	MIL
System	Code	Description	Criteria		Logic and Value	E. C.	Parameters		Conditions		Required	Illum.
			and with (c) heat capacity	=	1200.00	J/Kg/°C	exhaust-gas temperature sensor 1 and	>	-20.04	°C ℃		
			and with (d) factor and with	=	1000	kW/°C	exhaust-gas temperature sensor 1) and	<	499.96			
			(e) correction factor for heat flow quantity depending on exhaust gas mass flow for temperature sensor 1	=	1.00	factor	change in exhaust-gas temperature sensor 1	<	20.00	°C		
			and with (f) minimum permissible temperature deviation for exhaust	=	-120.00	°C	for time and	=	10.00	sec		
			gas temperature sensor 1 and with (g) maximum permissible temperature deviation for exhaust	=	100.00	°C	engine operation point suitable for diagnostic for	=255	255	-		
			gas temperature sensor 1				time and	>=	0.05	sec		
							change in modeled exhaust-gas temperature sensor 1 and	>	20.00	°C		
							(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		
							basic enable conditions met:	=	see sheet enable tables	-		
							and NO Pending or Confirmed DTCs:	=	see sheet inhibit tables	-		
Exhaust Temperature Sensor 2 Performance	P2084	Detects a fault in the exhaust temperature sensor 2 performance by comparing the heat quantity on the sensor position to a threshold.	integrated heat quantity of exhaust gas temperature sensor 2	<	(a) / (b) * (c) / (d) * (e) * (f)		exhaust gas system regeneration mode	=	FALSE		fail conditions exists for 3s monitor runs with 0.1 s rate	В

Component / System	Fault Code	Monitor Strategy Description	Primary Malfunction Criteria		Threshold Logic and Value		Secondary Parameters		Enable Conditions		Time Required	MIL Illum.
oyotom	0000	Decemption	or				for		oonationa		whenever	manh
			integrated heat quantity of exhaust gas temperature sensor 2	>	(a) / (b) * (c) / (d) * (e) * (g)		time	>	120.00	sec	enable	
			with		(-7 (37		and				are met	
			(a) exhaust gas mass flow	=	calculated parameter	-	time since start	>	120.00	sec		
			and with				and					
			(b) factor	=	3.60	g/sec	(
			and with (c) heat capacity	=	1200.00	J/Kg/°C	exhaust-gas temperature sensor 2 and	>	-20.04	°C		
			and with				exhaust-gas temperature sensor 2	<	499.96	°C		
			(d) factor	=	1000	kW/°C)					
			and with				and					
			(e) correction factor for heat flow quantity depending on exhaust gas	=	1.00	factor	change in exhaust-gas temperature sensor 2	<	30.00	°C		
			mass flow for temperature sensor 2									
							for					
			and with				time	=	10.00	sec		
			(f) minimum permissible	=	-140.00	K	and					
			temperature deviation for exhaust									
			gas temperature sensor 2 and with				engine operation point suitable for	=	255			
							diagnostic	=	200	-		
			(g) maximum permissible temperature deviation for exhaust gas temperature sensor 2	=	100.00	К	for					
							time	>=	0.05	sec		
							and					
							change in modeled exhaust-gas temperature sensor 2 and (>	20.00	°C		
							heat quantity for exhaust gas temperature sensor 2 and	>	20.00	kJ		
							and heat quantity for exhaust gas temperature sensor 2	<	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	-		
							and NO Pending or Confirmed DTCs:	=	see sheet inhibit tables	-		

Component / System	Fault Code	Monitor Strategy Description	Primary Malfunction Criteria		Threshold Logic and Value	I	Secondary Parameters		Enable Conditions		Time Required	MIL Illum.
	-					-		-		-		
Exhaust Temperature Sensor 3 Performance	P242B	Detects a fault in the exhaust temperature sensor 3 performance by comparing the heat quantity on the sensor position to a threshold.	integrated heat quantity of exhaust gas temperature sensor 3	<	(a) / (b) * (c) / (d) * (e) * (f)		exhaust gas system regeneration mode	=	FALSE		fail conditions exists for 3s monitor runs with 0.1 s rate	В
			or integrated heat quantity of exhaust gas temperature sensor 3	>	(a) / (b) * (c) / (d) * (e) * (g)		for time	>	120.00	sec	whenever enable conditions	
			with (a) exhaust gas mass flow	=	calculated	-	and time since start	>	120.00	sec	are met	
			and with (b) factor	=	parameter 3.60	g/sec	and (
			and with (c) heat capacity	=	1200.00	J/Kg/°C	exhaust-gas temperature sensor 3 and	>	-20.04	°C		
			and with (d) factor	=	1000	kW/°C	exhaust-gas temperature sensor 3)	<	499.96	°C		
			and with (e) correction factor for heat flow quantity depending on exhaust gas mass flow for temperature sensor 3	=	1.00	factor	and change in exhaust-gas temperature sensor 3	<	30.00	°C		
			and with (f) minimum permissible temperature deviation for exhaust gas temperature sensor 3	=	-120.00	K	for time and	=	10.00	sec		
			and with				engine operation point suitable for diagnostic	=	255	-		
			(g) maximum permissible temperature deviation for exhaust gas temperature sensor 3	=	100.00	K	for					
							time and	>=	0.05	sec		
							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					

Component / System	Fault Code	Monitor Strategy Description	Primary Malfunction Criteria	Threshold Logic and Value	Secondary Parameters engine has been in exhaust warm-up mode for time and basic enable conditions met: and NO Pending or Confirmed DTCs:	>=	Enable Conditions 120.00 see sheet enable tables see sheet inhibit tables	sec -	Time Required	MIL Illum.
Reductant Pump Control Circuit	P208A	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 and 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 6.2 s monitor runs with 0.10 s rate whenever enable conditions are met	A
Reductant Pump Performance	P208B	The ECM detects that the commanded state of the Reductant Pump driver and the actual state of the control circuit do not match.	timer for functional acknowledgement of the reductant pump motor timer for functional acknowledgement of the reductant pump motor	> 4 <= 6	sec (Sec 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) ((=	FALSE TRUE ON	-	fault exists for more than 0.3 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.
					Remaining defrosting time of the tank Remaining defrosting time of the tank) OR Reductant Defrost check (please see the definition)))	> <= =	0 120 TRUE	sec sec		
					(ambient temperature) basic enable conditions met:	>	-6.64 see sheet enable tables	deg C -		
Reductant Pump Control Circuit High Voltage	P208D	Diagnoses the Reductant Pump Motor low side driver circuit for circuit faults.	Voltage high during driver on state (indicates short to power)	 Short to power: - ≤ 0.5 Ω impedance between signal and controller power 	ignition on and 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	- sec V sec -	fail conditions exists for 3 s monitor runs with 0.10 s rate whenever enable conditions are met	В
Reductant Purge Valve Control Circuit	P20A0	Diagnoses the Reductant Purge Valve low side driver circuit for circuit faults.	Voltage low during driver off state (indicates open circuit)	 Open Circuit:≥ - 200 K Ω impedance between ECU pin and load 	ignition on and ECU Initialization tasks in progress for time and	=	TRUE FALSE 0.10	- - Sec	fail conditions exists for 3 s monitor runs with 0.10 s rate whenever enable conditions are met	A

Component / System	Fault Code	Monitor Strategy Description	Primary Malfunction Criteria	Threshold Logic and Value	Secondary Parameters Battery voltage for time and basic enable conditions met: AND NO Pending or Confirmed DTCs	>	Enable Conditions 10.50 3.00 see sheet enable tables see sheet inhibit	V sec -	Time Required	MIL Illum.
Reverting Valve Performance	P20A1	This diagnostic checks the reverting valve performance during operation by detecting a lack of reduction of the reductant pressure	Difference between reductant pump pressure at beginning and end of pressure reduction 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:		tables TRUE 350.00 20.00 100.00 100.00 100.00 .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	В

Component /	Fault Code	Monitor Strategy Description	Primary Malfunction		Threshold Logic and Value	Secondary		Enable Conditions		Time Required	MIL
System Reductant Purge Valve Control Circuit Low Voltage		Description Diagnoses the Reductant Purge Valve low side driver circuit for circuit faults.	Criteria 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 ECU Initialization tasks in progress for time and Battery voltage for time and basic enable conditions met: AND NO Pending or Confirmed DTCs		FALSE 0.10 10.50 3.00 see sheet enable tables see sheet inhibit tables	- sec V sec -	required fail conditions exists for 2 s monitor runs with 0.01 sec rate whenever enable conditions are met	Illum. B
Reductant Purge Valve Control Circuit High Voltage	P20A3	Diagnoses the Reductant Purge Valve low side driver circuit for circuit faults.	Voltage high during driver on state (indicates short to power)	=	Short to power: ≤ 0.5 Ω impedance between signal and controller power	and 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 0.01 sec 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.
Exhaust Gas Temperature (EGT) Sensors 1-2 not plausible	P20E2	Detects biased exhaust temperature sensors by comparing the upstream and downstream oxidation catalyst temperature sensors after a calibrated engine off soak time	Path 1:	>	20 to 3276.7	°C	minimum engine-off time	>=	28800.00	Sec	fail conditions exists for 0.050 s monitor runs with 0.050 s rate whenever	В
			(a) captured oxidation catalyst downstream temperature at start and with	-	measured parameter	-	and ambient temperature and Engine Running (see parameter	>	-50.04 TRUE	°C	enable conditions are met	
			(b) captured oxidation catalyst upstream temperature at start as reference temperature	=	measured parameter	-	definition) for					
							time and engine post drive/ afterun	> =	0.10 FALSE	sec		
							and diagnostic performed in current dc	=	FALSE	-		
							and basic enable conditions met:	=	see sheet enable tables	-		
							and NO Pending or Confirmed DTCs:	=	see sheet inhibit tables	-		
Exhaust Gas	P20E4	Detects biased exhaust	Path 1:				minimum engine-off time	>=	28800.00	sec	fail	В
Temperature Sensor 2/3 Correlation Bank 1		temperature sensors by comparing the upstream and downstream particulate filter temperature sensors after a calibrated engine off soak time									conditions exists for 0.050 s monitor runs with 0.050 s rate whenever	_
			 (a) - (b) (see Look-Up-Table #32) with (a) captured particle filter downstream 	> =	20 to 3276.7 measured	°C -	and ambient temperature and	>	-50.04	°C	enable conditions are met	
			temperature at start and with		parameter		Engine Running (see parameter definition)	=	TRUE	-		
			(b) captured particle filter upstream temperature at start as reference temperature	=	measured parameter	-	for		0.40	a (-		
							time and	>	0.10	sec		
							engine post drive/ afterun and	=	FALSE	-		

Component / System	Fault Code	Monitor Strategy Description	Primary Malfunction Criteria	Threshold Logic and Value	Secondary Parameters		Enable Conditions		Time Required	MIL Illum.
					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	-		
Reductant Pressure Too Low	P20E8	Compare Reductant tank pressure with lower thresholds under metering control	Reductant Pump Module Pressure	< 420.00 kPa	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 60.0 s monitor runs with 0.1 s rate whenever enable conditions are met	В
Reductant Pressure Too High	P20E9	Path 1: Compare Reductant tank pressure with upper threshold under metering control	Reductant Pump Module Pressure	> 650.00 kPa	status of SCR control sub state (please see the definition) AND status byte in substate METERING CONTROL AND Dwell time in Metering control substate AND ambient pressure AND	= = >	Metering control Running 2.00 0.00	- sec kPa	fail conditions exists for more than 10 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.
							ambient temperature AND NO Pending or Confirmed DTCs: AND	> =	-30.04 see sheet inhibit tables	°C -		
							basic enable conditions met:	=	see sheet enable tables	-		
		Path 2: Or Reductant tank pressure high	Unfiltered Reductant Pump Module Pressure	>=	795.00	kPa	ambient pressure AND	>	0.00	kPa	fail conditions exists for more than 1 s	
							ambient temperature AND basic enable conditions met:	>	-30.04 see sheet enable tables	°C -	monitor runs with 0.1 s rate whenever enable conditions are met	
SCR NOx Catalyst Efficiency Below Threshold Bank 1	P20EE	Compare EWMA filtered NOx conversion efficiency of SCR catalyst with a threshold value	EWMA filtered delta SCR catalyst efficiency of (a) - (b)	<	0.00	factor	NO Pending or Confirmed DTCs:	=	see sheet inhibit tables	-	fail conditions exists for more than 1	A
			where (a) measured SCR catalyst efficiency	=	measured parameter	factor	for time and	>	10.00	sec	event monitor runs with 0.01 s	
			(b) offset-corrected modeled SCR catalyst efficiency (please see the general description for details) (see Look-Up-Table #68)	=	-0.262 to -0.149	factor	Status of NOx signal of upstream NOx sensor (please see the definition)	=	Active	-	rate whenever enable conditions	
							for time	>	40.00	sec	are met	
							Status of NOx signal of downstream NOx sensor (please see the definition) for time	=	Active 40.00	- 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 	=	20.00	sec		
							, and (

Component / System	Fault Code	Monitor Strategy Description	Primary Malfunction Criteria	Threshold Logic and Value	Secondary Parameters		Enable Conditions		Time Required	MIL Illum.
					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	=	220.00	sec		
					or integrated upstream NOx)	>=	1.50	g		
					(Status of pre controlled dosing (please	=	FALSE	-		
					see the definition) for time	>	(a) + (b)			
					(a) Debounce time after pre controlled dosing off	=	0.50	sec		
					(b) Delay time after pre controlled dosing off	=	220.00	sec		
					integrated upstream NOx)	>=	1.50	g		
					and (
					Decrease of Reductant load level (please see the definition)	=	FALSE	-		
					for time)	>	300.00	sec		
					and (
					Average slow filtered NOx mass flow upstream SCR	<=	0.09	g/sec		
					for time	>	0.50	sec		
					Monitor disable time based on average NOx mass flow and the time (see Look- Up-Table #79)	>	0 to 60	sec		
) and					
					for time with ((>	15.00	sec		
					SCR temperature gradient (see Look- Up-Table #77)	<	1.36 to 3.96	°C		
					SCR temperature gradient (see Look- Up-Table #78)	>	-3.64 to -2.04	°C		
					filtered SCR catalyst temperature filtered SCR catalyst temperature	<= >=	350.06 215.06	℃ ℃		
) normalized HC load in SCR catalyst	>	4.00	factor		
1	1	l	l	I	ambient pressure	>=	75.00	kPa		

Component /	Fault	Monitor Strategy	Primary Malfunction	Threshold	Secondary		Enable		Time	MIL
System	Code	Description	Criteria	Logic and Value	Parameters		Conditions		Required	Illum.
					ambient temperature	>=	-7.04	°C		
					DPF Regeneration in progress	=	FALSE	-		
					integrated upstream NOx during SCR	>=	2.00	g		
					adaptation plausibility check active			Ū		
					Status of the SCR adaptation	=	FALSE	-		
					plausibility check active (please see the definition) for time	>	120.00	sec		
)			300		
					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		
) SCR estimated current Reductant load (see Look-Up-Table #72)	>=	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		
					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	<=	800.00	ppm		
					emission 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	>	0.00	sec		
					Inverse calculated accelerator pedal value	>	5.00	%		
					for time	>	0.00	sec		
1		1	I	1	ioi une	-	0.00	360	I I	1

Compor		Monitor Strategy	Primary Malfunction	Threshold	Secondary		Enable		Time	MIL
Syste	m Code	Description	Criteria	Logic and Value	Parameters		Conditions		Required	Illum.
					basic enable conditions met:	=	see sheet enable tables	-		
					EWMA fast initialization mode: filter coefficient for fast initialization number of SCR NOx efficiency	= >=	0.40 1.00	factor counts		
					measurements for current driving cycle of code clear mode Total number of SCR NOx efficiency measurements for Code clear mode	>=	2.00	counts		
					EWMA Rapid Response mode: EWMA filtered delta SCR catalyst efficiency	>	0.20	factor		
					(a) - (b)	<	0.00	factor		
					(a) measured SCR catalyst efficiency	=	measured parameter	-		
					 (b) offset-corrected modeled SCR catalyst efficiency (please see the general description for details) 	=	calculated parameter	-		
					offset-corrected modeled SCR catalyst efficiency (please see the general description for details)	>	0.00	factor		
					filter coefficient for Rapid Response mode	=	0.36	factor		
					number of SCR NOx efficiency measurements for current driving cycle of Rapid Response mode	>=	1.00	counts		
					Total number of SCR NOx efficiency measurements for Rapid Response mode	>=	6.00	counts		
					EWMA filtered value too small in Fast Init. And Rapid Response modes:					
					EWMA filtered delta SCR catalyst efficiency of (a) - (b)	<	0.00	factor		
					(a) measured SCR catalyst efficiency	=	measured parameter	-		
					(b) offset-corrected modeled SCR catalyst efficiency (please see the general description for details)	=	calculated parameter	-		
					EWMA stabilized mode: filter coefficient for stabilized mode number of SCR efficiency measurements for stabilized mode	=	0.16 1	factor counts		
						-	_	_		

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 1 Circuit Low Voltage	P2122	Detects low voltage readings on the APP circuit, indicating an OOR low condition on the APP 1 circuit	voltage of acceleration pedal sensor 1 same as acceleration pedal position	<=	-6.6	V %	ignition on and basic enable conditions met: and NO Pending or Confirmed DTCs:		TRUE see sheet enable tables see sheet inhibit tables	-	fail conditions exists for 0.20 s monitor runs with 0.01 s rate whenever enable conditions are met	A
Accelerator Pedal Position (APP) Sensor 1 Circuit High Voltage	P2123	Detects high voltage readings on the APP circuit, indicating an OOR high condition on the APP 1 circuit	voltage of acceleration pedal sensor 1 same as acceleration pedal position	>=	4.78	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	A
Accelerator Pedal Position (APP) Sensor 2 Circuit Low Voltage	P2127	Detects low voltage readings on the APP circuit, indicating an OOR low condition on the APP 2 circuit		<=	0.28 -13.9	V %	ignition on and basic enable conditions met: and NO Pending or Confirmed DTCs:	=	TRUE see sheet enable tables see sheet inhibit tables	-	fail conditions exists for 0.20 s monitor runs with 0.01 s rate whenever enable conditions are met	A

Component / System	Fault Code	Monitor Strategy Description	Primary Malfunction Criteria		Threshold Logic and Value		Secondary Parameters		Enable Conditions		Time Required	MIL Illum.
Accelerator Pedal Position (APP) Sensor 2 Circuit High Voltage		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	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 1-2 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 (b) factor between sensor raw values and with (c) minimum voltage and with (d) redundant voltage of acceleration pedal (from pedal position sensor 2)	>	0.12 to 0.18 measured parameter 2.00 0.45 calculated parameter	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 0.21 s monitor runs with 0.01 rate whenever enable conditions are met	A

Component / System	Fault Code	Monitor Strategy Description	Primary Malfunction Criteria	Threshold Logic and Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
Injector Positive Voltage Control Circuit Group 1	P2146	ECM Electronic out-put driver circuitry determines if	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: ≤ 0.5 Ω impedance between signal and controller ground	Engine Running (see parameter definition)	= TRUE -	required fail conditions exists for more than 0.04 s monitor runs with 0.01 s rate whenever enable conditions are met	A
					and fuel system status	= no fuel cut off -		

Component /	Fault	Monitor Strategy	Primary Malfunction		Threshold	Secondary		Enable		Time	MIL
System Injector Positive Voltage Control Circuit Group 2	Code P2149	Description ECM Electronic out-put driver circuitry determines if faults (open/short/no load) exist on injector charging bank #2.	Criteria Voltage high during driver off state (indicates short to power, short to ground, or open circuit)	=	Logic and Value Logic and Value Short to power: $\leq 0.5 \Omega$ impedance between signal and controller power Open Circuit: \geq 200 K Ω impedance between ECU pin and load signal and controller ground: $\leq 0.5 \Omega$ impedance between signal and controller ground	Parameters Engine Running (see parameter definition) and	-	Conditions TRUE		Required fail conditions exists for more than 0.04 s monitor runs with 0.01 s rate whenever enable conditions are met	A
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	=	TRUE measured parameter 0.55	fuel system status ignition switch on and urea tank heater powerstage on and battery voltage and battery voltage and engine off time and urea tank temperature and (= =	no fuel cut off TRUE TRUE 11.00 655.34 300.00 41.96	- - V V sec °C	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 conductance of the urea tank heater is steady or falling for time or heater activation time) and basic enable conditions met: and NO Pending or Confirmed DTCs:	= > = =	Enable Conditions TRUE 400.00 50.00 see sheet enable tables see sheet inhibit tables	- sec sec -	Time Required	MIL IIIum.
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: (a) - (b) (see Look-Up-Table #2) where (a) captured intake air temperature at start and (b) captured humidity temperature at start	> =	20 to 999 measured parameter measured parameter	°C - -	minimum engine-off time and engine off time is valid and ambient air temperature and ignition on (see parameter definition) for time and engine post drive/ afterun and diagnostic performed in current drive cycle and basic enable conditions met: and NO Pending or Confirmed DTCs:	>= > = > = = = =	28800.00 TRUE -60.04 TRUE 0.01 FALSE FALSE see sheet enable tables see sheet inhibit tables	sec °C - sec - - -	fail conditions exists for 0.1 s monitor runs once per trip with 0.1 s rate whenever enable conditions are met	В
Reductant Level Sensor 2 Circuit Low	P21AA	CAN message: Discrete level sensor level 2 short to ground error	Reductant Tank Level 2 Error Status (tank level sensor 2 voltage directly measured after a test impulse was applied)	=	1 (0.17)	v	ignition on battery voltage	=	TRUE 8	v	fail conditions exists for more than 3 sec. monitor runs	В

Component / System	Fault Code	Monitor Strategy Description	Primary Malfunction Criteria		Threshold Logic and Valu	9	Secondary Parameters basic enable conditions met:	=	Enable Conditions see sheet enable tables		Time Required with 0.01 s rate whenever enable conditions are met	MIL Illum.
Reductant Level Sensor 2 Circuit High	P21AB	Path 1: CAN message: Discrete level sensor 2 open load error	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 (3.56) (4.74)	- V V	ignition on battery voltage basic enable conditions met:	=	TRUE 8 see sheet enable tables	- V -	fail conditions exists for more than 3 sec monitor runs with 1 s rate whenever enable conditions are met	A
		Path 2: CAN message: Discrete level sensor 2 short to battery error	Reductant Tank Level 2 Error Status (measured tank level sensor 2 voltage after 1.5 ms since a test impulse was applied)	Ш Л	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 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)	=	1	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	В

Component / System	Fault Code	Monitor Strategy Description	Primary Malfunction Criteria		Threshold Logic and Valu	e	Secondary Parameters		Enable Conditions		Time Required conditions are met	MIL Illum.
Reductant Level Sensor 3 Circuit High	P21B0	Path 1: CAN message: Discrete level sensor 3 open load error	Reductant Tank Level 3 Error Status (measured tank level sensor 3 voltage after 1.5 ms since a test impulse was applied) (measured tank level sensor 3 voltage after 1.5 ms since a test impulse was applied)	= > <	3 (3.56) (4.74)	- V V	ignition on battery voltage basic enable conditions met:	= > =	TRUE 8 see sheet enable tables	- V -	fail conditions exists for more than 3 sec monitor runs with 1 s rate whenever enable conditions are met	A
		Path 2: CAN message: Discrete level sensor 3 short to battery error	Reductant Tank Level 3 Error Status (measured tank level sensor 3 voltage after 1.5 ms since a test impulse was applied)	-	2 (4.74)	- V	ignition on battery voltage basic enable conditions met:	= >	TRUE 8 see sheet enable tables	- V -	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	Detects a tank heater open circuit by detecting low conductance in the heater	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 and battery voltage and engine off time	= = >= <= >=	TRUE TRUE 11.00 655.34 300.00	- V V sec	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 urea tank temperature and	<=	41.96	°C		
					(conductance of the urea tank heater is steady or falling for	=	TRUE	-		
					time or	>	400.00	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	-		
NOx Sensor Circuit Bank 1 Sensor 1		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	>	10.00	Sec	fail conditions exists for more than 13 sec.	A
					battery voltage battery voltage SCR upstream temperature SCR upstream temperature Engine Running for time Can Bus Initialized (CAN Bus is Active) consisting of: ignition on for time battery voltage battery voltage Upstream NOx sensor dewpoint achieved (please see the definition) NO Pending or Confirmed DTCs: basic enable conditions met:	, , , , , , , , , , , , , , , , , , ,	11.00 655.34 99.96 599.96 TRUE 20.00 TRUE TRUE 3 9.8 655.34 TRUE see sheet inhibit tables see sheet enable	V °C °C - sec - V V -	monitor runs with 0.01 s rate whenever enable conditions are met	
							tables			

Component /	Fault	Monitor Strategy	Primary Malfunction	Thresh	nold	Secondary		Enable		Time	MIL
System	Code	Description	Criteria	Logic and	d Value	Parameters		Conditions		Required	Illum.
		Detects a failure when short circuit status message from NOx sensor is received continuously for a time period	Short Circuit NOx signal error	= TRU	-	following conditions for time	>	10.00	sec	fail conditions exists for more than 13 sec.	
						battery voltage battery voltage SCR upstream temperature SCR upstream temperature Status of Start stop condition. (Quick Key Cycle Delay) (20 sec) Engine Running for time Can Bus Initialized (CAN Bus is Active) consisting of: ignition on for time battery voltage battery voltage Upstream NOx sensor dewpoint achieved (please see the definition) NO Pending or Confirmed DTCs: basic enable conditions met:		11.00 655.34 99.96 599.96 TRUE TRUE 20.00 TRUE TRUE 3 9.8 655.34 TRUE see sheet inhibit tables see sheet enable tables	V °C °C - sec V V -	monitor runs with 0.01 s rate whenever enable conditions are met	
N0x Sensor Circuit High Bank 1 Sensor 1	P2203	Detects an out of range high fault of the upstream NoX Sensor	NOx sensor signal (raw information received via CAN from NOx sensor)	> 1500.0	DO ppm	NOx sensor 1 ready status (see parameter definition) Valid NOx signal from CAN is received (no NOx sensor communication failures) Engine Running (see parameter definition)	= = =	TRUE TRUE TRUE	-	fault exists for more than 10 sec; monitor runs at 0.1 s when enable conditions are met	В
N0x Sensor Circuit Low Bank 1 Sensor 1	P2202	Detects an out of range low fault of the upstream NoX Sensor	NOx sensor signal (raw information received via CAN from NOx sensor)	< -90.0	0 ppm	for time and Injection Quantity or Upstream NOx sensor dewpoint achieved (please see the definition) for time	> = >	20.00 4.00 TRUE 300.00	sec mm^3/r ev - sec		

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 battery voltage SCR upstream temperature SCR upstream temperature Status of Start stop condition. (Quick Key Cycle Delay) (20 sec) Engine Running for time Can Bus Initialized (CAN Bus is Active) consisting of: ignition on for time battery voltage battery voltage Upstream NOx sensor dewpoint achieved (please see the definition) NO Pending or Confirmed DTCs: basic enable conditions met:	> X	10.00 11.00 655.34 99.96 599.96 TRUE TRUE 20.00 TRUE 3 9.8 655.34 TRUE 3 9.8 655.34 TRUE see sheet inhibit tables see sheet enable tables	V V °C °C °C - sec V V V -	fail conditions exists for more than 13 sec. monitor runs with 0.01 s rate whenever enable conditions are met	A
		Detects a failure when short circuit status message from NOx sensor heater is received continuously for a time period	Short Circuit NOx heater signal error	= TRUE -	following conditions for time battery voltage battery voltage SCR upstream temperature Status of Start stop condition. (Quick Key Cycle Delay) (20 sec) Engine Running for time Can Bus Initialized (CAN Bus is Active) consisting of: ignition on for time battery voltage battery voltage	~	10.00 11.00 655.34 99.96 599.96 TRUE 20.00 TRUE 20.00 TRUE 3 9.8 655.34	V V °C °C - sec - Sec V V	fail conditions exists for more than 13 sec. monitor runs with 0.01 s rate whenever enable conditions are met	

Component / System	Fault Code	Monitor Strategy Description	Primary Malfunction Criteria		Threshold Logic and Valu	e	Secondary Parameters		Enable Conditions		Time Required	MIL Illum.
							Upstream NOx sensor dewpoint achieved (please see the definition) NO Pending or Confirmed DTCs: basic enable conditions met:	= =	TRUE see sheet inhibit tables see sheet enable tables	-		
NOx Heater Performance Bank 1 Sensor 1	P2209	Monitoring of the upstream NOx sensor signal readiness	Upstream NOx sensor heater temperature has reached setpoint	=	FALSE		(battery voltage and battery voltage and Oxidation Catalyst upstream temperature and Oxidation Catalyst upstream temperature and Engine running for time and Upstream NOx sensor dewpoint achieved (please see the definition)) for time and basic enable conditions met: No Pending or Confirmed DTC	>= <= >= <= = > = =	1.00 655.34 99.96 599.96 TRUE 20.00 TRUE 160 see sheet enable tables see sheet inhibit tables	V °C °C - sec - sec -	fault exists for more than 1 event when dewpoint end is reached; monitor runs at 0.02 s when enable conditions are met	В
Reductant pressure line heater open circuit	P221C	Detects a pressure line heater open circuit by detecting low conductance in the heater	a <= b with (a) conductance of the urea pressure line heater and with (b) minimum tolerance threshold of the conductance for the urea pressure line heater	=	TRUE measured parameter 0.35	1/Ohm 1/Ohm	ignition switch on and urea pressure line heater powerstage on and battery voltage and battery voltage and engine off time	= >= <= >=	TRUE TRUE 11.00 655.34 300.00	- V V sec	fail conditions exists for 5 s monitor runs with 3 s rate whenever enable conditions are met	В

Component / System	Fault Code	Monitor Strategy Description	Primary Malfunction Criteria		Threshold Logic and Value	e	Secondary Parameters		Enable Conditions		Time Required	MIL Illum.
							and 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	P221D	Detects a pressure line heater short circuit by	a >= b	=	TRUE	-	ignition switch on	=	TRUE	-	fail conditions	В
circuit		detecting high conductance in the heater	with (a) conductance of the urea pressure line heater and with (b) maximum tolerance threshold of the conductance for the urea pressure line heater	=	measured parameter 0.78		and urea pressure line heater powerstage on and battery voltage	= >=	TRUE 11.00	- V	exists for 5 s monitor runs with 3 s rate whenever enable conditions are met	
							and battery voltage	<=	655.34	V		
							and engine off time and	>=	300.00	sec		
							and 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 supply	P221E	Detects a supply module	a <= b	=	TRUE	-	ignition switch on	=	TRUE	-	fail	В
module heater open circuit		heater open circuit by detecting low conductance in the heater		=	measured	1/Ohm	and supply module heater powerstage on	=	TRUE	-	conditions exists for 0.001 s monitor runs once per trip	_
			and with				and		44.00	.,	with 0.001 s	
			(b) minimum tolerance threshold of the conductance for the supply module heater	=	0.14	1/Ohm	battery voltage	>=	11.00	V	rate whenever enable	
							and battery voltage and	<=	655.34	V	conditions are met	
							engine off time and (>=	300.00	sec		

Component / System	Fault Code	Monitor Strategy Description	Primary Malfunction Criteria		Threshold Logic and Value	e	Secondary Parameters		Enable Conditions		Time Required	MIL Illum.
.,							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	-		
De dustant sumble	P221F	Defects a sumply marked			TRUE				TRUE		fail	В
Reductant supply module heater short circuit	P221F	Detects a supply module heater short circuit by detecting high conductance	a >= b	=	TRUE	-	ignition switch on	=	IRUE	-	conditions exists for	в
		in the heater	with (a) maximum conductance of the supply module heater	=	measured parameter	1/Ohm	and supply module heater powerstage on	=	TRUE	-	0.001 s monitor runs once per trip	
			and with (b) maximum tolerance threshold of the conductance for the supply module heater	=	0.46	1/Ohm	and battery voltage	>=	11.00	V	with 0.001 s rate whenever enable	
							and battery voltage	<=	655.34	V	conditions are met	
							and 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	>=	50.00	sec		
							and 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.
Barometric Pressure Sensor "A" Circuit Low	P2228	Detects low voltage readings on the ECM internal BARO circuit, indicating an OOR low condition on the BARO circuit.	voltage of barometric pressure sensor same as ambient pressure	<=	1.97	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
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	>	4.54 115.00	V kPa	ignition on and NO Pending or Confirmed DTCs: and basic enable conditions met:		TRUE see sheet inhibit tables see sheet enable tables	-	fail conditions exists for 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

Component / System	Fault Code	Monitor Strategy Description	Primary Malfunction Criteria		Threshold Logic and Value		Secondary Parameters		Enable Conditions		Time Required	MIL Illum.
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	>	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	<	-1.30	V	duty cycle value during sensor heat-up for time	>= >=	90.25 19.50	% sec	conditions are met	
			A/F sensor raw voltage	>	3.22	V	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	-		
) Decel Fuel Cut-Off Active (DFCO)	=	FALSE	-		
							Battery voltage	>	11.00	V		
							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 = heater ramp up is deactivated]	=	TRUE			
							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	-		
	_					_		_		_		
O2 Sensor Negative Current Control Circuit/Open Bank 1 Sensor 1	P2251	Monitoring the A/F sensor negative current control circuit (VM circuit) for open circuit failures	A/F sensor resistance signal voltage	>	3.00	V	Ignition on	=	TRUE	-	fault exists for more than 2 sec; monitor runs at 0.1 s	В
			and				(when enable	
			A/F sensor raw voltage or	>	-0.20		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		

Component /	Fault	Monitor Strategy	Primary Malfunction		Threshold		Secondary		Enable		Time	MIL
System	Code	Description	Criteria		Logic and Valu	e	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	= >	FALSE 11.00	- V		
							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 = heater ramp up is deactivated]	=	TRUE			
							for time or	>	37.00	sec		
							A/F sensor temperature	>	805.96	°C		
							A/F sensor temperature No Pending or Confirmed DTCs:	< =	823.96 see sheet inhibit	°C -		
							basic enable conditions met:	=	tables see sheet enable	_		
								-	tables			
				_	_	_			_			_
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	A
	1											
			control deviation of the boost pressure calculated out of difference between	>	(g) * (h)	-	(=	FALSE	-	test performed	
				>	(g) * (h)	-	(VNT turbo charger offset adaptation	=	FALSE	-		
			calculated out of difference between desired and actual value	>	(g) * (h) 35.0 to 85.0	- kPa	(VNT turbo charger offset adaptation active and			-	performed continuously	
			calculated out of difference between desired and actual value with (g) the upper limit (see Look-Up-Table			- kPa factor	active and turbo charger (VNT) wiping is active and	=	FALSE	-	performed continuously	
			calculated out of difference between desired and actual value with (g) the upper limit (see Look-Up-Table #60)	=	35.0 to 85.0		active and turbo charger (VNT) wiping is active	=	FALSE	- - kPa	performed continuously	
			calculated out of difference between desired and actual value with (g) the upper limit (see Look-Up-Table #60)	=	35.0 to 85.0		active and turbo charger (VNT) wiping is active and absolute filtered gradient of boost pressure setpoint, PCR_pDesVal , calculated over a time dT constitutes the third condition for detecting the steady state	=	FALSE FALSE 7.50		performed continuously	
			calculated out of difference between desired and actual value with (g) the upper limit (see Look-Up-Table #60)	=	35.0 to 85.0		active and turbo charger (VNT) wiping is active 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	= = <	FALSE FALSE 7.50 120.00	kPa mm^3/r	performed continuously	

Compone System	Monitor Strategy Description	Primary Malfunction Criteria		Threshold Logic and Value	•	Secondary Parameters		Enable Conditions		Time Required	MIL Illum.
						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			
		Path 2: control deviation of the boost pressure calculated out of difference between desired and actual value	<	(i) * (j)	-	following conditions for time: (>	0.50	sec	fail conditions exists for 15 s test	
		with				VNT turbo charger offset adaptation active	=	FALSE	-	performed continuously	
		(i) the upper limit (see Look-Up-Table #59)(i) correction factor	=	-55.0 to -25.0 1.00	kPa factor	and turbo charger (VNT) wiping is active	=	FALSE	-	0.01 s rate	
			=	1.00	Tactor	and absolute filtered gradient of boost	=	7.50	- kPa		
						pressure setpoint, PCR_pDesVal , calculated over a time dT constitutes the third condition for detecting the steady state and	<	7.50	кга		
						injection Quantity	>=	120.00	mm^3/r ev		
						injection Quantity	<=	170.00	mm^3/r ev		
						and engine Speed engine Speed	>= <=	2000.00 3500.00	rpm rpm		
						and particulate filter regeneration	=	FALSE	-		
						and NO Pending or Confirmed DTCs:		see sheet inhibit tables	-		
) and basic enable conditions met:	=	see sheet enable			
								tables	_		

Component / System Barometric Pressure (BARO) Sensor 2 Circuit Performance	Fault Code P227B	Monitor Strategy Description Correlation at low engine operating speeds of the barometric pressure sensor 1 and barometric pressure sensor 2 for sensor performance failures	Primary Malfunction Criteria BARO 2 pressure - BARO1 pressure	>	Threshold Logic and Value 7.50	Secondary Parameters engine speed and No Pending or Confirmed DTCs: and basic enable conditions met:	<	Enable Conditions 1500 see sheet inhibit tables see sheet enable tables	rpm -	Time Required fail conditions exists for 7 s monitor runs with 0.01 s rate whenever enable conditions are met	MIL IIIum. B
Barometric Pressure (BARO) Sensor 2 Circuit Low	P227C	Monitoring the barometric pressure sensor 2 circuit for the short circuit to ground indicating an OOR low Note: BARO 2 signal used for Humidity Sensor signal correction	barometric pressure sensor 2 circuit voltage same as barometric pressure 2	<	1.96	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
Barometric Pressure (BARO) Sensor 2 Circuit High	P227D	Monitoring the barometric pressure sensor 2 circuit for short circuit to battery and open circuit indicating an OOR high Note: BARO 2 signal used for Humidity Sensor signal correction	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

Component / System	Fault Code	Monitor Strategy Description	Primary Malfunction Criteria	Threshold Logic and Value	Secondary Parameters	Enable Conditions	F	Time Required	MIL Illum.
Fuel Pressure Regulator 2 Control Circuit	P2294	Diagnoses the Fuel Pressure Regulator 2 low side driver circuit for circuit faults.	Voltage low during driver off state (indicates 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 	e ma w v	fail conditions exists for 0.28 s onitor runs vith 0.01 s rate whenever enable conditions are met	A
			Electronic power stage circuitry determines over temperature on the fuel pressure regulator 2 control circuit.		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 w sec v	fail conditions exists for 0.28 s onitor runs vith 0.01 s rate whenever enable conditions are met	
Fuel Pressure Regulator 2 Control Circuit Low Voltage		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	= TRUE	e mo w v	fail conditions exists for 0.05 s onitor runs vith 0.01 s rate whenever enable conditions	A

Component / System	Fault Code	Monitor Strategy Description	Primary Malfunction Criteria	Threshold Logic and Value	Secondary Parameters		Enable Conditions		Time Required	MIL Illum.
					time and basic enable conditions met: and NO Pending or Confirmed DTCs	∧	3.00 see sheet enable tables see sheet inhibit	sec -	are met	
							tables	_		
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	A
					Battery voltage for	>	10.50	V	enable conditions	
					time and	>	3.00	sec	are met	
					basic enable conditions met: and	=	see sheet enable tables	-		
					NO Pending or Confirmed DTCs	=	see sheet inhibit tables	-		
O2 Sensor Out of Range During Deceleration Bank 1 Sensor 1	P2297	A/Fsensor signal monitoring in DFCO, which monitors a deviation of the raw A/F sensor signal and calculated sensor signal.	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
			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	rpm	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	are met	
					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		

Component / System	Fault Code	Monitor Strategy Description	Primary Malfunction Criteria	Threshold Logic and Value	Secondary Parameters		Enable Conditions		Time Required	MIL Illum.
- Cyclom		2000.000	0.00.00		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	=	TRUE	-		
					Post injection is not active (post injection only active during cold start catalyst heating or DPF regeneration)	=	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 0.02	°C		
					Absolute change in actual calculated O2 concentration for time	< >=	1.50	- sec		
					Fuel volume in fuel tank	>=	0.00	1		
					Battery voltage	>=	11.00	V		
					Decel Fuel Cut-Off (DFCO)	=	TRUE	-		
					NO Pending or Confirmed DTCs:	=	see sheet inhibit tables	-		
					basic enable conditions met:	=	see sheet enable tables	-		
		A/Fsensor signal monitoring in DFCO, which monitors a deviation of the raw A/F sensor signal and calculated sensor signal.	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 with 0.02 s	
			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	rpm	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		
		l			DPF regeneration not active	=	TRUE	-		

Component / System	Fault Code	Monitor Strategy Description	Primary Malfunction Criteria	Threshold Logic and Value	Secondary Parameters		Enable Conditions		Time Required	MIL Illum.
					Post injection is not active (post injection only active during cold start catalyst heating or DPF regeneration)	=	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		
					Absolute change in actual calculated O2 concentration	<	0.02	-		
					for time	>=	1.50	sec		
					Fuel volume in fuel tank	>=	0.00	I V		
					Battery voltage Decel Fuel Cut-Off (DFCO)	>= =	11.00 TRUE	v -		
					NO Pending or Confirmed DTCs:	=	see sheet inhibit	-		
					itte i ending er commed biloc.	_	tables			
					basic enable conditions met:	=	see sheet enable tables	-		
	_					-		-		
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	>	10.00	Sec	fail conditions exists for more than 13 s monitor runs	A
					battery voltage	>=	11.00	V	with 0.1 s	
					battery voltage	<=	655.34	v	rate	
					SCR downstream temperature	>=	99.96	°Č	whenever	
					SCR downstream temperature	<=	599.96	°Č	enable	
					Engine Running	=	TRUE	-	conditions	
					for time	>=	20.00	sec	are met	
					Can Bus Initialized (CAN Bus is Active)	=	TRUE	-		
					consisting of:		TRUE	-		
					ignition on for time	= >=	3	- sec		
					battery voltage	>=	9.8	V		
					battery voltage	<	655.34	v		
					Downstream NOx sensor dewpoint	=	TRUE	-		
					achieved (please see the definition)					
					no pending or confirmed faults	=	see sheet inhibit tables	-		
					basic enable conditions met:	=	see sheet enable tables	-		
		Downstream NOx sensor	Short circuit NOx signal error of	= TRUE -	following conditions for time	>	10.00	sec	fail	
		short circuit error via the CAN message	downstream NOx sensor via CAN message						conditions exists for	

Component / System	Fault Code	Monitor Strategy Description	Primary Malfunction Criteria	Threshold Logic and Value	Secondary Parameters		Enable Conditions		Time Required	MIL Illum.
oyotom	0000	Description	Untonia	Logio una valuo	battery voltage	>=	11.00	V	more than	
					battery voltage	<=	655.34	V	13 s	
					SCR downstream temperature	>=	99.96	°C	monitor runs	
					SCR downstream temperature	<=	599.96	°C	with 0.1 s	
					Engine Running	=	TRUE	-	rate	
					for time	>=	20.00	sec	whenever	
					Can Bus Initialized (CAN Bus is Active	=	TRUE	-	enable	
)				conditions	
					, consisting of:				are met	
					ignition on	=	TRUE	-	ale met	
					for time	>=	3	sec		
					battery voltage	>	9.8	V		
					battery voltage	<	655.34	v		
					Downstream NOx sensor dewpoint	=	TRUE	-		
					achieved (please see the definition)		INCE			
					no pending or confirmed faults	=	see sheet inhibit	-		
					no ponding of committee reality	_	tables			
					basic enable conditions met:	=	see sheet enable			
					basic chable conditions met.	-	tables			
							tables			
NOx Sensor Circuit	P229F	Compares Delta NOx	Maximum deviation of downstream NOx	< 3.00 ppm	NO Pending or Confirmed DTCs:	=	See sheet		fail	В
Range/Performanc	1 2201	concentration of downstream		¢ 0.00 ppm	itte i enaling er committed biree.		inhibit table		conditions	D
e Bank 1 Sensor 2		NOx sensor with a threshold					initial table		exists for	
o Bank i Gondon 2									more than 1	
									event	
					Status of NOx signal of upstream NOx	=	TRUE	-	monitor runs	
					sensor (please see the definition)	-	INCL		with 0.01s	
					for time	>	0.00	sec	rate	
					Status of NOx signal of downstream NOx	=	TRUE	-	whenever	
					sensor (please see the definition)	-	INCL		enable	
					for time	>	0.00	sec	conditions	
					exhaust gas mass flow	>=	2.78	g/sec	are met	
					engine speed	>	200.00	rpm	are met	
					for time	>	10.00	sec		
						-	FALSE	300		
					Status of the SCR adaptation plausibility	_				
					Status of the SCR adaptation plausibility check active (please see the definition)	=	FALSE	-		
					Status of the SCR adaptation plausibility check active (please see the definition)	=	FALSE	-		
					check active (please see the definition)			SPC		
					check active (please see the definition) for time	>	0.00	sec °C		
					check active (please see the definition) for time SCR catalyst average temperature	> >=	0.00 180.06	°C		
					check active (please see the definition) for time SCR catalyst average temperature SCR catalyst average temperature	> >= <=	0.00 180.06 279.96	°C ℃		
					check active (please see the definition) for time SCR catalyst average temperature SCR catalyst average temperature SCR catalyst average temperature	> >= <= >=	0.00 180.06 279.96 400.06	℃ ℃ ℃		
					check active (please see the definition) for time SCR catalyst average temperature SCR catalyst average temperature	> >= <=	0.00 180.06 279.96	°C ℃		
					check active (please see the definition) for time SCR catalyst average temperature SCR catalyst average temperature SCR catalyst average temperature	> >= <= >=	0.00 180.06 279.96 400.06	℃ ℃ ℃		
					check active (please see the definition) for time SCR catalyst average temperature SCR catalyst average temperature SCR catalyst average temperature SCR catalyst average temperature (> >= <= >=	0.00 180.06 279.96 400.06	℃ ℃ ℃		
					check active (please see the definition) for time SCR catalyst average temperature SCR catalyst average temperature SCR catalyst average temperature SCR catalyst average temperature (State machine_0 : starting state and	> >= <= >=	0.00 180.06 279.96 400.06	℃ ℃ ℃		
					check active (please see the definition) for time SCR catalyst average temperature SCR catalyst average temperature SCR catalyst average temperature SCR catalyst average temperature (State machine_0 : starting state and waiting for low upstream NOx mass	> >= <= >=	0.00 180.06 279.96 400.06	℃ ℃ ℃		
					check active (please see the definition) for time SCR catalyst average temperature SCR catalyst average temperature SCR catalyst average temperature SCR catalyst average temperature (State machine_0 : starting state and	> >= <= >=	0.00 180.06 279.96 400.06	℃ ℃ ℃		
					check active (please see the definition) for time SCR catalyst average temperature SCR catalyst average temperature SCR catalyst average temperature SCR catalyst average temperature (State machine_0 : starting state and waiting for low upstream NOx mass flow / concentration (> >= <= >= <=	0.00 180.06 279.96 400.06 700.06	ů ů ů ů		
					check active (please see the definition) for time SCR catalyst average temperature SCR catalyst average temperature SCR catalyst average temperature SCR catalyst average temperature (State machine_0 : starting state and waiting for low upstream NOx mass	> >= <= >=	0.00 180.06 279.96 400.06	℃ ℃ ℃		

Component /	Fault	Monitor Strategy	Primary Malfunction	Threshold	Secondary		Enable		Time	MIL
System	Code	Description	Criteria	Logic and Value	Parameters		Conditions		Required	Illum.
					Exhaust mass flow message	<	40.28	g/sec		
					for time	<	2.00	sec		
)					
					State machine_1 : low upstream NOx					
					mass flow /concentration reached					
					(
					Old State machine_0 : starting state	=	TRUE	-		
					and waiting for low upstream NOx					
					mass flow / concentration					
					for time	>=	2.00	sec		
					Filtered upstream NOx mass flow	<	0.03	g/sec		
					Filtered NOx concentration		260.00			
					Exhaust mass flow message	<	40.28	ppm		
						<		g/sec		
					captured minimum downstream NOx	=	Measured	ppm		
					concentration in State machine_1		parameter			
)					
					State machine_2 : start Upstream NOx					
					peak					
					(
					Old State machine_1 : low upstream	=	TRUE	-		
					NOx mass flow /concentration reached					
					(
					Filtered upstream NOx mass flow	>	0.03	g/sec		
					or			-		
					Filtered NOx concentration	>	260.00	ppm		
					or					
					Exhaust mass flow message	>	40.28	g/sec		
)			J		
					for time	<	1.50	sec		
))					
					State machine_3 : Upstream NOx peak					
					detection					
					(
					Old State machine_2 : start Upstream	=	TRUE	-		
					NOx peak	-	INCL	-		
					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		
) Otata maakina Assialaw fan					
					State machine_4 : delay for					
					downstream NOx peak evaluation					
					(
					Old State machine_3 : Upstream NOx	=	TRUE	-		
					peak detection					
		1		1	for time	>=	1.20	sec		
									-	-

Component / System	Fault Code	Monitor Strategy Description	Primary Malfunction Criteria	Lo	Threshold ogic and Value		Secondary Parameters		Enable Conditions		Time Required	MIL Illum.
					-		Absolute deviation of downstream NOx concentration: (a) - (b) and with	=	Measured parameter	ppm		
							(a) Filtered downstream NOx concentration	=	Measured parameter	ppm		
							(b) captured minimum downstream NOx concentration in State	=	Measured parameter	ppm		
							machine 1 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 3.00	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	-		
)) basic enable conditions met:	=	see sheet enable tables	-		
	_				_	_		_		_		
NOx Sensor Circuit High Bank 1	P22A1	fault of the downstream NoX	information received via CAN from NOx	>	1500.00	ppm	Downstream NOx sensor ready status (see parameter definition)	=	TRUE	-	fault exists for more	В
Sensor 2		Sensor	sensor)				Valid NOx signal from CAN is received (no NOx sensor communication failures)	=	TRUE	-	than 10 sec; monitor runs at 0.1 s when enable	
NOx Sensor Circuit Low Bank 1 Sensor	P22A0	Detects an out of range low fault of the downstream NoX	Downstream NOx sensor signal (raw information received via CAN from NOx	<	-90.00	ppm	Engine Running (see parameter definition)	=	TRUE	-	conditions are met	
2		Sensor	sensor)				for time	>	20.00	sec		
							and Injection Quantity	>	4.00	mm^3/r		
							or			ev		
							Downstream NOx sensor dewpoint achieved (please see the definition)	=	TRUE	-		
							for time	>	300.00	Sec		

Component / System	Fault Code	Monitor Strategy Description	Primary Malfunction Criteria	Threshold Logic and Value	Secondary Parameters		Enable Conditions		Time Required	MIL Illum.
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 battery voltage battery voltage SCR downstream temperature SCR downstream temperature Engine Running for time Can Bus Initialized (CAN Bus is Active) consisting of: ignition on for time battery voltage battery voltage Downstream NOx sensor dewpoint achieved (please see the definition) no pending or confirmed faults basic enable conditions met:	~ """"""""""	10.00 11.00 655.34 99.96 599.96 TRUE 20.00 TRUE TRUE 3 9.8 655.34 TRUE see sheet inhibit tables see sheet enable tables	Sec V °C °C - Sec - Sec V V - -	fail conditions exists for more than 13 s monitor runs with 0.1 s rate whenever enable conditions are met	A
		Downstream NOx sensor heater short circuit error via the CAN message	Short circuit heater error of downstream NOx sensor via CAN message	= TRUE -	following conditions for time battery voltage battery voltage SCR downstream temperature SCR downstream temperature Engine Running for time Can Bus Initialized (CAN Bus is Active) consisting of: ignition on for time battery voltage battery voltage Downstream NOx sensor dewpoint achieved (please see the definition) no pending or confirmed faults basic enable conditions met:	~	10.00 11.00 655.34 99.96 599.96 TRUE 20.00 TRUE 3 9.8 655.34 TRUE see sheet inhibit tables see sheet enable tables	Sec 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	

Component /	Fault	Monitor Strategy	Primary Malfunction		Threshold		Secondary		Enable		Time	MIL
System	Code	Description	Criteria		Logic and Value		Parameters		Conditions		Required	Illum.
NOx Heater Performance Bank 1 Sensor 2	P22A7	Monitoring of the downstream NoX sensor signal readiness	Downstream NOx sensor heater temperature has reached setpoint	=	FALSE	-	(fault exists for more than 1 event	В
		-					battery voltage and	>=	11.00	V	when dewpoint	
							battery voltage and	<=	655.34	V	end is reached;	
							SCR downstream temperature and	>=	99.96	°C	monitor runs at 0.02 s	
							SCR downstream temperature and	<=	599.96	°C	when enable conditions	
							Engine running	=	TRUE	-	are met	
							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	P22FA	Compare sensor response	Upstream NOx response time between	>	1.80	sec	engine speed	>=	1320.00	rpm	fault exists	В
Performance - Slow Response High to Low Bank 1 Sensor 1	FZZFA	time with a threshold or if sensor signal does not reach 60% of initial vale within a threshold time	30% and 60% of the initial value	>	1.80	Sec	engine speed	>=	1320.00	Ipm	for more than 2 events; monitor runs at 0.02 s	D
			or				Combusted injection quantity	>=	60.00	mm^3/r ev	when enable conditions	
			Upstream NOx concentration	>	60% NOx concentration of initial value	-	Combusted injection quantity	<=	(a) + 20	mm^3/r ev	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	=	measured parameter	-		
							response (b) lower injection quantity limit for upstream NOx sensor dynamic	=	36.00	mm^3/r ev		
							response for time	>	1.20	sec		

Component / System	Fault Code	Monitor Strategy Description	Primary Malfunction Criteria		Threshold Logic and Value		Secondary Parameters		Enable Conditions		Time Required	MIL Illum.
- Oyotom	0000	Decemption	<u> </u>				Upstream NOx concentration Operating condition change from fueling to DFCO	>=	80.00	ppm	Roquilou	maini
							Combusted injection quantity	<=	0.00	mm^3/r ev		
							for time	>=	1.60	sec		
							basic enable conditions met:	=	see sheet enable tables	-		
NOx Sensor Performance - Sensing Element Bank 1 Sensor 2	P22FE	NOx sensor self-diagnosis, which occurs within the NOx sensor and reported to the ECM, which runs in the ECM afterrun, and measures the sensor drift by comparing to a reference point.		>	150.00		General Conditions required before Shutdown:				fault exists 3 times per driving-cycle; monitor run at 0.1 s rate during ECM afterrun	В
			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	<	200.00	ppm		
							temperature upstream of the SCR	>=	49.96	°C		
							catalyst temperature upstream of the SCR catalyst	<=	499.96	°C		
							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 means	=	TRUE	-		
							NOx sensor has sent via CAN that heater temperature setpoint has been reached (i.e. dewpoint achieved and no heater faults)	=	TRUE	-		
							Afterrun Conditions: NO Pending or Confirmed DTCs:	=	see sheet inhibit	-		
							ECM operating in Afterrun (please see the definition)	=	tables TRUE	-		
							vehicle speed	=	0			
							measured downstream NOx	<=	200.00	ppm		
							DPF regeneration active	=	FALSE	-		
							engine speed	>=	0.00	rpm		
							engine speed	<=	1000.00	rpm		I

Component / System	Fault Code	Monitor Strategy Description	Primary Malfunction Criteria	Lc	Threshold gic and Value		Secondary Parameters NOx sensor signal is valid (e.g. No CAN error of NOX CAN messages) maximum duration in afterrun number of self-diagnostic attempts status sensor reaction in afterrun (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)	= = = = <	Enable Conditions TRUE 150 4.00 50.00 TRUE	sec counts sec	Time Required	MIL Illum.
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: with (a) oxidation catalyst upstream temperature or (b) oxidation catalyst downstream temperature or (c) particulate filter downstream temperature or (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	=	TRUE 799.96 899.96 799.96 600.00 400.00	- 20 20 20 20 20	Basic enable conditions met: and NO Pending or Confirmed DTCs:	=	see sheet enable tables	-	fail conditions exists for 6 s test performed continuously 0.1 s rate	A
Exhaust Gas Temperature (EGT) Sensor 3 Sensor Circuit Low Voltage	P242C	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	<	0.55 -50.04	∨ °C	ignition on and basic enable conditions met:	=	TRUE see sheet enable tables	-	fail conditions exists for 0.05 s monitor runs 0.05 s rate whenever enable	A

Component / System	Fault Code	Monitor Strategy Description	Primary Malfunction Criteria	Threshold Logic and Value	Secondary Parameters	Enable Conditions		MIL lum.
Exhaust Gas Temperature (EGT) Sensor 3 Circuit High Voltage	P242D	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 °(and	= TRUE -	fail conditions exists for 0.05 s monitor runs 0.05 s rate whenever enable conditions are met	A
Diesel Particulate Filter Differential Pressure Sensor Performance	P2453	Checks for range faults of the DPF differential pressure sensor.	Absolute differential pressure of particle filter	> 3.20 kF	 Engine control unit in after-run state and NO Pending or Confirmed DTCs and basic enable conditions met Exhaust gas volume flow 	 TRUE - see sheet inhibit - tables see sheet enable - tables >= 40.00 m^3/t 	conditions exists for 0,2s monitor runs with 0.001 s rate whenever enable conditions are met	В
		exhaust gas volume to the resulting change in the measured differential pressure sensor reading	Exhaust gas volume flow change and	> 100.00 m^3/	/se and Exhaust gas volume flow	<= 60.00 m^3/t	conditions exists for 3s monitor runs with 0.001 s rate whenever en enable	

Component / System	Fault Code	Monitor Strategy Description	Primary Malfunction Criteria		Threshold Logic and Value	e	Secondary Parameters		Enable Conditions		Time Required	MIL Illum.
			Pressure difference change (see Look- Up-Table #26))	<	0.5 to 1.5	kPa/sec		>=	600.00	rpm	conditions are met	
							for time and NO Pending or Confirmed DTCs basic enable conditions met	∧	5.00 see sheet inhibit tables see sheet enable tables	sec - -		
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	<	0.35	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	mV 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

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) 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 	>=	120.00	sec	fail conditions exists for 0.1 s monitor runs	В
					(engine speed and	>=	1000.00	rpm	with 0.1 s rate whenever	
					engine speed) and	<=	3000.00	rpm	enable conditions are met	
					(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 downstream of the EGR cooler) and	<=	27.78	g/sec		
					EGR controller is active and	=	TRUE	-		
					((a) - (b) with (a) filtered temperature upstream of EGR-cooler and with (b) engine temperature) and	>=	60.00	К		
					((a) - (b)	<=	3276.70	°C		
					with (a) filtered temperature upstream of EGR-cooler and with	=	measured parameter	-		
					(b) engine temperature	=	measured parameter	-		
) and engine coolant temperature and	>=	69.96	°C		
					engine coolant temperature and	<=	125.96	°C		

Component / System	Fault Code	Monitor Strategy Description	Primary Malfunction Criteria		Threshold Logic and Value		Secondary Parameters		Enable Conditions		Time Required	MIL Illum.
							(actual valve position of exhaust-gas recirculation and actual valve position of exhaust-gas	>=	5	%		
							recirculation) and (<=	100.00	70		
							control value provided for EGR cooling bypass and	>=	-400.00	%		
							control value provided for EGR cooling bypass for	<=	5.00	%		
							time) and ambient pressure	>	10.00 74.80	sec kPa		
							and (ambient temperature	>=	-7.04	°C		
							and 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:) and	=	see sheet inhibit tables	-		
							basic enable conditions met:	=	see sheet enable tables	-		
Diesel Particulate Filter Regeneration Frequency	P2459	Detects a DPF that is regeneration too frequently by comparing a threshold to a soot model.	soot mass in the particulate filter (measured used for determining DPF regeneration trigger)	>	((a) - (b)) + ((c) * (d))	g	particulate filter regeneration - transition false to true	=	TRUE	-	fail conditions exists for more than 1	В
		a sour mouer.	with (a) engine out soot mass flow in the exhaust-gas (function of vehicle speed only)	=	measured parameter		and last particulate filter regeneration successful	=	TRUE	-	more than 1 event monitor runs 0.1 s rate whenever	
			and with (b) soot mass at the end of previous DPF regeneration and with	=	calculated parameter	-	or particulate filter regeneration must have been completed and	=	TRUE	-	enable conditions are met	

Component / System	Fault Code	Monitor Strategy Description	Primary Malfunction Criteria (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	-	Threshold Logic and Value 0 to 1040	g	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.
EGR Cooler Bypass Control Circuit/Open Bank 1	P245A	Monitoring the EGR cooler bypass control circuit for open circuit failures and overtemperature circuit failures	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
EGR Cooler Bypass Control Circuit Low Bank 1	P245C	Monitoring the EGR cooler bypass 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 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 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 basic enable conditions met: and NO Pending or Confirmed DTCs:	=	TRUE see sheet enable tables see sheet inhibit tables	-	fail conditions exists for 30 s test performed continuously 0.1 s rate	A
Closed loop Reductant Injection Control at Limit- Flow too high	P249D	Detects an out of range high of the long term Reductant quantity adaption factor	long term adaptation factor of Reductant quantity	>	1.45 factor	long term adaption triggered NO Pending or Confirmed DTCs basic enable conditions met:	=	TRUE see sheet inhibit tables see sheet enable tables	-	fault exists for more than 0.1 s; monitor runs at 0.1 s whenever enable conditions are met	В

Component / System	Fault Code	Monitor Strategy Description	Primary Malfunction Criteria		Threshold Logic and Value		Secondary Parameters		Enable Conditions		Time Required	MIL Illum.
Closed loop Reductant Injection Control at Limit- Flow too low	P249E	Detects an out of range low of the long term Reductant quantity adaption factor	long term adaptation factor of Reductant quantity	<	0.55	factor	NO Pending or Confirmed DTCs basic enable conditions met:	=	see sheet inhibit tables see sheet enable tables	•	fault exists for more than 0.1 s; monitor runs at 0.1 s whenever enable conditions are met	B
EGR Cooler Bypass Control Stuck Bank 1	P24A5	Monitoring of the absolute change in temperature downstream of the EGR cooler after a change in bypass valve position. The first temperature difference is measured when the ECB valve is intrusively commanded closed for a period of time and the second temperature difference is measured when the ECB valve is commanded open for a period of time		<	5.00	°C	for time 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	<pre></pre>	0.20 515.00 1130.00 20.00 0.20 1.86 FALSE 64.96 125.96 129.96 129.96 60.00 FALSE see sheet enable tables see sheet inhibit tables	sec rpm rpm - °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	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 Circuit Range/Performanc e	P24AF	PM Sensor bypass current rationality check	Measured particulate sensor Interdigital Electrode (IDE) current after sensor regeneration	>	5.00	μA	PM Sensor temperature	>	200.00	°C	fault exists for more than 5 sec; monitor runs at 0.1 s	В
							PM Sensor temperature	<	425.00	°C	when enable	
							Particulate sensor regeneration is completed	=	TRUE	-	conditions are met	
							Battery voltage (ECM) IDE supply voltage	>= >=	11.00 41.55	V V		
							and					
							IDE supply voltage Ignition on	<= =	49,72 TRUE	V -		
							for time	>	3.00	sec		
						_			_	_		
Particulate Matter Sensor Heater Control Circuit Range/Performanc e	P24B4	The PM sensor protection tube monitor uses the cooling effect of exhaust gas flow inside protection tube during protection heating, to ensure 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)	accumulated change in heater voltage	×	100.00	%	Accumulated change in exhaust gas velocity	>	30.00	m/sec	fault exists for more than 0.1 sec; monitor runs at 0.1 s once per trip	В
			with accumulated change in heater voltage	=	((a) / (b)) * (100)	-	(Absolute, filtered and temperature	>	0.65	m/sec^		
			accumulated change in heater voltage	-	((a) / (b)) (100)	-	compensated exhaust gas acceleration	7	0.05	2		
			where (a) change in the heater voltage	=	measured parameter	-	and Absolute, filtered and temperature compensated exhaust gas acceleration	<	6.51	m/sec^ 2		
			and with (b) minimum change in the heater	=	1.10	V) for time	>	0.90	sec		
			voltage				Diagnosis by the local unit is released means	=	TRUE	-		
							(PM sensor temperature and	>	190.00	°C		
							PM sensor temperature)	<	210.00	°C		

Fault Code	Monitor Strategy Description	Primary Malfunction Criteria		Threshold Logic and Value	e	Secondary Parameters		Enable Conditions		Time Required	MIL Illum.
				-		Time has elapsed since diagnosis by	>=	15.00	sec		
						Protection heating is active	=	TRUE	-		
						means PM sensor heater target temperature	=	200	degC		
						PM sensor dewpoint achieved (please	=	FALSE	-		
						Initialization values have been transferred (i.e. CAN communication with ECM	=	TRUE	-		
						established) Sensor temperature at engine start and	>	-10.04	°C		
						Sensor temperature at engine start	<	249.96	°C		
						Exhaust gas temperature	>	-10.04	°C		
						Exhaust gas temperature	<	179.96	°C		
						PM sensor temperature start temperature	>	-10.04	°C		
						and PM sensor temperature start temperature	<	99.96	°C		
						Battery voltage (ECM)	>=	11.00	V		
P24B7	Rationality check of heater resistance (heater aged), executed once after Power- up of the powertrain main	A functional error of the heater self diagnosis of the particulate sensor is detected in the sensor control unit	=	TRUE	-	Functional heater self diagnosis is tested	=	TRUE		fault exists for more than 0.1 sec; monitor runs	В
	Telay	means				means					
		Electric heater resistance based on temperature as measured by temperature meander (see Look-Up- Table #33)	>	2.93 to 4.13	Ohm	(conditions are met	
		Electric heater resistance based on temperature as measured by temperature meander (see Look-Up-	<	1.09 to 1.81	Ohm	Battery voltage (ECM) PM sensor temperature	>= >=	11.00 -30.00	°C		
						and					
							<=	150.00			
							<	150.00	°C		
						(a) maximum PM sensor temperature	=	calculated parameter	-		
						and with (b) minimum PM sensor temperature	=	calculated parameter	-		
	Code	Code Description P24B7 Rationality check of heater resistance (heater aged), executed once after Power-	Code Description Criteria P24B7 Rationality check of heater resistance (heater aged), executed once after Power-up of the powertrain main relay A functional error of the heater self diagnosis of the particulate sensor is detected in the sensor control unit means Electric heater resistance based on temperature as measured by	Code Description Criteria P24B7 Rationality check of heater resistance (heater aged), executed once after Power-up of the powertrain main relay A functional error of the heater self diagnosis of the particulate sensor is detected in the sensor control unit means Electric heater resistance based on temperature as measured by temperature meander (see Look-Up-Table #33) or Electric heater resistance based on temperature meander (see Look-Up-Table #33) or Electric heater resistance based on temperature meander (see Look-Up-Table #33) or Electric heater resistance based on temperature meander (see Look-Up-Table #33) or Electric heater resistance based on temperature meander (see Look-Up-Table #33) or Electric heater resistance based on temperature meander (see Look-Up-Table #33) or Electric heater resistance based on temperature meander (see Look-Up-Table #33) or Electric heater resistance based on temperature meander (see Look-Up-Table #33) or Electric heater resistance based on temperature meander (see Look-Up-Table #33) or Electric heater resistance based on temperature meander (see Look-Up-Table #33) or Electric heater resistance based on temperature meander (see Look-Up-Table #33) or Electric heater resistance based on temperature meander (see Look-Up-Table #33) or Electric heater resistance based on temperature meander (see Look-Up-Table #33) or Electric heater resistance based on temperature meander (see Look-Up-Table #33) or Electric heater resistance based on temperature meander (see Look-Up-Table #33) or Electric heater resistance based on temperature meander (see Look-Up-Table #33) or Electric heater resistance based on temperature meander (see Look-Up-Table #33) or Electric heater resistance based on temperature meander (see Look-Up-Table #33) or Electric heater resistance based on temperature meander (see Look-Up-Table #33) or Electric heater resistance based on temperature meande	Code Description Criteria Logic and Value P24B7 Rationality check of heater resistance (heater aged), executed once after Power- up of the powertrain main relay A functional error of the heater self diagnosis of the particulate sensor is detected in the sensor control unit means = TRUE Electric heater resistance based on temperature meander (see Look-Up-Table #33) or = 1.09 to 1.81	Code Description Criteria Logic and Value P24B7 Rationality check of heater resistance (heater age), executed once after Power- up of the powertrain main relay A functional error of the heater self diagnosis of the particulate sensor is detected in the sensor control unit means Electric heater resistance based on temperature as measured by temperature as measured by temperature meander (see Look-Up- Table #33) or = TRUE -	Code Description [®] Criteria Logic and Value Parameters The has elapsed since diagnosis by the local unit is released The has elapsed since diagnosis by the local unit is released to the power-local unit is released on temperature and the local unit is released to the power-local unit is released to the powerereliase to the local unit is released to the powere	Code Description Criteria Logic and Value Parameters Parameters The hase elapsed since disposits by the local unit is released The hase elapsed since disposits by the boal unit is released >= The hase elapsed since disposits by the local unit is released >= PM sensor heater triggt temperature = PM sensor heater triggt temperature = PM sensor devopint achieved (please see the definition) = PM sensor temperature at engine start sensor temperature at engine start estimated at temperature > P24B7 Rationality check of heater relay A functional error of the heater self diagnosis of the particulate sensor is executed once after Power up of the powertrain main relay A functional error of the heater self diagnosis of the particulate sensor is executed once after Power up of the powertrain main relay > 2.93 to 4.13 Ohm means (= P24B7 Rationality check of heater relay A functional error of the heater self diagnosis of the particulate sensor is decided in the sensor control unit relay > 2.93 to 4.13 Ohm means (= P24B7 Relationality check of heater relay A functional error of the heater self diagnosis of the particulate sensor is decided in the sensor control unit relay > 2.93 to 4.13 Ohm <t< td=""><td>Code Description Criteria Logic and Value Parameters Coorditions The hase signed since diagnosis by the local unit is released = 15.00 Harmonic Since Si</td><td>Code Description Criteria Logic and Value Parameters Conditions Production Time base dispectations </td><td>Code Description Criteria Logic and Value Parameteria Conditions Required The has elapsed aline diagnosis in the heat init is released in the released init is released in the procession diagnosis in the heat init is released in the released initial is released in the procession diagnosis in the heat initial is released in the heat initinitial is relea</td></t<>	Code Description Criteria Logic and Value Parameters Coorditions The hase signed since diagnosis by the local unit is released = 15.00 Harmonic Since Si	Code Description Criteria Logic and Value Parameters Conditions Production Time base dispectations	Code Description Criteria Logic and Value Parameteria Conditions Required The has elapsed aline diagnosis in the heat init is released in the released init is released in the procession diagnosis in the heat init is released in the released initial is released in the procession diagnosis in the heat initial is released in the heat 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Component / System	Fault Code	Monitor Strategy Description	Primary Malfunction Criteria	Lo	Threshold gic and Value	Secondary Parameters Debouncing time for the functional heater self diagnosis	>	Enable Conditions 0.00	Sec	Time Required	MIL Illum.
ECM/PCM Power Input Signal	P2505	Detects an interrupted supply voltage of the engine off time circuit (permanent battery voltage supply line to ECM)	permanent supply voltage is interrupted via open circuit	=	TRUE	ignition on and basic enable conditions met:	=	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	Detects stuck power relay that is not responding to ECM commands to power down or a relay that is opening too early in power down. Stuck on is determined by timer values longer than possible if relay opened at end of after run.	counter value out of EEPROM for open the main relay	>	2.00	ignition on and engine pre drive and basic enable conditions met:	=	TRUE TRUE 256.00	-	fail conditions exists for 0.02 s monitor runs once per driving cycle during predrive with 0.02 s rate whenever enable conditions are met	В
		Opening too soon is indicated by a lack of EEPROM write at the last after run.	sticky main relay is detected means time after request to open the main relay	=	TRUE - 2.00 sec	ignition off and engine pre drive and battery voltage	=	TRUE FALSE 0.50	- - V	fail conditions exists for 0.02 s monitor runs once per driving cycle during predrive with	

Component / System	Fault Code	Monitor Strategy Description	Primary Malfunction Criteria		Threshold gic and Value		Secondary Parameters and		Enable Conditions		Time Required 0.02 s rate	MIL Illum.
							basic enable conditions met: and NO Pending or Confirmed DTCs:	=	see sheet enable tables see sheet inhibit tables	-	whenever enable conditions are met	
Torque Management Request Input Signal "A"	P2544	request information received from the TCM	Path 1: number of messages with rolling count / protection value errors detected with number of consecutive frames or Path 2: internal calculated checksum value for transmission is not equal the received value and number of fault results	>= = >	7.00 10.00 TRUE 15.00	-	ignition on and basic enable conditions met: and NO Pending or Confirmed DTCs:		TRUE see sheet enable tables see sheet inhibit tables	-	fail conditions exist for 0.005 s test performed continuously 0.005 s rate	В
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	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 0.5 s test performed continuously 0.01 s rate	В

Component / System	Fault Code	Monitor Strategy Description	Primary Malfunction Criteria		Threshold Logic and Value		Secondary Parameters		Enable Conditions		Time Required	MIL Illum.
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	-	fail conditions exists for 0.5 s test performed continuously 0.01 s rate	В
									tables			
Turbocharger Boost Control Position Sensor "A" Circuit Range/Performanc e - Stuck Low	P2598	Detects in range Turbo vane position errors by comparing desired vane position to actual vane position	turbo charger control deviation calculated out of difference between desired and actual value	~	10.00	%	engine running and	=	TRUE	-	fail conditions exists for 10 s monitor runs with 0.02 s rate	В
							valve not jammed	=	FALSE	-	whenever	
Turbocharger Boost Control Position Sensor "A" Circuit Range/Performanc e - Stuck High	P2599	Detects in range Turbo vane position errors by comparing desired vane position to actual vane position	turbo charger control deviation calculated out of difference between desired and actual value	<	-10.00	%	and engine speed	>=	500.00	rpm	enable conditions are met	
5							and system not faulty	=	TRUE	-		
							and adaption not active	=	FALSE			
							and offset learned since last clearing of fault code memory and	=	TRUE	-		
							engine running for	=	TRUE	-		
							time and	>	1.00	sec		
							(Engine temperature enable condition and	>=	69.96	°C		
							Engine temperature enable condition) and	<=	125.96	°C		
							(Air temperature enable condition	>=	-15.04	°C		

Component / System	Fault Code	Monitor Strategy Description	Primary Malfunction Criteria	Threshold Logic and Value	Secondary Parameters		Enable Conditions		Time Required	MIL Illum.
					and Air temperature enable condition) and Governor Deviation Diagnosis not disabled and (<=	199.86 TRUE	°C -		
					brake position sensor voltage for time (see Look-Up-Table #35)	<	1.20 0 to 15	V sec		
					and basic enable conditions met: and no pending or confirmed DTCs	=	see sheet enable tables see sheet inhibit	-		
	_				no pending or confirmed DTCs	=	tables	-		
Unmetered Fuel - Forced Engine Shutdown	P25BD	Detects engine overspeed in the event that there is an error in the ECM or engine damage has occurred which is resulting in the engine speed increasing beyond desired control limits. Upon failure detection, the engine will be shutdown by closing the diesel intake air valve and disabling the fuel injectors	current engine speed	> 5400.00 rpm	ignition on and basic enable conditions met: and	=	TRUE see sheet enable tables	-	fail conditions exists for .01 s test performed continuously	A
					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.
Control Module Power Off Timer Performance	P262B	Detects a failure in the engine off timer if during the after run the internal SW timer and the EOT do not correlate. A failure is detected when the respective timers are started after a calibration time then both are stopped, if the difference between the calculated times exceeds a calibrated threshold a fault is set.	Path 1:				time since engine post drive/ afterun	<	20.00	Sec	fail conditions exists for 0.01 s monitor runs once per driving cycle with 0.01 s rate whenever enable conditions are met	В
			acquired engine off time or Path 2:	<	(a) * (b)	-	and engine post drive/ afterun and	=	TRUE	-		
			acquired engine off time	>	(c) * (b)	-	basic enable conditions met:	=	see sheet enable tables	-		
			where (a) lower tolerance factor and	=	0.94	factor						
			(b) evaluation time period and	=	20.00	sec						
			(b) upper tolerance factor)	=	1.06	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	=	TRUE		fail conditions exists for 3 s monitor runs with 0.01 s rate	A (no MIL)
							ignition on and	=	TRUE	-	whenever enable conditions	
							ECU Initialization tasks in progress for	=	FALSE	-	are met	
							time and ECU Shutdown tasks in progress	>	0.10 FALSE	sec		
							for time	=	1.00	sec		
							and Battery voltage for	>	10.50	V		
							time and	>	3.00	sec		
							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 MIL Control Circuit High	Code P263B	Description Diagnoses the Malfunction Indicator Lamp (MIL) low side driver circuit for circuit faults.	Criteria Voltage high during driver on state (indicates short to power)	Logic and Value = Short to power: ≤ 0.5 Ω impedance between signal and controller power	and ignition on and ECU Initialization tasks in progress for time	= TRUE = FALSE	Required fail conditions exists for 2 s monitor runs with 0.01 s rate whenever enable conditions are met	A (no MIL)
					and ECU Shutdown tasks in progress for time and Battery voltage for time and basic enable conditions met:	> 10.50	ec V ec	
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:	> 11.00 > 3.00 s > 850 to 1100 rp	fail conditions exists for 2 s monitor runs with 0.2 s rate ec whenever enable v conditions are met ec -	

Component / System Fuel Supply Heater	Fault Code P2688	Monitor Strategy Description Diagnoses the Fuel Filter	Primary Malfunction Criteria Voltage low during driver off state	=	Threshold Logic and Value Short to ground:	Secondary Parameters engine post drive/ afterun	=	Enable Conditions FALSE	-	Time Required fail	MIL Illum. B
Control Circuit Low		Heater low side driver circuit for short circuit to ground faults.	(indicates short-to-ground)		$\leq 0.5 \Omega$ impedance between signal and controller ground	for				conditions exists for 2 s monitor runs with 0.2 s rate whenever enable	
						time and battery voltage	>	1.00 11.00	sec V	conditions are met	
						for time	>	3.00	sec		
						and engine speed (see Look-Up-Table #81)	>	850 to 1100	rpm		
						for time and	>	0.10	sec		
						basic enable conditions met:	=	see sheet enable tables	-		
	Dooco							EALOE	-	C 11	
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	=	FALSE	-	fail conditions exists for 2 s monitor runs with 0.2 s rate whenever enable	В
						time and	>	1.00	sec	conditions are met	
						battery voltage for	>	11.00	V		
						time and engine speed (see Look-Up-Table #81)	>	3.00 850 to 1100	sec rpm		
						for			·		
						time and	>	0.10	sec		
						basic enable conditions met:	=	see sheet enable tables	-		
Cylinder 1 Injector Data Incompatible		Detects a unprogrammed Injector Calibration Data (IQA) in ECM	Path 1:			engine pre drive	=	TRUE	-	fail conditions exist for 1 s	В

Component / System	Fault Code	Monitor Strategy Description	Primary Malfunction Criteria the checksum of the injector adjustment code value is plausible	Threshold Logic and Value = FALSE -	Secondary Parameters and basic enable conditions met:	Enable Conditions = see sheet enable - tables	Time Required monitor runs once per driving cycle during predrive with 1 s rate	MIL Illum.
Cylinder 3 Injector Data Incompatible	P268E	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
Cylinder 4 Injector Data Incompatible	P268F	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
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	В

Component / System	Fault Code	Monitor Strategy Description	Primary Malfunction Criteria	Threshold Logic and Value	Secondary Parameters	Enable Conditions		Time Required predrive with 1 s rate	MIL Illum.
O2 Sensor Circuit Range/Performanc	P2A00	Monitoring the measured A/F sensor voltage for higher	filtered A/F sensor voltage	>= 4.70 V	modeled exhaust-gas pressure	< 250.00	kPa	fault exists for more	В
e Bank 1 Sensor 1		than expected values, indicating an OOR high failure			The calibration scheduler has requested a calibration sequence during signal acquisition A/F sensor temperature (based on sensor	TRUE = >= 804.96		than 2 sec; monitor runs at 0.1 s when enable conditions are met	
					internal resistance) and Status bit for valid A/F sensor inner Resistance (see parameter definition table) and A/F sensor error status bit (see parameter	TRUE =	-		
					definition table) and Temperature of lambda sensor and Temperature of lambda sensor	< 823.96 < 805.96 see sheet enable	°C °C °C		
					basic enable conditions met: NO Pending or Confirmed DTCs:	= tables = see sheet inhibit tables			
Reductant Delivery Performance monitor	P2BAA	Compared EWMA filtered pressure drop with the threshold	EWMA filtered pressure drop	< 365.00 kPa	Modeled SCR catalyst temperature Modeled SCR catalyst temperature Temperature gradient of SCR Temperature gradient of SCR for time Exhaust mass flow Exhaust mass flow (a) - (b) (a) Desired NH3 load level	>= 199.96 <= 399.96 >= -40.00 <= 40.00 > 0.20 > 5.00 <= 63.89 > -0.30 = calculated parameter		fault exists for more than 1 event; monitor runs at 0.1 s once	A

Component / System Fault Code Monitor Strategy Description Primary Malfunction Criteria Threshold Logic and Value Secondary Parameters Enable Conditions Time Required Value 0	Illum.
Estimated NH3 load level 3.00 g Status of the SCR adaptation plausibility check active (please see the definition) = FALSE - DPF Regen not active = TRUE - Reductant dosing off request = FALSE - SCR control sub state (please see the definition) = COSCR_METERI NGCONTROL - Dosed reductant amount of current driving cycle >= 7.00 g Dwell time in Metering control substate <= 42949672.95 sec amplitude of SCR pressure signal >= 0.00 kPa	
Estimated NH3 load level < 3.00 g	
Status of the SCR adaptation plausibility check active (please see the definition) = FALSE - DPF Regen not active = TRUE - Reductant dosing off request = FALSE - SCR control sub state (please see the definition) = COSCR_METERI Dosed reductant amount of current >= 7.00 g Dosed reductant amount of current <=	
Status of the SCR adaptation plausibility check active (please see the definition) = FALSE - DPF Regen not active Reductant dosing off request = TRUE - SCR control sub state (please see the definition) = COSCR_METERI NGCONTROL Dosed reductant amount of current driving cycle = 7.00 g Dosed reductant amount of current driving cycle <=	
DPF Regen not active = TRUE - Reductant dosing off request = FALSE - SCR control sub state (please see the definition) = CRCONTROL NGCONTROL Dosed reductant amount of current driving cycle >= 7.00 g Dosed reductant amount of current driving cycle <=	
Reductant dosing off request = FALSE - SCR control sub state (please see the definition) = COSCR_METERI Dosed reductant amount of current driving cycle >= 7.00 g Dosed reductant amount of current driving cycle - 100.00 g Dwell time in Metering control substate <=	
Reductant dosing off request = FALSE - SCR control sub state (please see the definition) = COSCR_METERI Dosed reductant amount of current driving cycle >= 7.00 g Dosed reductant amount of current driving cycle - 100.00 g Dwell time in Metering control substate <=	
SCR control sub state (please see the definition) = COSCR_METERI Dosed reductant amount of current driving cycle >= 7.00 g Dosed reductant amount of current driving cycle <=	
SCR control sub state (please see the definition) = COSCR_METERI NGCONTROL Dosed reductant amount of current driving cycle >= 7.00 g Dosed reductant amount of current driving cycle >= 100.00 g Dowell time in Metering control substate <= 42949672.95 sec	
definition) NGCONTROL Dosed reductant amount of current >= 7.00 g driving cycle Dosed reductant amount of current <=	
driving cycle <=	
driving cycle <= 100.00 g	
Dosed reductant amount of current driving cycle <=	
driving cycle <=	
Dwell time in Metering control substate <=	
amplitude of SCR pressure signal >= 0.00 kPa	
amplitude of SCR pressure signal <= 100.00 kPa	
State of Reductant injection valve =	
Component Protection (please see	
definition)	
vehicle acceleration < 2.00 m/sec^	
for time > 3.00 sec	
NO Pending or Confirmed DTCs = see sheet -	
inhibit tables	
basic enable conditions met: = see sheet enable -	
basic enable conditions met. – See anect enable - tables	
laures	
EWMA fast initialization mode:	
EVMA fast initialization inde: EWMA filter coefficient for Fast = 0.28 factor	
Initialization mode	
Maximum number of pressure drop per >= 3.00 counts	
driving cycle in Fast Initialization mode	
Total number of pressure drop for Fast = 4.00 counts	
EWMA Rapid Response mode:	
(b) EV/MA filtered pressure drop	
(b) EWMA filtered pressure drop = calculated -	
parameter	
EWMA filter coefficient for Response = 0.20 factor	
to Step Change mode	

Component / System	Fault Code	Monitor Strategy Description	Primary Malfunction Criteria	Threshold Logic and Value	Secondary Parameters Maximum number of pressure drop per driving cycle in Response to Step Change mode Total number of pressure drop measurement for Response to Step Change mode EWMA stabilized mode: EWMA filter coefficient for stabilized mode Total number of pressure drop for	>=	Enable Conditions 3.00 8.00 0.20 1.00	count count factor counts	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	 stabilized mode ignition on and basic enable conditions met: 	=	TRUE see sheet enable tables	-	fail conditions exists for 5 s. test performed continuously	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	В
Lost Communications with Transmission Control Module	U0101	Detects loss of communication between ECM (on-board control unit) and TCM (transmission control module)	time since last message from transmission control module was received	> 0.60 s	for time and battery voltage and battery voltage and basic enable conditions met: and NO Pending or Confirmed DTCs:	= >= <= =	TRUE 3.00 9.00 655.34 see sheet enable tables see sheet inhibit tables	- Sec V -	fail conditions exists for 10 s test performed continuously 0.01 s rate	В

Component / System	Fault Code	Monitor Strategy Description	Primary Malfunction Criteria	I	Threshold Logic and Value	;	Secondary Parameters		Enable Conditions		Time Required	MIL Illum.
					_					_		
Lost Communications with Glow Plug Control Module		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	В
							for time and	>=	3.00	sec	performed continuously	
							battery voltage and	>=	9.00	V	0.02 s rate	
							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 Communications with Fuel Pump Control Module	U0109	Detects loss of communication between ECM (on-board control unit) and Fuel Pump Control Module	time since last message from fuel pump control module was received	>	0.50	sec	ignition on	=	TRUE	-	fail conditions exists for 10 s test	В
		Wodule					for time and	>=	3.00	sec	performed	
							battery voltage and	>=	9.00	V	0.1 s rate	
							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 with Reductant	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	A
Control Module							Can Bus Initialized (CAN Bus is Active) consisting of:				more than 5 sec monitor runs with 0.1 s	
							ignition for	=	TRUE	-	rate	

Component / System	Fault Code	Monitor Strategy Description	Primary Malfunction Criteria	L	Threshold ogic and Valu	ue	Secondary Parameters		Enable Conditions		Time Required	MIL Illum.
							time battery voltage battery voltage	> < >	5.00 655.34 9.00	sec V V		
		CAN frame rolling counter and protection value verification using a sliding window evaluation	DLS1 Sliding Window error counter	>=	8.00	counts	CAN Bus is Active	=	TRUE	-	monitor runs with 1 s rate	
		Check of level sensor	within a number of message frames	=	9.00	counts	Can Bus Initialized (CAN Bus is Active) consisting of: ignition	=	TRUE	-		
							for time battery voltage battery voltage	> < >	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	
			within a number of message frames	=	9.00	counts	Can Bus Initialized (CAN Bus is Active) consisting of: ignition	=	TRUE	-		
							for time battery voltage battery voltage	> < >	5.00 655.34 9.00	sec V V		
		CAN frame rolling counter and protection value verification using a sliding window evaluation	DLS3 Sliding Window error counter	>=	8.00	counts	CAN Bus is Active	=	TRUE		monitor runs with 1 s rate	
		Check of error states	within a number of message frames	=	9.00	counts	Can Bus Initialized (CAN Bus is Active) consisting of: ignition for	=	TRUE	-		
							time battery voltage battery voltage	> < >	5.00 655.34 9.00	sec V V		

Component / System	Fault Code	Monitor Strategy Description	Primary Malfunction Criteria		Threshold Logic and Value		Secondary Parameters		Enable Conditions		Time Required	MIL Illum.
Engine Out NOx Sensor CAN Message #1	U029D		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 20 sec	A
							consisting of:				monitor runs with 0.005 s	
							ignition for time	=	TRUE 5.00	- sec	rate	
							battery voltage battery voltage	< >	655.34 9.00	V 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	>=	4.00	counts	CAN Bus is Active Can Bus Initialized (CAN Bus is Active)	=	TRUE	-	monitor runs whenever enable conditions are met	
		concentration					consisting of: ignition for	=	TRUE	-		
							time battery voltage	> <	5.00 655.34	sec V		
							battery voltage	· ^	9.00	v		
		CAN frame rolling counter and protection value verification using a sliding window evaluation	Sliding window error counter	>=	4.00	counts	CAN Bus is Active	=	TRUE	-	monitor runs whenever enable conditions	
		Check of engine out NOx sensor status	within a number of message frames	=	10.00	counts	Can Bus Initialized (CAN Bus is Active)				are met	
							consisting of: ignition for	=	TRUE	-		
							time battery voltage	> <	5.00 655.34	sec V		
							battery voltage	>	9.00	V		
Engine Out NOx Sensor CAN Message #2		Engine out NOx sensor CAN message #2 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	
100000g0 #2		number of times					Can Bus Initialized (CAN Bus is Active)				more than 20 sec	
							consisting of:				monitor runs with 0.005 s	

Component / System	Fault Code	Monitor Strategy Description	Primary Malfunction Criteria	L	Threshold ogic and Valu	le	Secondary Parameters		Enable Conditions		Time Required	MIL Illum.
							ignition for time battery voltage battery voltage	II	TRUE 5.00 655.34 9.00	sec V V	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		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 #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	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	ae	Secondary Parameters		Enable Conditions		Time Required	MIL Illum.
Engine Out NOx Sensor CAN Message #4		Engine out NOx sensor CAN message #4 frame not received after a calibrated number of times	Counts up when message frame is not received in the time out interval	>	25.00	counts	CAN Bus is Active Can Bus Initialized (CAN Bus is Active) consisting of: ignition	=	TRUE		fail conditions exists for more than 20 sec monitor runs with 0.02 s rate	
							for time battery voltage battery voltage	> < >	5.00 655.34 9.00	sec V 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	counts	CAN Bus is Active Can Bus Initialized (CAN Bus is Active)	=	TRUE	-	monitor runs whenever enable conditions are met	
		sensor heater resistance			0.00	counts	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 #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	counts	CAN Bus is Active Can Bus Initialized (CAN Bus is Active) consisting of:	=	TRUE	-	fail conditions exists for more than 20 sec monitor runs with 0.1 s	
							ignition for time battery voltage battery voltage	= ^ < >	TRUE 5.00 655.34 9.00	- sec V V	rate	
Post Catalyst NOx Sensor CAN Message #1	U029E	Post catalyst NOx sensor CAN message #1 frame not received after a calibrated number of times	Counts up when message frame is not received in the time out interval	>	5.00	counts	CAN Bus is Active	=	TRUE	-	fail conditions exists for more than	A

Component / System	Fault Code	Monitor Strategy Description	Primary Malfunction Criteria	10	Threshold	le	Secondary Parameters		Enable Conditions		Time Required	MIL Illum.
Uystani	out		Uncha				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	21 sec monitor runs with 0.005 s rate	incin.
		CAN frame rolling counter and protection value verification using a sliding window evaluation Check of post catalyst 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	=	TRUE TRUE 5.00 655.34	- - Sec V	monitor runs whenever enable conditions are met	
		CAN frame rolling counter and protection value verification using a sliding window evaluation Check of post catalyst NOx sensor 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	=	9.00 TRUE	- -	monitor runs whenever enable conditions are met	
Post Catalyst NOx		Post catalyst NOx sensor	Counts up when message frame is not	>	5.00	counts	for time battery voltage battery voltage	= ~ ~ ~	5.00 5.00 655.34 9.00	sec sec V V	fail	
Message #2		CAN message #2 frame not received after a calibrated number of times	received in the time out interval		0.00	Counta	Can Bus Initialized (CAN Bus is Active) consisting of: ignition for time battery voltage	= > <	TRUE 5.00 655.34	- sec V	conditions exists for more than 21 sec monitor runs with 0.005 s rate	

Component / System	Fault Code	Monitor Strategy Description	Primary Malfunction Criteria	Lo	Threshold ogic and Value		Secondary Parameters battery voltage	>	Enable Conditions 9.00	V	Time Required	MIL Illum.
		CAN frame rolling counter and protection value verification using a sliding window evaluation Check of post catalyst NOx sensor error status	Sliding window error counter within a number of message frames		4.00		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	
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	
		CAN frame rolling counter and protection value verification using a sliding window evaluation Check of post catalyst NOx sensor oxygen concentration	Sliding window error counter within a number of message frames		8.00	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		Threshold Logic and Valu	0	Secondary Parameters		Enable Conditions		Time Required	MIL Illum.
Post Catalyst NOx Sensor CAN Message #4	Code	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) 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 0.02 s rate	
		CAN frame rolling counter and protection value verification using a sliding window evaluation Check of post catalyst NOx sensor heater resistance	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	
Post Catalyst NOx Sensor CAN Message #5		Post catalyst NOx sensor CAN message #5 frame not received after a calibrated number of times	Counts up when message frame is not received in the time out interval	>	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	

Component /	Fault	Monitor Strategy	Primary Malfunction		Threshold	Secondary		Enable		Time	MIL
System	Code	Description	Criteria		Logic and Value	Parameters		Conditions		Required	Illum.
Lost Communication With PM Sensor		PM Sensor Control Unit (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)	=	TRUE -	Battery voltage (ECM)	>=	11.00	V	fault exists for more than 1.4 sec; monitor runs at 0.1 s when enable conditions	В
			OR SCU detects missing CAN- communication (i.e. no signal received by SCU but SCU still sends a signal)	=	TRUE -	Ignition on for time	= >	TRUE 1.20	- sec	are met	

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 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 and IDE supply voltage or IDE supply voltage or Path 2: (IDE supply voltage is on and IDE supply voltage) or Path 3: IDE supply voltage is on and ADC voltage for IDE current (SCU internal value) or Path 4: ADC voltage for IDE current (SCU internal value)	= <= = >= <	TRUE 49.72 41.55 FALSE 2.00 TRUE 0.3 4.70	- V V - V V	Ignition on for time Battery voltage (ECM) Battery voltage (ECM) Battery voltage (SCU)	= , , , , , , , , , , , , , , , , , , ,	3.00 11.00 6553.40 9.00	sec V V V	fault exists for more than 0.1 sec; monitor runs at 0.1 s when enable conditions are met	B
		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 OR	<	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	

Component /	Fault	Monitor Strategy	Primary Malfunction		Threshold		Secondary		Enable		Time	MIL
System	Code	Description	Criteria Measured IDE current change (when temperature changed from higher temperature to lower temperature)	<	Logic and Value 0.094	μΑ	Parameters (PM Sensor temperature (for absolute current threshold) and PM Sensor temperature (for absolute current threshold) Battery voltage (ECM)) Sensor regeneration is active with PM Sensor temperature (for change in temperature) and PM Sensor temperature (for change in temperature)	> < >= > < > <	Conditions 770.00 800.00 11.00 TRUE 770.00 800.00 580.00 670.00	2° 2 ∨ 2° 2° 2° 2° 2°	Required	Illum.
Particulate Matter Sensor Circuit High	P24B1	Negative Interdigtal Electrode (IDE) electric fault when supply voltage is off (Range check high)	measured ADC (analog to digital converter) voltage for IDE current (SCU internal value) for time	>=	4.10 2.00	V sec	Particulate sensor is in the "standby" state means Particulate sensor is not in the "measure" or "regeneration" state Battery voltage (ECM) Battery voltage (ECM) Supply voltage is off Ignition on for time	=	TRUE 11.00 6553.40 TRUE TRUE 3.00	- V V - sec	fault exists for more than 2 sec; monitor runs at 0.1 s when enable conditions are met	В
		supply voltage is on during	measured ADC (analog to digital converter) voltage for IDE current (SCU internal value) for time	>=	4.10	V	Particulate sensor is in the "measurement" state when failure occurs Particulate sensor plausibility check is terminated means	=	TRUE	-	fault exists for more than 2 sec; monitor 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 One sucessful sensor-Regeneration is completed Battery voltage (ECM) Supply voltage is on Ignition on for time	= >= = >	Enable Conditions TRUE 11.00 TRUE TRUE 3.00	- V - sec	Time Required	MIL Illum.
Particulate Matter Sensor Heater Control 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	·	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
Particulate Matter Sensor Heater Control Circuit High	P24B6	PM Sensor heater voltage (as detected by µC-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) OR Heater current		TRUE 7.00 0.20	- V A	Battery voltage (ECM) Heater off 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
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 or Voltage of PM sensor temperature signal or Temperature as measured by PM sensor temeprature	~	3.00 0.30 920.00	v v C	Ignition on for time Battery voltage (ECM) Exhaust gas temperature and Exhaust gas temperature	= > >= >= <=	3.00 11.00 -40.04 799.96	- ∨ °C °C	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 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	°C	Sensor in a measurement phase	=	TRUE	-	fault exists for more than 5 sec; monitor runs at 0.1 s when enable conditions	В
			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	are met	
							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		
							((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	-		
				_		_				_		
		Plausibility check of PM sensor temperature value upon start-up after a calibrated soaking time:	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	
		stuck high check (temperature cross check of PM temperature with 3 reference sensors after cold start)									per trip	
1			where reference temperatures				means					

Pathodate Mater Pathodate	Component /	Fault	Monitor Strategy	Primary Malfunction			Secondary	Enable		Time	MIL		
Parameter parameter <t< th=""><th>System</th><th>Code</th><th>Description</th><th>Criteria</th><th></th><th>Logic and Value</th><th></th><th>Parameters</th><th></th><th>Conditions</th><th></th><th>Required</th><th>Illum.</th></t<>	System	Code	Description	Criteria		Logic and Value		Parameters		Conditions		Required	Illum.
Protocolute Matter Series Supply Voltage Criculutor P2400 PM Sensor Sensor Control Unit (SCU) based frame and parameter parameter sensor Supply Parameter (a) SCR upstream temperature parameter parameter (a) SCR upstream temperature (b) SCR upstream temperature (c) SCR upstream temperature (c) SCR upstream temperature (c) SCR upstream temperature parameter para				(a) DOC upstream temperature	=	measured	-	Raw value of start temperature of	>=	-40.00	°C		
Particulate Matter Part 1: Particulate Matter Partin Particulate Matter<!--</td--><td></td><td></td><td></td><td></td><td></td><td>parameter</td><td></td><td>particulate sensor</td><td></td><td></td><td></td><td></td><td></td>						parameter		particulate sensor					
Particulate Matter Path 1: Path 1: Ignition on SCR upper control upper source > 15.00 Y </td <td></td> <td></td> <td></td> <td>(b) DOC downstream temperature</td> <td>=</td> <td>measured</td> <td>-</td> <td></td> <td>=</td> <td>TRUE</td> <td>-</td> <td></td> <td></td>				(b) DOC downstream temperature	=	measured	-		=	TRUE	-		
Particulate Matter P24D0 PM Sensor Sensor Centrol Unit (SCU) bitry supply Unit (SCU) bitry supply Data Sensor I Low Watego Circuit Low P24D0 PM Sensor Sensor Centrol Unit (SCU) bitry supply Data Sensor I Set means of the sensor Sensor Centrol Unit (SCU) bitry supply Data Sensor I Low Watego Circuit Lo						parameter							
Particulate Matter P2400 PM Senset Castor Control Path 1: Path 2: Path 1: Path 2: Path 2: <td></td> <td></td> <td></td> <td>(c) SCR upstream temperature</td> <td>=</td> <td>measured</td> <td>-</td> <td>Barometric pressure</td> <td>></td> <td>75.00</td> <td>kPa</td> <td></td> <td></td>				(c) SCR upstream temperature	=	measured	-	Barometric pressure	>	75.00	kPa		
Particulate Matter Sensor Supply Voltage Circuit Low PX4D0 PM Sensor Sensor Control Results of Market SCU with there on a result of Market SCU with there on result of Market SCU with there o						parameter							
Particulate Matter Sensor Suppy Voltage Circuit Low P24D0 PM Sensor Sensor Control Buttery voltage (ECM) and CUM in the share balance of SCU with the share of the control unit of the contro								Cold start detection	=	TRUE	-		
Particulare Matter P2400 PM Sensor Control Subject SCR-Catalyst voltage Great Low Voltage Creat Low Voltage Great Low Voltage Great Low Voltage Great Low Voltage Great Low Voltage Creat								means					
Particulare Matter P2400 PM Sensor Control Subject SCR-Catalyst voltage Great Low Voltage Creat Low Voltage Great Low Voltage Great Low Voltage Great Low Voltage Great Low Voltage Creat								(
Particulate Matter Scince Control Path 1: - 15.00 V Ignition on the state 'ready' -								Engine ECU shut-off time is	=	TRUE	-		
Pariculate Matter P2400 PM Sensor Sensor Control Unit (SCU) battery supply Voltage Sircuit Low Voltage Sircuit Low Path 1: Battery voltage (ECM) and Compares the difference of SCU voltage and ECM and Compares the difference of SCU voltage and Compares the difference of SCU voltage and ECM and Compares the difference of SCU voltage and Compares the difference of SCU voltage and Compares the difference of SCU voltag								reported as valid (see P2505 or					
Particulate Matter Sensor Control Unit Sensor Sensor Sensor Control Unit Sensor Sensor Sensor Control Unit Sensor Senso								P2610 for details on ECU / Engine-					
Particulate Matter P2420 PM Sensor Sensor Control voltages as means of the state weak of the sensor sensor Control unit interview of the								Off Time					
Particulate Matter P2400 PM Sensor Sensor Control Unit (SCU) battery supply voltage Grout Low eCM and SCU with threshold Path 1: Battery voltage (ECM) and > 15.00 V Ignition on = TRUE - rate means of more and to remperature before SCR-Catalyst and = TRUE - fault exis or or of ifference of SCU voltage and ECM and > 15.00 V Ignition on = TRUE - fault exis or or of ifference of SCU voltage and ECM and > 15.00 V Ignition on = TRUE - fault exis or or of ifference of SCU voltage and ECM and > 15.00 V Ignition on = TRUE - and ifference of condition Part 1: Ignition on = TRUE - if and condition - if and condition - if and condition If and exis if an or of ifference of SCU voltage and ECM or of ifference of SCU voltage and ECM or of ifference of SCU voltage and S								Shut-off time of the particulate	>	21600	sec		
Particulate Matter Sensor Support P24D0 M Sensor Sensor Control UNI (SCU) battery supply Voltage Circuit Low Path 1:								sensor control unit					
Particulate Matter Sensor Support P24D0 M Sensor Sensor Control UNI (SCU) battery supply Voltage Circuit Low Path 1:)					
Particulate Matter Sensor Support P2400 M Sensor Sensor Comport Unit (SCU) battery supply Voltage Circuit Low Path 1: Image: Sensor Comport Particulate Matter Sensor Support Voltage Circuit Low P2400 MS sensor Sensor Comtrol Unit (SCU) battery supply plausibility check which comports the difference of SCU voltage (ECM) and Comports the difference of SCU voltage and ECM or difference of SCU voltage and ECM or difference of SCU voltage and ECM or difference of SCU voltage and ECM or difference of SCU voltage and ECM								Temperature range check of the	=	TRUE	-		
Particulate Matter Sensor Sensor Control Voltage Circuit Low P24D0 PM Sensor Sensor Control unit (SCU) battery supply plausibility check which compares the difference in voltage as measured by ECM and SCU with threshold Path 1: Image: Sensor Sensor Control and Image: Sensor Senso													
Particulate Matter Sensor Supply Voltage Circuit Low P24D0 PM Sensor Sensor Control Unit (SCU) battery supply plausibility wheck which compares the difference in voltage as measured by ECM and SCU with threshold Path 1: Ignition on = TRUE - fault exist for more in the state "ready" Path difference of SCU voltage and SCU voltage or difference of ECM measured voltage or difference of ECM measured voltage and SCU voltage > 15.00 V for time for time sensor is in the state "ready" = TRUE - fault exist for and in the state "ready"								means					
Particulate Matter Sensor Supply Voltage Circuit Low P24D0 PM Sensor Sensor Control Unit (SCU) battery supply plausibility wheck which compares the difference in voltage as measured by ECM and SCU with threshold Path 1: Ignition on = TRUE - fault exist for more in the state "ready" Path difference of SCU voltage and SCU voltage or difference of ECM measured voltage or difference of ECM measured voltage and SCU voltage > 15.00 V for time for time sensor is in the state "ready" = TRUE - fault exist for and in the state "ready"								(
Particulate Matter Sensor Supply Voltage Circuit Low P24D0 PM Sensor Sensor Control Umit (SCU) battery supply plausibility check which compares the difference in voltages are measured by and Path 1: Ignition on = TRUE - fault exis tor none tor 0.5 Particulate Matter Sensor Supply Voltage Circuit Low P24D0 PM Sensor Sensor Control Umit (SCU) battery supply plausibility check which compares the difference in voltages are measured by and Path 1: Ignition on = TRUE - fault exis tor more till tor sensor Supply plausibility check which compares the difference in voltages are measured by and > 15.00 V for time initialization values have been transferred (i.e. CAN communication with ECM established) > 15.00 V for time initialization values have been transferred (i.e. CAN communication with ECM established) > 1.10 V Sensor is in the state "ready" = TRUE - difference of ECU woltage or difference of ECU measured voltage and SCU with thread and SCU with thread and SCU woltage > 1.10 V Sensor is in the state "ready" = TRUE -								Temperature before Oxi-Catalyst	>=	-40.04	°C		
Particulate Matter Sensor Supply Voltage Circuit Low P2400 PM Sensor Sensor Control Urit (SCU) battery supply plausibility check which and Path 1: Image: Sensor Supply (Stage Circuit Low Path 1: Image: Sensor Supply (Stage Circuit Low Ignition on = TRUE - fault exis for more stage Battery voltage (ECM) and > 15.00 V for time (initiazion values have been transferred established) > 3.00 sec sec and condition and Image: Sensor Supply Voltage Circuit Low P2400 PM Sensor Sensor Control Urit (SCU) battery supply plausibility check which compares the difference in voltage and SCU with threshold Path 1: - fault exis for more stage for time initiazion values have been transferred condition and > 15.00 V for time initiazion values have been transferred condition established) > 3.00 sec and condition and = TRUE - and condition are stage													
Particulate Matter Sensor Supply Voltage Circuit Low P2400 PM Sensor Sensor Control Uti (SCU) battery supply plausibility check which and Path 1: Image: Sensor Supply Voltage Circuit Low Ignition on = TRUE - fault exis or on the enable or ontice and Battery voltage (ECM) and > 15.00 V for time initialization values have been transferred or difference of SCU voltage and ECM woltage and SCU with threshold > 15.00 V for time initialization values have been transferred or difference of SCU voltage and ECM woltage and SCU voltage and ECM woltage and SCU voltage > 1.10 V Sensor is in the state "ready" = TRUE - - and confirer and > 1.10 V Sensor is in the state "ready" = TRUE - -								Temperature before Oxi-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 - four the vision for measured voltage or difference of SCU voltage and ECM and Battery voltage (ECM) and > 15.00 V Ignition on = TRUE - four the vision for measured or difference of SCU voltage and ECM or difference of SCU voltage and ECM or difference of SCU voltage and ECM or difference of ECM measured or difference of ECM measured voltage > 3.00 V = TRUE -													
Particulate Matter P24D0 PM Sensor Sensor Control Unit (SCU) battery supply voltage Circuit Low 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 exist for more ti 1.5 sec monitorial results in the state "ready" = TRUE - fault exist for more ti 1.5 sec monitorial results in the state "ready" = TRUE - fault exist for more ti 1.5 sec monitorial results in the state "ready" = TRUE - fault exist for more ti 1.5 sec monitorial results in the state "ready" = TRUE - fault exist for more ti 1.5 sec monitorial results in the state "ready" = TRUE - - fault exist for more ti 1.5 sec monitorial read (i.e. CAN communication with ECM established) > 1.10 V For time established) > 1.10 V means Battery voltage (ECM) > 1.10 V means								remperature before particulate inter	/-	-40.04	C		
Particulate Matter P24D0 PM Sensor Sensor Control Unit (SCU) battery supply voltage Circuit Low 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 exist for more ti 1.5 sec monitorial results in the state "ready" = TRUE - fault exist for more ti 1.5 sec monitorial results in the state "ready" = TRUE - fault exist for more ti 1.5 sec monitorial results in the state "ready" = TRUE - fault exist for more ti 1.5 sec monitorial results in the state "ready" = TRUE - fault exist for more ti 1.5 sec monitorial results in the state "ready" = TRUE - - fault exist for more ti 1.5 sec monitorial read (i.e. CAN communication with ECM established) > 1.10 V For time established) > 1.10 V means Battery voltage (ECM) > 1.10 V means								and					
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 exis for more til 1.5 sec romotor u Battery voltage (ECM) and > 15.00 V for time Initialization values have been transferred (i.e. CAN communication with ECM established) > 3.00 sec remeasured voltage or difference of SCU voltage and ECM voltages CU voltage > 1.10 V for time Initialization values have been transferred (i.e. CAN communication with ECM established) = TRUE - difference of SCU voltage and ECM voltage SCU voltage > 1.10 V Sensor is in the state "ready" = TRUE -									/-	70.06	°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 exis for more th unit (scu) battery supply plausibility check which compares the difference in voltages as measured by ECM and SCU with threshold Battery voltage (ECM) and > 15.00 V for time Initialization values have been transferred (i.e. CAN communication with ECM established) > 3.00 sec are met or difference of SCU voltage and ECM voltage > 1.10 V for time Initialization values have been transferred (i.e. CAN communication with ECM established) = TRUE - difference of SCU voltage and ECM voltage and SCU voltage > 3.00 V Battery voltage (ECM) > 1.10 V Sensor is in the state "ready" = TRUE -								remperature before particulate litter	~-	13.30	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 exis for more th unit (scu) battery supply plausibility check which compares the difference in voltages as measured by ECM and SCU with threshold Battery voltage (ECM) and > 15.00 V for time Initialization values have been transferred (i.e. CAN communication with ECM established) > 3.00 sec are met or difference of SCU voltage and ECM voltage > 1.10 V for time Initialization values have been transferred (i.e. CAN communication with ECM established) = TRUE - difference of SCU voltage and ECM voltage and SCU voltage > 3.00 V Battery voltage (ECM) > 1.10 V Sensor is in the state "ready" = TRUE -								Temperature before SCR-Catalyst	~-	-40.04	°C		
Particulate Matter Sensor Supply Voltage Circuit Low P24D0 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 exis for more th 1.5 sec monitor ru at 0.1 s with enable Battery voltage (ECM) > 15.00 V for time Initialization values have been transferred (i.e. CAN communication values have been transferred (i.e. CAN communication values have been transferred established) > 3.00 sec monitor ru at 0.1 s with enable difference of SCU voltage and ECM or difference of SCU voltage or difference of ECM measured voltage and SCU voltage > 1.10 V Sensor is in the state "ready" = TRUE - means or difference of SCU voltage or > 3.00 V Battery voltage (ECM) >= 11.00 V									~=	+0.0+	0		
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 exis for more the 1.5 sector monitor or at 0.1 s with enable Battery voltage (ECM) and > 15.00 V for time Initialization values have been transferred (i.e. CAN communication with ECM established) > 3.00 sector are meter (i.e. CAN communication with ECM established) difference of SCU voltage and ECM or difference of ECM measured voltage and SCU voltage > 1.10 V Sensor is in the state "ready" = TRUE -									/-	79.96	°C		
Sensor Supply Voltage Circuit Low Unit (SCU) battery supply plausibility check which compares the difference in voltages as measured by ECM and SCU with threshold Image: Circuit Low Image: Circuit Low </td <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td>~-</td> <td>13.30</td> <td>C</td> <td></td> <td></td>									~-	13.30	C		
Sensor Supply Voltage Circuit Low Unit (SCU) battery supply plausibility check which compares the difference in voltages as measured by ECM and SCU with threshold Image: Circuit Low Image: Circuit Low </td <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td>,</td> <td></td> <td></td> <td></td> <td></td> <td></td>								,					
Sensor Supply Voltage Circuit Low Unit (SCU) battery supply plausibility check which compares the difference in voltages as measured by ECM and SCU with threshold Image: Circuit Low Image: Circuit Low </th <th></th>													
Sensor Supply Voltage Circuit Low Unit (SCU) battery supply plausibility check which compares the difference in voltages as measured by ECM and SCU with threshold Image: Circuit Low Image: Circuit Low </th <th></th>													
Voltage Circuit Low plausibility check which compares the difference in voltages as measured by ECM and SCU with threshold Image: Circuit Low	Particulate Matter	P24D0	PM Sensor Sensor Control	Path 1:				Ignition on	=	TRUE	-	fault exists	В
Voltage Circuit Low plausibility check which compares the difference in voltages as measured by ECM and SCU with threshold Image: Circuit Low		-						5				for more than	
compares the difference in voltages as measured by ECM and SCU with threshold Battery voltage (ECM) and > 15.00 V for time Initialization values have been transferred (i.e. CAN communication with ECM established) > 3.00 sec are met difference of SCU voltage and ECM measured voltage or difference of ECM measured voltage and SCU voltage and SCU voltage and SCU voltage > 1.10 V Sensor is in the state "ready" = TRUE - difference of SCU voltage and SCU voltage and SCU voltage and SCU voltage and SCU voltage > 3.00 V Battery voltage (ECM) >= 11.00 V												1.5 sec;	
voltages as measured by ECM and SCU with threshold Battery voltage (ECM) and > 15.00 V for time Initialization values have been transferred (i.e. CAN communication with ECM established) > 3.00 sec are met difference of SCU voltage and ECM measured voltage or difference of ECM measured voltage and SCU voltage > 1.10 V Sensor is in the state "ready" = TRUE - means or means means means means = 11.00 V	· · · · · · · · · · · · · · · · · · ·											monitor runs	
ECM and SCU with threshold Battery voltage (ECM) and > 15.00 V for time initialization values have been transferred (i.e. CAN communication with ECM established) > 3.00 sec are met difference of SCU voltage and ECM measured voltage or difference of ECM measured voltage or difference of ECM measured voltage > 1.10 V Sensor is in the state "ready" = TRUE - Means or means means means = 11.00 V Battery voltage and SCU voltage > 3.00 V Battery voltage (ECM) >= 11.00 V												at 0.1 s when	
Battery voltage (ECM) and > 15.00 V for time Initialization values have been transferred established) > 3.00 sec are met are met difference of SCU voltage and ECM measured voltage or voltage and SCU voltage > 1.10 V Sensor is in the state "ready" = TRUE - difference of ECM measured voltage > 3.00 V Battery voltage (ECM) >= 11.00 V													
Battery voltage (ECM) and > 15.00 V for time Initialization values have been transferred (i.e. CAN communication with ECM established) > 3.00 sec are met difference of SCU voltage and ECM measured voltage or difference of ECM measured voltage and SCU voltage > 1.10 V Sensor is in the state "ready" = TRUE - means voltage and SCU voltage > 3.00 V Battery voltage (ECM) >= 11.00 V												conditions	
and Initialization values have been transferred = TRUE - (i.e. CAN communication with ECM established) = TRUE - measured voltage or difference of ECM measured > 3.00 V Sensor is in the state "ready" = TRUE - means Battery voltage (ECM) >= 11.00 V				Battery voltage (ECM)	>	15.00	V	for time	>	3.00	sec	are met	
difference of SCU voltage and ECM measured voltage or difference of ECM measured > 1.10 V Sensor is in the state "ready" = TRUE - Main or voltage and SCU voltage > 3.00 V Battery voltage (ECM) >= 11.00 V							-						
difference of SCU voltage and ECM measured voltage or difference of ECM measured voltage and SCU voltage													
difference of SCU voltage and ECM > 1.10 V Sensor is in the state "ready" = TRUE - measured voltage or difference of ECM measured voltage and SCU voltage > 3.00 V Battery voltage (ECM) >= 11.00 V													
measured voltage or difference of ECM measured voltage and SCU voltage > 3.00 V Battery voltage (ECM) >= 11.00 V				difference of SCU voltage and ECM	>	1.10	V		=	TRUE	-		
or means difference of ECM measured > 3.00 V Battery voltage (ECM) >= 11.00 V voltage and SCU voltage							•						
difference of ECM measured > 3.00 V Battery voltage (ECM) >= 11.00 V voltage and SCU voltage > > > > >				-				means					
voltage and SCU voltage					>	3.00	V		>=	11.00	V		
					-	0.00	•		-		•		
Battery voltage (ECM) <= 6553.40 V								Battery voltage (ECM)	<=	6553.40	V		
or				or				, tonago (o,	-	0000.10	•		

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

Component / System	Fault Code	Monitor Strategy Description	Primary Malfunction Criteria		Threshold Logic and Value	e	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
			or Path 3: Battery voltage (ECM) and Battery voltage (ECM) and difference of SCU voltage and ECM measured voltage or difference of ECM measured voltage and SCU voltage	>= <=	11.70 15.00 2.10 2.60	v v v v				

Component / System	State or Status Sub-Grouping	Description of State or Status found in 14OBDG04	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				
Exhaust Gas Recirculation (EGR)		Exhaust Gas Recirculation (EGR) Control is enabled	EGR controller is active continuously with exceptions for failures detected EGR controller is active Overrun			

Component / System	State or Status Sub-Grouping	Description of State or Status found in 14OBDG04	Defined by:	Enable Conditions
	eas ereaping		Long Idle Transmission Gear Shift Cold Start extreme temperature or pressure Critical Regeneration Modes	
			Overrun	
			Gear Shifting	
			Overlong Idle	
			permanent control deviation	
			Demand of the drift compensation System error	
			Error exhaust gas recirculation valve	
			Error throttle valve Engine Brake Status	
			Atmospheric pressure too low	
			Battery voltage too low	
			Switch-off coordinator	
			Environmental temperature too low	
			Environmental temperature too high	
			Engine temperature too low	

Component / System	State or Status Sub-Grouping	Description of State or Status found in 14OBDG04	Defined by:	Enable Conditions
			Engine temperature too high	
			Cold start	
			Injection quantity too large	
			Operating-mode coordinator	
			Rich Idle	
			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)	
			FOD controller is active in Oceanor	
			EGR controller is active in Overrun (Cold exhaust system)	
			AFS Faults	
			Request via SCR monitoring (NOx	
			sensor plausibility check)	
			Atmospheric Pressure too low in	
			Regeneration	
			Engine Temperature too low in	
			Regeneration	

Component / System	State or Status Sub-Grouping	Description of State or Status found in 14OBDG04	Defined by:	Ena Condi	
			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	>= 4.0	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	= TR < 1.0	
		Status of Diesel Fuel Refill Detection	<pre>((Filtered total fuel volume available with (a) Amount of fuel volume change that indicates a refueling event occurred and (b) captured remaining diesel fuel volume under the following conditions (Vehicle speed for time) and (Vehicle speed for time</pre>	> (a) + = 25. = meas parar <= 1.: > 4.0 <= 1.: > 30.	26 % sured - neter - 24 mph 20 sec

Component / System	State or Status Sub-Grouping	Description of State or Status found in 140BDG04	Defined by:		Enable Conditions	
			or at initialization of Diesel fuel level	=	TRUE	-
	Rail Pressure Control - Operating States	Rail Control at ECM Start	reset condition or NO Pending or Confirmed DTCs:	=	TRUE see sheet inhibit tables	-
		Rail Pre-Control (Just after start)	Rail Control at ECU Start and engine speed and (rail pressure or (a) - (b) and with (a)Fuel Rail Pressure Setpoint and (b)Maximum Rail Pressure for last 10ms	= <= >= =	TRUE 400.00 50000 1000 measured parameter measured parameter	rpm kPa kPa -
		Rail Control - PCV Closed Loop Control Only PCV = Pressure Control Valve	, (Rail Pressure Precontrol (Just after start) and Number of Crankshaft revolutions since entering Rail Pressure Precontrol	= >=	TRUE 10.00	- revs

Component / System	State or Status Sub-Grouping	Description of State or Status found in 14OBDG04	Defined by:	Enable Conditions
) 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
			(Fuel system pressure and high pressure pump outlet and	< 0.00 kPa
			engine status)	= RUNNING -
			state machine rail pressure control equal transitioning to metering unit pressure control mode and	= TRUE -
			Controller for PCV not wound-up (large corrective control)	= TRUE -
			state machine rail pressure control transitioning to coupled pressure control mode (rail pressure is controlled by metering unit and pressure control valve)	= TRUE -
			and	

Component / System	State or Status Sub-Grouping	Description of State or Status found in 14OBDG04	Defined by:		Enable Conditions	
			 (a) + (b) (see Look-Up-Table #8) and with (a)Torque Generating fuel injection quantity and (b)Non-Torque generating fuel injection quantity 	< = =	9 to 26 calculated parameter calculated parameter	mm^3/re v -
		Switchover Between Metering Unit + PCV Closed Loop Control to Metering Unit Closed Loop Control only	(state machine rail pressure control equal to pressure control valve or state machine rail pressure control transitioning pressure control valve mode	=	TRUE TRUE	-
) and (a) + (b) (a)Torque Generating fuel injection quantity (b)Non-Torque generating fuel injection quantity (c) (see Look-Up-Table #8)	< = =	(c) + (d) calculated parameter calculated parameter 9 to 26	- - - mm^3/re
			(d) and NO Pending or Confirmed DTCs: or	= = \$6	2.00 ee sheet inhibit tables	v mm^3/re v -

Component / System	State or Status Sub-Grouping	Description of State or Status found in 14OBDG04	Defined by:		Enable Conditions	
			(state machine rail pressure control equal to metering unit control mode or	=	TRUE	-
			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	(
			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	-

Component / System	State or Status Sub-Grouping	Description of State or Status found in 14OBDG04	Defined by:		Enable Conditions	
			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 ((DECEN	
			exhaust gas system regeneration mode) and	!=	REGEN	-
			NO Pending or Confirmed DTCs:	=	see sheet inhibit tables	-
		Switchover Between Metering Unit + PCV	(
		Closed Loop Control to PCV Closed Loop Control only				
			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)	<	9 to 26	mm^3/re v

Component / System	State or Status Sub-Grouping	Description of State or Status found in 14OBDG04	Defined by:	Enal Condi	
			with (a)Torque Generating fuel injection quantity and (b)Non-Torque generating fuel injection quantity	= calcu paran = calcu paran	neter lated -
Idle Speed Control		Idle Speed Controller Active "normal" low idle speed governor	no overrides for: Gear-Shift Harmonization Intrusive Diagnosis Action		
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	= TRI = TRI	
			HO2S Heater Control Circuit Bank 1 Sensor 1 Circuit Low or HO2S Heater Control Circuit Bank 1 Sensor 1 Circuit	= TRI = TRI	
		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	= TRI	JE -
			or A/F sensor short circuit to ground of sensor lines	= TRI	JE -

Component / System	State or Status Sub-Grouping	Description of State or Status found in 140BDG04	Defined by:	с	Enable onditions	
		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	-
			or 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	-
		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 Sensor 1 high	=	TRUE	-
			or 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	=	TRUE	-
			or O2 Sensor Performance - Signal low during Deceleration Bank 1 Sensor 1	=	TRUE	-
			or O2 Sensor Performance - Signal High during Moderate Load Sensor 1	=	TRUE	-
			or A/F Sensor Performance - Signal Low during Moderate Load Bank 1 Sensor 1	=	TRUE	-

Component / System	State or Status Sub-Grouping	Description of State or Status found in 140BDG04	Defined by:		Enable Conditions	
		A/F sensor dynamic error	A/F Sensor Circuit Slow Response Bank 1 Sensor 1	=	TRUE	-
	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	=	TRUE	-
			No Errors in CJ125 SPI communication and no low battery voltage detected by CJ125	=	TRUE	-
	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				
			(following condition met for time:	>	30.00	sec
			Integrated heat quantity (see Look-Up- Table #1)	>=	130 to 600	kJ

Component / System	State or Status Sub-Grouping	Description of State or Status found in 14OBDG04	Defined by:		Enable Conditions	
			NOx status signal received via CAN message (Please see the definition) for time calculated lambda value based on air mass flow and injection quantity for time engine speed for time NO Pending or Confirmed DTCs:))	= ^ ^ ^ ^ ~ =	TRUE 1 0.90 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
			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 NO Pending or Confirmed DTCs:	> =	20.00 see sheet inhibit tables	sec -

Component / System	State or Status Sub-Grouping	Description of State or Status found in 14OBDG04	Defined by:		Enable Conditions	
))			
		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 battery voltage	>= <=	11.00 655.34	V V
			and			
			Integrated heat quantity (see Look-Up- Table #3)	>=	310 to 1460	kJ
			for time)	>	30.00	sec
			and for time NO Pending or Confirmed DTCs:	>=	0.5 see sheet inhibit	sec
				_	tables	
PM Sensor		PM sensor dewpoint achieved	Integrated heat quantity (see Look-Up- Table #3)	>=	310 to 1460	kJ

Component / System	State or Status Sub-Grouping	Description of State or Status found in 14OBDG04	Defined by:		nable ditions	
System Regeneration of the Diesel Particulate Filter	Sub-Grouping	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 #5) (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 to 0	0 1.619995 0.949951 3 to 0.054	- factor - 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	C = T = F >= 4294 > 1 > 30 >= 203.6	etering ontrol TRUE ALSE 0.00 -100 49672.95 59.96 003.56 48228713 487 50.00	- - °C/sec °C/sec °C °C mph rpm

Component / System	State or Status Sub-Grouping	Description of State or Status found in 14OBDG04	Defined by:	Enable Conditions		
			NO Pending or Confirmed DTCs:	=	see sheet inhibit tables	-
	NOx Control System Reductant Dosing Pressure Control System States	State of Reductant Pressure Control System: Standby	ignition Dwell time in the state of standby NO Pending or Confirmed DTCs:	= < =	on 2.10 see sheet inhibit tables	- sec -
		State of Reductant Pressure Control System: No Pressure control	Old SCR control state (please see the definition) ignition Dwell time in the state of standby Dwell time in the state of no pressure control NO Pending or Confirmed DTCs:	= >= < =	Stand by on 2.10 2.00 see sheet inhibit tables	- sec sec -
		State of Reductant Pressure Control System: Pressure control	Old SCR control state (please see the definition) ignition engine speed Dwell time in the state of no pressure control exhaust gas temperature Upstream SCR (Reductant Defrost check (please see the definition) or	= > >= >= =	NO Pressure Control on 600.00 2.00 179.96 TRUE	- rpm sec ℃

Component / System	State or Status Sub-Grouping	Description of State or Status found in 140BDG04	Defined by:	Enable Conditions		
			The component protection release of the heater control (please see the definition)	=	TRUE	-
			or Preliminary release of the heater control for the main state machine (please see the definition)	=	TRUE	-
			, NO Pending or Confirmed DTCs:	-	see sheet inhibit tables	-
		State of Reductant Pressure Control System: Refilling Reductant in pressure line (substate of Pressure control)	SCR control state (please see the definition)	=	Pressure Control	-
			(Reductant filling state in the pressure line and	<	70.00	%
			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	%
			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	-

Component / System	State or Status Sub-Grouping	Description of State or Status found in 14OBDG04	Defined by:		Enable Conditions	
			Reductant filling state in the pressure line	>=	70.00	%
			or Reductant Pump Module Pressure for time)	>= >	95.00 0.50	kPa sec
			Reductant Pump Module Pressure Set-point duty cycle for Reductant dosing valve	< =	375.00 0%	kPa %
			Set-point duty cycle for the Reductant Pump pressure Motor actuator NO Pending or Confirmed DTCs:	=	40.00 see sheet inhibit tables	% -
				-	_	_
		State of Reductant Pressure Control System: Ventilation (substate of Pressure control)	SCR control state (please see the definition)	=	Pressure Control	-
			Reductant Pump Module Pressure Dwell time in Pressure Build up substate	< >	375.00 15.00	kPa 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 -

Component / System	State or Status Sub-Grouping	Description of State or Status found in 140BDG04	Defined by:		Enable Conditions	
		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
			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 for operation	SCR Engine State	Ignition	=	TRUE	-
			engine speed	>	600.00	rpm
		Status fill level decrease (please see the definition)				
			Particulate Filter Regeneration demand on	=	TRUE	

Component / System	State or Status Sub-Grouping	Description of State or Status found in 14OBDG04	Defined by:		Enable Conditions	
			or Reductant fill level of the SCR catalyst lowed to the target value under Particle filter Regeneration request (a) - (b) (a) Nominal value of Reductant fill level in the catalyst (b) Estimated current Reductant load (c) Reductant Dosing quantity limitation or SCR catalyst temperature too high to convert Reductant under Particle filter Regeneration request Average temperature inside the SCR catalyst:	>= = >	0 calculated parameter 0.90	- factor
	Reductant Heater and Defrost System Control States and Status	Reductant Defrost check	status of reductant tank heater temperature (please see the definition) State of the defrosting check of pressure line (please see the definition) State of the defrosting check of supply module (please see the definition) (duration, for which the conditions for a hydraulic release reset of pressure line heater circuit are satisfied	= = = <=	TRUE TRUE TRUE 600.00	- - sec

Component / System	State or Status Sub-Grouping	Description of State or Status found in 14OBDG04	Defined by:		Enable Conditions	
			ambient temperature	>	-7.14	°C
			Release heater pressure line and	=	FALSE	-
			duration, for which the conditions for a hydraulic release reset of supply module heater circuit are satisfied	<=	600.00	sec
			ambient temperature	>	-7.14	°C
			Release heater supply module)	=	FALSE	-
				-		_
		Status of reductant tank heater temperature	status of reductant tank heater temperature (please see the definition)			
			Reductant tank heat temperature at Standby state	>	-8.04	°C
			or Engine off Time	>	2147483647.00	sec
			Reductant tank heat temperature at Standby state	>	3003.56	°C
		State of the defrosting check of pressure line	State of the defrosting check of pressure line (please see the definition)			
			time since pressure line heating on under pressure line defrost mode or	>=	0 to 2200	sec
			status of SCR control state (please see the definition)	=	No Pressure Control	-
			Pressure line defrost timer or	=	0	sec
			ignition	=	on coo oo	Sec
I	I	I	engine speed	>	600.00	rpm

Component / System	State or Status Sub-Grouping	Description of State or Status found in 14OBDG04	Defined by:		Enable Conditions	
			(Pressure line defrost check in last driving cycle status of SCR control state (please see the definition) Engine off Time (see Look-Up-Table #21) NO Pending or Confirmed DTCs:	= = < =	TRUE No Pressure Control 120 to 900 TRUE	- - sec -
		State of the defrosting check of supply module	State of the defrosting check of supply module (please see the definition)			
			time since supply module heating on under supply module defrost mode or	>=	0 to 2200	sec
			status of SCR control state (please see the definition)	=	No Pressure Control	-
			Supply module defrost timer or	=	0	sec
			ignition engine speed (= >	on 600.00	sec rpm
			V 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 #20) NO Pending or Confirmed DTCs:	< =	120 to 900 TRUE	sec
			NOT enaling of committee DTCs.	-		-
			Current time for heating / not heating of heater circuit 1 (tank)	>=	32767	Sec

Component / System	State or Status Sub-Grouping	Description of State or Status found in 14OBDG04	Defined by:		Enable Conditions	
			Reductant Defrost check (please see the definition)	=	FALSE	-
		Preliminary release of the heater control for the main state machine	Preliminary release of the heater control for the main state machine (please see the definition)			
			Current time for heating / not heating of heater circuit 1 (tank)	>=	0 to 3276	sec
			status of reductant tank heater defrost status of reductant tank heater temperature (please see the definition)	= =	FALSE FALSE	-
			State of the defrosting check of pressure line (please see the definition)	=	TRUE	-
			State of the defrosting check of supply module (please see the definition)) or (=	TRUE	-
			ignition	=	on	sec
			engine speed	>	600.00	rpm
			Engine off Time State of the defrosting check of pressure line (please see the definition)	<= =	0.00 TRUE	sec -
			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	-
1			ignition	=	on	sec

Component / System	State or Status Sub-Grouping	Description of State or Status found in 14OBDG04	Defined by:		Enable Conditions	
			engine speed Engine off Time State of the defrosting check of pressure line (please see the definition)	> <= =	600.00 0.00 TRUE	rpm sec -
			State of the defrosting check of supply module (please see the definition)))	=	TRUE	-
		Release of tank heater circuit	(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)) and	>=	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

Component / System	State or Status Sub-Grouping	Description of State or Status found in 14OBDG04	Defined by:		Enable Conditions	
))			
			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 ((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
1			or			ļ

Component / System	State or Status Sub-Grouping	Description of State or Status found in 14OBDG04	Defined by:		Enable Conditions	
			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:	=	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
			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))	>=	0 to 180	sec

Component / System	State or Status Sub-Grouping	Description of State or Status found in 14OBDG04	Defined by:		Enable Conditions	
			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:	=	see sheet inhibit tables	-
		Release of tank heater circuit	(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)) and	>=	0 to 300	sec

Component / System	State or Status Sub-Grouping	Description of State or Status found in 14OBDG04	Defined by:		Enable 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 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

Component / System	State or Status Sub-Grouping	Description of State or Status found in 14OBDG04	Defined by:		Enable Conditions	
) 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)) 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	
		Status of the battery voltage being in the valid working range for Reductant tank heater	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 14OBDG04	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)	=	FALSE	-
) and			
			(status of reductant tank heater temperature (please see the definition)	=	TRUE	-
			Waiting time after tank heater release expired))	>	0	sec

Component / System	State or Status Sub-Grouping	Description of State or Status found in 14OBDG04	Defined by:		Enable Conditions	
			or ((Waiting time before tank heater released started with status of reductant tank heater temperature (please see the definition))	> =	32767.00 FALSE	sec -
			and (status of reductant tank heater temperature (please see the definition) Waiting time after tank heater release	=	TRUE 0.00	-
			expired))	>	0.00	Sec
	Reductant Tank Level System States and Status	status of Reductant tank level	Tank level > full (100%) Warning (66.67%) < tank level < full (100%)	=	Full OK	-
			Restriction (33.33%) < tank level < Warning (66.67%) Empty < tank level < Restriction (33.33%)	=	Warning Restriction	-
			Tank level < = 0.1%	=	Empty	-
		Status of Reductant tank level reset when refilling is detected (please see the definition)	(time since potential Reductant refill detection is set	>=	8.00	sec

Component / System	State or Status Sub-Grouping	Description of State or Status found in 14OBDG04	Defined by:		Enable Conditions	
			and with			
			(
			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	-
			Falling edge of ignition	=	TRUE	-
			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)	=	TRUE	-
			and with (Frozen state is active during a certain warning level (please see the definition)	=	TRUE	-
			and with			

Component / System	State or Status Sub-Grouping	Description of State or Status found in 14OBDG04	Defined by:		Enable Conditions	
			(Reductant tank Temperature or	>=	-100.04	°C
			Reductant low warning level (Please see the definition))))	>=	0.00	level
		Status of Reductant Tank Level Release	status of reductant tank level release (please see the definition) Status of Filter release for reductant tank level calculation (please see the definition) and (/	=	TRUE	-
			ambient temperature	>=	-100.04	°C
			((status of reductant tank heater temperature (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	sec
			or (status of reductant tank heater temperature (please see the definition)	=	FALSE	-
			Waiting time before tank heater released	>=	32767.00	sec

Component / System	State or Status Sub-Grouping	Description of State or Status found in 14OBDG04	Defined by:		Enable Conditions	
			and status of reductant tank heater temperature (please see the definition)	=	TRUE	-
			Waiting time after tank heater release expired))	>=	0.00	sec
			or Frozen state is active during a certain warning level (please see the definition)	=	TRUE	-
) Vehicle speed)	>=	6.22	mph
			or filter release for Reductant tank level calculation at T15 on (Please see the definition)	=	TRUE	-
		Status of Filter release for reductant tank level calculation				
			Reductant tank Temperature	>=	-100.04	°C
			Reductant low warning level (Please see the definition)	>=	0.00	-
			NO Pending or Confirmed DTCs: or	=	TRUE	-
			Frozen state is active during a certain warning level (please see the definition)	=	TRUE	-
				_		
		Filter release for Reductant tank level calculation at Ignition on	ignition	=	on	

Component / System	State or Status Sub-Grouping	Description of State or Status found in 14OBDG04	Defined by:		Enable Conditions	
			Engine on timer is expired (please see the definition)	=	False	
			Vehicle speed	>=	0.62	mph
			Reductant low warning level (Please see the definition)	>=	49.00	level
			and with ((Raw Reductant tank level	>=	33.3	%
			and with (Democratics Deducted months (c) (b)			
			Remaining Reductant quantity (a) - (b): (a) Tank level for reserve mode (Restriction level) in [g]	< =	(a) - (b) 1870.00	g
			(b) Tank level threshold range below Restriction threshold for T15 refill detection release	=	0.00	g
) or		00.7	0/
			Raw Reductant tank level and with (>=	66.7	%
			Remaining Reductant quantity (a) - (b): (a) Tank level for reserve mode (Warning level) in [g]	< =	(a) - (b) 5060.00	g
			 (b) Tank level threshold range below WARNING threshold for T15 refill detection release) 	=	0.00	g
			or Raw Reductant tank level and with	>=	100	%
			(Remaining Reductant quantity (a) - (b): (a) Tank level for reserve mode (Warning level) in [g]	>= =	(a) - (b) 5060.00	g

Component / System	State or Status Sub-Grouping	Description of State or Status found in 140BDG04	Defined by:		Enable Conditions	
			 (b) Tank level threshold range below WARNING threshold for T15 refill detection release)) 	=	0.00	g
		Status of Refill detection of Reductant	Status of Refill detection of Reductant			
		tank	tank (please see the definition) Reductant tank level changed	=	TRUE	-
			((Captured Reductant tank level at last tank level change	=	Empty	-
			or Captured Reductant tank level at last tank level change	=	Restriction	-
) and (
			one or more of following conditions are met			
			status of Reductant tank level (please see the definition)	=	Warning	-
			or status of Reductant tank level (please see the definition)	=	ОК	-
			or status of Reductant tank level (please see the definition)	=	Full	-
)) or ((
			Captured Reductant tank level at last tank level change	=	Warning	-
			or Captured Reductant tank level at last tank level change	=	ОК	-

Component / System	State or Status Sub-Grouping	Description of State or Status found in 14OBDG04	Defined by:		Enable Conditions	
	eas ereaping) and (status of Reductant tank level (please see the definition)) or	=	Full	-
			(Captured Reductant tank level at last tank level change status of Reductant tank level (please see the definition)))	=	OK Full	-
				_		_
		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 Vehicle speed)	= > >=	on 600.00 6.22	- rpm mph
			or (Vehicle speed NO Pending or Confirmed DTCs:	>= =	6.22 TRUE	mph -
			for time)) and with timer reset conditions (>	1.00	Sec
			Falling edge of ignition or	=	TRUE	-
			Reductant Refill enabling conditions reset timers	=	TRUE	-

Component / System	State or Status Sub-Grouping	Description of State or Status found in 14OBDG04	Defined by:		Enable Conditions	
)			
	Reducant Tank Level Low Warning States	Normal_Operation_OK: 0 decimal, normal operation	Reductant tank level and with	=	Full	-
			(Warning level or (<=	49	-
			Previous warning level vehicle speed))	> <=	49 98.18	- mph
			or Reductant Quality state	>	0	-
		Warning_Leve1: 1 decimal, Warning level	Reductant tank level	<	Full	
		1	Remaining mileage and with	>	1500.00	miles
			(Warning level	<=	49	Warning level in decimal
			or (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 14OBDG04	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 or	<=	49	Warning level in decimal
			(Previous warning level	>	49	Warning level in decimal
			vehicle speed))	<=	98.18	mph
			and with Reductant Quality state	=	0	-
					_	_
		Warning_Level3: 16 decimal, Warning level 3	Reductant tank level	<	Full	-
			Remaining mileage and with	>	800.00	miles
			(Warning level	=	2	Warning level in decimal
			or Warning level	=	16	Warning level in decimal

Component / System	State or Status Sub-Grouping	Description of State or Status found in 14OBDG04	Defined by:		Enable Conditions	
			and with initialization phase after Reductant refill event is active	=	TRUE	-
			Reductant Quality state	=	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
			vehicle speed))	<=	98.18	decimal mph
			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	<=	49	Warning level in decimal

Component / System	State or Status Sub-Grouping	Description of State or Status found in 14OBDG04	Defined by:		Enable Conditions	
			(Previous warning level	>	49	Warning level in
			vehicle speed))) or	<=	98.18	decimal mph
			(Warning level	=	48	Warning level in decimal
			initialization phase after Reductant refill event is active))	=	TRUE	-
			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) or	=	TRUE	-
			(Warning level	<	49	Warning level in decimal
			Failed Reductant system pressure build up)) and with	=	1	-

Component / System	State or Status Sub-Grouping	Description of State or Status found in 140BDG04	Defined by:		Enable Conditions	
			Reductant Quality state	=	0	
		Warning_Level8: 80 decimal,Vehicle speed restriction mild	Warning level	=	80	Warning level in decimal
			initialization phase after Reductant refill event is active and with	=	TRUE	-
			Reductant Quality state	=	0	-
		Warning_Level10: 112 decimal,Vehicle speed restriction aggressive	Warning level	=	112	Warning level in decimal
			initialization phase after Reductant refill event is active and with	=	TRUE	-
			Reductant Quality state	=	0	-
		Warning_Level12: 144 decimal, Vehicle	Warning level	=	144	Warning
		speed restriction severe		_	144	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 14OBDG04	Defined by:		Enable Conditions	
			initialization phase after Reductant refill event is active and with Reductant Quality state	=	TRUE 0	-
		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 (> <	14400.00 -11.04	sec °C
			Engine off Time time since the following conditions are met	<= <=	7200.00 7200.00	sec sec
			(status of reductant tank heater defrost Vehicle speed Status of urea tank as frozen (please see the definition)))	= > =	On or Defrost 6.22 TRUE	- mph -

Component /	State or Status	Description of State or Status	Defined by:		Enable Conditions	
System	Sub-Grouping	found in 14OBDG04	-		Conditions	
		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) OR	=	TRUE	-
			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)	>=	0.4 to 0.45	g
			#13) OR			

Component / System	State or Status Sub-Grouping	Description of State or Status found in 14OBDG04	Defined by:		Enable Conditions	
			Difference between the NOx mass of the sensor and of the model during second functional evaluation (see Look-Up-Table #14) OR Difference between the NOx mass of the sensor and of the model during third functional evaluation (see Look-Up-Table #15)	>=	0.08 to 0.09	g g
		Overdosing detected	Difference between the NOx mass of the sensor and of the model during first functional evaluation (see Look-Up-Table #10)	<=	-0.55 to -0.38	g
			OR Difference between the NOx mass of the sensor and of the model during second functional evaluation (see Look-Up-Table #11) OR	<=	-0.39 to -0.3	g
			Difference between the NOx mass of the sensor and of the model during third functional evaluation (see Look-Up-Table #12)	<=	-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	>	15.00	ppm

Component / System	State or Status Sub-Grouping	Description of State or Status found in 14OBDG04	Defined by:		Enable Conditions	
			for time	>	0.50	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
			(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	<=	0.04	g/sec

Component / System	State or Status Sub-Grouping	Description of State or Status found in 14OBDG04	Defined by:		Enable Conditions	
			(a) Filtered Upstream NOx mass flow			
			(b) Filtered actual upstream NOx mass flow)			
			Status of pre controlled dosing (please	=	False	
			see the definition) 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 overall aging factor of the SCR catalyst	<= >=	1.20 0.00	factor factor
			for time	>	10.00	sec
			Temperature gradient of SCR Temperature gradient of SCR	>= <=	-327.68 327.67	°C/sec °C/sec
			for time	>	0.20	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
			(
			bifference 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 14OBDG04	Defined by:	Enable Conditions	
		State of the NH3 (Ammonia) slip detection	Reductant concentration downstream SCR	< 30.00	ppm
			and (a) - (b) (a) Filtered NOx mass flow downstream SCR measured by the sensor	< 0.00 = measured parameter	g/sec -
			(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 SCR catalyst temperature time	> 49.96 < 349.96 > 60.00	°C °C sec
			and Currently dosed Reductant mass flow time	<= 0.05 > 300.00	g/sec sec
			and Feed ratio (a) / ((b) * (c)) (a) Currently dosed Reductant mass flow (b) NOx raw emission mass flow (c) Stoichiometric conversion factor NOx to Reductant	<= 0.10 = measured parameter = measured parameter = calculated parameter	ratio - -

Component / System	State or Status Sub-Grouping	Description of State or Status found in 140BDG04	Defined by:		Enable Conditions	
			for time and Estimated current Reductant load time	~	300.00 1.30 30.00	sec g sec
		Release plausibility of Reductant Load	Release plausibility timer active or (Release plausibility timer active Integrated NOx raw emission since fill level adaptation and plausibility have been locked)	>= >= >=	240.00 120.00 1.20	sec sec g
		Status for disabling the SCR Efficiency monitor following an SCR Adaptation cycle completion	Maximum dosing quantity or (a) - (b) (a) Reductant Dosing quantity (b) Maximum Reductant Dosing quantity or (a) - (b)	< > = =	0.60 0 measured parameter calculated parameter	g/sec -
			(a) - (b) (a) Reductant Desired value	> =	0 calculated parameter	-

Component / System	State or Status Sub-Grouping	Description of State or Status found in 14OBDG04	Defined by:		Enable Conditions	
			(b) Reductant Dosing quantity limitation due to frozen tank	=	calculated parameter	-
		Request for pre controlled dosing				
			Filtered exhaust gas mass flow (a) Correction factor for the upper hysteresis threshold for filtered exhaust- gas mass flow, dependent on HC- contamination	> =	(a) * (b) 1	- factor
			(b) Upper hysteresis threshold for filtered exhaust-gas mass flow, dependent on thermal ageing	=	910.17	g/sec
			and 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 exclant temperature		(a) + (b)	
			Engine coolant temperature (a) Lower hysteresis threshold for	< =	(a) + (b) 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			

Component / System	State or Status Sub-Grouping	Description of State or Status found in 14OBDG04	Defined by:		Enable Conditions	
			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)	
			(a) Lower hysteresis switch on threshold for inlet air temperature	=	-10.04	°C
			(b) Offset for upper hysteresis switch on threshold for inlet air temperature	=	403.00	°C
			or Intake air temperature	<	-50.04	°C
)			
			and			
			ambient temperature	>=	-9.04	°C
			ambient pressure	>=	74.80	kPa
			Selected temperature used for locking pre controlled mode	>=	-3549.94	°C
			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	-

Component / System	State or Status Sub-Grouping	Description of State or Status found in 14OBDG04	Defined by:		Enable Conditions	
			(((k) + (l) + (m)	>	0.00	
			 (k) = (a) * (b) (a) entry condition for pre controlled dosing at sea level (b) Alticular list of a standard li	=	0	-
			(b) Altitude multiplier factor for sea level	=	measured parameter	-
			 (I) = (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
	Reductant Tank Heater Performance Diagnosis Status	start temperature is captured in EERPOM if monitoring is active over several driving cycles		=	1.56	°C

Component / System	State or Status Sub-Grouping	Description of State or Status found in 14OBDG04	Defined by:		Enable Conditions	
		or start temperature is captured in EERPOM if monitoring is not active over several driving cycles	(continuation of previously started tank temperature performance monitoring cycle (see definition) (ignition on for time or ice detection by tank temperature difference: (a) - (b) (a) filtered current tank temperature (b) tank temperature captured at the beginning of current monitoring cycle)) or (a) - (b) (a) filtered current tank temperature (b) tank temperature captured at the beginning of current monitoring cycle or monitoring was performed in previous driving cycle	= > = = = = =	FALSE 60.00 TRUE -0.54 measured parameter measured parameter -0.54 measured parameter measured parameter measured parameter measured	- sec - - - - - - - - - -
		continuation of previously started tank temperature performance monitoring cycle	temperature difference: (a) - (b) (a) filtered current tank temperature (b) tank temperature of the previous driving cycle	<= = =	1.56 measured parameter measured parameter	°C - -

Component /	State or Status	Description of State or Status	Defined by:		Enable	
System	Sub-Grouping	found in 14OBDG04			Conditions	
			temperature difference: (a) - (b)	<=	0	°C
			(a) tank temperature of the previous	=	measured	-
			driving cycle		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	=	measured	-
			monitoring cycle from EEPROM (see definition)		parameter	
			Engine off Time	<=	2000.00	sec
			This monitor was complete in the last	=	FALSE	
			driving cycle			
			ice detection by tank temperature			
			difference:			
			(a) - (b)	>	-0.54	°C
			(a) filtered current tank temperature	=	measured	-
					parameter	
			(b) tank temperature captured at the	=	measured	-
			beginning of current monitoring cycle		parameter	
		State of Reductant injection valve Component Protection	((
		Component Flotection	status of SCR control sub state (please	=	Metering control	
			see the definition)	_	Metering control	_
			and with			
			(
			PM Filter Regeneration	=	not active	-
			Reluctant dosing valve modeled	>	119.96 to	°C
			temperature (see Look-Up-Table #16)		134.96	
)			
			or			
I	I	I	(

14 OBDG04 ECM Parameter Definitions

Component / System	State or Status Sub-Grouping	Description of State or Status found in 14OBDG04	Defined by:		Enable Conditions	
			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	-
			PM Filter Regeneration Modeled Reductant injection valve tip temperature based on its coil temperature (see Look-Up-Table #16)) or	= >	not active 119.96 to 134.96	- °C
			(PM Filter Regeneration Modeled Reductant injection valve tip temperature based on its coil temperature))))	= >	active 119.96	- °C
Turbo Charger		Turbocharger (VNT) wiping active	The Variable Nozzle Turbocharger Control has an intrusive mode where: VNT wiping is a sweep of the vane position control throughout its range of motion which is used to: avoid a binding of the VNT vanes due to soot accumulation during long idle operation with a cold engine.			

Table no. Fault Codes

1

Label (Internal Manufacturer Reference)

P0101	AFS_rAirThre	sLo_MAF)					
Injection Qty (mm^3/rev) / Ambient Pressure (kPa)	0	95	110	180	250	300	400	50
2	0.85	0.85	0.85	0.85	0.8	0.8	0.8	8.0
4	0.85	0.85	0.85	0.85	0.8	0.8	0.8	0.8
70	0.85	0.85	0.85	0.85	0.8	0.8	0.8	0.8
80	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.
100	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.
120	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.
140	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.
200	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.

2 P2199

Air_tDiffMaxHiTAFS_CUR

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

3 P10CF Air_tDiffMaxHiTCACDs_CUR

Engine Off Time (sec)	600	700	800	900	1000	2000	3000	4000	5000	8000	17999	18000	28799	28800	30000	32000
Delta Temperature (°C)	999	999	999	999	999	999	999	999	999	999	999	999	999	25	25	25

4 P040F

Air_tDiffMaxHiTEGRCIr2Ds_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	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

8 P0401

AirCtl_facEnvPresMinDvt_CUR

Ambient Pressure (kPa)	70	75	80	85	90	95	100	110
Correction Factor (factor)	0.75	0.75	0.825	0.9	1	1	1	1

9 P0401

AirCtl_mEGRMinDvtLim_CUR

Ambient Pressure (kPa)	67	70	73	76	79	82	85	88	91	94	97	100
EGR Commanded Air Mass (g/rev)	0.04	0.04	0.04	0.04	0.045	0.0525	0.0625	0.075	0.085	0.0925	0.0975	0.1

10 P0402

AirCtl_mMaxDvt_MAP

Injection Qty (mm^3/rev) / Engine Speed (rpm)	550	1000	1200	1750	2000	2500	3000	5000
10	0.033	0.033	0.033	0.033	0.040	0.060	0.075	0.075
20	0.033	0.033	0.033	0.033	0.040	0.060	0.075	0.075

[30	0.033	0.033	0.033	0.033	0.040	0.060	0.075	0.075
	40	0.033	0.033	0.033	0.033	0.040	0.060	0.075	0.075
	60	0.033	0.033	0.033	0.033	0.040	0.060	0.075	0.075
[80	0.035	0.035	0.035	0.035	0.040	0.060	0.075	0.075
	90	0.040	0.040	0.040	0.040	0.040	0.060	0.075	0.075
[100	0.060	0.060	0.060	0.060	0.060	0.060	0.075	0.075

11 P0401

AirCtl_mMinDvt_MAP

Injection Qty (mm^3/rev) / Engine Speed (rpm)	550	1000	1200	1600	1800	2000	2500	3000
10	-0.040	-0.040	-0.050	-0.050	-0.050	-0.050	-0.075	-0.150
20	-0.040	-0.040	-0.050	-0.050	-0.050	-0.050	-0.075	-0.150
30	-0.040	-0.040	-0.050	-0.050	-0.050	-0.050	-0.075	-0.150
40	-0.040	-0.040	-0.050	-0.050	-0.050	-0.050	-0.075	-0.150
60	-0.050	-0.050	-0.050	-0.050	-0.050	-0.075	-0.075	-0.150
80	-0.053	-0.053	-0.053	-0.053	-0.053	-0.075	-0.075	-0.150
90	-0.075	-0.075	-0.075	-0.075	-0.075	-0.075	-0.075	-0.150
100	-0.150	-0.150	-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

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

14 P026A

CAClg_dmThresHi_CUR

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	20	20	20

17 P0336

EpmCrS_facGapPlausHigh_CA

8 5.81 3.38 3.38

18	P0336	E¢	pmCrS_facIn	cPlausHiç	gh_CA	
	-		2	1.81	1.5	1.5
19	P02CD, P02CF, P02D1, P02D3	E	TClb_pRailSe			
	Rail Pressure Setpoint (kPa)		0	30000	80000	
20	P02CD, P02CF, P02D1, P02D3	E	TClb_tiET_M	AX_CA		
	Injector Energizing Time (µsec)		0	547.2	304.4	
21	P02CD, P02CF, P02D1, P02D3	E	TClb_tiET_M	IN_CA		
	Injector Energizing Time (µsec)		0	137.2	107.2	
22	P02CD, P02CF, P02D1, P02D3	E	TClb_tiETFb0	OfsMax_C	A	
	Injector Energizing Time (µsec)		0	16	12	
23	P02CD, P02CF, P02D1, P02D3	E	TClb_tiETFb0	DfsMin_C	A	
	Injector Energizing Time (µsec)		0	16	12	
24	P144E	E	TCtl_stPOpC	·	_	
	Injection Qty (mm^3/rev) / Engine Speed (rpm)	40	850	1000	2000	3500
		10 16	0	0	0	0
		40	1	1	1	1
		160	1	1	1	1
25	P144F	E	TCtl_stPOpC	•	_	

Injection Qty (mm^3/rev) / Engine Speed (rpm)	900	1000	2000	3500
10	0	0	0	0

		16 0	1	1	1										
		40 1 160 1	1 1	1 1	1 1										
26	P2453 Exhaust Gas Volume Flow Change (m^3/h/sec)	Exh_dpMinPc	osPPFItDif	f_CUR											
	Differential Pressure Change Threshold (kPa/sec)	0.5	1.5												
27	P11DC	Exh_facLamS	tatNoCat2	2Ds_CUF	R										
	-	1	1.5 0	2 0.5	5 0.5	7 0.5	9 0.5	10 0.5	15 0.5	20 0.5	25 0.5	30 0.5			
8	P11DB	Exh_facLamS	tatNSCD	s_CUR											
	-	1	1.5 0	2 0.5	5 0.5	7 0.5	9 0.5	10 0.5	15 0.5	20 0.5	25 0.5	30 0.5			
0	P11D3, P11D4	Exh_mAirAda	pActvNSC	Ds_CUF	ł										
	Upstream Measure NOx at DFCO Start (ppm) Integrated Air Mass Flow (g)	0	20 100	50 125	100 150	200 250	300 300	400 300	500 350	600 350	700 400	800 400	900 500	1000 500	1
1	P20E2	Exh_tDiffMaxI	HiTOxiCat	:Ds_CUR											
	Engine Off Time (sec) Delta Temperature (°C)	600 3276.7	700 3276.7	800 3276.7	900 3276.7	1000 3276.7	2000 3276.7	3000 3276.7	4000 3276.7	5000 3276.7	8000 3276.7	10000 3276.7	15000 3276.7	20000 3276.7	25 327
2	P20E4	Exh_tDiffMaxI	HiTPFltDs	_CUR											
	Engine Off Time (sec) Delta Temperature (°C)	600 3276.7	700 3276.7	800 3276.7	900 3276.7	1000 3276.7	2000 3276.7	3000 3276.7	4000 3276.7	5000 3276.7	8000 3276.7	10000 3276.7	15000 3276.7	20000	25 327
3	P24B 7														
-	PM Sensor Temperature (°C) Heater Resistance (Ohm)	-30.00	19.98 3.26	<u>69.98</u> 3.60	119.98 3.93	150.00 4.13									
84	P24B 7	-	· · · · ·												

500

20

20

500

20

20

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	3	0

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
14	-0.6	-0.6	-0.6	-0.6	-0.6	-0.6	-0.6	-0.6
16.6	-0.6	-0.6	-0.6	-0.6	-0.6	-0.6	-0.6	-0.6
18	0	0	0	0	0	0	0	0
20	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6
22	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8
24	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2
26	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4
28	2	2	2	2	2	2	2	2

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	0
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	1
60	1	1	1	1	1	1	1	1	1	1
72	1	1	1	1	1	1	1	1	1	1
84	1	1	1	1	1	1	1	1	1	1
100	1	1	1	1	1	1	1	1	1	1
120	1	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	166.6	166.6	166.6	166.6	166.6	166.6
-10.04	123.6	123.6	123.6	123.6	123.6	123.6
-0.04	122	122	122	122	122	122
19.96	100.6	100.6	100.6	100.6	100.6	100.6
39.96	82.4	82.4	82.4	82.4	82.4	82.4
69.96	78	78	78	78	78	78

42 P054F

InjCtl_qDesNeutrGearMonMax_MAP

ECT (°C) / Engine Speed (rpm)		0	400	600	825	1050	5000
-	20.04	117	117	117	117	117	117
	-0.04	88	88	88	88	88	88
	9.96	70.6	70.6	70.6	70.6	70.6	70.6
	19.96	63.8	63.8	63.8	63.8	63.8	63.8
	39.96	65.6	65.6	65.6	65.6	65.6	65.6
	69.96	61.8	61.8	61.8	61.8	61.8	61.8

43 P054E

InjCtl_qDesNeutrGearMonMin_MAP

ECT (°C) / Engine Speed (rpm)		0	400	600	825	1050	5000
-	20.04	26.6	26.6	26.6	26.6	26.6	26.6
	-0.04	17	17	17	17	17	17
	9.96	11.2	11.2	11.2	11.2	11.2	11.2
	19.96	9	9	9	9	9	9
	39.96	9.4	9.4	9.4	9.4	9.4	9.4
	69.96	8.2	8.2	8.2	8.2	8.2	8.2

44 P054E

InjCtl_qDesGearMonMin_MAP

ECT (°C) / Engine Speed (rpm)	0	400	600	825	1050	5000
-20.04	40.4	40.4	40.4	40.4	40.4	40.4
-0.04	26.2	26.2	26.2	26.2	26.2	26.2
9.96	25.6	25.6	25.6	25.6	25.6	25.6
19.96	18.4	18.4	18.4	18.4	18.4	18.4
39.96	12.4	12.4	12.4	12.4	12.4	12.4
69.96	10.8	10.8	10.8	10.8	10.8	10.8

45 P11A6, P11A9, P2297 LSU_mAirMax_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

LSU_nMax_C

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

48 P11A6, P11A9, P2297

LSU_qMax_C

Column Number (-)	0	1	2
Injection Quantity (mm^3/rev)	44	36	0.4

49 P11A6, P11A9, P2297

LSU_qMin_C

Column Number (-)	0	1	2
Injection Quantity (mm^3/rev)	16	8	-1

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_dnThresIdl_CUR

Injection Quantity (mm^3/rev)	10	18	40	60
Crankshaft Angular Acceleration (s^(-2))	-2.5	-4	-8	-12

53 P0606 MoFlnjQnt_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

Engine Speed (rpm)	0	2080	2120	4000
Energizing Time (µsec)	6000	6000	200	200

57 P0299

PCR_pMaxDvt_MAP

Injection Qty (mm^3/rev) / Engine Speed (rpm)		550	1000	1500	1750	2000	2500	3000	4500
	0	25	20	20	20	22.5	25	25	45
	20	25	20	20	20	25	35	40	45
	40	25	25	25	25	25	35	40	45
	60	27.5	27.5	30	35	35	35	45	45
	80	30	32.5	40	45	45	45	45	45
	100	35	35	47.5	50	50	50	55	55
	120	45	45	50	55	55	55	55	55
	140	50	50	55	55	55	55	55	55

58 P0234

PCR_pMinDvt_MAP

Injection Qty (mm^3/rev) / Engine Speed (rpm)	550	1200	1500	2000	2500	3000	3500	5500
2	-12.5	-12.5	-12.5	-10	-15	-20	-40	-40
10	-12.5	-12.5	-12.5	-15	-15	-20	-40	-40
20	-15	-15	-15	-15	-15	-20	-40	-40
30	-15	-15	-15	-15	-15	-20	-40	-40
80	-20	-20	-20	-20	-20	-20	-40	-40
100	-20	-20	-25	-25	-25	-25	-40	-40
120	-30	-30	-30	-30	-30	-30	-40	-40
140	-40	-40	-40	-40	-40	-40	-40	-40

59 P2263

PCR_pOvrBstDvt_MAP

Injection Qty (mm^3/rev) / Engine Speed (rpm)	550	1200	1500	2000	2500	3000	3500	5500
	2 -25	-25	-25	-25	-25	-30	-40	-40
1	-25	-25	-25	-25	-25	-30	-40	-40
2	-25	-25	-25	-25	-25	-30	-40	-40
3	-30	-30	-30	-30	-25	-30	-40	-40
8	-30	-30	-30	-30	-30	-30	-40	-40
10	-30	-30	-50	-50	-50	-50	-50	-50
12) -40	-40	-55	-55	-55	-55	-55	-55
14) -55	-55	-55	-55	-55	-55	-55	-55

60 P2263

PCR_pUndrBstDvt_MAP

Injection Qty (mm^3/rev) / Engine Speed (rpm)	500	1000	1500	1750	2000	2500	3000	4500
0	40	35	35	35	37.5	40	40	60
20	40	35	35	35	40	50	55	55
40	40	40	40	40	40	50	55	55
60	47.5	47.5	60	65	65	65	70	70
80	50	52.5	65	75	75	75	75	75
100	55	55	70	80	80	80	80	80
120	60	60	75	80	80	80	80	80
140	70	70	80	85	85	85	85	85

61 P2459

PFIt_mSotThresRgnFreq_CUR

Soot Mass at End of Regen (g)	0	4	8	20	24	26
Soot Mass (g)	0	160	320	800	960	1040

62 P128E Rail_pCPCFltMin_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

64 P0088 Rail_pMeUnDvtMin_CUR

Engine Speed (rpm)	0	200	400	600	700	725	775	850	900	1000	1200	1650	2000	3000	4000	5000
Rail Pressure (kPa)	-80000	00000	-80000	-80000	-80000	-80000			10000	-18000	-18000		-18000		-18000	40000

65	P128E	Rail_pMeUnFl	tMin_CUF	2													
	Engine Speed (rpm) Rail Pressure (kPa)	0	200 0	400 0	600 0	700 0	725 0	775 15000	850 15000	900 15000	1000 15000	1200 15000	1650 15000	2000 15000	3000 15000	4000 15000	5000 15000
66		Rail_pPCVDvt	Max_CUF	2													
	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_pPCVFltN	/lin_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		SCRChk_facE	<u> </u>														
	Filtered Exh Mass Flow (g/s) / SCR Upstream Temp (°C)	149.96	199.96	229.96	259.96		319.96	359.96	399.96								
	11.11 16.67	-0.205 -0.205	-0.205 -0.205	-0.205	-0.225 -0.225	-0.262 -0.262	-0.262	-0.262 -0.262	-0.262 -0.262								
	22.22	-0.205	-0.205	-0.205	-0.225	-0.262	-0.262	-0.262	-0.262								
	27.78	-0.205	-0.205	-0.205	-0.216	-0.257	-0.257	-0.257	-0.257								
	33.33	-0.205	-0.205	-0.205	-0.207	-0.257	-0.257	-0.257	-0.257								
	41.67	-0.163	-0.163	-0.163	-0.198	-0.234	-0.243	-0.243	-0.243								
	50.00	-0.149	-0.149	-0.149	-0.198	-0.225	-0.239	-0.239	-0.239								

69 P11CC

SCRChk_facRatHumMinNOxUs_CUR

-0.149 -0.198

-0.149 -0.149

Relative Humidity (%)	0	30.005	40.002	50	59.998	75	90.002	100
Correction Factor (factor)	1	1	1	1	1	1	1.1	1.2

69.45

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

-0.225 -0.239 -0.239 -0.239

80	0	0	0	0	0	0	0	0	0	0	0	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
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
1	-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)	3.06	3.06	3.16	3.96	2.36	1.76	1.46	1.36

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

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	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
F	65.8	1100	1100	1000	1000	1000	1000	850	850
F	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

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

ZFC_tiCldCham_CUR

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

end S1-14OBDG04 - Calibration Tables

S2-14OBDG04_PM_Sensor - Calibration Tables

Table no. Fault Codes

Label (Internal Manufacturer Reference)

1 P24C7

Exh_tPPDsTempMeaDifNeg_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_tPPDsTempMeaDifPos_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)	69.96	69.96	109.96	114.96	119.96	134.96	149.96	194.96

end S1-14OBDG04_PM_Sensor - Calibration Tables

Calibration Parameter Definition - Calibration Tables

Status and State Calibration Tables

Table no. Status or State

Label (Internal Manufacturer Reference)

DewDet_wThresLSU0_MAP

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
-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
Γ	-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

PFltLd_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	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
5.56	0.00	0.00	0.76	1.13	1.51	1.51	1.51	1.51
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	0.1399	0.2247	0.3538	0.5284	0.6799	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_qMeUnCtlType_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_mNH3

e 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

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_tUDosVlvCoPrActv_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

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
Reductant Heater Time (sec)	300	300	0	0

125

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	-6.04
Reductant Heater Time (sec)	2200	1800	1600	1200	600	300	0

19 Release of tank heater circuit UHC_tiDfrstC3_CUR

Reductant Tank Temp. (°C)	-45.04	-30.04	-25.04	-18.04	-9.04	-8.04	-6.04
Reductant Heater Time (sec)	2200	1800	1600	1200	600	300	0

20 State of the defrosting check of supply module

UHC_tiEngOffC3FrzLim_CUR

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

UHC_tiEngOffFrzLim_CUR

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

22 Release of tank heater circuit Release of pressure line heater circuit UHC_tiOnC2_CUR

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 UHC_tiOnC3_CUR

Reductant Tank Temp. (°C)	-60.04	-7.04	-6.04	9.96
Reductant Heater Time (sec)	180	180	0	0

24 Release of tank heater circuit

UHC_tiC1DfrstFirstCyc_MAP

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

Active DTC 16 - Crankshaft to Camshaft													
	P0315 - Crankshaft Position System	I		Inhibited DTCs									
Correlation	Variation Not Learned	D(110 1000 D (D1110 000 D (Deset 04.0	D1010 00 0 0 0	Deeps 000	564.66 00 0 C	-					
0030 - HO2S Heater Control Circuit Bank 1 Sensor 1	P0133 - O2 Sensor Circuit Slow Response Bank 1 Sensor 1	P11A6 - HO2S Performance - Signa High During Moderate Load Sensor	al P11A9 - O2 Sensor Performance - 1 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	1					
	P0133 - O2 Sensor Circuit Slow	P11A6 - HO2S Performance - Signa	Bank 1 Sensor 1 al P11A9 - O2 Sensor Performance -	1 P2237 - O2 Sensor Positive Current	1 P2243 - O2 Sensor Reference	1 P2251 - O2 Sensor Negative Current	P2A00 - O2 Sensor Circuit	-					
0031 - HO2S Heater Control Circuit Low Bank 1 Sensor 1	Response Bank 1 Sensor 1	High During Moderate Load Sensor	1 Signal Low During Moderate Load Bank 1 Sensor 1	Control Circuit/Open Bank 1 Sensor	Voltage Circuit/Open Bank 1 Sensor	Control Circuit/Open Bank 1 Sensor	Range/Performance Bank 1 Sensor	1					
032 - HO2S Heater Control	P0133 - O2 Sensor Circuit Slow	P11A6 - HO2S Performance - Signa	al P11A9 - O2 Sensor Performance -	1 P2237 - O2 Sensor Positive Current	P2243 - O2 Sensor Reference	1 P2251 - O2 Sensor Negative Current	P2A00 - O2 Sensor Circuit	1					
ircuit High Bank 1 Sensor 1	Response Bank 1 Sensor 1	High During Moderate Load Sensor	1 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	Range/Performance Bank 1 Sensor	1					
0047 - Turbocharger Boost	P0133 - O2 Sensor Circuit Slow Response Bank 1 Sensor 1	P0234 - Turbocharger Engine	P0299 - Turbocharger Engine Underboost	P0401 - Exhaust Gas Recirculation Flow Insufficient	P0402 - Exhaust Gas Recirculation Flow Excessive	P11A6 - HO2S Performance - Signal	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	P2A00 - O2 Sensor Circuit Range/Performance Bank 1 Sensor 1			
Control Circuit Low Voltage		Uverboost				High During Moderate Load Sensor 1	Signal Low During Moderate Load Bank 1 Sensor 1 P11A9 - O2 Sensor Performance -		1				
0048 - Turbocharger Boost ontrol 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	P2002 - Diesel Particulate Filter (DPF) Low Efficiency	P2237 - O2 Sensor Positive Current Control Circuit/Open Bank 1 Sensor	P2A00 - O2 Sensor Circuit Range/Performance Bank 1 Sensor 1			
Introl Circuit High Voltage	P0171 - System Too Lean Bank 1	P0172 - System Too Rich Bank 1					Bank 1 Sensor 1		1				
007C - CAC Temperature			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		P01D1 - Cylinder 4 Injection Timing Retarded	P01D2 - Cylinder 4 Injection Timing Advanced			
ensor Circuit Low Voltage	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					
	P0171 - System Too Lean Bank 1	P0172 - System Too Rich Bank 1	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			
07D - CAC Temperature	D0004 Turkerberrer Faring	P026C - Injection Quantity Too Low	Retarded r P026D - Injection Quantity Too High	Advanced	Retarded P0401 - Exhaust Gas Recirculation	Advanced P0402 - Exhaust Gas Recirculation	P01CF - Cylinder 3 Injection Timing Retarded P188A	Advanced P168B	Retarded	Advanced			
sor Circuit High Voltage	P0234 - Turbocharger Engine Overboost	Pozec - injection quantity roo cow	Pozed - Injection Guartity Too High	P0299 - Turbocharger Engine Underboost	Flow Insufficient	Flow Excessive	PIDDA	FIOOD					
0087 - Fuel Rail/System	P2002 - Diesel Particulate Filter								1				
ssure - Too Low Bank 1 8 - Fuel Rail Pressure Too	(DPF) Low Efficiency P2002 - Diesel Particulate Filter	-											
- Fuel Pressure Regulator 1	(DPF) Low Efficiency												
Control Circuit Low	P2002 - Diesel Particulate Filter (DPF) Low Efficiency												
Fuel Pressure Regulator 1 Control Circuit High	P2002 - Diesel Particulate Filter (DPF) Low Efficiency												
02 - Mass Air Flow Sensor Circuit Low	P0128 - Engine Coolant Temperature Below Thermostat Regulating	P0133 - O2 Sensor Circuit Slow Response Bank 1 Sensor 1	P0234 - Turbocharger Engine Overhoost	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 - Signal High During Moderate Load Sensor 1	P11A9 - O2 Sensor Performance - Signal Low During Moderate Load	P2237 - O2 Sensor Positive Current Control Circuit/Open Bank 1 Sensor	P2459 - Diesel Particulate Filter Regeneration Frequency	P24B4 - Particulate Matter Sensor Heater Control Circuit	T
	Temperature								Bank 1 Sensor 1	1		Range/Performance	<u> </u>
07 - Manifold Absolute ure (MAP) Sensor Circuit	P01CB - Cylinder 1 Injection Timing Retarded	P01CC - Cylinder 1 Injection Timing Advanced	g 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 Timing 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
Low Voltage	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	P0234 - Turbocharger Engine	P0299 - Turbocharger Engine	P0401 - Exhaust Gas Recirculation	P0402 - Exhaust Gas Recirculation	Range/Performance
108 - Manifold Absolute sure (MAP) Sensor Circuit	P01CB - Cylinder 1 Injection Timing Retarded	P01CC - Cylinder 1 Injection Timing Advanced	g 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 Timing 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
High Voltage	P0128 - Engine Coolant Temperature	P0401 - Exhaust Gas Recirculation	P0402 - Exhaust Gas Recirculation	P040F - Exhaust Gas Recirculation	P0420 - NMHC Catalyst Efficiency	P20E2 - Exhaust Gas Temperature	t	1	1	I			Range/Performance
2 - Intake Air Temperature Sensor 1 Circuit Low	P0128 - Engine Coolant Temperature Below Thermostat Regulating	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							
3 - Intake Air Temperature	P0128 - Engine Coolant Temperature	P0401 - Exhaust Gas Recirculation	P0402 - Exhaust Gas Recirculation	P040F - Exhaust Gas Recirculation	P0420 - NMHC Catalyst Efficiency	P20E2 - Exhaust Gas Temperature	1						
Sensor 1 Circuit High	Below Thermostat Regulating Temperature	Flow Insufficient	Flow Excessive	(EGR) Temperature Sensor 1-2 Correlation	Below Threshold Bank 1	(EGT) Sensors 1-2 not plausible							
	P0128 - Engine Coolant Temperature Below Thermostat Regulating	P01CB - Cylinder 1 Injection Timing Retarded	g 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 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
0117 - Engine Coolant	Temperature	Desses T. J.		Denet O F Lucitor F							Deres 18. 7	DAFAT 18 7	<u></u>
perature Sensor Circuit Low	P0272 - Cly 4 Balance System	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 Detected	I P0401 - Exhaust Gas Recirculation Flow Insufficient	P0402 - Exhaust Gas Recirculation Flow Excessive	P0420 - NMHC Catalyst Efficiency Below Threshold Bank 1	P0506 - Idle Speed Low	P0507 - Idle Speed High	1
				L '									1
	P0128 - Engine Coolant Temperature Below Thermostat Regulating	P01CB - Cylinder 1 Injection Timing Retarded	9 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 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
0118 - Engine Coolant	Below Thermostat Regulating Temperature P0272 - Cly 4 Balance System												
erature Sensor Circuit High	P0272 - Cly 4 Balance System	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 Detected	P0401 - Exhaust Gas Recirculation Flow Insufficient	P0402 - Exhaust Gas Recirculation Flow Excessive	P0420 - NMHC Catalyst Efficiency Below Threshold Bank 1	P0506 - Idle Speed Low	P0507 - Idle Speed High	1
		Underbooat						T IN TRANSPORT	I TOTA EXCLUSION	- JOW TITE AND DATA I			
P011B - Engine Coolant	P0420 - NMHC Catalyst Efficiency	İ											-
Temperature/Intake Air Temperature Correlation	Below Threshold Bank 1]											
0128 - Engine Coolant erature Below Thermostat	P01F0 - Coolant Temperature Dropped Below Diagnostic Monitoring												
Regulating Temperature	Temperature P0132 - HO2S Bank 1 Sensor 1												
31 - HO2S Bank 1 Sensor 1	P0132 - HO2S Bank 1 Sensor 1 circuit high	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	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 r Control Circuit/Open Bank 1 Sensor	P2A00 - O2 Sensor Circuit Range/Performance Bank 1 Sensor 1				
circuit low	P0131 - HO2S Bank 1 Sensor 1	P0133 - O2 Sensor Circuit Slow	P11A6 - HO2S Performance - Signal	Bank 1 Sensor 1 P11A9 - O2 Sensor Performance -	P2002 - Diesel Particulate Filter	1 P2237 - O2 Sensor Positive Current	1 P2243 - O2 Sensor Reference	1 P2251 - O2 Sensor Negative Current	P2A00 - O2 Sensor Circuit				
2 - HO2S Bank 1 Sensor 1 circuit high	circuit low	Response Bank 1 Sensor 1	High During Moderate Load Sensor 1	Signal Low During Moderate Load	(DPF) Low Efficiency	Control Circuit/Open Bank 1 Sensor	Voltage Circuit/Open Bank 1 Sensor	r Control Circuit/Open Bank 1 Sensor	Range/Performance Bank 1 Sensor 1				
33 - O2 Sensor Circuit Slow	P2002 - Diesel Particulate Filter	1	J	Bank 1 Sensor 1		1	1	1 1	1	1			
esponse Bank 1 Sensor 1	(DPF) Low Efficiency P11CB - NOx Sensor Performance -	P11CC - NOx Sensor Performance -	 P2002 - Diesel Particulate Filter 	1									
- System Too Lean Bank 1	Signal High Bank 1 Sensor 1	Signal Low Bank 1 Sensor 1	(DPF) Low Efficiency	1									
- System Too Rich Bank 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 	<u> </u>									
- Fuel Temperature Sensor	P01CB - Cylinder 1 Injection Timing				P01CF - Cylinder 3 Injection Timing				_				
		P01CC - Cylinder 1 Injection Timing	g P01CD - Cylinder 2 Injection Timing Retarded	P01CE - Cylinder 2 Injection Timing	PUTCE - Cylinder 3 Injection Timing Retarded	P01D0 - Cylinder 3 Injection Timing	P01D1 - Cylinder 4 Injection Timing Retarded	P01D2 - Cylinder 4 Injection Timing	I				
- Fuel Temperature Sensor	Retarded P01CB - Cylinder 1 Injection Timing	Advanced P01CC - Cylinder 1 Injection Timing	Retarded 9 P01CD - Cylinder 2 Injection Timing	P01CE - Cylinder 2 Injection Timing Advanced P01CE - Cylinder 2 Injection Timing	P01CF - Cylinder 3 Injection Timing Retarded P01CF - Cylinder 3 Injection Timing	Advanced P01D0 - Cylinder 3 Injection Timing	P01D1 - Cylinder 4 Injection Timing Retarded P01D1 - Cylinder 4 Injection Timing	Advanced P01D2 - Cylinder 4 Injection Timing	Į				
1 Circuit High	Retarded P01CB - Cylinder 1 Injection Timing Retarded P01CB - Cylinder 1 Injection Timing	Advanced P01CC - Cylinder 1 Injection Timing Advanced P01CC - Cylinder 1 Injection Timing	Retarded	Advanced P01CE - Cylinder 2 Injection Timing Advanced P01CE - Cylinder 2 Injection Timing	Retarded	Advanced P01D0 - Cylinder 3 Injection Timing Advanced P01D0 - Cylinder 3 Injection Timing	Retarded P01D1 - Cylinder 4 Injection Timing Retarded P01D1 - Cylinder 4 Injection Timing	P01D2 - Cylinder 4 Injection Timing Advanced P01D2 - Cylinder 4 Injection Timing Advanced P01D2 - Cylinder 4 Injection Timing	P2002 - Diesel Particulate Filter	1			
1 Circuit High	Retarded P01CB - Cylinder 1 Injection Timing Retarded	Advanced P01CC - Cylinder 1 Injection Timing Advanced P01CC - Cylinder 1 Injection Timing	Retarded 9 P01CD - Cylinder 2 Injection Timing Retarded 9 P01CD - Cylinder 2 Injection Timing Retarded	Advanced P01CE - Cylinder 2 Injection Timing Advanced P01CE - Cylinder 2 Injection Timing	Retarded P01CF - Cylinder 3 Injection Timing Retarded P01CF - Cylinder 3 Injection Timing Retarded	Advanced P01D0 - Cylinder 3 Injection Timing Advanced P01D0 - Cylinder 3 Injection Timing Advanced	Retarded P01D1 - Cylinder 4 Injection Timing Retarded P01D1 - Cylinder 4 Injection Timing Retarded	Advanced P01D2 - Cylinder 4 Injection Timing Advanced P01D2 - Cylinder 4 Injection Timing Advanced	(DPF) Low Efficiency]			
1 Circuit High Fuel Rail Pressure Sensor Circuit Low Fuel Rail Pressure Sensor	Retarded P01CB - Cylinder 1 Injection Timing Retarded P01CB - Cylinder 1 Injection Timing	Advanced P01CC - Cylinder 1 Injection Timing Advanced	Retarded 9 P01CD - Cylinder 2 Injection Timing Retarded	Advanced P01CE - Cylinder 2 Injection Timing Advanced	Retarded P01CF - Cylinder 3 Injection Timing Retarded P01CF - Cylinder 3 Injection Timing	Advanced P01D0 - Cylinder 3 Injection Timing Advanced P01D0 - Cylinder 3 Injection Timing	Retarded P01D1 - Cylinder 4 Injection Timing Retarded P01D1 - Cylinder 4 Injection Timing Retarded	Advanced P01D2 - Cytinder 4 Injection Timing Advanced P01D2 - Cytinder 4 Injection Timing Advanced	(DPF) Low Efficiency				
1 Circuit High Fuel Rail Pressure Sensor Circuit Low Fuel Rail Pressure Sensor	Retarded P01CB - Cylinder 1 Injection Tirming Retarded P01CB - Cylinder 1 Injection Tirming Retarded P2002 - Diesel Particulate Filter	Advanced P01CC - Cylinder 1 Injection Timing Advanced P01CC - Cylinder 1 Injection Timing Advanced P01CC - Cylinder 1 Injection Timing	Retarded 9 P01CD - Cylinder 2 Injection Timing Retarded 9 P01CD - Cylinder 2 Injection Timing Retarded	Advanced P01CE - Cylinder 2 Injection Timing Advanced P01CE - Cylinder 2 Injection Timing Advanced P01CE - Cylinder 2 Injection Timing	Retarded P01CF - Cylinder 3 Injection Timing Retarded P01CF - Cylinder 3 Injection Timing Retarded	Advanced P01D0 - Cylinder 3 Injection Timing Advanced P01D0 - Cylinder 3 Injection Timing Advanced P01D0 - Cylinder 3 Injection Timing	Retarded P01D1 - Cylinder 4 Injection Timing Retarded P01D1 - Cylinder 4 Injection Timing Retarded P01D1 - Cylinder 4 Injection Timing	Advanced P01D2 - Cylinder 4 Injection Timing Advanced P01D2 - Cylinder 4 Injection Timing Advanced P01D2 - Cylinder 4 Injection Timing	(DPF) Low Efficiency P2002 - Diesel Particulate Filter]			
1 Circuit High Fuel Rail Pressure Sensor Circuit Low Fuel Rail Pressure Sensor Circuit High 28 - Cylinder 1 Injection Timing Retarded C - Cylinder 1 Injection	Retarded P01CB - Cylinder 1 hjection Timing Retarded P01CB - Cylinder 1 hjection Timing Retarded P2002 - Diesel Particulate Filter (DFT) Low Efficiency P2002 - Diesel Particulate Filter	Advanced P01CC - Cylinder 1 Injection Timing Advanced P01CC - Cylinder 1 Injection Timing Advanced P01CC - Cylinder 1 Injection Timing	Retarded 9 P01CD - Cylinder 2 Injection Timing Retarded 9 P01CD - Cylinder 2 Injection Timing Retarded	Advanced P01CE - Cylinder 2 Injection Timing Advanced P01CE - Cylinder 2 Injection Timing Advanced P01CE - Cylinder 2 Injection Timing	Retarded P01CF - Cylinder 3 Injection Timing Retarded P01CF - Cylinder 3 Injection Timing Retarded	Advanced P01D0 - Cylinder 3 Injection Timing Advanced P01D0 - Cylinder 3 Injection Timing Advanced P01D0 - Cylinder 3 Injection Timing	Retarded P01D1 - Cylinder 4 Injection Timing Retarded P01D1 - Cylinder 4 Injection Timing Retarded P01D1 - Cylinder 4 Injection Timing	Advanced P01D2 - Cylinder 4 Injection Timing Advanced P01D2 - Cylinder 4 Injection Timing Advanced P01D2 - Cylinder 4 Injection Timing	(DPF) Low Efficiency P2002 - Diesel Particulate Filter]			
1 Circuit High - Fuel Rail Pressure Sensor Circuit Low - Fuel Rail Pressure Sensor Circuit High CB - Cylinder 1 Injection Timina Attanced CC - Cylinder 1 Injection Timina Attanced	Retarded P01CB - Cylinder 1 hijection Timing Retarded P01CB - Cylinder 1 hijection Timing Retarded P2002 - Diesel Particulate Filter (DF1 Low Efficiency P2002 - Diesel Particulate Filter (DF1 Low Efficiency	Advanced P01CC - Cylinder 1 Injection Timing Advanced P01CC - Cylinder 1 Injection Timing Advanced P01CC - Cylinder 1 Injection Timing	Retarded 9 P01CD - Cylinder 2 Injection Timing Retarded 9 P01CD - Cylinder 2 Injection Timing Retarded	Advanced P01CE - Cylinder 2 Injection Timing Advanced P01CE - Cylinder 2 Injection Timing Advanced P01CE - Cylinder 2 Injection Timing	Retarded P01CF - Cylinder 3 Injection Timing Retarded P01CF - Cylinder 3 Injection Timing Retarded	Advanced P01D0 - Cylinder 3 Injection Timing Advanced P01D0 - Cylinder 3 Injection Timing Advanced P01D0 - Cylinder 3 Injection Timing	Retarded P01D1 - Cylinder 4 Injection Timing Retarded P01D1 - Cylinder 4 Injection Timing Retarded P01D1 - Cylinder 4 Injection Timing	Advanced P01D2 - Cylinder 4 Injection Timing Advanced P01D2 - Cylinder 4 Injection Timing Advanced P01D2 - Cylinder 4 Injection Timing	(DPF) Low Efficiency P2002 - Diesel Particulate Filter]			
1 Circuit High Freid Rail Pressure Sensor Circuit Low Fuel Rail Pressure Sensor Circuit High C8 - Cylinder 1 Injection Timina Actanated CC - Cylinder 1 Injection Timina Actanaced CD - Cylinder 2 Injection Timina Partaneted	Retarded POICE - Cytoder 1 hysics Timing POICE - Cytoder 1 hysics Timing Poice - Cytoder 1 hysics Timing Poice - Cytoder 1 hysics Point (DPF) Low Efficiency P2020 - Diseal Particulate Filter (DPF) Low Efficiency P2020 - Diseal Particulate Filter (DPF) Low Efficiency P2020 - Diseal Particulate Filter	Advanced P01CC - Cylinder 1 Injection Timing Advanced P01CC - Cylinder 1 Injection Timing Advanced P01CC - Cylinder 1 Injection Timing	Retarded 9 P01CD - Cylinder 2 Injection Timing Retarded 9 P01CD - Cylinder 2 Injection Timing Retarded	Advanced P01CE - Cylinder 2 Injection Timing Advanced P01CE - Cylinder 2 Injection Timing Advanced P01CE - Cylinder 2 Injection Timing	Retarded P01CF - Cylinder 3 Injection Timing Retarded P01CF - Cylinder 3 Injection Timing Retarded	Advanced P01D0 - Cylinder 3 Injection Timing Advanced P01D0 - Cylinder 3 Injection Timing Advanced P01D0 - Cylinder 3 Injection Timing	Retarded P01D1 - Cylinder 4 Injection Timing Retarded P01D1 - Cylinder 4 Injection Timing Retarded P01D1 - Cylinder 4 Injection Timing	Advanced P01D2 - Cylinder 4 Injection Timing Advanced P01D2 - Cylinder 4 Injection Timing Advanced P01D2 - Cylinder 4 Injection Timing	(DPF) Low Efficiency P2002 - Diesel Particulate Filter	}			
1 Circuit High - Fuel Rail Pressure Sensor - Circuit Low - Fuel Rail Pressure Sensor - Circuit High (B- Cylinder 1 Injection Timina Advanced C0 - Cylinder 1 Injection Timina Advanced C0 - Cylinder 2 Injection Timina Ratarded CE - Cylinder 2 Injection Timina Ratarded	Retarded POICB - Cylinder T lysecia Timing Retarded POICB - Cylinder T lysecia Timing Retarded P2002 - Dissel Particulate Filter DDFJ Low Efficiency P2002 - Dissel Particulate Filter P2002 - Dissel Particulate Filter P2002 - Dissel Particulate Filter DDFJ Low Efficiency P2002 - Dissel Particulate Filter (DPF) Low Efficiency	Advanced P01CC - Cylinder 1 Injection Timing Advanced P01CC - Cylinder 1 Injection Timing Advanced P01CC - Cylinder 1 Injection Timing	Retarded 9 P01CD - Cylinder 2 Injection Timing Retarded 9 P01CD - Cylinder 2 Injection Timing Retarded	Advanced P01CE - Cylinder 2 Injection Timing Advanced P01CE - Cylinder 2 Injection Timing Advanced P01CE - Cylinder 2 Injection Timing	Retarded P01CF - Cylinder 3 Injection Timing Retarded P01CF - Cylinder 3 Injection Timing Retarded	Advanced P01D0 - Cylinder 3 Injection Timing Advanced P01D0 - Cylinder 3 Injection Timing Advanced P01D0 - Cylinder 3 Injection Timing	Retarded P01D1 - Cylinder 4 Injection Timing Retarded P01D1 - Cylinder 4 Injection Timing Retarded P01D1 - Cylinder 4 Injection Timing	Advanced P01D2 - Cylinder 4 Injection Timing Advanced P01D2 - Cylinder 4 Injection Timing Advanced P01D2 - Cylinder 4 Injection Timing	(DPF) Low Efficiency P2002 - Diesel Particulate Filter]			
1 Circol High Fuel Rail Pressure Sensor Circol Low Fuel Rail Pressure Sensor Circol High 36: Cylinder 1 Injection Timine Retarded 20: Cylinder 1 Injection Timine Retarded 20: Cylinder 2 Injection Timine Advanced 20: Cylinder 2 Injection Timine Advanced 20: Cylinder 2 Injection Timine Advanced 20: Cylinder 2 Injection Timine Advanced 20: Cylinder 3 Injection 75: Cylinder 3 Injection	Retarated Pol/CBOptice T lipecton Timing Pol/CBOptice T lipecton Timing Retarated P2022 - Desc Particular Fler (DPF) Low Efficiency P2022 - Desc Particular Fler (DPF) Low Efficiency P2022 - Desc Particular Fler P2022 - Desc Particular Fler	Advanced P01CC - Cylinder 1 Injection Timing Advanced P01CC - Cylinder 1 Injection Timing Advanced P01CC - Cylinder 1 Injection Timing	Retarded 9 P01CD - Cylinder 2 Injection Timing Retarded 9 P01CD - Cylinder 2 Injection Timing Retarded	Advanced P01CE - Cylinder 2 Injection Timing Advanced P01CE - Cylinder 2 Injection Timing Advanced P01CE - Cylinder 2 Injection Timing	Retarded P01CF - Cylinder 3 Injection Timing Retarded P01CF - Cylinder 3 Injection Timing Retarded	Advanced P01D0 - Cylinder 3 Injection Timing Advanced P01D0 - Cylinder 3 Injection Timing Advanced P01D0 - Cylinder 3 Injection Timing	Retarded P01D1 - Cylinder 4 Injection Timing Retarded P01D1 - Cylinder 4 Injection Timing Retarded P01D1 - Cylinder 4 Injection Timing	Advanced P01D2 - Cylinder 4 Injection Timing Advanced P01D2 - Cylinder 4 Injection Timing Advanced P01D2 - Cylinder 4 Injection Timing	(DPF) Low Efficiency P2002 - Diesel Particulate Filter]			
1 Circuit High Freid Rail Pressure Sensor Circuit Low Freid Rail Pressure Sensor Circuit High C6 - Cylrider 1 Injection Timina Advanced C0 - Cylrinder 2 Injection Timina Advanced C0 - Cylrinder 2 Injection Timina Retarded C6 - Cylrinder 2 Injection Timing Advanced C7 - Cylrinder 3 Injection Timing Advanced C7 - Cylrinder 3 Injection	Retarated Pol/CBOpticel T lipecton Timing Pol/CBOpticel T lipecton Timing Retarated P2022 - Desc Particular Fler (DPF) Low Efficiency P2022 - Desc Particular Fler (DPF) Low Efficiency P2022 - Desc Particular Fler P2022 - Desc Particular Fler	Advanced P01CC - Cylinder 1 Injection Timing Advanced P01CC - Cylinder 1 Injection Timing Advanced P01CC - Cylinder 1 Injection Timing	Retarded 9 P01CD - Cylinder 2 Injection Timing Retarded 9 P01CD - Cylinder 2 Injection Timing Retarded	Advanced P01CE - Cylinder 2 Injection Timing Advanced P01CE - Cylinder 2 Injection Timing Advanced P01CE - Cylinder 2 Injection Timing	Retarded P01CF - Cylinder 3 Injection Timing Retarded P01CF - Cylinder 3 Injection Timing Retarded	Advanced P01D0 - Cylinder 3 Injection Timing Advanced P01D0 - Cylinder 3 Injection Timing Advanced P01D0 - Cylinder 3 Injection Timing	Retarded P01D1 - Cylinder 4 Injection Timing Retarded P01D1 - Cylinder 4 Injection Timing Retarded P01D1 - Cylinder 4 Injection Timing	Advanced P01D2 - Cylinder 4 Injection Timing Advanced P01D2 - Cylinder 4 Injection Timing Advanced P01D2 - Cylinder 4 Injection Timing	(DPF) Low Efficiency P2002 - Diesel Particulate Filter]			
1 Circuit High Fuel Rail Pressure Sensor Circuit Low Fuel Rail Pressure Sensor Circuit High 26 - Cylinder 1 highetion Timos Relativela CC - Cylinder 1 highetion Timos Relativela CC - Cylinder 1 highetion Timos Relativela CC - Ophidar 2 highetion Timos Relativela CC - Ophidar 2 highetion Timos Relativela CC - Ophidar 2 highetion Timos Relativela Do - Cylinder 3 highetion Timos Relativela	Retarded POICE - Cynder Hupston Timory Retarded - Hupston Timory Retarded POICE - Cynder Hupston Timory Retarded POICE - Cynder History (DPT) Low Efficiency (DPT) Low Efficiency (DPT) Low Efficiency (DPT) Low Efficiency (DPT) Low Efficiency (DPT) Low Efficiency P2020 - Disea Particulas Filer (DPT) Low Particulas Filer P2020 - Disea Particulas Filer	Advanced P01CC - Cylinder 1 Injection Timing Advanced P01CC - Cylinder 1 Injection Timing Advanced P01CC - Cylinder 1 Injection Timing	Retarded 9 P01CD - Cylinder 2 Injection Timing Retarded 9 P01CD - Cylinder 2 Injection Timing Retarded	Advanced P01CE - Cylinder 2 Injection Timing Advanced P01CE - Cylinder 2 Injection Timing Advanced P01CE - Cylinder 2 Injection Timing	Retarded P01CF - Cylinder 3 Injection Timing Retarded P01CF - Cylinder 3 Injection Timing Retarded	Advanced P01D0 - Cylinder 3 Injection Timing Advanced P01D0 - Cylinder 3 Injection Timing Advanced P01D0 - Cylinder 3 Injection Timing	Retarded P01D1 - Cylinder 4 Injection Timing Retarded P01D1 - Cylinder 4 Injection Timing Retarded P01D1 - Cylinder 4 Injection Timing	Advanced P01D2 - Cylinder 4 Injection Timing Advanced P01D2 - Cylinder 4 Injection Timing Advanced P01D2 - Cylinder 4 Injection Timing	(DPF) Low Efficiency P2002 - Diesel Particulate Filter]			
1 Circuit High Fuel Rail Pressum Sensor Circuit Low Fuel Rail Pressum Sensor Circuit Low Fuel Rail Pressum Sensor Circuit And Sensor Timos Rataneed Circuit Circuit Sensor Timos Rataneed Circuit Circuit Sensor Circuit Se	Retarded POICE - Cyndre 1 Hyston Timing POICE - Cyndre 1 Hyston Timing POICE - Cyndre 1 Hyston Timing POICE - Cyndre Efficiency P2020 - Dissel Particulate Filter (DPT) Low Efficiency P2020 - Dissel Particulate Filter (DPT) Low Efficiency P2020 - Dissel Particulate Filter (DPT) Low Efficiency P2020 - Dissel Particulate Filter (DPT) Lew Efficiency P2020 - Dissel Particulate Filter (DPT) Lew Efficiency P2020 - Dissel Particulate Filter	Advanced P01CC - Cylinder 1 Injection Timing Advanced P01CC - Cylinder 1 Injection Timing Advanced P01CC - Cylinder 1 Injection Timing	Retarded 9 P01CD - Cylinder 2 Injection Timing Retarded 9 P01CD - Cylinder 2 Injection Timing Retarded	Advanced P01CE - Cylinder 2 Injection Timing Advanced P01CE - Cylinder 2 Injection Timing Advanced P01CE - Cylinder 2 Injection Timing	Retarded P01CF - Cylinder 3 Injection Timing Retarded P01CF - Cylinder 3 Injection Timing Retarded	Advanced P01D0 - Cylinder 3 Injection Timing Advanced P01D0 - Cylinder 3 Injection Timing Advanced P01D0 - Cylinder 3 Injection Timing	Retarded P01D1 - Cylinder 4 Injection Timing Retarded P01D1 - Cylinder 4 Injection Timing Retarded P01D1 - Cylinder 4 Injection Timing	Advanced P01D2 - Cylinder 4 Injection Timing Advanced P01D2 - Cylinder 4 Injection Timing Advanced P01D2 - Cylinder 4 Injection Timing	(DPF) Low Efficiency P2002 - Diesel Particulate Filter	}			
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P02E8 - Diesel Intake Air Flow	P0171 - System Too Lean Bank 1	P0172 - System Too Rich Bank 1	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 Timir	g P01D2 - Cylinder 4 Injection Timing Advanced	P0234 - Turbocharger Engine	P026C - Injection Quantity Too Low	P026D - Injection Quantity Too High
P02E8 - Diesel Intake Air Flow Position Sensor Circuit Low	P0299 - Turbocharger Engine	P0401 - Exhaust Gas Recirculation	Retarded P0402 - Exhaust Gas Recirculation Flow Excessive	Advanced	Retarded	Advanced	Retarded	Advanced	Retarded	Advanced	Overboost		
P02E9 - Diesel 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	P01CE - Cylinder 2 Injection Timing Advanced	P01CF - Cylinder 3 Injection Timing Retarded	P01D0 - Cylinder 3 Injection Timing Advanced	P01D1 - Cylinder 4 Injection Timir Retarded	g P01D2 - Cylinder 4 Injection Timing Advanced	P0234 - Turbocharger Engine Overboost	P026C - Injection Quantity Too Low	P026D - Injection Quantity Too High
Position Sensor Circuit High	P0299 - Turbocharger Engine Underboost	P0401 - Exhaust Gas Recirculation Flow Insufficient	P0402 - Exhaust Gas Recirculation Flow Excessive	Portinood	Netaloca	Novanced		Paratosa	Realized	Advanced	Ontrobal		
P02EB - Intake Air Flow Valve Control Motor Current Performance	P0234 - Turbocharger Engine Overboost	P0299 - Turbocharger Engine Underboost	P0401 - Exhaust Gas Recirculation Flow Insufficient	P0402 - Exhaust Gas Recirculation Flow Excessive]								
P0300 - Engine Misfire Detected	P2002 - Diesel Particulate Filter (DPF) Low Efficiency												
P0301 - Cylinder 1 Misfire Detected	P2002 - Diesel Particulate Filter												
P0302 - Cylinder 2 Misfire Detected	P2002 - Diesel Particulate Filter (DPF) Low Efficiency												
P0303 - Cylinder 3 Misfire Detected	P2002 - Diesel Particulate Filter (DPF) Low Efficiency												
P0304 - Cylinder 4 Misfire Detected	P2002 - Diesel Particulate Filter (DPF) Low Efficiency												
P0335 - Crankshaft Position Sensor Circuit	Correlation	P0102 - Mass Air Flow Sensor Circuit Low P0102 - Mass Air Flow Sensor Circuit	Retarded	Advanced	P01CD - Cylinder 2 Injection Timing Retarded	Advanced	P01CF - Cylinder 3 Injection Timing Retarded	Advanced	Retarded	Advanced	Variation Not Learned	n P0506 - Idle Speed Low	P0507 - Idle Speed High P0507 - Idle Speed High
P0336 - Crankshaft Position Sensor Performance	P0016 - Crankshaft to Camshaft Correlation	P0102 - Mass Air Flow Sensor Circuit Low P0315 - Crankshaft Position System	t 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 Timir Retarded	g P01D2 - Cylinder 4 Injection Timing Advanced	P0315 - Crankshaft Position System Variation Not Learned	n Public - Idle Speed Low	Pusu7 - Idle Speed High
20340 - Clarikshaft Position Sensor Performance 20340 - Carnshaft Position Sensor Circuit 20341 - Carnshaft Position Sensor	P0016 - Crankshaft to Camshaft Correlation P0016 - Crankshaft to Camshaft	Variation Not Learned P0315 - Crankshaft Position System											
Performance	P0133 - O2 Sensor Circuit Slow	Variation Not Learned 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 Timir	g P11A6 - HO2S Performance - Signal	P11A9 - O2 Sensor Performance -	P11CB - NOx Sensor Performance -	P11CC - NOx Sensor Performance -
P0401 - Exhaust Gas	Response Bank 1 Sensor 1	Retarded	Advanced	Retarded	Advanced	Retarded	Advanced	Retarded	Advanced	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
Recirculation Flow Insufficient	P2002 - Diesel Particulate Filter (DPF) Low Efficiency	P2237 - O2 Sensor Positive Current Control Circuit/Open Bank 1 Sensor	P2459 - Diesel Particulate Filter Regeneration Frequency	P249D - Closed Loop Reductant Injection Control At Limit - Flow Too	P249E - Closed Loop Reductant Injection Control At Limit - Flow Too	P24B4 - Particulate Matter Sensor Heater Control Circuit	P2A00 - O2 Sensor Circuit Range/Performance Bank 1 Sensor 1						
	P0133 - O2 Sensor Circuit Slow Response Bank 1 Sensor 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 Timing Retarded	P01D0 - Cylinder 3 Injection Timing Advanced	P01D1 - Cylinder 4 Injection Timing Retarded	P01D2 - Cylinder 4 Injection Timir Advanced	g P11A6 - HO2S Performance - Signal High During Moderate Load Sensor 1	P11A9 - O2 Sensor Performance - Signal Low During Moderate Load	P11CB - NOx Sensor Performance - Signal High Bank 1 Sensor 1	P11CC - NOx Sensor Performance - Signal Low Bank 1 Sensor 1
P0402 - Exhaust Gas Recirculation Flow Excessive	P2002 - Diesel Particulate Filter	P2237 - O2 Sensor Positive Current	P2459 - Diesel Particulate Filter				P2A00 - O2 Sensor Circuit	Relaided	Advanced	High Duning Moderate Load Sensor	Bank 1 Sensor 1	Signal High Bank T Sensor T	Signal Low Bank 1 Sensor 1
	(DPF) Low Efficiency	Control Circuit/Open Bank 1 Sensor	Regeneration Frequency	P249D - Closed Loop Reductant Injection Control At Limit - Flow Too Low	P249E - Closed Loop Reductant Injection Control At Limit - Flow Too High	P24B4 - Particulate Matter Sensor Heater Control Circuit Range/Performance	Range/Performance Bank 1 Sensor 1						
P0405 - Exhaust Gas Recirculation Position Sensor	P0401 - Exhaust Gas Recirculation Flow Insufficient	P0402 - Exhaust Gas Recirculation Flow Excessive	P2002 - Diesel Particulate Filter (DPF) Low Efficiency	P24B4 - Particulate Matter Sensor Heater Control Circuit	- 25(1)			-					
Circuit Low P0406 - Exhaust Gas				Range/Performance	-								
Recirculation Position Sensor Circuit High	P0401 - Exhaust Gas Recirculation Flow Insufficient	P0402 - Exhaust Gas Recirculation Flow Excessive	P2002 - Diesel Particulate Filter (DPF) Low Efficiency	P24B4 - Particulate Matter Sensor Heater Control Circuit Range/Performance									
P040C - Exhaust Gas Recirculation (EGR) Temperature	P040F - Exhaust Gas Recirculation (EGR) Temperature Sensor 1-2 Correlation												
Sensor 2 Circuit Low Voltage		4											
P040D - Exhaust Gas Recirculation (EGR) Temperature Sensor 2 Circuit High Voltage	P040F - Exhaust Gas Recirculation (EGR) Temperature Sensor 1-2 Correlation		_										
P0420 - NMHC Catalyst Efficiency Below Threshold Bank 1	P249D - Closed Loop Reductant Injection Control At Limit - Flow Too	P249E - Closed Loop Reductant Injection Control At Limit - Flow Too											
P0545 - Exhaust Gas Temperature (EGT) Sensor 1	Low P0420 - NMHC Catalyst Efficiency Below Threshold Bank 1	High P2002 - Diesel Particulate Filter	P20E2 - Exhaust Gas Temperature (EGT) Sensors 1-2 not plausible	P2428 - Exhaust Gas High Temperature	P24B4 - Particulate Matter Sensor Heater Control Circuit	1							
P0546 - Exhaust Gas Temperature (EGT) Sensor 1 P0546 - Exhaust Gas Temperature (EGT) Sensor 1	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	P2428 - Exhaust Gas High	Heater Control Circuit Range/Performance P24B4 - Particulate Matter Sensor								
Temperature (EGT) Sensor 1 Circuit High Voltage	Below Threshold Bank 1	(DPF) Low Efficiency	(EGT) Sensors 1-2 not plausible	Temperature	Heater Control Circuit								
P057C - Brake Pedal Position Sensor Circuit High Voltage	P057D - Brake Pedal Position Sensor Circuit Low Voltage	r			Kanderendmande	4							
P057D - Brake Pedal Position Sensor Circuit Low Voltage	P057C - Brake Pedal Position Sensor Circuit High Voltage	r											
	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 Timing Retarded	P01D2 - Cylinder 4 Injection Timing Advanced	P0234 - Turbocharger Engine Overboost	P026C - Injection Quantity Too Low	P026D - Injection Quantity Too Higt	P0299 - Turbocharger Engine Underboost	P0462 - Fuel Level Sensor Circuit Low
P0641 - 5 Volt Reference 1 Circuit	P01CB - Cylinder 1 Injection Timing Retarded	P01CC - Cylinder 1 Injection Timing Advanced P0533 - Air Conditioning Refrigerant Paragrup Sector Climit Mich	P01CD - Cylinder 2 Injection Timing Retarded P2127 - Accelerator Pedal Position Senera 2 Circuit Low	P01CE - Cylinder 2 Injection Timing Advanced P2128 - Accelerator Pedal Position (APR) Sensor 2 Circuit Mich Voltage	P01CF - Cylinder 3 Injection Timing Retarded P2138 - Accelerator Pedal Position (APP) Sensor 1-2 Correlation	P01D0 - Cylinder 3 Injection Timing Advanced P2454 - Diesel Particulate Filter Differential Program Sanger Circuit	P01D1 - Cylinder 4 Injection Timing Retarded P2455 - Diesel Particulate Filter Differential Programs Sensor Circuit	P01D2 - Cylinder 4 Injection Timing Advanced	P0234 - Turbocharger Engine Overboost	P026C - Injection Quantity Too Low	P026D - Injection Quantity Too Higt	n P0299 - Turbocharger Engine Underboost	P0462 - Fuel Level Sensor Circuit Low
	P01CB - Cylinder 1 Injection Timing Retarded P0532 - Air Conditioning Refrigerant Pressure Sensor Circuit Low	P0533 - Air Conditioning Refrigerant Pressure Sensor Circuit High						P01D2 - Cylinder 4 Injection Timing Advanced	P0234 - Turbocharger Engine Overboost	P026C - Injection Quantity Too Low	P026D - Injection Quantity Too Higt	1 P0299 - Turbocharger Engine Underboost	P0462 - Fuel Level Sensor Circuit Low
P0641 - 5 Volt Reference 1 Circuit P064C - Glow Plug Control Module Performance	P01CB - Cylinder 1 Injection Timing Retarded		P2127 - Accelerator Pedal Position	P2128 - Accelerator Padal Position	P2138 - Accelerator Pedal Position	P2454 - Diesel Particulate Filter Differential Pressure Sensor Circuit	P2455 - Diesel Particulate Filter Differential Pressure Sensor Circuit	P01D2 - Cylinder 4 Injection Timing Advanced	P0234 - Turbocharger Engine Overboost	P026C - Injection Quantity Too Low	P026D - Injection Quantity Too Higt	n P0299 - Turbocharger Engine Underboost	P0462 - Fuel Level Sensor Circuit Low
P064C - Glow Plug Control Module Performance	P01CB - Cylinder 1 hjoction Timing Retarded P0532 - Nic Conditioning Refrigerant Pressure Sensor Circuit Low P11DB - NOx Sensor Current Performance Bank 1 Sensor 1 P0171 - System Too Lean Bank 1	P0533 - Air Conditioning Refrigerant Pressure Sensor Circuit High P2209 - N0x Heater Performance	P2127 - Accelerator Pedal Position Sensor 2 Circuit Low	P2128 - Accelerator Pedal Position (APP) Sensor 2 Circuit High Voltage P01CC - Cylinder 1 Injection Timing Advanced	P2138 - Accelerator Pedal Position	P2454 - Diesel Particulate Filter Differential Pressure Sensor Circuit Low Voltage	P2455 - Diesel Particulate Filter Differential Pressure Sensor Circuit High Voltage		1				P0462 - Fuel Level Gensor Circut Low P026D - Injection Quantity Too High
P064C - Glow Plug Control Module Performance	P01CB - Cylinder 1 hjection Timing Retarded P0532 - Ar Conditioning Refrigerant Pressure Sensor Circuit Low P11DB - NOx Sensor Current Performance Bank 1 Sensor 1	P0533 - Air Conditioning Refrigerant Pressure Sensor Circuit High P2209 - N0x Heater Performance Bank 1 Sensor 1	P2127 - Accelerator Pedal Position Sensor 2 Circuit Low	P2128 - Accelerator Pedal Position (APP) Sensor 2 Circuit High Voltage	P2138 - Accelerator Pedal Position (APP) Sensor 1-2 Correlation	P2454 - Diesel Particulate Filter Differential Pressure Sensor Circuit Low Voltage	P2455 - Diesel Particulate Filter Differential Pressure Sensor Circuit High Voltage		1				·
P064C - Glow Plug Control Module Performance	P01CB - Cylinder 1 lipecian Timing Retaraded P0532 - Air Conditioning Refingement Pressure Sensor Circuiti Low P01DB - NOx Sensor Current Performance Bank 1 Sensor 1 P0171 - System Too Lean Bank 1 P0299 - Turbocharger Engine Underboost	P0533 - Air Conditioning Refrigerant Pressure Sensor Circuit High P2209 - N0x Heater Performance Bank 1 Sensor 1 P0172 - System Too Rich Bank 1 P2122 - Accelerator Pedal Position Sensor 1 Circuit Low	P2127 - Accelerator Pedal Position Sensor 2 Circuit Low P01CB - Cylinder 1 Injection Timing Retarded P2123 - Accelerator Pedal Position Sensor 1 Circuit High	P2128 - Accelerator Pedal Position (APP) Sensor 2 Circuit High Voltage P01CC - Cylinder 1 Injection Timing Advanced P2138 - Accelerator Pedal Position (APP) Sensor 1-2 Correlation	P2138 - Accelerator Pedal Position (APP) Sensor 1-2 Correlation P01CD - Cylinder 2 Injection Timing Retarded	P2454 - Diesel Particulate Filter Differential Pressure Sensor Circuit Low Voltage P01CE - Cylinder 2 Injection Timing Advanced	P2455 - Diesel Particulate Filter Differential Pressure Sensor Circuit High Voltage P01CF - Cylinder 3 Injection Timing Retarded	P01D0 - Cylinder 3 Injection Timing Advanced	P01D1 - Cylinder 4 Injection Timir Retarded	g P01D2 - Cylinder 4 Injection Timing Advanced	P0234 - Turbocharger Engine Overboost	P026C - Injection Quantity Too Low	P026D - Injection Quantity Too High
P064C - Glow Plug Control Module Performance	P010B- Cyinder 1 legiclon Timing Retaried P0322: Ar Condening Refingent Pressure Sensor Circuit Low P110B-NOX Sensor Curret Performance Bank 1 Sensor 1 P0171- System Too Lean Bank 1 P0299 - Tutocharger Engle Underboost P0171- System Too Lean Bank 1 P0297 - Tutocharger Engle	P0533 - Ar Conditioning Refrigurant Pressure Sensor Circuit High P2209 - NDr Heater Performance Bank 1 Sensor 1 P0172 - System Too Rich Bank 1 P2172 - Accelerator Pectal Postion Sensor 1 Circuit Low P0172 - System Too Rich Bank 1 P0172 - System Too Rich Bank 1	P2127 - Accelerator Padal Position Sensor 2 Circuit Low P01CB - Cylinder 1 hypotion Timing <u>Retarded</u> P2123 - Accelerator Padal Position Sensor 1 Circuit High P01CB - Cylinder 1 hypotion Timing <u>Retarded</u>	P2128 - Accelerator Pedal Position (APP) Sensor 2 Circuit High Voltage P01CC - Cylinder 1 Injection Timing Advanced P2138 - Accelerator Pedal Position (APP) Sensor 1-2 Correlation	P2138 - Accelerator Pedal Position (APP) Sensor 1-2 Correlation P01CD - Cylinder 2 Injection Timing Retarded	P2454 - Diesel Particulate Filter Differential Pressure Sensor Circuit Low Voltage P01CE - Cylinder 2 Injection Timing Advanced	P2455 - Diesel Particulate Filter Differential Pressure Sensor Circuit High Voltage	P01D0 - Cylinder 3 Injection Timing Advanced	P01D1 - Cylinder 4 Injection Timir Retarded	g P01D2 - Cylinder 4 Injection Timing Advanced	P0234 - Turbocharger Engine Overboost	P026C - Injection Quantity Too Low	·
P084C - Glow Plug Control Module Performance P0851 - 5 Volt Reference 2 Circuit P0897 - 5 Volt Reference 3 Circuit	P0108- Cyinder 1 legiclan Timing Retaried P0532 Ar Conditioning Refingment Pressure Sensor Circuit Low P1108-MC Sensor Circuit Performance Bank 1 Sensor 1 P0171 - System Too Lean Bank 1 P0299 - Tudocharget Engine Underboot	P0533 - Ar Conditioning Refrigarant Pressure Sensor Circuit High P2209 - N0k Heater Performance Bank 1 Sensor 1 P0172 - System Too Rich Bank 1 P2122 - Accelerator Pedal Position Sensor 1 Circuit Low P0172 - System Too Rich Bank 1	P2127 - Accelerator Pedal Position Sensor 2 Circuit Low P01CB - Cylinder 1 Injection Timing Retarated P2123 - Accelerator Pedal Position Sensor 1 Circuit High P01CB - Cylinder 1 Injection Timing Retarated	P2128 - Accelerator Pedal Position (APP) Sensor 2 Circuit High Voltage P01CC - Cylinder 1 Injection Timing Advanced P2138 - Accelerator Pedal Position (APP) Sensor 1-2 Correlation	P2138 - Accelerator Pedal Position (APP) Sensor 1-2 Correlation P01CD - Cylinder 2 Injection Timing Retarded	P2454 - Diesel Particulate Filter Differential Pressure Sensor Circuit Low Voltage P01CE - Cylinder 2 Injection Timing Advanced	P2455 - Diesel Particulate Filter Differential Pressure Sensor Circuit High Voltage P01CF - Cylinder 3 Injection Timing Retarded	P01D0 - Cylinder 3 Injection Timing Advanced	P01D1 - Cylinder 4 Injection Timir Retarded	g P01D2 - Cylinder 4 Injection Timing Advanced	P0234 - Turbocharger Engine Overboost	P026C - Injection Quantity Too Low	P026D - Injection Quantity Too High
P064C - Glow Plug Control Module Performance P0651 - 5 Volt Reference 2 Circuit	P010B- Cyinder 1 legiclon Timing Retaried P0322: Ar Condening Refingent Pressure Sensor Circuit Low P110B-NOX Sensor Curret Performance Bank 1 Sensor 1 P0171- System Too Lean Bank 1 P0299 - Tutocharger Engle Underboost P0171- System Too Lean Bank 1 P0297 - Tutocharger Engle	P0533 - Ar Conditioning Refrigurant Pressure Sensor Circuit High P2209 - NDr Heater Performance Bank 1 Sensor 1 P0172 - System Too Rich Bank 1 P2172 - Accelerator Pectal Postion Sensor 1 Circuit Low P0172 - System Too Rich Bank 1 P0172 - System Too Rich Bank 1	P2127 - Accelerator Padal Position Sensor 2 Circuit Low P01CB - Cylinder 1 hypotion Timing <u>Retarded</u> P2123 - Accelerator Padal Position Sensor 1 Circuit High P01CB - Cylinder 1 hypotion Timing <u>Retarded</u>	P2128 - Accelerator Pedal Position (APP) Sensor 2 Circuit High Voltage P01CC - Cylinder 1 Injection Timing Advanced P2138 - Accelerator Pedal Position (APP) Sensor 1-2 Correlation	P2138 - Accelerator Pedal Position (APP) Sensor 1-2 Correlation P01CD - Cylinder 2 Injection Timing Retarded	P2454 - Diesel Particulate Filter Differential Pressure Sensor Circuit Low Voltage P01CE - Cylinder 2 Injection Timing Advanced	P2455 - Diesel Particulate Filter Differential Pressure Sensor Circuit High Voltage P01CF - Cylinder 3 Injection Timing Retarded	P01D0 - Cylinder 3 Injection Timing Advanced	P01D1 - Cylinder 4 Injection Timir Retarded	g P01D2 - Cylinder 4 Injection Timing Advanced	P0234 - Turbocharger Engine Overboost	P026C - Injection Quantity Too Low	P026D - Injection Quantity Too High
P064C - Glow Plug Control Module Performance P0651 - 5 Volt Reference 2 Circuit P0697 - 5 Volt Reference 3 Circuit P0697 - 5 Volt Reference 3 Circuit P06951 - Park/Neutral Position (PNP) Switch Circuit Low Voltage	POICE - Cylinder 1 Hyection Timing Restanded POISS - Ar Constioning Refingenet Pressure Sensor Crust Low POISS - Ar Consterning POISS - Not Sensor Crust Low Poisson Bank 1 Sensor 1 POISS - Turbocharger Engine Underbood POISS - ParkNeural Poisson (PMP) Setter Crist High Voltage Setter Crist High Voltage	P0533 - Ar Conditioning Refrigurant Pressure Sensor Circuit High P2209 - NDr Heater Performance Bank 1 Sensor 1 P0172 - System Too Rich Bank 1 P2172 - Accelerator Pectal Postion Sensor 1 Circuit Low P0172 - System Too Rich Bank 1 P0172 - System Too Rich Bank 1	P2127 - Accelerator Padal Position Sensor 2 Circuit Low P01CB - Cylinder 1 hypotion Timing <u>Retarded</u> P2123 - Accelerator Padal Position Sensor 1 Circuit High P01CB - Cylinder 1 hypotion Timing <u>Retarded</u>	P2128 - Accelerator Pedal Position (APP) Sensor 2 Circuit High Voltage P01CC - Cylinder 1 Injection Timing Advanced P2138 - Accelerator Pedal Position (APP) Sensor 1-2 Correlation	P2138 - Accelerator Pedal Position (APP) Sensor 1-2 Correlation P01CD - Cylinder 2 Injection Timing Retarded	P2454 - Diesel Particulate Filter Differential Pressure Sensor Circuit Low Voltage P01CE - Cylinder 2 Injection Timing Advanced	P2455 - Diesel Particulate Filter Differential Pressure Sensor Circuit High Voltage P01CF - Cylinder 3 Injection Timing Retarded	P01D0 - Cylinder 3 Injection Timing Advanced	P01D1 - Cylinder 4 Injection Timir Retarded	g P01D2 - Cylinder 4 Injection Timing Advanced	P0234 - Turbocharger Engine Overboost	P026C - Injection Quantity Too Low	P026D - Injection Quantity Too High
V64C - Claw Plug Control Module Performance V651 - 5 Volt Reference 2 Circuit V607 - 5 Volt Reference 3 Circuit P0551 - Fanh Neutral Postion PMP3 Selfs - Fanh Neutral Postion PMP3 Selfs - Fanh Neutral Postion PMP3 Selfs - Circuit David Voltage V6512 - Postion Postion	POICE - Cylinder 1 Hyection Timing Re-traited POIS2 - Art Conditioning Refingent Pressure State Charal Low Point - Charal Charal Low Point - Charal Bank 1 Series 1 POINT - System Too Lean Bank 1 POINT - Park-Nautal Position (PNP) Seak Charal Low Voltage POINT - Park-Nautal Position (PNP)	1903) - Au Constitoring Refligement Pressure Servic Circle High 19209 - NOX Heater Performance Bain 1 General 1 19712 - Symm To Rich Baint 1 19712 - Constantion Pedial Foldor Service 1 Circuita Low Port 2- Constantion Pedial Foldor Pedial - Ethaust Gas Rescutation Plane Insultation	P2127 - Accelerator Padal Position Sensor 2 Circuit Low P01CB - Cylinder 1 hypotion Timing <u>Retarded</u> P2123 - Accelerator Padal Position Sensor 1 Circuit High P01CB - Cylinder 1 hypotion Timing <u>Retarded</u>	P2128 - Accelerator Pedal Position (APP) Sensor 2 Circuit High Voltage P01CC - Cylinder 1 Injection Timing Advanced P2138 - Accelerator Pedal Position (APP) Sensor 1-2 Correlation	P2138 - Accelerator Pedal Position (APP) Sensor 1-2 Correlation P01CD - Cylinder 2 Injection Timing Retarded	P2454 - Diesel Particulate Filter Differential Pressure Sensor Circuit Low Voltage P01CE - Cylinder 2 Injection Timing Advanced	P2455 - Diesel Particulate Filter Differential Pressure Sensor Circuit High Voltage P01CF - Cylinder 3 Injection Timing Retarded	P01D0 - Cylinder 3 Injection Timing Advanced	P01D1 - Cylinder 4 Injection Timir Retarded	g P01D2 - Cylinder 4 Injection Timing Advanced	P0234 - Turbocharger Engine Overboost	P026C - Injection Quantity Too Low	P026D - Injection Quantity Too High
VOLG - Gleve Plug Control Module Performance VOLG 1 - 5 Volt Reference 2 Circuit VOLG 1 - 5 Volt Reference 3 Circuit VOLG 1 - Park/Neutral Persition PODS 1 - Park/Neutral Persition PODS - Neutral Circuit - Sec 1	POICE - Cyinder 1 kyeckon Timing Restanded POISE - Art Constioning Refingenet Pressure Sensor Crussi Low POISE - Art Constioning Refingenet Poise - Constitution - Constitution Poise - Constitution - Constitution POISE - Statution - Constitution POISE - Park-Neural Poisition (PMP) Setted Cristic Refin (PMP) Setted Cri	PO33 - At Constituting Relingement Pressure Service Cleark High P2209 - NDk Heater Performance Bain 1 Sensor 1 P1272 - System Too Rich Back 1 P1272 - Accelerator Pedia Factor Sensor 1 Circuit Low P0172 - System Too Rich Back 1 P0471 - Ethanat Gas Recretabilitien Four Insultations P0481 - Chanat Loop Reductable P2486 - Chanat Loop Reductable P2486 - Chanat Loop Reductable P2486 - Chanat Loop Reductable	P2127 - Accelerator Padal Position Sensor 2 Circuit Low P01CB - Cylinder 1 hypotion Timing <u>Retarded</u> P2123 - Accelerator Padal Position Sensor 1 Circuit High P01CB - Cylinder 1 hypotion Timing <u>Retarded</u>	P2128 - Accelerator Pedal Position (APP) Sensor 2 Circuit High Voltage P01CC - Cylinder 1 Injection Timing Advanced P2138 - Accelerator Pedal Position (APP) Sensor 1-2 Correlation	P2138 - Accelerator Pedal Position (APP) Sensor 1-2 Correlation P01CD - Cylinder 2 Injection Timing Retarded	P2454 - Diesel Particulate Filter Differential Pressure Sensor Circuit Low Voltage P01CE - Cylinder 2 Injection Timing Advanced	P2455 - Diesel Particulate Filter Differential Pressure Sensor Circuit High Voltage P01CF - Cylinder 3 Injection Timing Retarded	P01D0 - Cylinder 3 Injection Timing Advanced	P01D1 - Cylinder 4 Injection Timir Retarded	g P01D2 - Cylinder 4 Injection Timing Advanced	P0234 - Turbocharger Engine Overboost	P026C - Injection Quantity Too Low	P026D - Injection Quantity Too High
P0542 - Glow Plag Central Model Performance P0551 - 5 Volt Reference 2 Cacult P0551 - 5 Volt Reference 3 Cacult P0551 - Park/Neutral Position P0551 - Park/Neutral Position P0552 - Park/Neutral Position	POICE - Cylinder 1 leytesion Timing POICE - Cylinder 1 leytesion Timing POISE - Ar Conditioning Refingement Pressure Source Cricial Low POIDE - NOX Senses Cricial Low Point - System Too Lean Bank 1 POIDE - Voltanger Engine Underboard POIDE - Leytesianger Engine POIDE - Leytesianger Engine POIDE - Point-Nanael Poission (PNP) Switch Circuit High Voltage POIDE - Leytesianger Engine POIDE - Leytesianger Engine	PO33 - AL Constituing Relingeau Pressure Service Crusk High P2209 - NOX Heater Performance Bank 1 Sensor 1 P0172 - System Too Rich Bank 1 P0172 - System Too Rich Bank 1 P0172 - System Too Rich Bank 1 P01972 - System Too Rich Bank 1 P0491 - Ethawal Gas Reirouation Planet Gas Reirouation P0491 - Classed Leop Reductant begletin Control ALLINT - Spatial P2495 - Classed Leop Reductant Bank - Spatial P2495 - Classed Leop Reductant P2495 - Classed L	P2127 - Accelerator Padal Position Sensor 2 Circuit Low P01CB - Cylinder 1 hypotion Timing <u>Retarded</u> P2123 - Accelerator Padal Position Sensor 1 Circuit High P01CB - Cylinder 1 hypotion Timing <u>Retarded</u>	P2128 - Accelerator Pedal Position (APP) Sensor 2 Circuit High Voltage P01CC - Cylinder 1 Injection Timing Advanced P2138 - Accelerator Pedal Position (APP) Sensor 1-2 Correlation	P2138 - Accelerator Pedal Position (APP) Sensor 1-2 Correlation P01CD - Cylinder 2 Injection Timing Retarded	P2454 - Diesel Particulate Filter Differential Pressure Sensor Circuit Low Voltage P01CE - Cylinder 2 Injection Timing Advanced	P2455 - Diesel Particulate Filter Differential Pressure Sensor Circuit High Voltage P01CF - Cylinder 3 Injection Timing Retarded	P01D0 - Cylinder 3 Injection Timing Advanced	P01D1 - Cylinder 4 Injection Timir Retarded	g P01D2 - Cylinder 4 Injection Timing Advanced	P0234 - Turbocharger Engine Overboost	P026C - Injection Quantity Too Low	P026D - Injection Quantity Too High
DB4C - Claw Plug Control Module Performance DB51 - 5 Volt Reference 2 Claub DB51 - 5 Volt Reference 3 Claub P0851 - 5 Volt Reference 3 Claub P0851 - Park/Neutral Postion PNP3 Set Claub - Claub P0852 - 7anh Alexa Postion PNP3 Set Claub - Postion PNP3 Set Claub - Rolation Third - Rolation Third - Rolation Set Claub - Rolation Set Cl	POICE - Cyinder 1 leyelson Timing POICE - Cyinder 1 leyelson Timing POISE - ALC Conditioning Refingement Pressure Server Christi Lew Point - Conditioner Christi Lew Point - System Too Leane Bark 1 POIST - Texhootanger Engine Underboost POIST - Parkhoused Possition (PNP) Switch Circuit High Votage POIST - Parkhoused Possition (PNP) Switch Circuit Lew Votage Position Control ALL Int Pow Too Position Control ALL Int Pow Too Position Control ALL Int Pow Too Position Control ALL Int Pow Too	PO33 - A4 Constituting Relingeau Pressure Borocical High P2209 - N0A Heater Performance Bank 1 Sensor 1 P0172 - System Too Rich Bank 1 P0172 - System Too Rich Bank 1 P0172 - Austeinator Peal Pastion Sensor 1 Circuital Low P0172 - System Too Rich Bank 1 P0401 - Educati Gas Recircuition Pow Insufficient P2456 - Closed Loop Reductant byection Control ALLink - Pow Too P2456 - Closed Loop Reductant byection Control ALLink - Pow Too P2456 - Closed Loop Reductant byection Control ALLink - Pow Too	P2127 - Accelerator Padal Position Sensor 2 Circuit Low P01CB - Cylinder 1 hypotion Timing <u>Retarded</u> P2123 - Accelerator Padal Position Sensor 1 Circuit High P01CB - Cylinder 1 hypotion Timing <u>Retarded</u>	P2128 - Accelerator Pedal Position (APP) Sensor 2 Circuit High Voltage P01CC - Cylinder 1 Injection Timing Advanced P2138 - Accelerator Pedal Position (APP) Sensor 1-2 Correlation	P2138 - Accelerator Pedal Position (APP) Sensor 1-2 Correlation P01CD - Cylinder 2 Injection Timing Retarded	P2454 - Diesel Particulate Filter Differential Pressure Sensor Circuit Low Voltage P01CE - Cylinder 2 Injection Timing Advanced	P2455 - Diesel Particulate Filter Differential Pressure Sensor Circuit High Voltage P01CF - Cylinder 3 Injection Timing Retarded	P01D0 - Cylinder 3 Injection Timing Advanced	P01D1 - Cylinder 4 Injection Timir Retarded	g P01D2 - Cylinder 4 Injection Timing Advanced	P0234 - Turbocharger Engine Overboost	P026C - Injection Quantity Too Low	P026D - Injection Quantity Too High
OS4C - Cleve Plug Control Module Performance OS51 - 5 Voli Reference 2 Circuit OS51 - 5 Voli Reference 3 Circuit POS51 - Panh/Neutral Position POS51 - Panh/Neutral Position POS51 - Panh/Neutral Position POS52 - Pan	POICE- Cylinder 1 leytesion Timing POICE- Cylinder 1 leytesion Timing POICE- Ark Conditioning Refingement Pressure Samos Charul Low POIDE 1 Point Samos Charul Low Point Samos Charul Low Point Samos Charul Low Point Samos Charul Low Point - System Too Leans Bank 1 Point - Constant Point Only Bank Point O Constant Point Only Bank Point O Consta Low Point - New Too Point O Consta Low Point Constant Ingention Consta Low Point Const Point O Consta Low Point Const Point Consta Low Point Const Point Const br>Point Const Low Point Const Point	PO33 - At Constrong Retirgener Pressure Borro Circle High Possile Borro Circle High PO372 - System Too Ruch Back 1 PO172 - System Too Ruch Back 1 PO	P2127 - Accelerator Padal Position Sensor 2 Circuit Low P01CB - Cylinder 1 hypotion Timing <u>Retarded</u> P2123 - Accelerator Padal Position Sensor 1 Circuit High P01CB - Cylinder 1 hypotion Timing <u>Retarded</u>	P2128 - Accelerator Pedal Position (APP) Sensor 2 Circuit High Voltage P01CC - Cylinder 1 Injection Timing Advanced P2138 - Accelerator Pedal Position (APP) Sensor 1-2 Correlation	P2138 - Accelerator Pedal Position (APP) Sensor 1-2 Correlation P01CD - Cylinder 2 Injection Timing Retarded	P2454 - Diesel Particulate Filter Differential Pressure Sensor Circuit Low Voltage P01CE - Cylinder 2 Injection Timing Advanced	P2455 - Diesel Particulate Filter Differential Pressure Sensor Circuit High Voltage P01CF - Cylinder 3 Injection Timing Retarded	P01D0 - Cylinder 3 Injection Timing Advanced	P01D1 - Cylinder 4 Injection Timir Retarded	g P01D2 - Cylinder 4 Injection Timing Advanced	P0234 - Turbocharger Engine Overboost	P026C - Injection Quantity Too Low	P026D - Injection Quantity Too High
OS4C - Cleve Pug Control Module Performance OS51 - 5 Volt Reference 2 Circuit OS57 - 5 Volt Reference 3 Circuit POS51 - Park Neutral Position POS51 - Park Neutral Position POS52 - Park Neutral Position Position Park Position Par	POICE - Cyinder 1 leyelson Timing POICE - Cyinder 1 leyelson Timing POISE - ALC Conditioning Refingement Pressure Server Christi Lew Point - Conditioner Christi Lew Point - System Too Leane Bark 1 POIST - Texhootanger Engine Underboost POIST - Parkhoused Possition (PNP) Switch Circuit High Votage POIST - Parkhoused Possition (PNP) Switch Circuit Lew Votage Position Control ALL Int Pow Too Position Control ALL Int Pow Too Position Control ALL Int Pow Too Position Control ALL Int Pow Too	PO33 - A4 Constituting Retrigement Pressure Barco Cice High Pessare Barco Cice High P2209 - NDk Heater Performance Man 1 Genet 1 P0172 - Symm To Reich Bark 1 P0172 - Symm To R	P2127 - Accelerator Padal Position Sensor 2 Circuit Low P01CB - Cylinder 1 hypotion Timing <u>Retarded</u> P2123 - Accelerator Padal Position Sensor 1 Circuit High P01CB - Cylinder 1 hypotion Timing <u>Retarded</u>	P2128 - Accelerator Pedal Position (APP) Sensor 2 Circuit High Voltage P01CC - Cylinder 1 Injection Timing Advanced P2138 - Accelerator Pedal Position (APP) Sensor 1-2 Correlation	P2138 - Accelerator Pedal Position (APP) Sensor 1-2 Correlation P01CD - Cylinder 2 Injection Timing Retarded	P2454 - Diesel Particulate Filter Differential Pressure Sensor Circuit Low Voltage P01CE - Cylinder 2 Injection Timing Advanced	P2455 - Diesel Particulate Filter Differential Pressure Sensor Circuit High Voltage P01CF - Cylinder 3 Injection Timing Retarded	P01D0 - Cylinder 3 Injection Timing Advanced	P01D1 - Cylinder 4 Injection Timir Retarded	g P01D2 - Cylinder 4 Injection Timing Advanced	P0234 - Turbocharger Engine Overboost	P026C - Injection Quantity Too Low	P026D - Injection Quantity Too High
064 - Glaw Plug Control Module Performance 0651 - 5 Volt Reference 2 Circuit 0667 - 5 Volt Reference 3 Circuit 0670 - 5 Volt Reference 3 Circuit 0700 - 7 Volt Reference 3 Circu	POICE - Cylinder 1 Hjection Timing Restanded POISE - Art Constitioning Refingeant Pressure Standson Charalt Dev Poisson - Dev Po	PO33 - A4 Constituting Relingment Pressure Boros Ciccult High Pessore Boros Ciccult High P2209 - NOA Heater Performance Bank 1 Sensor 1 P127 - Styntim Too Richt Bank 1 P127 - Schutter Deal Fraktion Sensor 1 Ciccult Low P0172 - Styntim Too Richt Bank 1 P0491 - Erbaust Gas Recrutation Poster Lough Reducted P0491 - Chevet Lough Reducted P0491 - Chevet Lough Reducted P1491 - Chevet Lough Reducted P149	P2127 - Accelerator Padal Position Sensor 2 Circuit Low P01CB - Cylinder 1 hypotion Timing <u>Retarded</u> P2123 - Accelerator Padal Position Sensor 1 Circuit High P01CB - Cylinder 1 hypotion Timing <u>Retarded</u>	P2128 - Accelerator Pedal Position (APP) Sensor 2 Circuit High Voltage P01CC - Cylinder 1 Injection Timing Advanced P2138 - Accelerator Pedal Position (APP) Sensor 1-2 Correlation	P2138 - Accelerator Pedal Position (APP) Sensor 1-2 Correlation P01CD - Cylinder 2 Injection Timing Retarded	P2454 - Diesel Particulate Filter Differential Pressure Sensor Circuit Low Voltage P01CE - Cylinder 2 Injection Timing Advanced	P2455 - Diesel Particulate Filter Differential Pressure Sensor Circuit High Voltage P01CF - Cylinder 3 Injection Timing Retarded	P01D0 - Cylinder 3 Injection Timing Advanced	P01D1 - Cylinder 4 Injection Timir Retarded	g P01D2 - Cylinder 4 Injection Timing Advanced	P0234 - Turbocharger Engine Overboost	P026C - Injection Quantity Too Low	P026D - Injection Quantity Too High
264 C - Glaw Plag Cartrol Medde Performance 20051 - 5 Volt Reference 2 Circuit 0057 - 5 Volt Reference 3 Circuit 0057 - 5 Volt Reference 3 Circuit 20051 - Pankheatral Position 20053 - Pankheatral Position	POICE- Cylinder 1 leytector Timing POICE- Cylinder 1 leytector Timing POICE- Art Conditioning Refingement Pressure Sensor Circuit Low POICE - Network Conditioner Circuit POICE - Point Conditionary Engine Underboard POICE - Point Nondersamer Engine Underboard POICE - Point Named Position (PMP) Switch Circuit High Voltage POICE - Point Named Position (PMP) Switch Circuit Low Voltage POICE - Conset Loge Reductant Ingention Centre J Low	PO33 - A4 Constituting Retrigement Pressure Barco Cice High Pessare Barco Cice High P2209 - NDk Heater Performance Man 1 Genet 1 P0172 - Symm To Reich Bark 1 P0172 - Symm To R	P2127 - Accelerator Padal Position Sensor 2 Circuit Low P01CB - Cylinder 1 hypotion Timing <u>Retarded</u> P2123 - Accelerator Padal Position Sensor 1 Circuit High P01CB - Cylinder 1 hypotion Timing <u>Retarded</u>	P2128 - Accelerator Pedal Position (APP) Sensor 2 Circuit High Voltage P01CC - Cylinder 1 Injection Timing Advanced P2138 - Accelerator Pedal Position (APP) Sensor 1-2 Correlation	P2138 - Accelerator Pedal Position (APP) Sensor 1-2 Correlation P01CD - Cylinder 2 Injection Timing Retarded	P2454 - Diesel Particulate Filter Differential Pressure Sensor Circuit Low Voltage P01CE - Cylinder 2 Injection Timing Advanced	P2455 - Diesel Particulate Filter Differential Pressure Sensor Circuit High Voltage P01CF - Cylinder 3 Injection Timing Retarded	P01D0 - Cylinder 3 Injection Timing Advanced	P01D1 - Cylinder 4 Injection Timir Retarded	g P01D2 - Cylinder 4 Injection Timing Advanced	P0234 - Turbocharger Engine Overboost	P026C - Injection Quantity Too Low	P026D - Injection Quantity Too High
064 - Glaw Plug Control Module Performance 0651 - 5 Volt Reference 2 Circuit 0667 - 5 Volt Reference 3 Circuit 0670 - 5 Volt Reference 3 Circuit 0700 - 1000 - 5 Volt Reference 3 Circuit 0700 - 5 Volt	POICE - Cylinder 1 Hjection Timing Restanded POISE - Art Constitioning Refingeant Pressure Standson Charalt Dev Poisson - Dev Po	PO33 - A4 Constituting Retrigement Pressure Barco Cice High Pessare Barco Cice High P2209 - NDk Heater Performance Man 1 Genet 1 P0172 - Symm To Reich Bark 1 P0172 - Symm To R	P2127 - Accelerator Padal Position Sensor 2 Circuit Low P01CB - Cylinder 1 hypotion Timing <u>Retarded</u> P2123 - Accelerator Padal Position Sensor 1 Circuit High P01CB - Cylinder 1 hypotion Timing <u>Retarded</u>	P2128 - Accelerator Pedal Position (APP) Sensor 2 Circuit High Voltage P01CC - Cylinder 1 Injection Timing Advanced P2138 - Accelerator Pedal Position (APP) Sensor 1-2 Correlation	P2138 - Accelerator Pedal Position (APP) Sensor 1-2 Correlation P01CD - Cylinder 2 Injection Timing Retarded	P2454 - Diesel Particulate Filter Differential Pressure Sensor Circuit Low Voltage P01CE - Cylinder 2 Injection Timing Advanced	P2455 - Diesel Particulate Filter Differential Pressure Sensor Circuit High Voltage P01CF - Cylinder 3 Injection Timing Retarded	P01D0 - Cylinder 3 Injection Timing Advanced	P01D1 - Cylinder 4 Injection Timir Retarded	g P01D2 - Cylinder 4 Injection Timing Advanced	P0234 - Turbocharger Engine Overboost	P026C - Injection Quantity Too Low	P026D - Injection Quantity Too High
OS4C - Gise Plag Cantol Model Performance OS51 - 5 Volt Reference 2 Circuit OS51 - 5 Volt Reference 3 Circuit OS57 - 5 Volt Reference 3 Circuit POS5 - Park/Netral Position PNO5 - Sense Circuit Law Voltage PNO5 - Sense Circuit Law Voltage PTIO3 - Not Sense Circuit Sense Circuit Law Voltage PTIO3 - Not Sense Circuit Sense Circuit Law Voltage PTIO3 - Not Sense Circuit Sense Circuit Law Voltage PTIO3 - Not Sense Circuit Sense Circuit Law Voltage PTIO3 - Not Sense Circuit Sense Circuit Law Voltage PTIO3 - Not Sense Circuit PTIO3 - Not Sense Circuit PFIO5 - Not Sense Circuit Performance Bank 1 Sense 1 PFIO5 - Not Sense Circuit Law PTIO3 - Inside Mandeld Kruner Clause Circuit Ci	POICE- Cylinder 1 leyclason Timing POICE- Cylinder 1 leyclason Timing POISE: Arc Conditioning Refingement Pressure Sensor Circuit Low PITIDE - NOX Sensor Count Con- Performance Bank 1 Sensor 11 POIT1 - System Too Lean Bank 1 POIT2 - Turbocharguer Engine Underboost POISE - Tenthumad Postson (PMP) Switch Circuit High Voltage POISE - Tenthumad Postson (PMP) Switch Circuit Low Voltage POISE - Tenthum Postson (P	19033 - Al Constituing Relingeman Pressure Service Cost High P2209 - NOA Heater Performance Bain 1 Sensor 1 P2172 - System Too Rich Bank 1 P2172 - System Too Rich Bank 1 P2172 - Accelerator Peder School Sensor 1 Circuita Loop Reducted P2172 - System Too Rich Bank 1 P2481 - Cheese Loop Reducted P2481 - Cheese Loop Reducted P2485 - Cheese Loop Reducted Hydelin Control ALLimit - Flow Too High P2485 - Cheese Loop Reducted Hydelin Control ALLimit - Flow Too High P2485 - Cheese Loop Reducted Hydelin Control ALLimit - Flow Too High	P2127-Accelerato Pede Posito Sensor 2 Circuit Low P01CB - Optical - Lipection Timing P2123 - Accelerato Pede Posito Sensor 1 Circuit High P01CB - Optical High P01CB - Optical High P04C2 - Extension Posito - Excession	P2121 Accelerator Pedi Polici (APP) Senor 2 Cincul High Voltage P01CC - Oylicatr 1 legicitan Timing P2128 Accelerator Pedi Polici (APP) Senor 1 Correlator P01CC - Oylicatr 1 legicitan Timing P01CC - Oylicatr 1 legicitan Timing P01CC - Oylicatr 1 legicitan Timing	P2138 - Accelerator Pedal Position (APP) Sensor 1-2 Correlation P01CD - Cylinder 2 Injection Timing Retarded	P2454 - Diesel Particulate Filter Differential Pressure Sensor Circuit Low Voltage P01CE - Cylinder 2 Injection Timing Advanced	P2455 - Diesel Particulate Filter Differential Pressure Sensor Circuit High Voltage P01CF - Cylinder 3 Injection Timing Retarded	P01D0 - Cylinder 3 Injection Timing Advanced	P01D1 - Cylinder 4 Injection Timir Retarded	g P01D2 - Cylinder 4 Injection Timing Advanced	P0234 - Turbocharger Engine Overboost	P026C - Injection Quantity Too Low	P026D - Injection Quantity Too High
064C - Glow Plug Control Medde Performance 0051 - 5 Volt Reference 2 Circuit 0057 - 5 Volt Reference 3 Circuit 0 Pli03 - Nos Sensor Ciferent 0 Pli04 - Nos Sensor Ciferent 0 Pli05 - Nos Sensor Ciferent 0 Pli	POICE- Cylinder 1 leyclason Timing POICE- Cylinder 1 leyclason Timing POICE- Ale Constancing Refingerent Pressure Service Crisini Law POICE- No. Sensor Crisini Law Poictan- Not Sensor Crisini Law Poictan- Underhoost POICE- Law Constanger Engine Underhoost POICE- Law Constanger Engine DOISE - Perukunaal Position (PNP) Switch Crisical High Voltage POISE- Farkhanad Position (PNP) Switch Crisical High Voltage POISE- I Perukunaal Position (PNP) Switch Crisical High Voltage POISE- Law Constant Position (PNP) Switch Crisical Law Voltage Poistor - Carlon Ale Junit - Pow Too Switch Crisical Law Constant Ingelian Control AL Link - Pow Too Poistor - Carlon Reductant Ingelian Control AL Link - Pow Too Poistor Constant Perukung Pier (PAPI) - Constant Perukung Poistor Constan	PO33 - Al Constituing Relinguant Pressure Service Cash High P2209 - NDA Heater Performance Bain 1 Sensor 1 P1212 - System Too Rohn Bank 1 P1212 - System Too Rohn Bank 1 P1212 - Accelerator Peelf Postor Sensor 1 Circuit Low P1212 - Constend Loop Reductatel P2416 - Closed Loop Reductatel P2416 - Closed Loop Reductatel Nyetion Control At Limit - Flow Too Hogh P2416 - Closed Loop Reductatel Nyetion Control At Limit - Flow Too Hogh P2416 - Closed Loop Reductatel Nyetion Control At Limit - Flow Too Hogh P2416 - Closed Loop Reductatel Nyetion Control At Limit - Flow Too Hogh P1416 - Closed Loop Reductatel Nyetion Control At Limit - Flow Too Hogh P1416 - Closed Loop Reductatel Nyetion Control At Limit - Flow Too Hogh P1416 - Closed Loop Reductatel Nyetion Control At Limit - Flow Too Hogh P1416 - Closed Loop Reductatel Nyetion Control At Limit - Flow Too Hogh P1416 - Closed Loop Reductatel Nyetion Control At Limit - Flow Too Hogh P1416 - Closed Loop Reductatel Nyetion Control At Limit - Flow Too Hogh P1416 - Closed Loop Reductatel Nyetion Control At Limit - Flow Too Hogh P1416 - Closed Loop Reductatel Nyetion Control At Limit - Flow Too Hogh Nyetion Control At Limit - Flow Too Hogh	P2127-Accelerato Pede Posito Sensor 2 Circuit Low P01CB - Optical - Lipection Timing P2123 - Accelerato Pede Posito Sensor 1 Circuit High P01CB - Optical High P01CB - Optical High P04C2 - Extension Posito - Excession	P218 - Accelerator Pedis Position (APP) Sence 2 Cincul High Voltage P210C - Option 2 Cincul High Voltage P210C - Option 1 Report Network (Accelerator Pedis Position (P210C - Constant Pedis Position (P210C - Constant Pedis Position P210C - Option 1 Report Pedis Position P210C - Option 1 Report Page Patient P210C - Option 1 Report Page Page Page P210C - Option 1 Report Page Page Page Page Page P210C - Option 1 Report Page Page Page Page Page Page Page Page	P2138 - Accelerator Pedal Position (APP) Sensor 1-2 Correlation P01CD - Cylinder 2 Injection Timing Retarded	P2454 - Diesel Particulate Filter Differential Pressure Sensor Circuit Low Voltage P01CE - Cylinder 2 Injection Timing Advanced	P2455 - Diesel Particulate Filter Differential Pressure Sensor Circuit High Voltage P01CF - Cylinder 3 Injection Timing Retarded	P01D0 - Cylinder 3 Injection Timing Advanced	P01D1 - Cylinder 4 Injection Timir Retarded	g P01D2 - Cylinder 4 Injection Timing Advanced	P0234 - Turbocharger Engine Overboost	P026C - Injection Quantity Too Low	P026D - Injection Quantity Too High
0642 - Giber Plug Control Medde Performance 0651 - 5 Volt Reference 2 Circuit 0657 - 5 Volt Reference 3 Circuit 0657 - 5 Volt Reference 3 Circuit 0657 - 5 Volt Reference 3 Circuit 07053 - Park Neutral Poston PNP) Self-Circuit Low Voltage 19053 - Park Neutral Poston PNP) Self-Circuit Low Voltage 19103 - No. Sensor Ciferen Learning at Mo. Link - Bank 1 Deformance Bank Control Figure 20 19103 - No. Sensor Ciferen 19103 - Louis Maeldel Rumer 19203 - Linka Maeld	POICE- Cylinder 1 leyclason Timing POICE- Cylinder 1 leyclason Timing POISE: Arc Conditioning Refingement Pressure Sensor Circuit Low PITIDE - NOX Sensor Count Con- Performance Bank 1 Sensor 11 POIT1 - System Too Lean Bank 1 POIT2 - Turbocharguer Engine Underboost POISE - Tenthumad Postson (PMP) Switch Circuit High Voltage POISE - Tenthumad Postson (PMP) Switch Circuit Low Voltage POISE - Tenthum Postson (P	19033 - Al Constituing Relingeman Pressure Service Cost High P2209 - NOA Heater Performance Bain 1 Sensor 1 P2172 - System Too Rich Bank 1 P2172 - System Too Rich Bank 1 P2172 - Accelerator Peder School Sensor 1 Circuita Loop Reducted P2172 - System Too Rich Bank 1 P2481 - Cheese Loop Reducted P2481 - Cheese Loop Reducted P2485 - Cheese Loop Reducted Hydelin Control ALLimit - Flow Too High P2485 - Cheese Loop Reducted Hydelin Control ALLimit - Flow Too High P2485 - Cheese Loop Reducted Hydelin Control ALLimit - Flow Too High	P2127 - Accelerator Peda Pesator Sensor 2 Circuit Low P0108 - Cyndre 1 Nextername P0108 - Conset Loop Reductive P0109 - Closed Loop Reductive Reductive P0109 - Closed Loop Reduc	P218: Accelerator Peels Peels (APP) Sensor 2 Circuit High Voltage PVICE: Cylinder Transform (Architector Peels Peels) PVICE: Cylinder Transform (PV) Sensor 2 Circuit High Voltage P218: Accelerator Peels Peels (PV) Sensor 2 Circuit High Voltage P218: Consider Deals Peels PVICE: Cylinder T Ippedon Transform PVICE: Cylinder T Ippedon Transform PVICE: Colleget Loop Restated	P2138 - Accelerator Pedal Position (APP) Sensor 1-2 Correlation P01CD - Cylinder 2 Injection Timing Retarded	P2454 - Diesel Particulate Filter Differential Pressure Sensor Circuit Low Voltage P01CE - Cylinder 2 Injection Timing Advanced	P2455 - Diesel Particulate Filter Differential Pressure Sensor Circuit High Voltage P01CF - Cylinder 3 Injection Timing Retarded	P01D0 - Cylinder 3 Injection Timing Advanced	P01D1 - Cylinder 4 Injection Timir Retarded	g P01D2 - Cylinder 4 Injection Timing Advanced	P0234 - Turbocharger Engine Overboost	P026C - Injection Quantity Too Low	P026D - Injection Quantity Too High
OBG - Gisen Plug Control Model Petermence OBG1 - 5 Volt Reference 3 Circuit OBG1 - 5 Volt Reference 3 Circuit OBG1 - 5 Volt Reference 3 Circuit POBS1 - Pant/Neutral Position PR05 - Bant/Neutral Position PR05 - Pant/Neutral Position Pr016 - No. Second Concert Pation-Neutral Position Pr016 - Neutral Resolution Pr016 - Resolution	POICE - Cylinder 1 Hyelson Timing POICE - Cylinder 1 Hyelson Timing POISE - Ark Cardisoing Refingennt Pressue States Charal Low POISE - Ark Cardisoing Refingennt Poise - Poise Poise - Character Poise - Turbocharger Eigne Underboost POIT1 - System Too Lean Bark 1 POIT1 - System Too Lean Bark 1 POISE - Perk-Nactaryer Eigner Underboost POISE - Desk Lowanger Eigner POISE - Perk-Nactaryer Eigner POISE - Desk Low High Volkger POISE - Desk Low Ander POISE - Desk Low High Volkger POISE - Desk Denketzer Ingen Desk Low High Volkger POISE - Desk Denketzer Ingen Desk Desk Low High Volkger POISE - Desk Denketzer (DPT) Low Ellisters POISE - Desk Denketzer POISE - Desk Denketzer	PO33 - Al Constituing Relingeman Pressure Service Carl High Pessore Service Carl High P2209 - NOX Heater Performance Bain 1 Sensor 1 P172 - System Too Roth Back 1 P172 - System Too Roth Back 1 P172 - Carlestore Peel Pessore P172 - System Too Roth Back 1 P041 - Exhaut Gas Recretation Power I - Exhaut Gas Recretation Power I - Exhaut Gas Recretation P040 - Const Al Large Restanted Hydron Control Restante	P2127 Accelerator Peda Pesidon Sensor 2 Cinal Low P0108 - Cybert 1 Noted Things P0108 - Accelerator Peda Pesidon Sensor 1 Carut High P0108 - Cyberder 1 Noted Things P0108 - Cyberder 1 Noted Things P0108 - Cyberder 1 Noted Things P0108 - Conset Loop Reductient Note Execution P0108 - Conset Loop Reductient Ingestion Control AL Limit - Phor 05 P0101 - Execution P0101 - Execution Reductions	P218: Accelerator Pedis Position (JPP) Sence 2 Circuit High Voltage POIC: Options 2 Circuit High Voltage POID: Options 2 Circu	P2136 Academic Pedi Posten (APP) Sensor 1-2 Carliston P01CD - Cylinder 2 Nectoria Betadled P01CD - Cylinder 2 Nectoria P01CD - Cylinder 2 Nectoria Retarded	P2454 - Diesel Particulate Filter Differential Pressure Sensor Circuit Low Voltage P01CE - Cylinder 2 Injection Timing Advanced	P2455 - Diesel Particulate Filter Differential Pressure Sensor Circuit High Voltage P01CF - Cylinder 3 Injection Timing Retarded	P01D0 - Cylinder 3 Injection Timing Advanced	P01D1 - Cylinder 4 Injection Timir Retarded	g P01D2 - Cylinder 4 Injection Timing Advanced	P0234 - Turbocharger Engine Overboost	P026C - Injection Quantity Too Low	P026D - Injection Quantity Too High
OBG1 - Glow Plug Centel Media Performance Performa	POICE- Cysider 1 Hyelson Timing POICE- Cysider 1 Hyelson Timing POICE- Ark Conditioning Refingent Pressure States Charal Low POICE- Ark Conditioning Refingent Poictom condition Bank 1 Sensor 1 POITI - System Too Lam Bank 1 POITI - System System Too Lam Bank 1 POITI - System Too Lam Bank 1 POITI - System Too Lam Bank 1 POITI - System System Too Lam Bank 1 POITI - System Too Lam Bank 1 POITI - System Sys	PO33 - At Constrong Refigures Pressure Borox Circle High Pezode Nox Nox Heater Performance Bain 1 General PO172 - Symm To Reich Bealt PO172 - Symm To Reich PO172	P2127 - Accelerator Peda Position Sensor 2 Cinal Low P010B - Operat 1 Injurio Sensor 1 Cinal High P010B - Accelerator Peda Position Sensor 1 Cinal High P010B - Accelerator Peda Position Restancial High P010B - Conset Loop Reduction Public Accelerator Page 1 Position Public Accelerator Public Accelerator Public Accel	P218 - Accelerator Pedis Position (PP) Sensor 2 Circuit High Voltage P1012 - Cylinder 1 High Voltage P1012 - Cylinder 1 High Voltage P1013 - Accelerator Pedis Position Territory P218 - Consider Dedis Pedis P218 - Consider Dedis P218 - Consid	P219 Acatemati Pedi Poste (APP) Sensor 1-2 Centelation P01CD - Cyliciter J Algoston Treing Detected P01CD - Cyliciter J Algoston Treing P01CD - Cyliciter J Algoston Treing P01CD - Cyliciter J Algoston Treing Research	P2454 - Diesel Particulate Filter Differential Pressure Sensor Circuit Low Voltage P01CE - Cylinder 2 Injection Timing Advanced	P2455 - Diesel Particulate Filter Differential Pressure Sensor Circuit High Voltage P01CF - Cylinder 3 Injection Timing Retarded	P01D0 - Cylinder 3 Injection Timing Advanced	P01D1 - Cylinder 4 Injection Timir Retarded	g P01D2 - Cylinder 4 Injection Timing Advanced	P0234 - Turbocharger Engine Overboost	P026C - Injection Quantity Too Low	P026D - Injection Quantity Too High
OGAC - Giew Pug Control Module Peteromica Peteromica OGAC - Strukt Reference 3 Circuit POSS - 5 Volt Reference 3 Circuit POSS - 5 Volt Reference 3 Circuit POSS - Part/Neutral Position PMS - Data - Neutral Position PMS - Strukt - Strukt - Strukt PMS - Strukt - Strukt - Strukt PMS - Strukt - Strukt - Strukt PMS - Strukt - Struk	POICE - Cysider 1 Hyelson Timing POICE - Cysider 1 Hyelson Timing POISE - Art Conditioning Refingent Pressure States Charal Low POISE - Art Conditioning Refingent Poise - Conditioning Refingent Poise - Conditioning Refine POISE - TexhNead Poisson POISE - TexhNead Poisson POISE - TexhNead Poisson (PMP) Switch Circuit High Volkage POISE - Descharter Poisson Circuit Conditions POISE - Descharter Poisson Circuit Conditions POISE - Descharter Poisson Circuit Conditions POISE - Descharter POISE - DOISE - Descharter POISE - DOISE - DEScharter POISE - DOISE - DE	PO33 - Al Constituing Refiguress Pressure Barco Cice High Pessore Barco Cice High P2209 - NOX Heater Performance Bain 1 General P2102 - Symme To Rein Barch P1172 - NOL Symme To Rein	P2127 Accelerator Peda Pesidon Sensor 2 Cinal Low P0108 - Cybert 1 Noted Things P0108 - Accelerator Peda Pesidon Sensor 1 Carut High P0108 - Cyberder 1 Noted Things P0108 - Cyberder 1 Noted Things P0108 - Cyberder 1 Noted Things P0108 - Conset Loop Reductient Note Execution P0108 - Conset Loop Reductient Ingestion Control AL Limit - Phor 05 P0101 - Execution P0101 - Execution Reductions	P218 - Accelerator Pedis Position (PP) Sensor 2 Circuit High Voltage P1012 - Cylinder 1 High Voltage P1012 - Cylinder 1 High Voltage P1013 - Accelerator Pedis Position Territory P218 - Consider Dedis Pedis P218 - Consider Dedis P218 - Consid	P2136 Academic Pedi Posten (APP) Sensor 1-2 Carliston P01CD - Cylinder 2 Nectoria Betadled P01CD - Cylinder 2 Nectoria P01CD - Cylinder 2 Nectoria Retarded	P2454 - Diesel Particulate Filter Differential Pressure Sensor Circuit Low Voltage P01CE - Cylinder 2 Injection Timing Advanced	P2455 - Diesel Particulate Filter Differential Pressure Sensor Circuit High Voltage P01CF - Cylinder 3 Injection Timing Retarded	P01D0 - Cylinder 3 Injection Timing Advanced	P01D1 - Cylinder 4 Injection Timir Retarded	g P01D2 - Cylinder 4 Injection Timing Advanced	P0234 - Turbocharger Engine Overboost	P026C - Injection Quantity Too Low	P026D - Injection Quantity Too High
OBG1 - Glow Plug Centel Media Performance Performa	POICE - Cysinder 1 legislosin Timing POICE - Cysinder 1 legislosin Timing POISE - Are Conditioning Relingerint Pressure Source Cricial Loss POISE - Are Conditioning Relingerint Poist - Poistone Bank 1 Sensor 1 POISE - Poiston Bank 1 Sensor 1 POISE - Poistonarguer Engine Underboard POISE - Poistonarguer Engine DOISE - Poistonarguer Engine DOISE - Poistonarguer Engine DOISE - Poistonarguer Engine POISE - Poistonarger Engine POISE - Doise Long Reductant legention Centre AL Link - Flowr Too Low POISE - Doise Poistonarger Engine POISE - Doise Poistonarger POISE - Poistonarger POISE - Doise Poistonarger P	PO33 - Al Constituing Relingeman Pressure Service Carl High Pessore Service Carl High P2209 - NOX Heater Performance Bain 1 Sensor 1 P172 - System Too Roth Back 1 P172 - System Too Roth Back 1 P172 - Carlestore Peel Pessore P172 - System Too Roth Back 1 P041 - Exhaut Gas Recretation Power I - Exhaut Gas Recretation Power I - Exhaut Gas Recretation P040 - Const Al Large Restanted Hydron Control Restante	P2127 Accelerator Peda Pesidon Sensor 2 Cinal Low P0108 - Cybert 1 Noted Things P0108 - Accelerator Peda Pesidon Sensor 1 Carut High P0108 - Cyberder 1 Noted Things P0108 - Cyberder 1 Noted Things P0108 - Cyberder 1 Noted Things P0108 - Conset Loop Reductient Note Execution P0108 - Conset Loop Reductient Ingestion Control AL Limit - Phor 05 P0101 - Execution P0101 - Execution Reductions	P218: Accelerator Peels Peels (PP) Sensor 2 Cincul High Voltage P01CC - Optical 1 legicities P01CC - Optical 1 legicities P11C - Accelerator Peel Peelson (PP) Sensor 2 Cincul High Voltage P11C - Optical 1 legicities P01C - Optical 1 legicities P010 - Doptical 1 legicities	P210 Acatemate Pede Packin (APP) Searce 1-2 Contestion P01CD - Cylicite 2 Algoriton Treing Detected P01CD - Cylicite 2 Algoriton Treing P01CD - Cylicite 2 Algoritation Treing P01CD - Cylicite 2 Algoriton Treing	P364. Diesel Parkolate Film Differential Pressue Sono Circuit Low Vottage P01CE - Cylinder 2 Injection Tening Advanced P01CE - Cylinder 2 Injection Tening Advanced	P365-Desa Paricolate File Differential Pressue Sensor Crust High Voltage P01CF- Cyloder 3 layection Tening Retarbit P01CF- Cyloder 3 layection Tening Retarbit P01CF- Cyloder 3 layection Tening Retarbit	PotDo - Off-der 3 hijection Timing Advanced PotDo - Oplinder 3 hijection Timing Advanced	P01D1 - Cylinder & Injection Timi Retarded P01D1 - Cylinder & Hyscian Timi Retarded	P0102 - Clinde 4 lepcton Timing Advanced P0102 - Clinder 4 lepcton Timing P0102 - Clinder 4 lepcton Timing	P0234 - Turtscharger Engre Overhoos P0234 - Turtscharger Engre Overhoos	P226C - Injection Quantity Too Low P228C - Injection Quantity Too Low	P028D - Hylection Quantity Too High P028D - Hylection Quantity Too High
Control Model Performance Perform	POICE - Cylinder 1 Hjecken Timing POICE - Cylinder 1 Hjecken Timing POICE - Ark Conditioning Refitigiant Pressure Samo Charult Con- POIDE - Not Samor Charuft - Poittin - Samor Charuft - Poittin - Samor Charuft - POIDE - Thoreas Bark 1 Samor 1 POIDE - Thoreas Bark 1 POIDE - Thoreas Charuft - POIDE - Thoreas Charuft - POIDE - Thoreas Charuft - POIDE - Thoreas Charuft - POIDE - Charuft High Voltage PP Poide - Consol Loop Reductant Ingelatio - Consol Loop Reductant Ingelatio - Consol Loop Reductant Poide - Consol Loop Reductant Poide - Consol Loop Reductant Poide - Consol Loop Reductant Ingelatio - Consol Loop Reductant Poide - No. Samor Terremance- Signi High Bank 1 Samor 1 Poide - Consol Periodales Filer (DP) Loor Efficiency Poide - Cons	PO33 - Al Constituing Relingeau Pressure Barco Close High Pessare Barco Close High P2203 - Nox Heater Performance Barco Tolong All Constitution P3172 - Symm To Roch Bark 1 P3172 - Symm To Roch Bark 1 P3172 - Symm To Roch Bark 1 P3172 - Symm To Roch Bark 1 P3171 - Ensare Closed Loop Relocated Hydron Control All Inter - Flow Too P3182 - Closed Loop Relocated Hydron Control All Inter - Flow Too P3182 - Closed Loop Relocated Hydron Control All Inter - Flow Too P3182 - Closed Loop Relocated Hydron Control All Inter - Flow Too P3182 - Closed Loop Relocated Hydron Control All Inter - Flow Too Hydron Control All Inter - Flow Too Hydron Control All Inter - Flow Too P3182 - Closed Loop Relocated Hydron Control All Inter - Flow Too Hydron Control All Inter - Fl	P2127 Accelerator Peda Pesidon Sensor 2 Cinal Low P0108 - Cybert 1 Noted Things P0108 - Accelerator Peda Pesidon Sensor 1 Carut High P0108 - Cyberder 1 Noted Things P0108 - Cyberder 1 Noted Things P0108 - Cyberder 1 Noted Things P0108 - Conset Loop Reductient Note Execution P0108 - Conset Loop Reductient Ingestion Control AL Limit - Phor 05 P0101 - Execution P0101 - Execution Reductions	P218 - Accelerator Pedis Position (PP) Sensor 2 Circuit High Voltage P1012 - Cylinder 1 High Voltage P1012 - Cylinder 1 High Voltage P1013 - Accelerator Pedis Position Territory P218 - Consider Dedis Pedis P218 - Consider Dedis P218 - Consid	P2136 Academic Pedi Posten (APP) Sensor 1-2 Carliston P01CD - Cylinder 2 Nectoria Betadled P01CD - Cylinder 2 Nectoria P01CD - Cylinder 2 Nectoria Retarded	P2454 - Diesel Particulate Filter Differential Pressure Sensor Circuit Low Voltage P01CE - Cylinder 2 Injection Timing Advanced	P2455 - Diesel Particulate Filter Differential Pressure Sensor Circuit High Voltage P01CF - Cylinder 3 Injection Timing Retarded	P01D0 - Cylinder 3 Injection Timing Advanced	P01D1 - Cylinder 4 Injection Timir Retarded	g P01D2 - Cylinder 4 Injection Timing Advanced	P0234 - Turbocharger Engine Overboost	P226C - Injection Quantity Too Low P228C - Injection Quantity Too Low	P026D - Injection Quantity Too High

P2010 - Intake Manifold Runner Control Circuit High Bank 1	P0133 - O2 Sensor Circuit Slow Response Bank 1 Sensor 1	P0171 - System Too Lean Bank 1	P0172 - System Too Rich Bank 1	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	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	P2459 - Diesel Particulate Filter Regeneration Frequency	P2A00 - O2 Sensor Circuit Range/Performance Bank 1 Sensor 1
P2032 - Exhaust Gas Temperature (EGT) Sensor 2 Circuit Low Votage	P0420 - NMHC Catalyst Efficiency Below Threshold Bank 1	P2002 - Diesel Particulate Filter (DPF) Low Efficiency	P20E2 - Exhaust Gas Temperature (EGT) Sensors 1-2 not plausible	P2428 - Exhaust Gas High Temperature										
P2033 - Exhaust Gas Temperature (EGT) Sensor 2 Circuit High Voltage	P0420 - NMHC Catalyst Efficiency Below Threshold Bank 1	P2002 - Diesel Particulate Filter (DPF) Low Efficiency	P20E2 - Exhaust Gas Temperature (EGT) Sensors 1-2 not plausible	P2428 - Exhaust Gas High Temperature										
P2048 - Reductant Injector Control Circuit Low Voltage P2049 - Reductant Injector Control	P1048 - Reductant Injector High Control Circuit Low Voltage P1049 - Reductant Injector High				-									
Circuit High Voltage P204B - Reductant Pump Pressure Sensor Performance	Control Circuit High Voltage P204F - Reductant System Performance Bank 1 (cannot build	P20E8 - Reductant Pressure Too	1											
P204C - Reductant Pump	pump pressure) P204B - Reductant Pump Pressure	P20A1 - Reductant Purge Valve Performance	-											
Pressure Sensor Circuit Low P204D - Reductant Pump Pressure Sensor Circuit High	Sensor Performance 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	1										
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)	Performance P20A1 - Reductant Purge Valve	Low											
P20A2 - Reductant Purge Valve Control Circuit Low Voltage	P204F - Reductant System Performance Bank 1 (cannot build pump pressure) P204F - Reductant System	Performance P20A1 - Reductant Purge Valve	P20E8 - Reductant Pressure Too Low P20E8 - Reductant Pressure Too											
P20A3 - Reductant Purge Valve Control Circuit High Voltage P20B9 - Reductant Heater 1	Performance Bank 1 (cannot build pump pressure)	Performance	Low	J										
P20B9 - Reductant Heater 1 Control Circuit P20BB - Reductant Heater 1 Control Circuit Low	P214F - Reductant Heater 1 Current Too High P214F - Reductant Heater 1 Current Too High	P21DD - Reductant Heater 1 Current Too Low P21DD - Reductant Heater 1 Current Too Low	-											
Control Circuit Low P20BC - Reductant Heater 1 Control Circuit High P20C0 - Reductant Heater 2	P214F - Reductant Heater 1 Current Too High	P21DD - Reductant Heater 1 Current Too Low												
P20C0 - Reductant Heater 2 Control Circuit High P20E2 - Exhaust Gas Temperature (EGT) Sensors 1-2	P214F - Reductant Heater 1 Current	P21DD - Reductant Heater 1 Current Too Low P2002 - Diesel Particulate Filter	-											
not plausible	P0420 - NMHC Catalyst Efficiency Below Threshold Bank 1 P0128 - Encine Coolant Temperature	(DPF) Low Efficiency P2138 - Accelerator Pedal Position	4											
P2122 - Accelerator Pedal Position Sensor 1 Circuit Low	P0128 - Engine Coolant Temperature Below Thermostat Regulating Temperature D0128 - Engine Coolant Temperature	P2138 - Accelerator Pedal Position (APP) Sensor 1-2 Correlation P2138 - Accelerator Pedal Position	4											
P2123 - Accelerator Pedal Position Sensor 1 Circuit High	Below Thermostat Regulating Temperature	P2138 - Accelerator Pedal Position (APP) Sensor 1-2 Correlation P2138 - Accelerator Pedal Position												
P2127 - Accelerator Pedal Position Sensor 2 Circuit Low	P0128 - Engine Coolant Temperature Below Thermostat Regulating Temperature	(APP) Sensor 1-2 Correlation												
P2128 - Accelerator Pedal Position (APP) Sensor 2 Circuit High Voltage	P0128 - Engine Coolant Temperature Below Thermostat Regulating Temperature	P2138 - Accelerator Pedal Position (APP) Sensor 1-2 Correlation												
P2138 - Accelerator Pedal Position (APP) Sensor 1-2 Correlation	Temperature P0128 - Engine Coolant Temperature Below Thermostat Regulating Temperature		_											
P2146 - Injector Positive Voltage Control Circuit Group 1 P2149 - Injector Positive Voltage	P01CB - Cylinder 1 Injection Timing Retarded P01CB - Cylinder 1 Injection Timing	P01CC - Cylinder 1 Injection Timing Advanced P01CC - Cylinder 1 Injection Timing	P01CD - Cylinder 2 Injection Timing Retarded P01CD - Cylinder 2 Injection Timing	P01CE - Cylinder 2 Injection Timing Advanced P01CE - Cylinder 2 Injection Timing	P01CF - Cylinder 3 Injection Timing Retarded P01CF - Cylinder 3 Injection Timing	P01D0 - Cylinder 3 Injection Timing Advanced P01D0 - Cylinder 3 Injection Timing	P01D1 - Cylinder 4 Injection Timing Retarded P01D1 - Cylinder 4 Injection Timing	P01D2 - Cylinder 4 Injection Timing Advanced P01D2 - Cylinder 4 Injection Timing	P2146 - Injector Positive Voltage	1				
Control Circuit Group 2 P2199 - Intake Air Temperature	Retarded P0128 - Engine Coolant Temperature Below Thermostat Regulating	Advanced P0420 - NMHC Catalyst Efficiency Below Threshold Bank 1	Retarded	Advanced	Retarded	Advanced	Retarded	Advanced	Control Circuit Group 1]				
Sensor 1/2 Correlation P2200 - N0x Sensor Circuit Bank	P11DB - NOx Sensor Current Performance Bank 1 Sensor 1	P2209 - N0x Heater Performance Bank 1 Sensor 1	-											
1 Sensor 1 P2202 - N0x Sensor Circuit Low Bank 1 Sensor 1	P249D - Closed Loop Reductant Injection Control At Limit - Flow Too	P249E - Closed Loop Reductant Injection Control At Limit - Flow Top	-											
P2203 - N0x Sensor Circuit High 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												
P2205 - N0x Heater Control Circuit Bank 1 Sensor 1	P11DB - NOx Sensor Current Performance Bank 1 Sensor 1	High P2209 - N0x Heater Performance Bank 1 Sensor 1												
P2209 - N0x Heater Performance Bank 1 Sensor 1	P249D - Closed Loop Reductant Injection Control At Limit - Flow Too Low	P249E - Closed Loop Reductant Injection Control At Limit - Flow Too High												
P220A - N0x Sensor Supply Voltage Out Of Range Bank 1 Sensor 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 - Signal High During Moderate Load Sensor 1	P11A9 - O2 Sensor Performance - 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	P2459 - Diesel Particulate Filter Regeneration Frequency	P2A00 - O2 Sensor Circuit Range/Performance Bank 1 Sensor 1	I	
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 - Signal High During Moderate Load Sensor 1	Bank 1 Sensor 1 P11A9 - O2 Sensor Performance - 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	P2459 - Diesel Particulate Filter Regeneration Frequency	P2A00 - O2 Sensor Circuit Range/Performance Bank 1 Sensor 1	1	
P2237 - O2 Sensor Positive Current Control Circuit/Open Bank	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	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 1	1					•	
1 Sensor 1 P2243 - O2 Sensor Reference Voltage Circuit/Open Bank 1	P0131 - HO2S Bank 1 Sensor 1 circuit low	P0132 - HO2S Bank 1 Sensor 1 circuit high	Bank 1 Sensor 1 P0133 - O2 Sensor Circuit Slow Response Bank 1 Sensor 1	P11A6 - HO2S Performance - Signal High During Moderate Load Sensor 1	1 P11A9 - O2 Sensor Performance - Signal Low During Moderate Load Bank 1 Sensor 1	1 P2237 - O2 Sensor Positive Current Control Circuit/Open Bank 1 Sensor	P2251 - O2 Sensor Negative Current Control Circuit/Open Bank 1 Sensor	t P2A00 - O2 Sensor Circuit Range/Performance Bank 1 Sensor 1	I					
Sensor 1 P2251 - O2 Sensor Negative Current Control Circuit/Open Bank	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 - Signal High During Moderate Load Sensor 1	P11A9 - O2 Sensor Performance - Signal Low During Moderate Load	1 P2237 - O2 Sensor Positive Current Control Circuit/Open Bank 1 Sensor	1 P2243 - O2 Sensor Reference Voltage Circuit/Open Bank 1 Sensor	P2A00 - O2 Sensor Circuit Range/Performance Bank 1 Sensor 1	t					
1 Sensor 1 P2263 - Turbo Boost System Performance	P0234 - Turbocharger Engine Overboost	P0299 - Turbocharger Engine Underboost	P2459 - Diesel Particulate Filter Regeneration Frequency		Bank 1 Sensor 1	1	1	L	1					
P2295 - Fuel Pressure Regulator 2 Control Circuit Low Voltace	P01CB - Cylinder 1 Injection Timing Retarded P20A1 - Reductant Purge Valve	P01CC - Cylinder 1 Injection Timing Advanced P249D - Closed Loop Reductant Injection Control At Limit - Flow Too	P01CD - Cylinder 2 Injection Timing Retarded P249E - Closed Loop Reductant	P01CE - Cylinder 2 Injection Timing Advanced	P01CF - Cylinder 3 Injection Timing Retarded	P01D0 - Cylinder 3 Injection Timing Advanced	P01D1 - Cylinder 4 Injection Timing Retarded	P01D2 - Cylinder 4 Injection Timing Advanced	l					
P229F - NOx Sensor Performance Bank 1 Sensor 2	Performance	Injection Control At Limit - Flow Too Low P249E - Closed Loop Reductant Injection Control At Limit - Flow Too	P249E - Closed Loop Reductant Injection Control At Limit - Flow Too High	J										
P22A7 - NOx Heater Performance Bank 1 Sensor 2	P249D - Closed Loop Reductant Injection Control At Limit - Flow Too Low P2428 - Exhaust Gas High	P249E - Closed Loop Reductant Injection Control At Limit - Flow Too High P24B4 - Particulate Matter Sensor	4											
P242C - Exhaust Gas Temperature (EGT) Sensor 3 Circuit Low Voltage	Temperature	Heater Control Circuit Range/Performance												
P242D - Exhaust Gas Temperature (EGT) Sensor 3 Circuit High Voltage	P2428 - Exhaust Gas High Temperature	P24B4 - Particulate Matter Sensor Heater Control Circuit Range/Performance												
P2454 - Diesel Particulate Filter Differential Pressure Sensor	P2455 - Diesel Particulate Filter Differential Pressure Sensor Circuit High Voltage	P2459 - Diesel Particulate Filter Regeneration Frequency												
Circuit Low Voltage P2455 - Diesel Particulate Filter Differential Pressure Sensor Circuit High Voltage	P2454 - Diesel Particulate Filter Differential Pressure Sensor Circuit	P2459 - Diesel Particulate Filter Regeneration Frequency												
P2459 - Diesel Particulate Filter Regeneration Frequency P245C - Exhaust Gas	Low Voltage P2002 - Diesel Particulate Filter (DPF) Low Efficiency 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	P0402 - Exhaust Gas Recirculation	P2002 - Diesel Particulate Filter	1						
Recirculation (EGR) Cooler Bypass Valve Control Circuit 1	PUTT - System Too Lean Bank 1	PUTZ - System Too Kich Bank 1	Pozec - Injection Quantity Too Low	- uzeu - injection Quantity Too High	P0401 - Exhaust Gas Recirculation Flow Insufficient	P0402 - Exhaust Gas Recirculation Flow Excessive	P2002 - Diesel Particulate Filter (DPF) Low Efficiency							
Low Voltage		1	1	1	1	1	1	1						

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 (DPF) Low Efficiency					
P24AF - Particulate Matter Sensor Circuit Range/Performance	P2002 - Diesel Particulate Filter (DPF) Low Efficiency		-				
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	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	P2243 - O2 Sensor Reference Voltage Circuit/Open Bank 1 Sensor 1	P2251 - O2 Sensor Negative Current Control Circuit/Open Bank 1 Sensor 1	
U0073 - CAN A BUS OFF	P0851 - Park/Neutral Position (PNP) Switch Circuit Low Voltage	P0852 - Park/Neutral Position (PNP) Switch Circuit High Voltage					
U0101 - Lost Communications With Transmission Control System	P0851 - Park/Neutral Position (PNP) Switch Circuit Low Voltage	P0852 - Park/Neutral Position (PNP) Switch Circuit High Voltage]				

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 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)			
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)	engine is not in standby state (standby state occurs after ECM initialization or following after-run)	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)	engine is not in standby state (standby state occurs after ECM initialization or following after-run)	battery voltage is above 11 V for at least 3s	engine is running which means the engine speed is greater than 600 to 850 rpm			
P0047 - Turbocharger Boost Control Circuit Low Voltage	engine not in afterrun mode (defined as engine speed greater than 0 rpm)	engine is not 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			
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 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)
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)	engine is not in standby state (standby state occurs after ECM initialization or following after-run)	battery voltage is above 11 V for at least 3s	engine is running which means the engine speed is greater than 600 to 850 rpm			
P0091 - Fuel Pressure Regulator 1 Control Circuit Low	engine not in afterrun mode (defined as engine speed greater than 0 rpm)	engine is not in standby state (standby state occurs after ECM initialization or following after-run)	battery voltage is above 11 V for at least 3s	engine is running which means the engine speed is greater than 600 to 850 rpm			
P0092 - Fuel Pressure Regulator 1 Control Circuit High	engine not in afterrun mode (defined as engine speed greater than 0 rpm)	engine is not in standby state (standby state occurs after ECM initialization or following after-run)	battery voltage is above 11 V for at least 3s	engine is running which means the engine speed is greater than 600 to 850 rpm			
P0097 - Intake Air Temperature Sensor 2 Circuit Low	engine not in afterrun mode (defined as engine speed greater than 0 rpm)	Engine 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)
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			

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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 Low	engine is not in standby state (standby state occurs after ECM initialization or following after-run)						
P0118 - Engine Coolant Temperature Sensor Circuit High	engine is not in standby state (standby state occurs after ECM initialization or following after-run)						
P011B - Engine Coolant Temperature/Intake Air Temperature 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			
P0128 - Engine Coolant Temperature Below Thermostat Regulating 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)		
P0131 - HO2S 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 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)					
P0133 - O2 Sensor Circuit Slow Response 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)
P0171 - System Too Lean Bank 1	System is not in active regeneration mode						

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P0172 - System Too Rich Bank 1	System is not in active regeneration mode							_	
P0182 - Fuel Temperature Sensor 1 Circuit Low	engine not in afterrun mode (defined as engine speed greater than 0 rpm)	Engine 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)		
P0183 - Fuel 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)		
P0191 - Fuel Rail Pressure Sensor 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							
P0192 - Fuel Rail Pressure Sensor Circuit Low	engine is not in standby state (standby state occurs after ECM initialization or following after-run)	battery voltage is above 11 V for at least 3s							
P0193 - Fuel Rail Pressure Sensor Circuit High	engine is not in standby state (standby state occurs after ECM initialization or following after-run)	battery voltage is above 11 V for at least 3s		_					
P01CB - Cylinder 1 Injection Timing Retarded	ambient air temperature is above -7 deg C	ambient pressure is above 74.8kPa	engine is not in ready state (which is active when the ignition is on or following a stall of the engine)						
P01CC - Cylinder 1 Injection Timing Advanced	ambient air temperature is above -7 deg C	ambient pressure is above 74.8kPa	engine is not in ready state (which is active when the ignition is on or following a stall of the engine)						
P01CD - Cylinder 2 Injection Timing Retarded	ambient air temperature is above -7 deg C	ambient pressure is above 74.8kPa	engine is not in ready state (which is active when the ignition is on or following a stall of the engine)						
P01CE - Cylinder 2 Injection Timing Advanced	ambient air temperature is above -7 deg C	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 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)				
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 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)

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)			
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							
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 Indicator 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 Recirculation Flow Insufficient	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)
P0402 - Exhaust Gas Recirculation Flow Excessive	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)
P0405 - Exhaust Gas Recirculation 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)			

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March March Market Part March Market March Market Mark Mark <t th=""> Mark Mark<t th=""> Mark Mark Mark</t></t></t></t></t></t></t></t></t></t></t></t></t></t></t></t></t></t></t></t></t></t></t></t></t></t>	Recirculation Position Sensor		as engine speed greater than 90	(standby state occurs after ECM	battery voltage is above 11 V for at least 3s	mode (defined as engine speed greater than 90 rpm) to indicate the	engine speed is greater than 600 to	active when the ignition is on or			
Number of State State	Recirculation (EGR) Temperature Sensor 2 Circuit		as engine speed greater than 90	(standby state occurs after ECM		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 speed is greater than 600 to	active when the ignition is on or			
Markade Production	Recirculation (EGR) Temperature Sensor 2 Circuit	engine not in afterrun mode (defined as engine speed greater than 0 rpm)	as engine speed greater than 90	(standby state occurs after ECM	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 speed is greater than 600 to	active when the ignition is on or			
Mathematical Structure St	Recirculation (EGR) Temperature Sensor 1-2		as engine speed greater than 90	(standby state occurs after ECM	engine speed is greater than 600 to	active when the ignition is on or					
Machine Subscription Subscrin Subscription Subscrip	Recirculation (EGR) Temperature Sensor 1 Circuit		as engine speed greater than 90	(standby state occurs after ECM	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 speed is greater than 600 to	active when the ignition is on or			
Mail:	Recirculation (EGR) Temperature Sensor 1 Circuit		as engine speed greater than 90	(standby state occurs after ECM		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 speed is greater than 600 to	active when the ignition is on or			
Main Hamiltonian Private State S	Efficiency Below Threshold		as engine speed greater than 90	(standby state occurs after ECM	(value of 0 means ECM is locked and	ambient air temperature is above -7 deg C	ambient pressure is above 74.8kPa	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 speed is greater than 600 to	active when the ignition is on or
Pit Schule genus designation formation compared and schule designation compared and schule			as engine speed greater than 90	(standby state occurs after ECM		seconds (Engine not in cranking mode (defined as engine speed greater than 90 rpm) to indicate the	engine speed is greater than 600 to	active when the ignition is on or			
Years Standard St			as engine speed greater than 90	(standby state occurs after ECM		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 speed is greater than 600 to	active when the ignition is on or			
Bender Giel Websch Bender We			as engine speed greater than 90	(standby state occurs after ECM	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 speed is greater than 600 to	active when the ignition is on or			
Biomedia (BR) Max Biomedia (Bar) Max Biomedia (Recirculation (EGR) Motor	(standby state occurs after ECM									
P350 - Ids Spectal engine at national service signation engine at national service signation engine at national service signation P350 - Ids Spectal engine signation engine signation index of signation engine sig	Recirculation (EGR) Motor	(standby state occurs after ECM									
P3907 - 168 Speer Hay subscription for management that is subscription and management that subscription subscriphy subscription and management that subscrip	P0506 - Idle Speed Low	seconds (Engine not in cranking mode (defined as engine speed greater than 90 rpm) to indicate the	active when the ignition is on or								
P0545 - 5thaust Gam engine not in afterum mode (defined an ongine speed greater han ongine pend greater	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	active when the ignition is on or								
Temperature (ECT) Sense 1 engine not in afterum mode (defined as engine speed greater than 0 rpm) est engine speed greater than 0 rpm) is engine is not in attachy state cours after ECM initialization or following after-rum is engine speed greater than 0 rpm) is engine is not in stathy state (standy state cours after ECM) engine is not in stathy state engine speed greater than 0 rpm) is engine speed greater than 0 rpm) is engine speed greater than 0 rpm) engine is not in stathy state (standy state cours after ECM) engine is not in attrum mode (stafferd as engine speed greater than 0 rpm) engine is not in stathy state (standy state cours after ECM) engine is not in active regeneration intialization or following after-rum engine speed greater than 0 rpm) engine is not in active regeneration records after CM engine is not in active regeneration records after CM en	Temperature (EGT) Sensor 1		as engine speed greater than 90	(standby state occurs after ECM		engine speed is greater than 600 to					
Fuel Quanty Lower Than Expected engine peed greater than 0 pm pm is engine speed greater than 0 pm	Temperature (EGT) Sensor 1		as engine speed greater than 90	(standby state occurs after ECM		engine speed is greater than 600 to					
Fuel Quarkty Higher Than Bergine Speed greater than 0 rpm) as engine speed greater than 0 rpm) (standay state cours after ECM) (standay state values as indicated as unit of the speed greater than 0 to initialization or following after rum, mode (defined as engine speed greater than 0 rpm) as engine speed greater than 0 rpm) (standay state cours after ECM) (standay state values as indicated as unit of the speed dig C and/texp espeed is greater than 0 to 800 rpm active when the ignition is on or following a stall of the engines P0564 - Chuise Control Multi- Function Input 'A' Circuit engine not in afterrum mode (defined as engine speed greater than 0 to pm) Engine not in ranking mode (defined initialization or following after rum, pm) Status of the Reductant Tark is not following after rum, pm) System is not in active regeneration mode System is not in active regeneration mode System is not in active regeneration mode 100567 - Chuise Control Multi- Base on the rum mode (defined as engine speed greater than 0 to engine is not in active rum mode Engine not in cranking mode (defined engine is not in active regeneration initialization or following after rum, pm) System is not in active regeneration mode System is not in ac	P054E - Idle Control System - Fuel Quantity Lower Than Expected		as engine speed greater than 90	(standby state occurs after ECM		engine speed is greater than 600 to	active when the ignition is on or				
P0664 - Cruise Control Multi- Function Input 'A' Circuit engine not in afterrun mode (defined as engine speed greater than 0 rpm) Engine not in caraking mode (defined as engine speed greater than 0 rpm) Engine not in caraking mode (defined as engine speed greater than 0 rpm) Engine not in caraking mode (defined as engine speed greater than 0 rpm) Engine not in caraking mode (defined as engine speed greater than 0 rpm) Engine not in caraking mode (defined as engine speed greater than 0 rpm) Engine not in caraking mode (defined as engine speed greater than 0 rpm) Engine not in caraking mode (defined as engine speed greater than 0 rpm) Engine not in caraking mode (defined as engine speed greater than 0 rpm) Engine not in caraking mode (defined as engine speed greater than 0 rpm) Engine not in caraking mode (defined as engine speed greater than 0 rpm) Engine not in caraking mode (defined as engine speed greater than 0 rpm) Engine not in caraking mode (defined as engine speed greater than 0 rpm) Engine is not in standy state engine is not in standy state Engine not in ready state (which is active when the inpinion is on or		engine not in afterrun mode (defined as engine speed greater than 0 rpm)	as engine speed greater than 90	(standby state occurs after ECM	deg C	engine speed is greater than 600 to	active when the ignition is on or				
Page 2 - Cruise Control Resume engine not in afterrum mode (defined engine server than 9 by state (which is engine s			as engine speed greater than 90	(standby state occurs after ECM	Frozen which means the ambient air temperature is >= -7°C and the reductant tank temperature is >= -	System is not in active regeneration mode		- 		_	
(pri) mitualization on louving a later-run) out or assention paint intoce) gleater trans do (pri) (prioticater tre equipter trunning) end (prioticater tre end)	P0567 - Cruise Control Resume 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)		seconds (Engine not in cranking mode (defined as engine speed greater than 90 rpm) to indicate the	engine is running which means the engine speed is greater than 600 to 850 rpm	engine is not in ready state (which is active when the ignition is on or following a stall of the engine)		

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P0568 - Cruise Control Set 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)
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							
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 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 strutining) 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)	1	

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P1048 - Reductant Injector 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)	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 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)
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										
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 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					
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)	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)		
P11DC - NOx Sensor Current 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)	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)	engine is not in standby state (standby state occurs after ECM initialization or following after-run)	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									

							engine Run Time is greater than 10			
P140B - Exhaust Gas Recirculation Slow Response- Increasing 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	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								
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 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)				
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 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)	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 Module 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								
P2008 - 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									
P2010 - 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 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					
P2033 - Exhaust Gas Temperature (EGT) Sensor 2 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					

P203B - Reductant Level 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	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 (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)
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 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)	
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 rpm) to indicate the engine is running)	engine is running which means the engine speed is greater than 600 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 rpm) to indicate the engine is running)	engine is running which means the engine speed is greater than 600 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 rpm) to indicate the engine is running)	engine is running which means the engine speed is greater than 600 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				
P208D - Reductant Pump 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 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 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)		
P20A1 - Reductant Purge Valve Performance	battery voltage is above 11 V for at least 3s			E B ¹			-	

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P20A2 - Reductant Purge Valve 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)		
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 running which means the engine speed is greater than 600 to 850 rpm	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 running which means the engine speed is greater than 600 to 850 rpm	engine is not in ready state (which is active when the ignition is on or following a stall of the engine)			
P20E8 - Reductant Pressure Too Low	SCR Reductant Level not in restriction or empty level state (see parameter definitions for reductant level warning definition)	engine not in afterrun mode (defined as engine speed greater than 0 rpm)	Engine 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 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)
P20EE - SCR Nox Catalyst Efficiency Below Threshold Bank 1	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)
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 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)	
P21DD - Reductant Heater 1 Current Too Low	SCR Reductant Level not in restriction or empty level state (see parameter definitions for reductant level warning definition)	engine not in afterrun mode (defined as engine speed greater than 0 rpm)	Engine 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						
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 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)	
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				
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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 runnino)	engine is running which means the engine speed is greater than 600 to 850 rpm	engine is not in ready state (which is active when the ignition is on or following a stall of the engine)		
P229F - NOx Sensor Performance Bank 1 Sensor 2	engine not in afterrun mode (defined as engine speed greater than 0 rpm)	Engine 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 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)	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 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)		
P22FA - NOx Sensor 1 Performance - Slow Response High to 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)	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 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					
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 (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)			
P2454 - Diesel Particulate Filter Differential Pressure 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)			
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 (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)			
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)				

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P2459 - Diesel Particulate Filter Regeneration Frequency	ambient air temperature is above -7 deg C	ambient pressure is above 74.8kPa							
P245A - Exhaust Gas Recirculation (EGR) Cooler Bypass Valve Control Circuit	engine is not in standby state (standby state occurs after ECM initialization or following after-run)	battery voltage is above 11 V for at least 3s							
P245C - Exhaust Gas Recirculation (EGR) Cooler Bypass Valve Control Circuit 1 Low Voltage	engine is not in standby state (standby state 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 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)			
P249D - Closed Loop Reductant Injection Control At Limit - Flow 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)	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	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)	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 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)		
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 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)			
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					
P2687 - Fuel Supply Heater Control Circuit/Open	battery voltage is above 11 V for at least 3s				-				
P2688 - Fuel Supply Heater Control Circuit Low	battery voltage is above 11 V for at least 3s								
P2689 - Fuel Supply Heater Control Circuit High	battery voltage is above 11 V for at least 3s								
		-							

14 OBDG04 ECM Enable Tables

P268C - 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)							
P268D - 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)							
P268E - 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)							
P268F - 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)							
P2A00 - O2 Sensor Circuit Range/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					
P2BAA - NOx Exceedence - Low Reagent Consumption	SCR Reductant Level not in restriction or empty level state (see parameter definitions for reductant	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 which means the engine speed is greater than 600 to 850 rpm	engine is not in ready state (which is active when the ignition is on or following a stall of the engine)
	level warning definition)					engine is running)		
U0073 - CAN A BUS OFF	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	ş,		engine is running)		
U0073 - CAN A BUS OFF U0074 - CAN B BUS OFF	engine not in afterrun mode (defined	(standby state occurs after ECM	battery voltage is above 11 V for at			engine is running)	I	
	engine not in afterrun mode (defined as engine speed greater than 0 rpm) engine not in afterrun mode (defined	(standby state occurs after ECM initialization or following after-run) engine is not in standby state (standby state occurs after ECM	battery voltage is above 11 V for at least 3s battery voltage is above 11 V for at			engine is running)		

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REVISED:

Component /	Fault	Monitor Strategy	Primary Malfunction		Threshold		Secondary		Enable	Time	MIL
System	Code	Description	Criteria		Logic and Value	•	Parameters		Conditions	Required	
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 O	amps volts	glow plugs are commanded on DTCs P163C, P0671-P0678	=	True Not set	fail conditions exists for 3. seconds. monitor runs 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 runs 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 runs 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 runs 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 measured voltage of charge	Criteria Charge Pump Under voltage	<=	Logic and Value Battery voltage	volts	Parameters Battery voltage at GPCM	>	Conditions 6	volts	Required fail	Illum.
		pump is determined to be out of tolerance	Charge Pump Under Voltage	<=	at GPCM + 7	voits	Battery voltage at GPCM	>	6	Voits	conditions exists for 3.13 seconds. monitor runs with 0.13 s rate	
											whenever enable conditions are met. fail	
		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 Path 1: fail	
		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	= ^ ~ v = v	On 6 60 Not set 2	volts	Path 1: 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.	

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

Component /	Fault	Monitor Strategy	Primary Malfunction		Threshold		Secondary		Enable		Time	MIL
System	Code	Description	Criteria		Logic and Value	e	Parameters		Conditions		Required	Illum.
		glow plug short: electronic	Path 1: Glow Plug Current	>	60	amps	Ignition	=	on		Path1: fail	
		circuitry determines a fault					glow plug command	=	on		conditions	
		exists on GP circuit	Path 2: Hardware over current	>	80	amps	over temperature condition	=	false		exists for	
							over voltage condition	=	false		1.13	
							abs[Battery supply at GPCM - IGN				seconds.	
							voltage at GPCM]	<	6.0	volts	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	
		glow plug high resistance:	Glow Plug Resistance	>	1.83	ohm	Ignition on	=	on		fail	<u> </u>
		electronic circuitry	AND	-		0,111	Battery voltage at GPCM	>	7.0	volts	conditions	
		determines a fault exists on	Glow Plug Current	>=	4.00	amps	glow plugs are commanded on	=	on		exists for	
		GP circuit	elett i lag earrent	-			over temperature condition	=	false		1.16	
							over voltage condition		false		seconds.	
							abs[Battery supply at GPCM - IGN	<	7.0	volts	monitor runs	
							voltage at GPCM]				with 0.16 s	
											rate	
											whenever	
											enable	
											conditions	
											are met	

Component /	Fault	Monitor Strategy	Primary Malfunction		Threshold		Secondary		Enable		Time	MIL
System	Code	Description	Criteria Path 1: Glow Plug Resistance	<	Logic and Value	e mOhm	Parameters glow plugs are commanded on	_	Conditions on		Required	Illum.
		Glow plug low resistance: electronic circuitry determines a fault exists on GP circuit	Path 1: Glow Plug Resistance Path 2: Glow Plug Resistance	<	400	mOhm	glow plugs are commanded on over temperature 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 volts	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	9	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
		lange	PATH 2: (IGN - voltage supply to GPCM)	>	+/-5	volt	GPCM voltage supply GPCM Ignition voltage	> <	6.0 4.0	volt volt	monitor runs with 1 s rate whenever enable	
			or PATH 3: (ECM reported voltage via CAN	>	+/-3	volt	or GPCM supply voltage Engine speed	> >	6 10< rpm >400	volt rpm	conditions are met.	
			- voltage supply to GPCM)									
Glow Plug Module	P163D	Electronic GPCM circuitry	Path 1: Key state (Ign 1)	=	OFF		Path 1 glow plug activation request	=	ON		fail	В
Secondary Circuit		determines serveral signal voltage levels to GPCM are out of range	or	-			from ECM or	_	or		conditions exists for 4 seconds.	
			Path 2: Electronic circuitry determines voltage at glow plug pin	>	6.0	volt	Path 2 GP commanded	=	Off		monitor runs with 1 s rate whenever enable	
			or Path 3: [GPCM ground - GP ground]	>	1.5	volts	or		or		conditions are met.	
			Fain S. [GFGM ground - GF ground]	>	1.5	VOILS	Path 3 GP commanded DTCs not set IAH dutycycle	=	ON P0671,P0675 0 or 100	%		
								_	0 01 100	70		
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	v ,	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

Component /	Fault	Monitor Strategy	Primary Malfunction		Threshold		Secondary		Enable		Time	MIL
System	Code	Description	Criteria		Logic and Value	9	Parameters		Conditions		Required	Illum.
Reductant Heater 1 Control Circuit Low voltage	P20BB	ECM monitors serial data from GPCM for P20BB Error Message indicating GPCM detects reductant heater output shorted to	Path 1: Reductant Heater Plug Current	>	21	amp	reductan heater commanded: GPCM temperature GPCM supply voltage KL30	= < >	ON 123 7.0	°C volt volt	fail conditions exists for 1.5 seconds. monitor runs	A
		ground or an overload condition	or		or		or	or	or	or	with 1 s rate whenever enable conditions	
			Path 2: load at output (detected by hardware)	<	0.047	ohm	reductan heater commanded: GPCM temperature	= <	ON 123	°C	are met.	
			Path 3: hardware over current Path 4: hardware over temperature condition	^ ^	27 175	amp °C	GPCM supply voltage KL30	>	7.0	volt		
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

Component /	Fault	Monitor Strategy	Primary Malfunction		Threshold	_	Secondary		Enable		Time	MIL
System	Code	Description	Criteria		Logic and Value	1	Parameters		Conditions	-	Required	Illum.
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	Path 1: Reductant Heater Plug Current	>	21	amp	reductan heater commanded: GPCM temperature GPCM supply voltage KL30	= < >	ON 123 7.0	°C volt volt	fail conditions exists for 1.5 seconds. monitor runs	A
		ground or an overload condition	or		or		or	or	or	or	with 1 s rate whenever enable conditions	
			Path 2: load at output (detected by hardware)	<	0.047	ohm	reductan heater commanded: GPCM temperature	= <	ON 123	°C	are met.	
			Path 3: hardware over current Path 4: hardware over temperature condition	> >	27 175	amp °C	GPCM supply voltage KL30	>	7.0	volt		
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
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	DTCs not set: reductan heater commanded: GPCM temperature GPCM battery supply voltage	= < >	P20C3 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

Component /	Fault	Monitor Strategy	Primary Malfunction		Threshold		Secondary		Enable		Time	MIL
System	Code	Description	Criteria		Logic and Value	e	Parameters		Conditions	-	Required	Illum.
Reductant Heater 3 Control Circuit Low voltage	P20C3	ECM monitors serial data from GPCM for P20C3 Error Message indicating GPCM detects reductant	Path 1: Reductant Heater Plug Current	>	21	amp	reductan heater commanded: GPCM temperature GPCM supply voltage KL30	= < >	ON 123 7.0	°C volt volt	fail conditions exists for 1.5 seconds.	A
		heater output shorted to ground or an overload condition	or		or		or	or	or	or	monitor runs with 1 s rate whenever enable	
			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.	
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 whenever	В
			PATH 2: DC/DC booster output current duration	> >	5.0 0.010	amp sec	status DC/DC booster or	=	ON		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 Nox Sensor Supply voltage Circuit Bank 1 Sensor 2	Code P220B	Description ECM monitors serial data from GPCM for P220B Error Message indicating GPCM detects DC/DC booster output shorted to ground or shorted to battery	Criteria PATH 1:Electronic circuitry determines voltage at DC/DC booster output pin or PATH 2: DC/DC booster output current duration or	>	5.0 5.0 0.010	volt amp sec	Parameters Status DC/DC booster or status DC/DC booster or	=	Conditions OFF, power up procedure has started after reset or ON or		Required fail conditions exists for 5.5 seconds. monitor runs with 5 s rate whenever enable conditions are met.	<u>Illum.</u> B
			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 PATH 2: GPCM temperature sensor voltage	<	0.210	volts	Engine Off Timer (GMLAN) and Intake Air Temperature (GMLAN) or Engine Coolant Temperature (GMLAN) and Intake Air Temperature (GMLAN) (Engine Off Timer (GMLAN) or Intake Air Temperature (GMLAN)) and (Engine Coolant Temperature (GMLAN) or	>= >= > > < < < = = <	28800 -7 70 -10 28800 -7 60 -10	sec °C °C °C °C °C °C °C °C °C	fail conditions exists for 1.81 seconds. monitor runs with 1.31 s rate whenever enable conditions are met.	В
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 /	Fault	Monitor Strategy	Primary Malfunction		Threshold		Secondary		Enable		Time	MIL
System	Code	Description	Criteria		Logic and Value	•	Parameters	Conditions		Required	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

14 OBDG04 FSCM Summary Tables

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illumination
Mechanical Actuator Performance (Functionality)	P059F	Compare commanded shutter position to sensed position	Failure to achieve commanded position	Two (2) consecutive intrusive tests fail to achieve commanded position. Intrusive tests are triggered immediately following any failure to achieve a commanded position.	1. Power mode	1. Run/Crank	Frequency: 1 sample after every shutter movement. 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)	DTC Type B 2 trips
					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)	Ignition OR	Run or Crank	1 failure if it occurs during the first ROM test of the ignition cycle, otherwise 5 failures Frequency: Runs continuously in the background	DTC Type A 1 trip
Control Module	P0602	Indicates that the	This DTC is set via calibration,		HS Comm	enabled	Runs once at power	DTC Type A
Not Programmed		FSCM needs to be programmed	KeMEMD_b_NoStartCal		Ignition OR Ign1 Accessory mode	Run or Crank enabled	up	1 trip

	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 power-up	Checksum at power-up	≠ checksum at power-down	Ignition OR	Run or Crank	1 failure Frequency: Once at power-up	DTC Type A 1 trip
Control Module Random Access Memory (RAM)	P0604	Indicates that control module is unable to	Data read	≠ Data written	Ign1 Accessory mode	enabled	1 failure if it occurs during the first RAM test of the ignition	DTC Type A 1 trip
		correctly write and read data to and from RAM					cycle, otherwise 5 failures	
					Ignition OR Ign1 Accessory mode	Run or Crank enabled	Frequency: Runs continuously in the background.	
Control Module 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 (PID 2032	 Register contents All I/O configuration register 				(12.5015)	
		discriminates the source of the fault)	faults - 2 Processor clock fault -	 <> correct value. 2. 	 Ignition OR Ign1 Accessory mode For all I/O configuration register 	 Run or Crank enabled 	Test 3	
2. Processor clock test			a. EE latch flag set in EEPROM OR	a. == 0x5A5A	faults: •KeMEMD_b_ProcFltCfgRegEnbl	3. TRUE	3 failures out of 15 samples 1 sample/12.5 ms	

14 OBDG04 FSCM Summary Tables

Component/ System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value		Enable Conditions	Time Required	MIL Illumination
			b. RAM latch flag.	b. == 0x5A	4 . For Processor Clock Fault: •KeMEMD_b_ProcFltCLKDiagEnb	4. TRUE		
3. External watchdog test			3 External Watchdog Fault - Software control of fuel pump driver	3. = Control Lost	5. For External Watchdog Fault: •KeFRPD_b_FPExtWDogDiagEn bl			
					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			1 test failure Once on controller power-up	DTC Type A 1 trip
Performance					Ignition OR	Run or Crank		
					Ign1 Accessory mode	enabled		
Ignition 1 Switch Circuit Low Voltage	P2534	This DTC detects if the Ignition1 Switch circuit is shorted	Ignition 1 voltage	<= 6 V	Engine	Running	180 failures out of 200 samples	DTC Type A 1 trip
		to low or open					1 sample/25.0 ms	
Ignition 1 Switch Circuit High Voltage	P2535	Detects if the Ignition1 Switch circuit is shorted	Ignition 1 voltage	> 11.7 V	Ignition Run_Crank terminal	Off	180 failures out of 200 samples	DTC Type A 1 trip
		to vehicle supply voltage					1 sample/25.0 ms	

1 · · ·	Fault	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Required	MIL Illumination
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	1. Power mode	1. Run/Crank	12 failures out of 12 samples (12 seconds)	DTC Type B 2 trips
					2. Ignition Run/Crank Voltage 3. U0073	 2. 11V<voltage<32v< li=""> 3. not active </voltage<32v<>		
Lost Communication With "Actuator"	U0284	Detects loss of communication condition has occurred between ECU and device Active Grill Air Shutter "A" actuator	PWM Message	Undetected	1. Power mode	 not active Run/Crank 1. Run/Crank 2. 11V < voltage < 32V 	Frequency: 100ms 150 failures out of 167 samples	DTC Type B 2 trips