Section 1 : S1-12OBDG09

Contains information that is common to all applications within 12OBDG09 GMT911 - Chevrolet Silverado HD GMT610 - Chevrolet Express GMT912 - GMC Sierra HD

Section 2 : S2-12OBDG09_Glow Plug Module

Contains diagnostic information that is performed within the Glow Plug Control Module and common to all applications within 12OBDG09 The diagnostic algorithms are contained within the Glow Plug Control Module, but the Fault Code storage handling and MIL Illumination are performed within the ECM

Section 3 : S3-12OBDG09-LGH_Specific

Contains information that is specific to the LGH applications within 12OBDG09 GMT911 - Chevrolet Silverado HD GMT610 - Chevrolet Express GMT912 - GMC Sierra HD

Parameter Definition

Contains definitions of secondary parameters which are used in the parameter document. These secondary parameters conditions are shown in the respective physical parameters which define each condition.

Calibration Look-Up Tables

Contains the calibration look-up tables from both the Section 1, Section 3, and the Parameter Definitions

Inhibit Tables

Contains the matrix of diagnostics which are inhibited from being executed if an active DTC is stored in the ECM

Enable Tables

Contains the matrix of additional enable conditions which need to be satisfied for each diagnotic to be enabled

Component / System	Fault Code	Monitor Strategy Description	Primary Malfunction Criteria		Thresho	old Value	Secondary Parameters		Enable Conditions		Time Required	MIL Illum.
					- <u>-</u>			_		_		
Crankshaft to Camshaft Correlation	P0016	Detects a shift of the camshaft angle by monitoring the average offset angle.	average value of camshaft offset	<	-20.00	degrees	ignition on and	=	TRUE	-	fail conditions exists for more than 4 events test performed continuously 0.01 s rate	В
							basic enable conditions met:	=	see sheet enable tables	-		
Turbocharger Boost Control Position Not Learned	P003A	Detects in range vane position errors during a vane sweep initiated to learn minimum and maximum vane position values.	Path 1:				(fail conditions exists for 0.01 s monitor runs once per trip with 0.01 s rate whenever enable conditions are met	В
			mean offset learned value at fully open valve position or	<	5.54	%	turbocharger offset adaptation timer)	>=	0.15	Sec		
			mean offset learned value at fully open valve position	>	36.94	%	and					
			or				offset learning for turbo charger (VNT) actuator position sensor is active during idling	=	TRUE	-		

Component / Fault System Code	Monitor Strategy Description	Primary Malfunction Criteria	L	Thresho ogic and	old Value	Secondary Parameters		Enable Conditions		Time Required	MIL Illum.
		Path 2:				 in order to compensate sensor drift and valve aging the valve is closed and opened fully once in a driving cycle during engine idling, the read positions for opening and closing are averaged and used for the calculation of offset drift of the valve 					
		time taken to learn the mean offset learned value at fully open valve position	>	30	sec	and					
		or time taken to learn the mean offset learned value at fully closed valve position or	>	30	sec	engine idle means (=	TRUE	-		
		Path 3:	<	68.01	%	Engine Running (see parameter definition) and	=	TRUE	-		
		at fully closed valve position or		00.01	,,	time since start	<	21474836	sec		
		mean offset learned value at fully closed valve position	>	95.61	%) and					
						diagnostic performed in current dc and	=	FALSE	-		
						basic enable conditions met:	=	see sheet enable tables	-		

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Component / System	Fault Code	Monitor Strategy Description	Primary Malfunction Criteria	Threshold Logic and Value	Secondary Parameters	(Enable Conditions		Time Required	MIL Illum.
Turbocharger Boost Control Circuit	P0045	Electronic output driver circuitry determines circuit integrity on the turbo boost solenoid control circuit.	The ECM detects that the commanded state of the driver and the actual state of the control circuit do not match.		(fail conditions exists for 3 s monitor runs with 0.01 s rate whenever enable conditions are	В
					battery voltage for	>	11	V	met	
					time	>	3	sec		
					and battery voltage	<	655.34	V		
					for time)	>	3	sec		
					and starter is active cranking	=	FALSE	-		
					for	>	3	sec		
					battery voltage	<	655.34	V		
					for time	>	3	sec		
					and basic enable conditions met:	=	see sheet enable tables	-		
			The ECM detects that the commanded state of the driver and the actual state of the control circuit do not match.		(fail conditions exists for 1 s monitor runs with 0.01 s rate whenever enable	
					battery voltage for	>	11	V	conditions are met	
I	I	I			time	>	3	sec		

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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	<	655.34	V		
					for time	>	3	sec		
) and starter is active cranking	_	FALSE	_		
					for		TREOL			
					time battery voltage	> <	3 655.34	sec V		
					for time	>	3	sec		
					basic enable conditions met:	=	see sheet enable tables	-		
Turbocharger Boost Control Circuit Low Voltage	P0047	Electronic out-put driver circuitry determines circuit integrity on the turbo boost solenoid control circuit.	The ECM detects that the commanded state of the driver and the actual state of the control circuit do not match.		(fail conditions exists for 3 s monitor runs with 0.01 s rate whenever enable conditions are	В
					battery voltage for	>	11	V	met	
					time and	>	3	sec		
					battery voltage for	<	655.34	V		
					time)	>	3	sec		
					and					

Component / System	Fault Code	Monitor Strategy Description	Primary Malfunction Criteria	Threshold Logic and Value	Secondary Parameters		Enable Conditions		Time Required	MIL Illum.
					starter is active cranking	=	FALSE	-		
					for					
					time	>	3	sec		
					battery voltage	<	655.34	V		
					for					
					time	>	3	sec		
					and					
					basic enable conditions met:	=	see sheet enable tables	-		
Turbocharger Boost Control Circuit High Voltage	P0048	Electronic out-put driver circuitry determines circuit integrity on the turbo boost solenoid control	The ECM detects that the commanded state of the driver and the actual state of the control circuit do not match.		(fail conditions exists for 1 s monitor runs with 0.01 s rate whenever enable	В
		circuit.			battery voltage for	>	11	V	met	
					time	>	3	sec		
					and					
					battery voltage for	<	655.34	V		
					time	>	3	sec		
					, and					
					starter is active cranking	=	FALSE	-		
					for					
					time	>	3	sec		
					battery voltage	<	655.34	V		
					for					
I	I .	I			time	>	3	sec		

Component / System	Fault Code	Monitor Strategy Description	Primary Malfunction Criteria	Threshold Logic and Value	Secondary Parameters		Enable Conditions		Time Required	MIL Illum.
					and basic enable conditions met:	-	see sheet enable tables	-		
Turbocharger Boost High Control Circuit Low Voltage	P006E	Electronic output driver circuitry determines circuit integrity on the turbo boost solenoid control circuit.	The ECM detects that the commanded state of the driver and the actual state of the control circuit do not match.		ignition on and basic enable conditions met:	=	TRUE see sheet enable tables	-	fail conditions exists for 1.5 s monitor runs with 0.1 s rate whenever enable conditions are met	В
Turbocharger Boost High Control Circuit High Voltage	P006F	Electronic output driver circuitry determines circuit integrity on the turbo boost solenoid control circuit.	The ECM detects that the commanded state of the driver and the actual state of the control circuit do not match.		engine pre drive for time and (battery voltage for time	= > >	FALSE 1 11 3	- sec V sec	fail conditions exists for 0.1 s monitor runs with 0.1 s rate whenever enable conditions are met	В

Component / System	Fault Code	Monitor Strategy Description	Primary Malfunction Criteria	L	Thresho ogic and \	ld /alue	Secondary Parameters		Enable Conditions		Time Required	MIL Illum.
							and battery voltage for time	<	655.34 3	V sec		
							, and starter is active cranking for	=	FALSE	-		
							time and basic enable conditions met:	>	3 see sheet enable tables	sec -		
CAC Temperature Sensor Circuit High Voltage	P007C	Detects a CAC temperature sensor circuit short to ground.	CAC downstream temperature sensor voltage same as	<	0.1058	V	ignition on and	=	TRUE	-	fail conditions exists for 5 s test performed continuously 0.1 s rate	A
			downstream CAC temperature	>	150	°C	basic enable conditions met:	=	see sheet enable tables	-		
							and NO Pending or Confirmed DTCs:	=	see sheet inhibit tables	-		

Component /	Fault	Monitor Strategy	Primary Malfunction		Threshol	ld /aluo	Secondary Paramotors		Enable		Time Poquirod	MIL
CAC Temperature Sensor Circuit Low Voltage	P007D	Detects a CAC temperature sensor circuit short to high voltage or a sensor open circuit	CAC downstream temperature sensor voltage	>	4.9306	V	ignition on	=	TRUE	-	fail conditions exists for 5 s test performed continuously 0.1 s rate	A
			downstream CAC temperature	<	-53	°C	basic enable conditions met:	=	see sheet enable tables	-		
							NO Pending or Confirmed DTCs:	=	see sheet inhibit tables	-		
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 #58)	>	11000 to 80000	kPa	state machine rail pressure control equal to metering unit control mode	=	TRUE	-	fail conditions exists for 8 s monitor runs with 0.02 s rate whenever enable conditions are met	В
							basic enable conditions met:	=	see sheet enable tables	-		
							metering unit actuator test active and	=	FALSE	-		
							NO Pending or Confirmed DTCs:	=	see sheet inhibit tables	-		

Component /	Fault	Monitor Strategy	Primary Malfunction	Threshold		Secondary		Enable		Time	MIL	
System	Code	Description	Criteria	_	Logic and V	alue	Parameters		Conditions		Required	Illum.
			rail pressure deviation from setpoint calculated out of difference between desired and actual value (see Look- Up-Table #61)	>	11000 to 80000	kPa	(state machine rail	=	TRUE	-	fail conditions exists for 8 s monitor runs with 0.02 s rate whenever enable conditions are met	
							pressure control equal to pressure control valve or state machine rail pressure control equal coupled pressure control (rail pressure is controlled by metering unit and pressure control valve)	=	TRUE	-		
							, and basic enable conditions met: and metering unit actuator test active and NO Pending or Confirmed DTCs:	=	see sheet tables FALSE see sheet inhibit tables	-		

Component / System	Fault Code	Monitor Strategy Description	Primary Malfunction Criteria	L	Threshold ogic and Va	lue	Secondary Parameters		Enable Conditions		Time Required	MIL Illum.
Fuel Rail Pressure [FRP] Too High	P0088	Measured rail pressure is checked against desired rail pressure to detect high rail pressure conditions.	rail pressure deviation from setpoint calculated out of difference between desired and actual value (see Look- Up-Table #59)	<	-80000 to - 20000	kPa	Path 1:				fail conditions exists for 8 s monitor runs with 0.02 s rate whenever enable conditions are met	В
							current injection quantity	>	8	mm^3 /rev		
							state machine rail pressure control equal to metering unit control mode and	=	TRUE	-		
							basic enable conditions met: and	=	see sheet enable tables	-		
							metering unit actuator test active and	=	FALSE	-		
							NO Pending or Confirmed DTCs:	=	see sheet inhibit tables	-		
			rail pressure deviation from setpoint calculated out of difference between desired and actual value	<	-20000	kPa	(state machine rail pressure control equal to pressure control valve or	=	TRUE	-	fail conditions exists for 8 s monitor runs with 0.02 s rate whenever enable conditions are met	

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Component /	Fault	Monitor Strategy	Primary Malfunction		Threshold	d alua	Secondary		Enable		Time	MIL
Jystem	Coue	Description	Gintena				state machine rail pressure control equal coupled pressure control (rail pressure is controlled by metering unit and pressure control valve)	=	TRUE	-	Nequireu	inum.
) and basic enable conditions met:	=	see sheet enable tables	-		
							and NO Pending or Confirmed DTCs:	=	see sheet inhibit tables	-		
Engine Coolant Temperature (ECT)- Fuel Temperature Not Plausible	P008F	Detects a biased ECT or fuel temperature by comparing start-up temperatures between the two sensors.	Path 1:		100 to	*0	minimum engine-off time	>=	28800	Sec	fail conditions exists for 0.2 s monitor runs once per trip with 0.2 s rate whenever enable conditions are met	В
			Table #16) where	>	999	C	anio	>	-60.04	°C		
			(a) captured engine coolant temperature at start	=	measured parameter	-	and		-00.04	0		
			and with				engine speed (see Look- Up-Table #87)	>	600 to 850	rpm		

Component / System	Fault Code	Monitor Strategy Description	Primary Malfunction Criteria		Threshol Logic and V	d alue	Secondary Parameters		Enable Conditions		Time Required	MIL Illum.
			(b) captured fuel temperature at start	=	measured parameter	-	for					
)				time and	>	0	sec		
			or				engine post drive/ afterun	=	FALSE	-		
			Path 2:				and	1				
			(a) - (b) (see Look-Up- Table #16) with	<=	100 to 999	°C	diagnostic performed in current dc and	=	FALSE	-		
			(a) captured engine coolant temperature at start	=	measured parameter	-	basic enable conditions met:	=	see sheet enable tables	-		
			and				and	I.				
			(b) captured fuel temperature at start	=	measured parameter	-	NO Pending or Confirmed DTCs:	=	see sheet inhibit tables	-		
			and					1				
			(a) - (b) (see Look-Up- Table #17) where	>	20 to 999	°C		I				
			(a) captured engine coolant temperature at start	=	measured parameter	-		l				
			and (b) captured fuel temperature at start	=	measured parameter	-		l				
			and (1				
			status of block heater (see parameter definition)	=	FALSE	-		1				

Component / System	Fault Code	Monitor Strategy Description	Primary Malfunction Criteria	Threshold Logic and Value	Secondary Parameters		Enable Conditions		Time Required	MIL Illum.
Fuel Pressure Regulator 1 Control Circuit/Open	P0090	Electronic out-put driver circuitry determines circuit integrity on the Fuel Pressure Regulator Control Circuit.	The ECM detects that the commanded state of the driver and the actual state of the control circuit do not match.		battery voltage for	>	11	V	fail conditions exists for 1 s monitor runs with 0.01 s rate whenever enable conditions are met	A
					time	>	3	sec		
					and					
					battery voltage	<	655.34	V		
					for					
					time	>	3	sec		
					and					
					starter is active cranking	=	FALSE	-		
					for					
					time	>	3	sec		
					and					
					basic enable conditions met:	=	see sheet enable tables	-		
			The ECM detects that the commanded state of the driver and the actual state of the control circuit do not match.		battery voltage	>	11	V	fail conditions exists for 1 s monitor runs with 0.01 s rate whenever enable conditions are	
					time	>	3	sec	met	
					and					
					battery voltage	<	655.34	V		
					for					
					time	>	3	sec		
1					and					

Component / F System C	Fault Code	Monitor Strategy Description	Primary Malfunction Criteria	Threshold Logic and Value	Secondary Parameters		Enable Conditions		Time Required	MIL Illum.
					starter is active cranking for time and basic enable conditions met:	= > =	FALSE 3 see sheet enable tables	- sec -		
Fuel Pressure Regulator 1 Control Circuit Low	20091	Detects low voltage readings on the fuel pressure regulator 1 control circuit, indicating low voltage condition on the fuel pressure regulator control circuit.	The ECM detects that the commanded state of the driver and the actual state of the control circuit do not match.		battery voltage for time and battery voltage for time and starter is active cranking for time and basic enable conditions met:		11 3 655.34 3 FALSE 3 see sheet enable tables	V sec - sec -	fail conditions exists for 0.75 s monitor runs with 0.01 s rate whenever enable conditions are met	A

Component / System	Fault Code	Monitor Strategy Description	Primary Malfunction Criteria	L	Threshold ogic and Va	lue	Secondary Parameters		Enable Conditions		Time Required	MIL Illum.
Component / System Fuel Pressure Regulator 1 Control Circuit High	Fault Code P0092	Monitor Strategy Description	Primary Malfunction Criteria The ECM detects that the commanded state of the driver and the actual state of the control circuit do not match.	L	Threshold ogic and Va	lue	Secondary Parameters battery voltage for time and battery voltage for time and starter is active cranking for time	>	Enable Conditions 11 3 655.34 3 FALSE 3	V sec v sec -	Time Required fail conditions exists for 1 s monitor runs with 0.01 s rate whenever enable conditions are met	MIL Illum.
Intake Air Temperature Sensor 2 Circuit Low Voltage	P0097	Detects low voltage readings on the intake air temperature sensor 2 circuit, indicating an OOR low condition.	intake air temperature sensor 2 voltage	<	0.0326	V	basic enable conditions met: ignition on	=	see sheet enable tables	-	fail conditions exists for 5 s test performed continuously 0.1 s rate	В
			same as				and					

COMMON SECTION 1 OF 3 SECTIONS

Component / System	Fault Code	Monitor Strategy Description	Primary Malfunction Criteria	I	Thresho Logic and V	ld /alue	Secondary Parameters		Enable Conditions		Time Required	MIL Illum.
			temperature of intake air temperature sensor 2	>	250	deg	basic enable conditions met:	=	see sheet enable tables	-		
							and NO Pending or Confirmed DTCs:	=	see sheet inhibit tables	-		
Intake Air Temperature Sensor 2 Circuit High Voltage	P0098	Detects high voltage readings on the intake air temperature sensor 2 circuit, indicating an OOR high condition.	intake air temperature sensor 2 voltage	>	4.9306	V	ignition on	=	TRUE	-	fail conditions exists for 5 s test performed continuously 0.1 s rate	В
			same as temperature of intake air temperature sensor 2	<	-53	°C	and basic enable conditions met: and NO Pending or Confirmed DTCs:	=	see sheet tables see sheet inhibit tables	-		
Fuel Pressure Regulator 1 High Control Circuit Low Voltage	P00C9	Detects low voltage readings on the fuel pressure regulator 1 control circuit.	The ECM detects that the commanded state of the driver and the actual state of the control circuit do not match.				(battery voltage for time	>	11 3	V sec	fail conditions exists for 0.5s monitor runs with 0.01 s rate whenever enable conditions are met	A

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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	<	655.34	V		
					time for	>	3	sec		
					time)		3	sec		
					starter is active cranking	=	FALSE	-		
					for time	>	з	500		
					and		5	360		
					basic enable conditions met:	=	see sheet enable tables	-		
Fuel Rail Pressure Regulator 1 High Control Circuit High Voltage	P00CA	Detects high voltage readings on the fuel rail pressure regulator 1 circuit, indicating high condition on the fuel pressure actuator circuit.	The ECM detects that the commanded state of the driver and the actual state of the control circuit do not match.		(fail conditions exists for 0.1 s monitor runs with 0.1 s rate whenever enable conditions are met	A
					battery voltage for	>	11	V		
					time and		3	sec		
					battery voltage for	<	655.34	V		
					time for	>	3	sec		
l		l			time		3	sec		

Component / System	Fault Code	Monitor Strategy Description	Primary Malfunction Criteria	L	Threshold Logic and Va	alue	Secondary Parameters		Enable Conditions		Time Required	MIL Illum.
) and starter is active cranking for time and basic enable conditions met:	= >	FALSE 3 see sheet enable tables	- sec -		
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	(ambient pressure	>	74.8	kPa	fail conditions exists for 10 s monitor runs with 0.01 s rate whenever enable conditions are met	В
			measured air mass flow signal with	<	(a) - (b)	-	and (
			(a) engine load dependent MAP for calculating lower threshold (see Look-Up- Table #2)	=	0.75 to 0.8	-	engine coolant temperature	>=	-20.04	°C		
			and with (b) air temperature dependent correction factor curve (see Look-Up- Table #1)	=	0 to 0.05	-	and engine coolant temperature	<=	122.96	°C		
			or measured air mass flow signal with	>	(c) + (b)	-) and (

Component /	Fault	Monitor Strategy	Primary Malfunction	Threshold	Secondary Parameters		Enable		Time	MIL
System	Code	Description	Criteria	Logic and value	Parameters		Conditions	s • • • • •	Required	mum.
			(c) Engine load dependent MAP for calculating higher threshold	= 1.2 -	gradient of the charge-air temperature	>=	-2	°C/s		
			and with	0.1. 0.05	and		0	001		
			(b) air temperature dependent correction factor curve (see Look-Up- Table #1))	= 0 to 0.05 -	temperature)	<=	2	°C/s		
					and (
					engine speed (see Look- Up-Table #87) for	>	600 to 850	rpm		
					time since start)	>	90	sec		
					control value of the throttle valve and	>=	-400	%		
					control value of the throttle valve and (<=	5.00	%		
					(setpoint valve position of exhaust-gas recirculation	>=	-400	%		
					and					
					setpoint valve position of exhaust-gas recirculation	<=	2.00	%		
					for					
					time	>	3	sec		
					and					
					injection quantity	<=	300	mm^3 /rev		

Component / System	Fault Code	Monitor Strategy Description	Primary Malfunction Criteria	Lo	Threshold gic and Va	d alue	Secondary Parameters		Enable Conditions		Time Required	MIL Illum.
							and air pressure in the induction volume	<=	280	kPa		
							and					
							engine speed	>=	625	rpm		
							engine speed	<=	1500	rpm		
) and					
							intake air temperature	>=	-7.04	°C		
							intake air temperature	<=	51.96	°C		
) basic enable conditions met:	=	see sheet enable tables	-		
							and NO Pending or Confirmed DTCs:	=	see sheet inhibit tables	-		
Mass Air Flow (MAF) Sensor Circuit High Voltage	P0102	Detects low frequency readings on the MAF circuit, indicating an OOR high condition on the MAF circuit	signal period of air mass flow sensor (MAF)	>	881	us	ignition on	=	TRUE	-	fail conditions exists for 3 s monitor runs 0.01 s rate whenever enable conditions are met	A
			same as air mass flow	<	1.08	g/s	and basic enable conditions met:	=	see sheet enable tables	-		

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Component / System	Fault Code	Monitor Strategy Description	Primary Malfunction Criteria	L	Threshol ogic and V	d ′alue	Secondary Parameters		Enable Conditions		Time Required	MIL Illum.
							and NO Pending or Confirmed DTCs:	=	see sheet inhibit tables	-		
Mass Air Flow (MAF) Sensor Circuit Low Voltage	P0103	Detects low frequency readings on the MAF circuit, indicating an OOR low condition on the MAF circuit	PWM period too long	=	TRUE		ignition on	=	TRUE	-	fail conditions exists for 3 s monitor runs 0.01 s rate whenever enable conditions are met	A
			signal period of air mass flow sensor (MAF)	<	50	us	basic enable conditions met:	=	see sheet enable tables	-		
			same as air mass flow	>	560.83	g/s	and NO Pending or Confirmed DTCs:	=	see sheet inhibit tables	-		
Manifold Absolute Pressure (MAP) Sensor Performance	P0106	Detects a skewed MAP or BARO sensor by comparing MAP readings to the BARO sensor	Path 1:				measured coolant engine downstream temperature	>	-3549.94	°C	fail conditions exists for 5 s monitor runs with 0.01 s rate whenever enable conditions are	В
			(a) - (b)	<	-15.0	kPa	and current injection quantity	<	1308	mm^3 /rev	met	
			or Path 2:				and actuator position of	<=	327.67	%		
			(a) - (b)	>	15.0	kPa	throttle valve and					

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Component / System	Fault Code	Monitor Strategy Description	Primary Malfunction Criteria	Threshold Logic and Value		Secondary Enable Parameters Conditions			Time Required	MIL Illum.		
			where (a) MAP sensor measured pressure	=	measured parameter	-	turbo charger (VNT) wiping is active and	=	FALSE	-		
			and (b) BARO sensor measured pressure	=	measured parameter	-	(engine speed	>=	0	rpm		
							and engine speed)	<=	100	rpm		
							and vehicle speed and	<	3.11	mph		
							basic enable conditions met:	=	see sheet enable tables	-		
							and NO Pending or Confirmed DTCs:	=	see sheet inhibit tables	-		
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 continuously 0.01 s rate	A
			(sensor voltage of manifold absolute pressure	<	0.9106	V	and basic enable conditions met:	=	see sheet enable tables	-		

Component / System	Fault Code	Monitor Strategy Description	Primary Malfunction Criteria	L	Thresho	old Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
			same as manifold absolute pressure	<	44.9	kPa				
			and actuator position of throttle valve) or	<=	20	%				
			Path 2: (sensor voltage of manifold absolute pressure	<	0.3794	V				
			same as manifold absolute pressure and	<	-0.3	kPa				
			actuator position of throttle valve)	>	20	%				
Manifold Absolute Pressure (MAP) Sensor Circuit High Voltage	P0108	Detects high voltage readings on the MAP circuit, indicating an OOR high condition on the MAP circuit	sensor voltage of manifold absolute pressure	>	4.75	V	engine synchronization completed	= TRUE	- fail conditions exists for 5 s test performed continuously 0.01 s rate	A
			same as manifold absolute pressure	>	371.3	kPa	and basic enable conditions met:	= see sheet enable tables	-	

Component / System	Fault Code	Monitor Strategy	Primary Malfunction Criteria		Threshol	d alue	Secondary Parameters		Enable Conditions		Time Required	MIL Illum.
eyeteini	Couc	Decemption		_	logio ana i	uluo	T urumotoro		Contantionio		noquirou	
Intake Air Temperature (IAT) Sensor Circuit High Voltage	P0113	Detects high voltage readings on the IAT circuit, indicating an OOR high condition on the IAT circuit	intake air temperature sensor voltage same as	>	4.9286	V	ignition	=	on	-	fail conditions exists for 5 s test performed continuously with 0.1 s rate	A
			intake air temperature	<	-52	°C	basic enable conditions met:	=	see sheet enable tables	-		
Intake Air Temperature (IAT) Sensor Circuit Low Voltage	P0112	Detects low voltage readings on the IAT circuit, indicating an OOR low condition on the IAT circuit	intake air temperature sensor voltage same as intake air temperature	< >	0.0794	V °C	ignition and basic enable conditions met:	=	on see sheet enable tables	-	fail conditions exists for 5 s test performed continuously with 0.1 s rate	A
Engine Coolant Temperature (ECT) Sensor Circuit High Voltage	P0118	Detects high voltage readings on the ECT circuit, indicating an OOR high condition on the ECT circuit	voltage of engine coolant temperature sensor same as	>	4.8962	V	ignition	=	on	-	fail conditions exists for 60 s test performed continuously 0.2 s rate	A

Component / System	Fault Code	Monitor Strategy Description	Primary Malfunction Criteria	L	Thresho ogic and V	old Value	Secondary Parameters		Enable Conditions		Time Required	MIL Illum.
			engine coolant temperature	<	-53	deg C	basic enable conditions met:	=	see sheet enable tables	-		
Engine Coolant Temperature (ECT) Sensor Circuit Low Voltage	P0117	Detects low voltage readings on the ECT circuit, indicating an OOR low condition on the ECT circuit	voltage of engine coolant temperature sensor same as engine coolant temperature	~	0.509	V deg C	ignition and basic enable conditions met:	=	on see sheet enable tables	-	fail conditions exists for 15 s test performed continuously 0.2 s rate	A
Engine Coolant	P0128	Detects a stuck open	modeled coolant	~	50.06	°C	engine pre drive	_	EAL SE		fail conditions	B
Temperature (ECT) Below Thermostat Regulating Temperature	F U 120	thermostat by comparing actual engine coolant heat up profile to an expected modeled heat up profile. The targets are dependent on start up conditions (high and low regions)	temperature (model derived from injection quantity, coolant temperature at start, and ambient temperature)		33.30	0	engine pre unve	_	TALOE	-	exists for 0.2 s monitor runs once per trip with 0.2 s rate whenever enable conditions are met	J
			and				and					
			measured engine coolant temperature	<	49.96	°C	time since start and	<	1440	sec		
							measured engine coolant temperature	>	-40.04	°C		

Component /	Fault	Monitor Strategy	Primary Malfunction	Threshold	Secondary	Enable)	Time	MIL
System	Code	Low Pegion	Criteria	Logic and value	Parameters	Conditio	ns	Required	illum.
		Engine Temperature at start < 31 °C AND ambient air temperature <= 10 °C.							
					captured value of coolant temperature during start	< 30.96	°C		
					and (
					ambient temperature	> -7.04	°C		
					and				
					ambient temperature)	< 59.96	°C		
					and				
					ambient temperature (used for low region determination) and	< 9.96	°C		
					engine idle time ratio	< 0.50	%		
					which is defined by the following conditions:				
					(
					accelerator pedal value	<= 10.01	%		
					and				
					vehicle speed	<= 9.94	mph		
					and				
					engine speed)	<= 750	rpm		
					and				
					diagnostic performed in current dc and	= FALSE	-		

Component / System	Fault Code	Monitor Strategy Description	Primary Malfunction Criteria	L	Thresho ogic and \	ld /alue	Secondary Parameters		Enable Conditions		Time Required	MIL Illum.
					-		basic enable conditions met:	=	see sheet enable tables	-		
							and NO Pending or Confirmed DTCs:	=	see sheet inhibit tables	-		
		Detects a stuck open thermostat by comparing actual engine coolant heat up profile to an expected modeled heat up profile. The targets are dependant on start up conditions (high and low regions)	modeled coolant temperature (model derived from injection quantity, coolant temperature at start, and ambient temperature)	>	81.96	°C	engine pre drive	Ξ	FALSE	-	fail conditions exists for 0.2 s monitor runs once per trip with 0.2 s rate whenever enable conditions are met	
			and				and					
			measured engine coolant temperature	<	70.96	°C	time since start	<	1440	sec		
		High region Engine Temperature at start < 52 °C AND ambient air temperature > 10 °C					measured engine coolant temperature and	>	-40.04	°C		
							captured value of coolant temperature during start	<	51.96	°C		
							and (
							ambient temperature	>	-7.04	°C		
			COMMO	N SE	CTION P	age 28 (of 491		1 0	F 3 S	ECTIONS	

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Component / System	Fault Code	Monitor Strategy Description	Primary Malfunction Criteria	Threshold Logic and Value	Secondary Parameters		Enable Conditions		Time Required	MIL Illum.
					and ambient temperature	<	59.96	°C		
					.)					
					and ambient temperature (used for high region determination)	>	9.96	°C		
					and					
					engine idle time ratio	<	0.50	%		
					following conditions:					
					(accelerator pedal value	<=	10.01	%		
					and					
					vehicle speed	<=	9.94	mph		
					engine speed	<=	750	rpm		
					and					
					diagnostic performed in current dc and	=	FALSE	-		
					basic enable conditions met:	=	see sheet enable tables	-		
					and					
					NO Pending or Confirmed DTCs:	=	see sheet inhibit tables	-		

Component / System	Fault Code	Monitor Strategy Description	Primary Malfunction Criteria		Threshol Logic and V	d alue	Secondary Parameters		Enable Conditions		Time Required	MIL Illum.
HO2S Bank1 Sensor2 Circuit High	P0138	Detects an out of range high fault of the downstream Nox sensor lambda signal	Downstream Nox sensor lambda signal low received via CAN	>	1550	counts	Valid downstream NOx signal from CAN is received (no Nox sensor communication failures)	=	TRUE	-	fault exists for more than 3 sec; monitor runs at 0.1 s when enable conditions are met	В
					(1550 counts = 0.65 Lambda = -0.1178 %O2)		Engine Running (see parameter definition)	=	TRUE	-		
							for time (required for the NOx sensor to give valid response) and	>	20	sec		
							basic enable conditions met:	=	see sheet enable tables	-		
HO2S Bank1 Sensor2 Circuit Low	P0137	Detects an out of range low fault of the	Downstream Nox sensor lambda signal high received	<	-150	counts	Valid downstream NOx signal from CAN is	=	TRUE	-	fault exists for more than 3 sec;	В
		downstream Nox sensor lambda signal	via CAN				received (no Nox sensor communication failures)				monitor runs at 0.1 s when enable conditions are met	
					(-150 counts = 1100 Lambda = ~27 %O2)		Engine Running (see parameter definition)	=	TRUE	-		
							for time (required for the NOx sensor to give valid response) and	>	20	sec		

Component / System	Fault Code	Monitor Strategy Description	Primary Malfunction Criteria	L	Threshol ogic and V.	ld /alue	Secondary Parameters		Enable Conditions	Time Required	MIL Illum.
							basic enable conditions met:	=	see sheet - enable tables		
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	>	4.7132	V	ignition on	=	TRUE -	fail conditions exists for 5 s test performed continuously 0.2 s rate	В
			same as fuel temperature	<	- 50	degC	and basic enable conditions met:	=	see sheet - enable tables		
Fuel Temperature Sensor 1 Circuit Low	P0182	Detects low voltage readings in the fuel pump temperature sensor 1 circuit, indicating an OOR low condition on the fuel pump temperature sensor 1 circuit	voltage of fuel temperature sensor 1	<	0.599	V	ignition on	=	TRUE -	fail conditions exists for 5 s test performed continuously 0.2 s rate	В
			or same as fuel temperature	>	60	deg C	and basic enable conditions met:	=	see sheet - enable tables		

Component /	Fault	Monitor Strategy	Primary Malfunction		Thresho	old Valuo	Secondary Paramotors		Enable	6	Time Poquirod	MIL
System	Code	Description	Criteria			value	Farameters		Conditions	5	Required	inum.
Fuel Rail Pressure [FRP] Sensor Performance	P0191	Detects a drifted fuel rail pressure sensor by determining the adaptation factor of the fuel rail pressure regulator 2.	fuel pressure regulator 2 adaptation factor	>=	1.25	factor	fuel pressure regulator 2 in closed loop control	=	TRUE	-	fail conditions exists for 0.01 s monitor runs with 0.01 s rate whenever enable conditions are met	A
			or				and					
			fuel pressure regulator 2 adaptation factor	<=	0.75	factor	adaptation for fuel pressure regulator 2 active means	=	TRUE	-		
							counter for successful adaptation or	>	0	count s		
							counter for the successful calculation of the adaptation and (>	9	count s		
							engine speed	>	400	rpm		
							and			-		
							engine speed) and	<	1000	rpm		
							vehicle speed	<=	1.86	mph		
							and (
							fuel rail pressure control in fuel pressure regulator 2 mode	=	TRUE	-		
	1						or					

Component / System	Fault Code	Monitor Strategy Description	Primary Malfunction Criteria	L	Thresho ogic and	ld /alue	Secondary Parameters		Enable Conditions	5	Time Required	MIL Illum.
							fuel rail pressure control in combined pressure control (CPC) mode) and basic enable conditions met:	=	TRUE 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	<	0.352	V	engine post drive/ afterun	=	TRUE	-	fail conditions exists for more than 0.30 s monitor runs once per driving cycle with 0.01 s rate whenever enable conditions are met	A
			or rail pressure sensor voltage	>	0.65	V	and fuel temperature and	>	-0.04	°C		
							engine has already run in this driving cycle and	=	TRUE	-		
							rail pressure is reduced means	=	TRUE	-		
							rail pressure does not exceed and	<	0	kPa		
							fuel pressure regulator 2 current and	<=	1700	mA		

Component / System	Fault Code	Monitor Strategy Description	Primary Malfunction Criteria	L	Thresho ogic and	ld /alue	Secondary Parameters		Enable Conditions		Time Required	MIL Illum.
							time since engine off and number of measurements during engine postdrive/ afterun	> >	30.08 10	sec count s		
							and basic enable conditions met:	=	see sheet enable tables	-		
							and NO Pending or Confirmed DTCs:		see sheet inhibit tables	-		
Fuel Rail Pressure [FRP] Sensor Circuit Low	P0192	Detects low voltage readings on the FRP circuit, indicating an OOR low condition on the FRP circuit	rail pressure sensor voltage	<	0.189	V	ignition on	=	TRUE	-	foil conditions	A
			same as rail pressure	<	0	kPa	and basic enable conditions met: and	=	see sheet enable tables	-	exists for 0.14 s monitor runs with 0.01 s rate whenever enable conditions are met	
							NO Pending or Confirmed DTCs:	=	see sheet inhibit tables	-		

Component /	Fault	Monitor Strategy	Primary Malfunction		Thresho	ld Value	Secondary Parameters		Enable		Time Required	MIL
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 rail pressure	>	4.81 220000	kPa	and basic enable conditions met: and NO Pending or Confirmed DTCs:	=	TRUE see sheet enable tables see sheet inhibit tables	-	fail conditions exists for 0.2 s monitor runs with 0.01 s rate whenever enable conditions are met	A
Injector 1 Control Circuit	P0201	Electronic out-put driver circuitry determines circuit integrity on the injector Control Circuit.	The ECM detects that the commanded state of the driver and the actual state of the control circuit do not match.				Engine 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	Electronic out-put driver circuitry determines circuit integrity on the injector Control Circuit.	The ECM detects that the commanded state of the driver and the actual state of the control circuit do not match.				Engine 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 Condition	s	Time Required	MIL Illum.
Injector 3 Control Circuit	P0203	Electronic out-put driver circuitry determines circuit integrity on the injector Control Circuit.	The ECM detects that the commanded state of the driver and the actual state of the control circuit do not match.		Engine Running (see parameter definition)	= TRUE	-	fail conditions exists for more than 0.04 s monitor runs with 0.01 s rate whenever enable conditions are met	A
Injector 4 Control Circuit	P0204	Electronic out-put driver circuitry determines circuit integrity on the injector Control Circuit.	The ECM detects that the commanded state of the driver and the actual state of the control circuit do not match.		Engine Running (see parameter definition)	= TRUE	-	fail conditions exists for more than 0.04 s monitor runs with 0.01 s rate whenever enable conditions are met	A
Injector 5 Control Circuit	P0205	Electronic out-put driver circuitry determines circuit integrity on the injector Control Circuit.	The ECM detects that the commanded state of the driver and the actual state of the control circuit do not match.		Engine 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.	
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Injector 6 Control Circuit	P0206	Electronic out-put driver circuitry determines circuit integrity on the injector Control Circuit.	The ECM detects that the commanded state of the driver and the actual state of the control circuit do not match.		Engine Running (see parameter definition)	= TRUE -	fail conditions exists for more than 0.04 s monitor runs with 0.01 s rate whenever enable conditions are met	A	
Injector 7 Control Circuit	P0207	Electronic out-put driver circuitry determines circuit integrity on the injector Control Circuit.	The ECM detects that the commanded state of the driver and the actual state of the control circuit do not match.		Engine Running (see parameter definition)	= TRUE -	fail conditions exists for more than 0.04 s monitor runs with 0.01 s rate whenever enable conditions are met	A	
Injector 8 Control Circuit	P0208	Electronic out-put driver circuitry determines circuit integrity on the injector Control Circuit.	The ECM detects that the commanded state of the driver and the actual state of the control circuit do not match.		Engine Running (see parameter definition)	= TRUE -	fail conditions exists for more than 0.04 s monitor runs with 0.01 s rate whenever enable conditions are met	A	

Component /	Fault	Monitor Strategy	Primary Malfunction	n Threshold			Secondary	Secondary Enable			Time	MIL
System	Code	Description	Criteria		Logic and	Value	Parameters		Condition	S	Required	Illum.
Turbocharger Engine Overboost	P0234	Detects an Overboost condition by comparing desired to measured boost values.	control deviation of the boost pressure calculated out of difference between desired and actual value (see Look-Up-Table #50)	<	-35.0 to - 12.5	kPa	engine Speed	>=	1450	rpm	fail conditions exists for 10 s monitor runs with 0.02 s rate whenever enable conditions are met	В
							engine Speed	<=	3200	rpm		
							injection Quantity	>=	132	mm^3 /rev		
							injection Quantity	<=	480	mm^3 /rev		
							turbocharger control deviation	>=	-100	%		
							turbocharger control deviation	<=	100	%		
							commanded turbocharger position (<	100	%		
							injection quantity is stable means	=	TRUE	-		
							increase of injection quantity	<	60.00	(mm^ 3/rev)/ sec		
							and					
							engine speed is stable	=	TRUE	-		
							means					
							increase of engine speed	<	75	rpm/s ec		
							and turbo charger (VNT) wiping is active	=	FALSE	-		

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Component /	Fault	Monitor Strategy	Primary Malfunction	Threshold	Secondary	Enabl	9	Time	MIL
System	Code	Description	Criteria	Logic and Value	Parameters	Conditio	ons	Required	Illum.
					 in order to prevent soot accumulation e.g. in a long idle operation under cold engine condition on the turbine the desired value of the boost pressure actuator position governor is assigned from the set- 				
					offset learning for turbo	= FALS	Ξ -		
					- in order to compensate				
					sensor drift and valve aging, the valve is closed and opened fully once in a driving cycle during engine idling, the read positions for opening and closing are averaged and used for the calculation of offset drift of the valve				
					and working range of boost pressure is in closed-loop	= TRUE	E -		
					means (engine speed and	> 1200	rpm		
					injection quantity and	> 20	mm^3 /rev		

Component / System	Fault Code	Monitor Strategy Description	Primary Malfunction Criteria	L	Threshol ogic and V	d alue	Secondary Parameters		Enable Conditions		Time Required	MIL Illum.
							NO Pending or Confirmed DTCs:	=	see sheet inhibit tables	-		
) for time	>	2	sec		
							and basic enable conditions met:	=	see sheet enable tables	-		
Turbocharger Engine Underboost	P0299	Detects an Underboost condition by comparing desired to measured boost values.	control deviation of the boost pressure calculated out of difference between desired and actual value (see Look-Up-Table #49)	>	17.5 to 40.0	kPa	engine Speed	>=	1450	rpm	fail conditions exists for 10 s monitor runs with 0.02 s rate whenever enable conditions are met	В
							engine Speed	<=	2000	rpm		
							injection Quantity	>=	132	mm^3		
							injection Quantity (<=	480	mm^3 /rev		
							injection quantity is stable means	=	TRUE			
							increase of injection quantity	<	60.00	(mm^ 3/rev)/ sec		
							and					
							engine speed is stable	=	TRUE	-		
							means increase of engine speed	<	75	rpm/s ec		

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Component /	Fault	Monitor Strategy	Primary Malfunction	Threshold	Secondary		Enable	Time	MIL
System	Code	Description	Criteria	Logic and Value	Parameters	Co	onditions	Required	Illum.
					and turbo charger (VNT) wiping is active - in order to prevent soot accumulation e.g. in a long idle operation under cold engine condition on the turbine the desired value of the boost pressure actuator position governor is assigned from the set- point value	=	FALSE -		
					and offset learning for turbo charger (VNT) actuator position sensor is active during idling - in order to compensate sensor drift and valve aging, the valve is closed and opened fully once in a driving cycle during engine idling, the read positions for opening and closing are averaged and used for the calculation of offset drift of the valve	=	FALSE -		
					and working range of boost pressure is in closed-loop means (engine speed	=	TRUE - 1200 rpm		

Component / System	Fault Code	Monitor Strategy Description	Primary Malfunction Criteria	I	Thresho	old Value	Secondary Parameters		Enable Conditions		Time Required	MIL Illum.
					<u> </u>		injection quantity and NO Pending or Confirmed DTCs:) for time and basic enable conditions met:	> =	20 see sheet tables 2 see sheet enable tables	mm^3 /rev - sec		
Cylinder 1 Balance System	P0263	Detects if the injection system is at the control limits by monitoring the amount of fuel compensation (reduction) as determined by Fuel Balance Control (FBC)	fuel balance correction quantity	<	(a) * (b)	-	fuel balance control in closed loop (see closed loop conditions document for details)	=	TRUE	-	fail conditions exists for 10 s monitor runs with 0.01 s rate whenever enable conditions are met	В
			or fuel balance correction quantity	>	(c) * (b)	-	and current injection quantity	>	52	mm^3 /rev		
			with				current injection quantity	<	200	mm^3 /rev		
			(a) lower limitation (see Look-Up-Table #40)	=	-44 to 0	mm^3/re v	engine coolant temperature	>=	39.96	°C		
							ambient pressure	>=	0	kPa		
			and with			<i>.</i> .	engine speed	>	590	rpm		
			(b) factor for correction quantity	=	0.99	tactor	engine speed	<	1500	rpm		
l			and with				vehicle speed	<=	186.45	mph		

Component / System	Fault Code	Monitor Strategy Description	Primary Malfunction Criteria	L	Thresho ogic and	old Value	Secondary Parameters		Enable Conditions	i	Time Required	MIL Illum.
			(c) upper limitation (see Look-Up-Table #41)	=	0 to 44	mm^3/re v	and					
							basic enable conditions met:	=	see sheet enable tables	-		
							and NO Pending or Confirmed DTCs:	=	see sheet inhibit tables	-		
Cylinder 2 Balance System	P0266	Detects if the injection system is at the control limits by monitoring the amount of fuel compensation (reduction) as determined by Fuel Balance Control (FBC)	fuel balance correction quantity	<	(a) * (b)	-	fuel balance control in closed loop (see closed loop conditions document for details)	=	TRUE	-	fail conditions exists for 10 s monitor runs with 0.01 s rate whenever enable conditions are met	В
			or				and					
			fuel balance correction	>	(c) * (b)	-	current injection quantity	>	52	mm^3		
			with				current injection quantity	<	200	mm^3		
			(a) lower limitation (see Look-Up-Table #40)	=	-44 to 0	mm^3/re v	engine coolant temperature	>=	39.96	/rev °C		
							ambient pressure	>=	0	kPa		
			and with				engine speed	>	590	rpm		
			(b) factor for correction quantity and with	=	0.99	factor	engine speed	<	1500	rpm		
			(c) upper limitation (see Look-Up-Table #41)	=	0 to 44	mm^3/re v	and	~=	100.40	шрп		

Component /	Fault	Monitor Strategy	Primary Malfunction		Thresho	old	Secondary		Enable		Time	MIL
System	Code	Description	Criteria	L	ogic and	Value	Parameters		Conditions		Required	Illum.
							basic enable conditions met:	=	see sheet enable tables	-		
							and NO Pending or Confirmed DTCs:	=	see sheet inhibit tables	-		
Cylinder 3 Balance System	P0269	Detects if the injection system is at the control limits by monitoring the amount of fuel compensation (reduction) as determined by Fuel Balance Control (FBC)	fuel balance correction quantity	<	(a) * (b)	-	fuel balance control in closed loop (see closed loop conditions document for details)	=	TRUE	-	fail conditions exists for 10 s monitor runs with 0.01 s rate whenever enable conditions are met	В
			or				and					
			fuel balance correction quantity with	>	(c) * (b)	-	current injection quantity current injection quantity	> <	52 200	mm^3 /rev mm^3		
			(a) lower limitation (see Look-Up-Table #40)	=	-44 to 0	mm^3/re v	engine coolant temperature	>=	39.96	/rev °C		
							ambient pressure	>=	0	kPa		
			and with				engine speed	>	590	rpm		
			(b) factor for correction quantity	=	0.99	factor	engine speed	<	1500	rpm		
			and with				vehicle speed	<=	186.45	mph		
			(c) upper limitation (see Look-Up-Table #41)	=	0 to 44	mm^3/re v	and					

Component / System	Fault Code	Monitor Strategy Description	Primary Malfunction Criteria	L	Thresho ogic and	old Value	Secondary Parameters		Enable Conditions		Time Required	MIL Illum.
							basic enable conditions met:	=	see sheet enable tables	-		
							and NO Pending or Confirmed DTCs:	=	see sheet inhibit tables	-		
Cylinder 4 Balance System	P0272	Detects if the injection system is at the control limits by monitoring the amount of fuel compensation (reduction) as determined by Fuel Balance Control (FBC)	fuel balance correction quantity	<	(a) * (b)	-	fuel balance control in closed loop (see closed loop conditions document for details)	=	TRUE	-	fail conditions exists for 10 s monitor runs with 0.01 s rate whenever enable conditions are met	В
			or				and					
			fuel balance correction quantity	>	(c) * (b)	-	current injection quantity	>	52	mm^3 /rev		
			with				current injection quantity	<	200	mm^3 /rev		
			(a) lower limitation (see Look-Up-Table #40)	=	-44 to 0	mm^3/re v	engine coolant temperature	>=	39.96	°C		
							ambient pressure	>=	0	kPa		
			and with				engine speed	>	590	rpm		
			(b) factor for correction quantity	=	0.99	factor	engine speed	<	1500	rpm		
			and with				vehicle speed	<=	186.45	mph		
			(c) upper limitation (see Look-Up-Table #41)	=	0 to 44	mm^3/re v	and					
							basic enable conditions met:	=	see sheet enable tables	-		

Component / System	Fault Code	Monitor Strategy	Primary Malfunction Criteria	Threshold Logic and Value		old Value	Secondary Parameters	Enable Conditions			Time Required	MIL Illum.
		beschption				, and a	and NO Pending or Confirmed DTCs:	-	see sheet inhibit tables	-	noquirou	
Cylinder 5 Balance System	P0275	Detects if the injection system is at the control limits by monitoring the amount of fuel compensation (reduction) as determined by Fuel Balance Control (FBC)	fuel balance correction quantity	<	(a) * (b)	-	fuel balance control in closed loop (see closed loop conditions document for details)	Ξ	TRUE	-	fail conditions exists for 10 s monitor runs with 0.01 s rate whenever enable conditions are met	В
			or				and					
			fuel balance correction	>	(c) * (b)	-	current injection quantity	>	52	mm^3 /rev		
			with				current injection quantity	<	200	mm^3		
			(a) lower limitation (see Look-Up-Table #40)	=	-44 to 0	mm^3/re v	engine coolant temperature	>=	39.96	°C		
							ambient pressure	>=	0	kPa		
			and with				engine speed	>	590	rpm		
			(b) factor for correction quantity	=	0.99	factor	engine speed	<	1500	rpm		
			and with		01.44		vehicle speed	<=	186.45	mph		
			(c) upper limitation (see Look-Up-Table #41)	=	U to 44	mm^3/re v	and					
							basic enable conditions met:	=	see sheet enable tables	-		
		l					and					

Component /	Fault	Monitor Strategy	Primary Malfunction		Thresho	old Value	Secondary Paramotors		Enable Conditions		Time Required	MIL
Jystem	Coue	Description	Gillena			Value	NO Pending or Confirmed DTCs:	=	see sheet inhibit tables	-	Kequired	inum.
Cylinder 6 Balance System	P0278	Detects if the injection system is at the control limits by monitoring the amount of fuel compensation (reduction) as determined by Fuel Balance Control (FBC)	fuel balance correction quantity	<	(a) * (b)	-	fuel balance control in closed loop (see closed loop conditions document for details)	=	TRUE	-	fail conditions exists for 10 s monitor runs with 0.01 s rate whenever enable conditions are met	В
			or				and					
			fuel balance correction quantity	>	(c) * (b)	-	current injection quantity	>	52	mm^3 /rev		
			with				current injection quantity	<	200	mm^3		
			(a) lower limitation (see Look-Up-Table #40)	=	-44 to 0	mm^3/re v	engine coolant temperature	>=	39.96	°C		
							ambient pressure	>=	0	kPa		
			and with				engine speed	>	590	rpm		
			(b) factor for correction quantity	=	0.99	factor	engine speed	<	1500	rpm		
			and with (c) upper limitation (see Look-Up-Table #41)	=	0 to 44	mm^3/re v	venicle speed and	<=	186.45	mpn		
							basic enable conditions met:	=	see sheet enable tables	-		
							and					

Component /	Fault	Monitor Strategy	Primary Malfunction		Thresho	old Value	Secondary Paramotors		Enable		Time Required	MIL
Jystem	Coue	Description	Unteria			Value	NO Pending or Confirmed DTCs:	=	see sheet inhibit tables	-	Kequireu	inum.
Cylinder 7 Balance System	P0281	Detects if the injection system is at the control limits by monitoring the amount of fuel compensation (reduction) as determined by Fuel Balance Control (FBC)	fuel balance correction quantity	<	(a) * (b)	-	fuel balance control in closed loop (see closed loop conditions document for details)	=	TRUE	-	fail conditions exists for 10 s monitor runs with 0.01 s rate whenever enable conditions are met	В
			or				and					
			fuel balance correction quantity	>	(c) * (b)	-	current injection quantity	>	52	mm^3 /rev		
			with				current injection quantity	<	200	mm^3		
			(a) lower limitation (see Look-Up-Table #40)	=	-44 to 0	mm^3/re v	engine coolant temperature	>=	39.96	°C		
							ambient pressure	>=	0	kPa		
			and with				engine speed	>	590	rpm		
			(b) factor for correction quantity	=	0.99	factor	engine speed	<	1500	rpm		
			and with (c) upper limitation (see Look-Up-Table #41)	=	0 to 44	mm^3/re v	vehicle speed and	<=	186.45	mph		
							basic enable conditions met:	=	see sheet enable tables	-		
							and					

Component /	Fault	Monitor Strategy	Primary Malfunction		Thresho	old Value	Secondary Paramotors		Enable Conditions		Time Required	MIL
Jystem	Coue	Description	Gillena			Value	NO Pending or Confirmed DTCs:	=	see sheet inhibit tables	-	Required	inum.
Cylinder 8 Balance System	P0284	Detects if the injection system is at the control limits by monitoring the amount of fuel compensation (reduction) as determined by Fuel Balance Control (FBC)	fuel balance correction quantity	<	(a) * (b)	-	fuel balance control in closed loop (see closed loop conditions document for details)	=	TRUE	-	fail conditions exists for 10 s monitor runs with 0.01 s rate whenever enable conditions are met	В
			or				and					
			fuel balance correction quantity	>	(c) * (b)	-	current injection quantity	>	52	mm^3 /rev		
			with				current injection quantity	<	200	mm^3		
			(a) lower limitation (see Look-Up-Table #40)	=	-44 to 0	mm^3/re v	engine coolant temperature	>=	39.96	°C		
							ambient pressure	>=	0	kPa		
			and with				engine speed	>	590	rpm		
			(b) factor for correction quantity	=	0.99	factor	engine speed	<	1500	rpm		
			and with (c) upper limitation (see Look-Up-Table #41)	=	0 to 44	mm^3/re v	venicle speed and	<=	186.45	mpn		
							basic enable conditions met:	=	see sheet enable tables	-		
							and					

Component / System	Fault Code	Monitor Strategy Description	Primary Malfunction Criteria	Threshold Logic and Value	Secondary Parameters		Enable Conditions	;	Time Required	MIL Illum.
					NO Pending or Confirmed DTCs:	Ξ	see sheet inhibit tables	-		
CAC Efficiency Below Threshold	P026A	Detects insufficient charge-air cooler efficiency. The efficiency is calculated out of temperature upstream of the cooler, temperature downstream of the cooler and ambient temperature	filtered charge-air cooler efficiency	< 0.2000 -	vehicle speed and (air mass flow and air mass flow (see Look- Up-Table #15)) and (engine temperature and engine temperature and ((maximum value of (a) and (b)) the maximum value is then divided by (b)	> > - - - - - - - - - - - - - - - - - -	31.08 13.89 55.56 to 277.78 69.96 122.96 122.96	mph g/sec g/sec °C °C -	fail conditions exists for 30 s monitor runs once per driving cycle with 0.1 s rate whenever enable conditions are met	В

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Component / System	Fault Code	Monitor Strategy	Primary Malfunction Criteria	Threshold	Secondary Parameters		Enable Conditions		Time Required	MIL Illum
- Cyclom	0000	Doonpilon			(a) boost pressure downstream compressor	=	measured parameter]	-	Itoquilou	
					and with (b) ambient pressure	=	measured parameter]	-		
) and (
					control value of the throttle valve and	>=	-400	%		
					control value of the throttle valve	<=	5.004883	%		
					/ and diagnostic performed in	=	FALSE	-		
					(a) - (b)	>=	40	°C		
					(a) temperature after compressor	=	measured parameter	-		
					and with (b) ambient air temperature	=	measured parameter	-		
					and	>=	80 1	nm^3		
					and	. –		/rev		
					ambient pressure and	>	74.8	kPa		

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 basic enable conditions met:	> =	-7.04 see sheet enable tables	°C -		
					and NO Pending or Confirmed DTCs:	=	see sheet inhibit tables	-		
Intake Air Flow Valve Control Circuit	P02E0	Detects open circuit faults on the intake air flow valve control circuit.	The ECM detects that the commanded state of the driver and the actual state of the control circuit do not match.		(battery voltage for time and battery voltage for time) and starter is active cranking for time and Throttle Valve Actuator Solenoid Control Circuit and		11 3 655.34 3 FALSE 3 ACTIVE	V sec sec -	fail conditions exists for 5s monitor runs with 0.005 s rate whenever enable conditions are met	В

Component / System	Fault Code	Monitor Strategy Description	Primary Malfunction Criteria	Threshold Logic and Value	Secondary Parameters		Enable Conditions		Time Required	MIL Illum.
					basic enable conditions met:	=	see sheet enable tables	-		
					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		(fail conditions exists for 3 s monitor runs with 0.005 s rate	
			match.		battery voltage	>	11	V	conditions are met	
					time	>	3	sec		
					and battery voltage	<	655.34	V		
					for time	>	3	sec		
)					
					and starter is active cranking	=	FALSE			
					for					
					time and	>	3	sec		
					Throttle Valve Actuator Solenoid Control Circuit	=	ACTIVE	-		
					and					
					basic enable conditions met:	=	see sheet enable tables	-		
I		I	I							

Component / Faul System Cod	t 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	-		
		The ECM detects that the commanded state of the driver and the actual state of the control circuit do not match.		(battery voltage	>	11	V	fail conditions exists for 3 s monitor runs with 0.005 s rate whenever enable conditions are met	
				time and battery voltage	>	3 655.34	sec V		
				for time) and	>	3	sec		
				starter is active cranking for time	=	FALSE 3	sec		
				and Throttle Valve Actuator Solenoid Control Circuit and	=	ACTIVE	-		
				basic enable conditions met: and	=	see sheet enable tables	-		

Component / System	Fault Code	Monitor Strategy Description	Primary Malfunction Criteria	Threshold Logic and Value	Secondary Parameters		Enable Conditions		Time Required	MIL Illum.
					NO Pending or Confirmed DTCs:	=	see sheet inhibit tables	-		
Intake Air Flow Valve Control Circuit 1 Low Voltage	P02E2	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 battery voltage for time) and starter is active cranking for time and Throttle Valve Actuator Solenoid Control Circuit and basic enable conditions met: and NO Pending or Confirmed DTCs:		11 3 655.34 3 FALSE 3 ACTIVE see sheet enable tables see sheet inhibit tables	V sec - sec - -	fail conditions exists for 3 s monitor runs with 0.005 s rate whenever enable conditions are met	В

Component /	Fault	Monitor Strategy	Primary Malfunction	Threshold	Secondary		Enable		Time	MIL
System	Code	Description	Criteria	Logic and value	Farameters	_	Conditions		Required	mum.
Intake Air Flow Valve Control Circuit 1 High Voltage	P02E3	Electronic out-put driver circuitry determines circuit integrity on the intake	The ECM detects that the commanded state of the driver and the actual state of the control circuit do not match		(fail conditions exists for 3 s monitor runs with 0.005 s rate	В
					battery voltage for	>	11	V	conditions are met	
					time and	>	3	sec		
					battery voltage for	<	655.34	V		
					time)	>	3	sec		
					and starter is active cranking	=	FALSE	-		
					for time	>	3	sec		
					and Throttle Valve Actuator Solenoid Control Circuit	=	ACTIVE	-		
					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		Thresho Logic and	old Value	Secondary Parameters		Enable Conditions		Time Required	MIL Illum.
Diesel Intake Air Flow Position Sensor Circuit Range 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	<	10	%	throttle valve controller bypass is active and	=	FALSE	-	fail conditions exists for 0.010 s monitor runs with 0.005 s rate whenever enable conditions are met	В
			throttle valve control deviation calculated out of difference between desired and actual value	>	-10	%	throttle valve is driven to a mechanical stop	=	FALSE	-		
							Throttle Governor Active	=	TRUE	-		
							and Throttle Valve Permanent Control Deviation	=	FALSE	-		
							and throttle valve is detected as frozen	=	TRUE	-		
							means charge air cooler temperature and	<	198.96	°C		
							engine speed (see Look- Up-Table #87) and	>	600 to 850	rpm		
							basic enable conditions met:	=	see sheet enable tables	-		
							and NO Pending or Confirmed DTCs:	=	see sheet inhibit tables	-		

Component /	Fault	Monitor Strategy	Primary Malfunction		Thresho	ld	Secondary		Enable	Time	MIL
System	Code	Description	Criteria	L	ogic and V	/alue	Parameters		Conditions	Required	Illum.
Diesel Intake Air Flow Position Sensor Circuit High Voltage	P02E9	Detects high voltage readings on the throttle valve position sensor circuit, indicating an OOR high condition on the throttle valve position sensor circuit	measured throttle valve position value via sensor	>	94.99	%	ignition	=	on -	fail conditions exists for 5 s test performed continuously 0.005 s rate	A
							and basic enable conditions met:	=	see sheet - enable tables		
							and NO Pending or Confirmed DTCs:	=	see sheet - inhibit tables		
Diesel Intake Air Flow Position Sensor Circuit Low Voltage	P02E8	Detects low voltage readings on the throttle valve position sensor circuit, indicating an OOR low condition on the throttle valve position sensor circuit	measured throttle valve position value via sensor	<	5.01	%	ignition and basic enable conditions met: and	=	on - see sheet - enable tables	fail conditions exists for 5 s test performed continuously 0.005 s rate	A

Component / System	Fault Code	Monitor Strategy	Primary Malfunction Criteria	Threshold	Secondary Parameters		Enable Conditions		Time Required	MIL Illum.
eyoto		Decomption			NO Pending or Confirmed DTCs:	=	see sheet inhibit tables	-		
Intake Air Flow Valve Control Motor Current Performance	P02EB	Electronic out-put driver circuitry determines circuit integrity on the intake air flow valve.	The ECM detects that the commanded state of the driver and the actual state of the control circuit do not match.		(battery voltage for time and battery voltage for time) and starter is active cranking for time and Throttle Valve Actuator Solenoid Control Circuit and basic enable conditions met:		11 3 655.34 3 FALSE 3 ACTIVE see sheet enable tables	V sec - sec -	fail conditions exists for 2 s monitor runs with 0.005 s rate whenever enable conditions are met	В

Component /	Fault Code	Monitor Strategy	Primary Malfunction		Thresho	old Value	Secondary Parameters		Enable		Time Required	MIL
Engine Misfire	D0300	Indicates engine has	angular acceleration of the			value	r al allielei S		Conditions		fail conditions	B
Detected	F 0300	experienced more than one cylinder misfiring	crankshaft		-1.5999	-					exists for 0.02 s monitor runs with 0.02 s rate	В
			and				Engine Running (see parameter definition)	=	TRUE	-	whenever enable conditions are	
			evaluated crankshaft revolutions	>=	(a) * (b)	-	and				met	
			with				engine speed	>	400	rpm		
			(a) number of crankshaft revolutions per block	=	20	revs	and					
			and with				engine speed	<	1300	rpm		
			(b) number of test blocks	=	20	counts)					
			and				and					
			misfires exist on more than one cylinder	=	TRUE	-	(a) - (b)	<	200	rpm		
							with					
							(a) actual desired idle speed	=	calculated parameter	-		
							and with					
							(b) engine speed	=	measured parameter	-		
							and					
							current injection quantity	>	20	mm^3 /rev		
							and					
							current injection quantity	<	400	mm^3 /rev		
							and					
							engine coolant temperature and	>=	39.96	°C		

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Component /	Fault	Monitor Strategy	Primary Malfunction	Threshold	Secondary		Enable		Time	MIL
System	Code	Description	Criteria	Logic and Value	Parameters		Conditions		Required	Illum.
					vehicle speed	<=	1.86	mph		
					and					
					time since start	>=	10	sec		
					and					
					deletion of error memory	=	TRUF	_		
					(Mode\$4) not executed		INCL			
					since last check of the					
					monitoring conditions					
					and					
					adaptation value for tooth	=	TRUE	-		
					wheel has been learned					
					and					
					number of detected	>	140	count		
					mistires			s		
					basic enable conditions	=	see sneet	-		
					met.		tables			
							labico			
					and					
					NO Pending or	=	see sheet	-		
					Confirmed DTCs:		inhibit			
							tables			

Component / System	Fault Code	Monitor Strategy Description	Primary Malfunction Criteria		Thresho Logic and	old Value	Secondary Parameters		Enable Conditions		Time Required	MIL Illum.
Cylinder 1 Misfire Detected	P0301	Detects cylinder misfire. The minimum average angle acceleration is calculated every 2 rotations and represents the average angle acceleration that all cylinders are rotating at after a combustion event.	angular acceleration of the crankshaft	<	-1.3999	-	(fail conditions exists for 0.02 s monitor runs with 0.02 s rate whenever enable conditions are met	В
			and evaluated crankshaft	>=	(a) * (b)	_	Engine Running (see parameter definition) and	=	TRUE	-		
			revolutions with				engine speed	>	400	rnm		
			(a) number of crankshaft revolutions per block	=	20	revs	and		100	.b		
			and with				engine speed	<	1300	rpm		
			(b) number of test blocks	=	20	counts)					
							and					
							(a) - (b) with	<	200	rpm		
							(a) actual desired idle speed	=	calculated parameter	-		
							and with (b) engine speed	=	measured parameter	-		
							and (
							current injection quantity and	>	20	mm^3 /rev		
			001110				- (404		4.0		FOTIONO	

Component /	Fault	Monitor Strategy	Primary Malfunction	Threshold	Secondary		Enable		Time	MIL
System	Code	Description	Criteria	Logic and Value	Parameters		Conditions	;	Required	Illum.
					current injection quantity	<	400	mm^3 /rev		
					, and					
					engine coolant	>=	39.96	°C		
					temperature		00.00	Ŭ		
					and					
					vehicle speed	<=	1.86	mph		
		Calculates angle acceleration after an injection event for the			and					
		cylinder under test and compares it to the minimum threshold.								
					time since start	>=	10	sec		
					and					
					deletion of error memory (Mode\$4) not executed since last check of the monitoring conditions	=	TRUE	-		
					and					
					adaptation value for tooth wheel has been learned	=	TRUE	-		
					and					
					number of detected misfires and	>	140	count s		
					basic enable conditions	=	see sheet	-		
					met:		enable tables			
					and					
					NO Pending or Confirmed DTCs:	=	see sheet inhibit tables	-		

COMMON SECTION 1 OF 3 SECTIONS

Component / System	Fault Code	Monitor Strategy Description	Primary Malfunction Criteria		Thresho Logic and V	old Value	Secondary Parameters		Enable Conditions		Time Required	MIL Illum.
Cylinder 2 Misfire Detected	P0302	Detects cylinder misfire. The minimum average angle acceleration is calculated every 2 rotations and represents the average angle acceleration that all cylinders are rotating at after a combustion event.	angular acceleration of the crankshaft	v	-1.3999	-	(fail conditions exists for 0.02 s monitor runs with 0.02 s rate whenever enable conditions are met	В
			and				Engine Running (see parameter definition)	=	TRUE	-		
			evaluated crankshaft revolutions with	>=	(a) * (b)	-	and		400	rom		
			(a) number of crankshaft revolutions per block	=	20	revs	and	-	400	ipin		
			and with (b) number of test blocks	=	20	counts	engine speed)	<	1300	rpm		
							and					
							(a) - (b) with	<	200	rpm		
							(a) actual desired idle speed	=	calculated parameter	-		
							and with					
							(b) engine speed	=	measured parameter	-		
							and (
							current injection quantity	>	20	mm^3 /rev		
			СОММО	N SE	CTION P	age 64	of 491		1 0	F 3 S	ECTIONS	

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Component / Fa	⁻ ault Code	Monitor Strategy Description	Primary Malfunction Criteria	Threshold Logic and Value	Secondary Parameters		Enable Conditions	i	Time Required	MIL Illum.
					and current injection quantity)	<	400	mm^3 /rev		
					and engine coolant temperature	>=	39.96	°C		
		Calculates angle acceleration after an			vehicle speed and	<=	1.86	mph		
		injection event for the cylinder under test and compares it to the minimum threshold.								
					time since start and	>=	10	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 number of detected misfires and	>	140	count s		
					basic enable conditions met:	=	see sheet enable tables	-		
					and NO Pending or Confirmed DTCs:	=	see sheet inhibit tables	-		

COMMON SECTION 1 OF 3 SECTIONS

Component / System	Fault Code	Monitor Strategy Description	Primary Malfunction Criteria	I	Thresho ogic and	ld /alue	Secondary Parameters		Enable Conditions		Time Required	MIL Illum.
Cylinder 7 Misfire Detected	P0307	Detects cylinder misfire. The minimum average angle acceleration is calculated every 2 rotations and represents the average angle acceleration that all cylinders are rotating at after a combustion event.	angular acceleration of the crankshaft	v	-1.3999	-	(fail conditions exists for 0.02 s monitor runs with 0.02 s rate whenever enable conditions are met	В
			and				Engine Running (see parameter definition)	=	TRUE	-		
			evaluated crankshaft revolutions with	>=	(a) * (b)	-	and		400	rom		
			(a) number of crankshaft revolutions per block	=	20	revs	and	-	400	ipin		
			and with (b) number of test blocks	=	20	counts	engine speed)	<	1300	rpm		
							and					
							(a) - (b) with	<	200	rpm		
							(a) actual desired idle speed	=	calculated parameter	-		
							and with					
							(b) engine speed	=	measured parameter	-		
							and (
							current injection quantity	>	20	mm^3 /rev		
			СОММО	N SE	CTION P	age 66 (of 491		1 0	F 3 S	ECTIONS	

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Component / Fa	⁻ ault Code	Monitor Strategy Description	Primary Malfunction Criteria	Threshold Logic and Value	Secondary Parameters		Enable Conditions	i	Time Required	MIL Illum.
					and current injection quantity)	<	400	mm^3 /rev		
					and engine coolant temperature	>=	39.96	°C		
		Calculates angle acceleration after an			vehicle speed and	<=	1.86	mph		
		injection event for the cylinder under test and compares it to the minimum threshold.								
					time since start and	>=	10	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 number of detected misfires and	>	140	count s		
					basic enable conditions met:	=	see sheet enable tables	-		
					and NO Pending or Confirmed DTCs:	=	see sheet inhibit tables	-		

COMMON SECTION 1 OF 3 SECTIONS

Component / System	Fault Code	Monitor Strategy Description	Primary Malfunction Criteria		Thresho Logic and V	old Value	Secondary Parameters		Enable Conditions		Time Required	MIL Illum.
Cylinder 8 Misfire Detected	P0308	Detects cylinder misfire. The minimum average angle acceleration is calculated every 2 rotations and represents the average angle acceleration that all cylinders are rotating at after a combustion event.	angular acceleration of the crankshaft	v	-1.3999	-	(fail conditions exists for 0.02 s monitor runs with 0.02 s rate whenever enable conditions are met	В
			and				Engine Running (see parameter definition)	=	TRUE	-		
			evaluated crankshaft revolutions with	>=	(a) * (b)	-	and		400	rom		
			(a) number of crankshaft revolutions per block	=	20	revs	and	-	400	ipin		
			and with (b) number of test blocks	=	20	counts	engine speed)	<	1300	rpm		
							and					
							(a) - (b) with	<	200	rpm		
							(a) actual desired idle speed	=	calculated parameter	-		
							and with					
							(b) engine speed	=	measured parameter	-		
							and (
							current injection quantity	>	20	mm^3 /rev		
			СОММО	N SE	CTION P	age 68	of 491		1 0	F 3 S	ECTIONS	

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Component / System	Fault Code	Monitor Strategy Description	Primary Malfunction Criteria	Threshold Logic and Value	Secondary Parameters		Enable Conditions	;	Time Required	MIL Illum.
					and current injection quantity)	<	400	mm^3 /rev		
					and engine coolant temperature and	>=	39.96	°C		
		Calculates angle acceleration after an injection event for the cylinder under test and compares it to the			vehicle speed and	<=	1.86	mph		
		minimum meshold.			time since start and	>=	10	sec		
					(Mode\$4) not error memory (Mode\$4) not executed since last check of the monitoring conditions	=	TRUE	-		
					and adaptation value for tooth wheel has been learned	=	TRUE	-		
					and number of detected misfires and	>	140	count s		
					basic enable conditions met:	=	see sheet enable tables	-		
					and NO Pending or Confirmed DTCs:	=	see sheet inhibit tables	-		

COMMON SECTION 1 OF 3 SECTIONS

Component / System	Fault Code	Monitor Strategy Description	Primary Malfunction Criteria	I	Thresho ogic and	ld /alue	Secondary Parameters		Enable Conditions		Time Required	MIL Illum.
Cylinder 4 Misfire Detected	P0304	Detects cylinder misfire. The minimum average angle acceleration is calculated every 2 rotations and represents the average angle acceleration that all cylinders are rotating at after a combustion event.	angular acceleration of the crankshaft	<	-1.3999	-	(fail conditions exists for 0.02 s monitor runs with 0.02 s rate whenever enable conditions are met	В
			and				Engine Running (see parameter definition)	=	TRUE	-		
			evaluated crankshaft revolutions with	>=	(a) * (b)	-	and	>	400	rom		
			(a) number of crankshaft revolutions per block	=	20	revs	and	-	400	ipin		
			and with (b) number of test blocks	=	20	counts	engine speed)	<	1300	rpm		
							and					
							(a) - (b) with	<	200	rpm		
							(a) actual desired idle speed	=	calculated parameter	-		
							and with					
							(b) engine speed	=	measured parameter	-		
							and (
							current injection quantity	>	20	mm^3 /rev		
			СОММО	N SE	CTION P	age 70	of 491		1 0	F 3 S	ECTIONS	

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Component / System	Fault Code	Monitor Strategy Description	Primary Malfunction Criteria	Threshold Logic and Value	Secondary Parameters		Enable Conditions		Time Required	MIL Illum.
e jotom		Docomption	entona		and	-		-	Roquirou	
					current injection quantity	<	400	mm^3 /rev		
					and					
					engine coolant temperature and	>=	39.96	°C		
					vehicle speed	<=	1.86	mph		
		Calculates angle acceleration after an injection event for the cylinder under test and compares it to the minimum threshold.			and					
					time since start	>=	10	sec		
					and deletion of error memory (Mode\$4) not executed since last check of the monitoring conditions	=	TRUE	-		
					and adaptation value for tooth wheel has been learned	=	TRUE	-		
					number of detected misfires and	>	140	count s		
					basic enable conditions met:	=	see sheet enable tables	-		
					and NO Pending or Confirmed DTCs:	=	see sheet inhibit tables	-		

COMMON SECTION 1 OF 3 SECTIONS

Component / System	Fault Code	Monitor Strategy Description	Primary Malfunction Criteria	I	Thresho ogic and	ld /alue	Secondary Parameters		Enable Conditions		Time Required	MIL Illum.
Cylinder 5 Misfire Detected	P0305	Detects cylinder misfire. The minimum average angle acceleration is calculated every 2 rotations and represents the average angle acceleration that all cylinders are rotating at after a combustion event.	angular acceleration of the crankshaft	v	-1.3999	-	(fail conditions exists for 0.02 s monitor runs with 0.02 s rate whenever enable conditions are met	В
			and		/ · · + // ·		Engine Running (see parameter definition)	=	TRUE	-		
			evaluated crankshaft revolutions with	>=	(a) * (b)	-	and	>	400	rom		
			(a) number of crankshaft revolutions per block	=	20	revs	and	-	400	ipin		
			and with (b) number of test blocks	=	20	counts	engine speed)	<	1300	rpm		
							and					
							(a) - (b) with	<	200	rpm		
							(a) actual desired idle speed	=	calculated parameter	-		
							and with					
							(b) engine speed	=	measured parameter	-		
							and (
							current injection quantity	>	20	mm^3 /rev		
			СОММО	N SE	CTION P	age 72	of 491		1 0	F 3 S	ECTIONS	

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Component / System	Fault Code	Monitor Strategy Description	Primary Malfunction Criteria	Threshold Logic and Value	Secondary Parameters		Enable Conditions		Time Required	MIL Illum.
					and current injection quantity)	<	400	mm^3 /rev		
					and engine coolant temperature	>=	39.96	°C		
		Calculates angle			vehicle speed and	<=	1.86	mph		
		injection event for the cylinder under test and compares it to the minimum threshold.								
					time since start	>=	10	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 number of detected misfires and	>	140	count s		
					basic enable conditions met:	=	see sheet enable tables	-		
					and NO Pending or Confirmed DTCs:	=	see sheet inhibit tables	-		

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Component / System	Fault Code	Monitor Strategy Description	Primary Malfunction Criteria	Threshold Logic and Value		old Value	Secondary Enable Parameters Conditions		Time Required	MIL Illum.		
Cylinder 6 Misfire Detected	P0306	Detects cylinder misfire. The minimum average angle acceleration is calculated every 2 rotations and represents the average angle acceleration that all cylinders are rotating at after a combustion event.	angular acceleration of the crankshaft	v	-1.3999	-	(fail conditions exists for 0.02 s monitor runs with 0.02 s rate whenever enable conditions are met	В
			and				Engine Running (see parameter definition)	=	TRUE	-		
			evaluated crankshaft revolutions with	>=	(a) * (b)	-	and	>	400	rom		
			(a) number of crankshaft revolutions per block	=	20	revs	and	-	400	ipin		
			and with (b) number of test blocks	=	20	counts	engine speed)	<	1300	rpm		
							and					
							(a) - (b) with	<	200	rpm		
							(a) actual desired idle speed	=	calculated parameter	-		
							and with					
							(b) engine speed	=	measured parameter	-		
							and (
							current injection quantity	>	20	mm^3 /rev		
			СОММО	N SE	CTION F	age 74	of 491		1 0	F 3 S	ECTIONS	

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Component / System	Fault Code	Monitor Strategy Description	Primary Malfunction Criteria	Threshold Logic and Value	Secondary Parameters		Enable Conditions		Time Required	MIL Illum.
					and current injection quantity)	<	400	mm^3 /rev		
					and engine coolant temperature and	>=	39.96	°C		
		Calculates angle acceleration after an			vehicle speed and	<=	1.86	mph		
		injection event for the cylinder under test and compares it to the minimum threshold.								
					time since start and	>=	10	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 number of detected misfires and	>	140	count s		
					basic enable conditions met:	=	see sheet enable tables	-		
					and NO Pending or Confirmed DTCs:	=	see sheet inhibit tables	-		

COMMON SECTION 1 OF 3 SECTIONS

Component / System	Fault Code	Monitor Strategy Description	Primary Malfunction Criteria	Threshold Logic and Value		ld /alue	Secondary Enable Parameters Conditions		Time Required	MIL Illum.		
Cylinder 3 Misfire Detected	P0303	Detects cylinder misfire. The minimum average angle acceleration is calculated every 2 rotations and represents the average angle acceleration that all cylinders are rotating at after a combustion event.	angular acceleration of the crankshaft	v	-1.3999	-	(fail conditions exists for 0.02 s monitor runs with 0.02 s rate whenever enable conditions are met	В
			and				Engine Running (see parameter definition)	=	TRUE	-		
			evaluated crankshaft revolutions with	>=	(a) * (b)	-	and		400	rom		
			(a) number of crankshaft revolutions per block	=	20	revs	and	-	400	ipin		
			and with (b) number of test blocks	=	20	counts	engine speed)	<	1300	rpm		
							and					
							(a) - (b) with	<	200	rpm		
							(a) actual desired idle speed	=	calculated parameter	-		
							and with					
							(b) engine speed	=	measured parameter	-		
							and (
							current injection quantity	>	20	mm^3 /rev		
			СОММО	N SE	CTION P	age 76	of 491		1 0	F 3 S	ECTIONS	

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Component / System	Fault Code	Monitor Strategy Description	Primary Malfunction Criteria	Threshold Logic and Value	Secondary Parameters		Enable Conditions		Time Required	MIL Illum.
					and current injection quantity)	<	400	mm^3 /rev		
					and engine coolant temperature	>=	39.96	°C		
		Calculates angle			vehicle speed and	<=	1.86	mph		
		injection event for the cylinder under test and compares it to the minimum threshold.								
					time since start	>=	10	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 number of detected misfires and	>	140	count s		
					basic enable conditions met:	=	see sheet enable tables	-		
					and NO Pending or Confirmed DTCs:	=	see sheet inhibit tables	-		

System	Fault Code	Monitor Strategy Description	Primary Malfunction Criteria	L	Thresho ogic and N	ld /alue	Secondary Parameters		Enable Conditions		Time Required	MIL Illum.
Crankshaft Position F System Variation Not Learned	P0315	Wheel Learn - Fuel Balance System - Tooth Wheel Variation and Crankshaft Dynamics not learned quickly enough	fuel balance wheel learn complete	=	FALSE	-	fuel system is in fuel cut off	=	TRUE	-	fail conditions exists for 5000 s cumulative time monitor runs with 1 s rate whenever enable conditions are met	В
		Path 1: Low Speed Learn Range or Path 2:					engine speed engine speed engine speed	> < >=	900 1450 1450	rpm rpm rpm		
		Mid Speed Learn Range					engine speed NO Pending or Confirmed DTCs:	=	1900 see sheet inhibit tables	rpm -		
Crankshaft Position [CKP] Sensor Circuit	P0335	Detects crankshaft sensor circuit failure by monitoring for valid signals from CKP sensor while CMP sensor is also sending valid signals	ECM has detected reference mark on the crankshaft and number of detected camshaft rotations	= >=	FALSE 6	counts	set condition ((engine speed	>=	400	rpm	fail conditions exists for more than 6 events monitor runs with 0.1 s rate whenever enable conditions are met	A

COMMON SECTION 1 OF 3 SECTIONS

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System Code Description Criteria Logic and Value Parameters Contitionization science A Image: Second Content and	Component /	Fault	Monitor Strategy	Primary Malfunction	Threshold	Secondary Enable			Time	MIL	
synchronization = TRUE completed or starter is active cranking = TRUE completed or starter is active cranking = TRUE TRUE completed or starter is active cranking = TRUE TRUE completed or starter is active cranking = TRUE completed or vehicle speed er and and basic enable condition (engine speed met tables completed or starter is active cranking = FALSE completed	System	Code	Description	Criteria	Logic and Value	Parameters		Conditions		Required	Illum.
starter is active cranking = TRUE and vehicle speed = 0 mph or vehicle speed > 16 mph and engine speed >= 200 mm basic enable conditions engine speed >= 200 mm and basic enable conditions engine speed < 200 mm and starter is active cranking = FALSE - and basic enable conditions engine speed < 200 mm and starter is active cranking = FALSE - and basic enable conditions engine speed - enable tables						synchronization completed	=	TRUE			
<pre>interview of the state of states is active states is a state of states is active states is a state of states is a states is a state of states is a state of states is a state of states is a state of states is a state of states is a states is a states is a states is a stat</pre>						or or	=	TRUE			
Image: section of the section of th)		into L			
vehicle speed > 0 mph vehicle speed > 16 mph and - 200 rpm and - - - and - - - basic enable conditions = see sheet - engine speed - - - and not - - - and not - - - reset condition - - - and not - - - and - - - basic enable condition =						and (
<pre>vehicle speed > 16 mph and engine speed >= 200 rpm) and basic enable conditions rest condition (</pre>						vehicle speed or	=	0	mph		
and engine speed basic enable conditions met:						vehicle speed	>	16	mph		
) and basic enable conditions met: and not reset condition (engine speed and starter is active cranking starter is active cranking basic enable conditions = FALSE -) and basic enable conditions = see sheet - enable tables						engine speed	>=	200	rpm		
basic enable conditions met: and not reset condition (engine speed and starter is active cranking = FALSE -) and basic enable conditions = see sheet - enable and = FALSE - = enable tables) and					
and not and not reset condition (() engine speed and and starter is active cranking = pand and basic enable conditions = tables -						basic enable conditions met:	=	see sheet enable tables	-		
(engine speed and starter is active cranking) and basic enable conditions met: enable tables						and not reset condition					
starter is active cranking = FALSE -) and basic enable conditions met: reality real						(engine speed	<	200	rpm		
) and basic enable conditions = see sheet - met: enable tables						starter is active cranking	=	FALSE	-		
basic enable conditions = see sheet - met: enable tables) and					
						basic enable conditions met:	=	see sheet enable tables	-		

Component / System	Fault Code	Monitor Strategy Description	Primary Malfunction Criteria	Threshold Logic and Value		Secondary Parameters	Enable Conditions		Time Required	MIL Illum.		
Crankshaft Position Sensor Performance	P0336	Detects implausible crankshaft sensor operation by detecting incorrect crank sensor signal patterns.	number of disturbances in crankshaft signal crankshaft signal disturbance detected under the following conditions:	>=	10	counts	Engine Running (see parameter definition) and	=	TRUE	-	fail conditions exists for 0.1 s monitor runs with 0.1 s rate whenever enable conditions are met	В
			Current tooth time period	>	166667	us	basic enable conditions met:	=	see sheet enable tables	-		
			or Crankshaft tooth counts between detected gaps or	>	68	counts						
			If gap not expected, ratio of current tooth time to previous tooth time (see Look-Up-Table #20) or	>	1.5 to 2	ratio						
			If gap expected, ratio of current tooth time to previous tooth time (see Look-Up-Table #19)	>	3.375 to 8	ratio						
Camshaft Position [CMP] Sensor Performance	P0341	Detects implausible camshaft sensor operation by detecting incorrect cam sensor patterns	number of camshaft edges	>	4	edges	ECM has detected reference mark on the crankshaft	=	TRUE	-	fail conditions exists for more than 6 events test performed continuously 0.01 s rate	В
							and basic enable conditions met:	=	see sheet enable tables	-		

Component / System	Fault Code	Monitor Strategy Description	Primary Malfunction Criteria	n Threshold Logic and Value		Secondary Parameters	Enable Conditions			Time Required	MIL Illum.
Camshaft Position [CMP] Sensor Circuit	P0340	Detects camshaft sensor circuit failure by monitoring for valid signals from CMP sensor while CKP sensor is also sending valid signals	number of crankshaft revolutions during missed camshaft signal	>= 4	revs	ECM has detected reference mark on the crankshaft	Ξ	TRUE	-	fail conditions exists for 0.01 s test performed continuously 0.01 s rate	A
						and basic enable conditions met:	=	see sheet enable tables	_		
Wait to Start (WTS) Lamp Control Circuit	P0381	This diagnostic checks the circuit for electrical integrity during operation.	The ECM detects that the commanded state of the driver and the actual state of the control circuit do not match.			lamp is commanded on and	=	TRUE	-	fail conditions exists for 3 s monitor runs with 0.01 s rate whenever enable conditions are met	В
						battery voltage	>	11	V		
						for time	>	3	sec		
) and					
						battery voltage	<	655.34	V		
						time)	>	3	sec		
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Component / System	Fault Code	Monitor Strategy Description	Primary Malfunction Criteria	Threshold Logic and Value	Secondary Parameters		Enable Conditions		Time Required	MIL Illum.
					basic enable conditions met:	=	see sheet enable tables	-		
			The ECM detects that the commanded state of the driver and the actual state of the control circuit do not match.		lamp is commanded off and	=	TRUE	-	fail conditions exists for 1.0 s monitor runs with 0.01 s rate whenever enable conditions are met	
					battery voltage	>	11	V		
					for time	>	3	sec		
) and (
					battery voltage	<	655.34	V		
					for time)	>	3	sec		
					and basic enable conditions met:	=	see sheet enable tables	-		
			The ECM detects that the commanded state of the driver and the actual state of the control circuit do not match.		circuit active at low current and (=	TRUE		fail conditions exists for 0.2 s monitor runs with 0.01 s rate whenever enable conditions are met	
					battery voltage	>	11	V		

Component / System	Fault Code	Monitor Strategy Description	Primary Malfunction Criteria	Lo	Thresho gic and	old Value	Secondary Parameters		Enable Conditions		Time Required	MIL Illum.
							for time) and (battery voltage for time) and basic enable conditions met:	> <	3 655.34 3 see sheet enable tables	sec V sec		
Exhaust Gas Recirculation (EGR) Flow Excessive	P0400	Detects excessive EGR flow. Actual MAF readings are compared to desired MAF values as an indication of how much EGR is flowing.	controller deviation of the air mass = actual minus desired value	>	2	g/rev	(EGR controller is active and VGT offset learning is active and NO Pending or Confirmed DTCs:)	=	TRUE FALSE see sheet inhibit tables	-	fail conditions exists for 15 s monitor runs 0.02 s rate whenever enable conditions are met	A

Component / System	Fault Code	Monitor Strategy Description	Primary Malfunction Criteria	Threshold Logic and Value		ld /alue	Secondary Enable Parameters Conditions		Time Required	MIL Illum.		
Exhaust Gas Recirculation (EGR) Flow Insufficient	P0401	Detects insufficient EGR flow. Actual MAF readings are compared to desired MAF values as an indication of how much EGR is flowing.	controller deviation of the exhaust gas recirculation (EGR) - calculated out of desired and actual value	>	(a)*(b)		(fail conditions exists for 10 s monitor runs 0.02 s rate whenever enable conditions are met	В
			with				EGR controller is active	=	TRUE	-		
			(a) Minimum Controller Deviation	=	-0.7	g/rev	and					
			(b) Environmental Pressure correction factor (see Look-Up-Table #11)	=	0.6 to 1	factor	(
							change of injection quantity between actual and last received value	<	80.00	(mm^ 3/rev)/ sec		
							with					
							low-pass filter time) and (=	0.25	sec		
							change of engine speed between actual and last received value	<	75	rpm/s ec		
							with					
							low-pass filter time) and	=	1.00	Sec		
							VGT offset learning is active	= F	FALSE			
							maximum setpoint for air- mass flow and	>	1000	mm^3 /rev		

Component /	Fault	Monitor Strategy	Primary Malfunction	Threshold	Secondary	Enable			Time	MIL
System	Code	Description	Criteria	Logic and Value	Parameters		Conditions		Required	Illum.
					Engine speed	<=	950	rpm		
					and	1				
					Engine speed	>=	575	rpm		
					and					
					Torque generating	<=	72	mm^3		
					engine fuel injection			/rev		
					quantity					
					and		00			
					I orque generating	>=	20	/rev		
					quantity			//01		
					and	1				
					setpoint valve position of	>	5.00	%		
					exhaust-gas recirculation	1				
					and	1				
					and	1				
					throttle position	-	5	0/2		
					and		5	70		
					basic onable conditions	-	soo shoot			
					met:	-	enable	-		
						1	tables			
						1				
					and	1				
					NO Pending or	=	see sheet	-		
					Commed DTCs.	1	tables			
)	I				
					for	I				
					for time	>=	3	sec		
						I				
						L				

Component / System	Fault Code	Monitor Strategy Description	Primary Malfunction Criteria		Thresho Logic and V	ld /alue	Secondary Parameters	C	Enable Conditions	6	Time Required	MIL Illum.
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 8 s monitor runs 0.02 s rate whenever enable conditions are met	В
			with				EGR controller is active	=	TRUE	-		
			(a) Maximum Controller Deviation (see Look-Up- Table #13)	=	0.4 to 1.2	g/rev	and					
			(b) Environmental Pressure correction factor (see Look-Up-Table #10)	=	1 to 2	factor	(
							change of injection quantity between actual and last received value	<	80.00	(mm^ 3/rev)/ sec		
							with					
							low-pass filter time) and	=	0.25	Sec		
							change of engine speed between actual and last received value	<	75	rpm/s ec		
							with					
							low-pass filter time) and	=	1.00	sec		
							VGT offset learning is active	=	FALSE	-		
							maximum setpoint for air- mass flow	<	960	mm^3 /rev		

Component / System	Fault Code	Monitor Strategy Description	Primary Malfunction Criteria	Threshold Logic and Value	Secondary Parameters		Enable Conditions		Time Required	MIL Illum.
					and Engine speed and	<=	1700	rpm		
					Engine speed and	>=	1150	rpm		
					Torque generating engine fuel injection quantity and	<=	480	mm^3 /rev		
					Torque generating engine fuel injection quantity and	>=	160	mm^3 /rev		
					basic enable conditions met:	=	see sheet enable tables	-		
					and NO Pending or Confirmed DTCs:	=	see sheet inhibit tables	-		
) for for time	>=	1.5	sec		
Exhaust Gas Recirculation (EGR) Motor Control Circuit	P0403	Electronic out-put driver circuitry determines circuit integrity on the EGR solenoid.	The ECM detects that the commanded state of the driver and the actual state of the control circuit do not match.		EGR Solenoid Control Circuit	=	ACTIVE	-	fail conditions exists for 5 s monitor runs with 0.005 s rate whenever enable conditions are	В
					offset learning for EGR valve is completed and	=	TRUE	-	met	
			COMMO		engine pre drive	=	FALSE	-	ECTIONS	
			1 431		T C	1239	ECHON3			

Component / System	Fault Code	Monitor Strategy Description	Primary Malfunction Criteria	Threshold Logic and Value	Secondary Parameters		Enable Conditions		Time Required	MIL Illum.
		Decemption			for			_	itoquirou	
					time	>	1	sec		
					and					
					(
					battery voltage	>	11	V		
					for					
					time	>	3	sec		
					and					
					battery voltage	<	655.34	V		
					for					
					time	>	3	sec		
)					
					and					
					starter is active cranking	=	FALSE	-		
					for					
					time	>	3	sec		
					and					
					basic enable conditions	=	see sheet	-		
					met.		tables			
					and					
					NO Pending or	=	see sheet	-		
					Confirmed DTCs:		inhibit tables			
							tables			
			The ECM detects that the		EGR Solenoid Control	=	ACTIVE		fail conditions	
			commanded state of the		Circuit				exists for 3 s	
			of the control circuit do not						0.005 s rate	
			match.						whenever enable	
					and				conditions are	
					(met	

Component / System	Fault Code	Monitor Strategy Description	Primary Malfunction Criteria	Lo	Threshold ogic and Va	lue	Secondary Parameters		Enable Conditions		Time Required	MIL Illum.
							battery voltage for time and battery voltage for time) and	> < >	11 3 655.34 3 EALSE	V sec V sec		
							for time and basic enable conditions met:	>	3 see sheet enable tables	sec -		
Exhaust Gas Recirculation (EGR) Position Sensor Circuit Low Voltage	P0405	Detects low voltage readings on the EGR position circuit, indicating an OOR low condition on the EGR position circuit	raw voltage of EGR actuator position sensor same as EGR actuator position	<	0.25	V %	ignition on and basic enable conditions met: and NO Pending or Confirmed DTCs:	=	TRUE see sheet enable tables see sheet inhibit tables	-	fail conditions exists for 5 s test performed continuously 0.005 s rate	A

Component /	Fault	Monitor Strategy	Primary Malfunction		Thresho	old	Secondary		Enable		Time	MIL
System	Code	Description	Criteria	L	ogic and	Value	Parameters		Conditions		Required	Illum.
Exhaust Gas Recirculation (EGR) Position Sensor Circuit High Voltage	P0406	Detects high voltage readings on the EGR position circuit, indicating an OOR high condition on the EGR position circuit	raw voltage of EGR actuator position sensor	>	4.8	V	ignition on	=	TRUE	-	fail conditions exists for 5 s test performed continuously 0.005 s rate	A
			same as EGR actuator position	>	127	%	and basic enable conditions met: and NO Pending or Confirmed DTCs:	=	see sheet enable tables see sheet inhibit tables	-		
Exhaust Gas Recirculation (EGR) Temperature Sensor 1 Circuit High Voltage	P040D	Detects high voltage readings on the EGR temperature cooler circuit, indicating an OOR high condition on the EGR cooler temperature 1 circuit	EGR temperature sensor 2 voltage	>	4.838	V	(fail conditions exists for 5 s monitor runs 0.05 s rate whenever enable conditions are met	В
			same as EGR sensor 2 temperature	<	-50	°C	time since engine start and engine coolant temperature and ambient temperature	>	0 -60.04 -60.04	sec °C °C		

Component / System	Fault Code	Monitor Strategy Description	Primary Malfunction Criteria	Threshold Logic and Value	Secondary Parameters		Enable Conditions		Time Required	MIL Illum.
		· · · · ·			and				· · · · ·	
					ambient pressure	>	20	kPa		
					and					
					(
					setpoint valve position of	>	-100	%		
					exhaust-gas recirculation					
					and					
					setpoint valve position of	<	200	%		
					exhaust-gas recirculation					
)					
					and					
					Engine Running (see	=	TRUE	-		
					parameter definition)					
					current injection quantity	>	0	mm^3		
					current injection quantity	-	0	/rev		
					and					
					(
					valve position of EGR	>	-100	%		
					and					
					valve position of EGR	<	200	%		
					cooler bypass					
)					
) for					
					time	>	0	sec		
					and					
					basic enable conditions	=	see sheet	-		
					met:		enable			
							tables			
					and					
					NO Pending or	=	see sheet	-		
					Confirmed DTCs:		inhibit tablaa			
							เฉมเธร			

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Component / System	Fault Code	Monitor Strategy Description	Primary Malfunction Criteria	Threshold Logic and Value		old Value	Secondary Parameters		Enable Conditions		Time Required	MIL Illum.
Exhaust Gas Recirculation (EGR) Temperature Sensor 1 Circuit Low Voltage	P040C	Detects low voltage readings on the EGR cooler temperature circuit, indicating an OOR low condition on the EGR cooler temperature 1 circuit	EGR temperature sensor 2 voltage	V	0.4642	V	(fail conditions exists for 5 s monitor runs 0.05 s rate whenever enable conditions are met	В
			same as				time since engine start	>	0	sec		
			EGR sensor 2 temperature	>	220	°C	and					
							engine coolant temperature and	<	199.96	°C		
							ambient temperature and	>	-60.04	°C		
						ambient pressure and	>	20	kPa			
							(setpoint valve position of exhaust-gas recirculation	>	-100	%		
							and setpoint valve position of exhaust-gas recirculation	<	200	%		
) and					
							Engine Running (see parameter definition) and (=	TRUE	-		
							valve position of EGR cooler bypass and	>	-100	%		
							valve position of EGR cooler bypass	<	200	%		
-	-	-			OTIONI		- (101					-

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Component / System	Fault Code	Monitor Strategy Description	Primary Malfunction Criteria		Threshold Logic and Va	lue	Secondary Parameters		Enable Conditions		Time Required	MIL Illum.
)) for time and basic enable conditions met: and NO Pending or Confirmed DTCs:	> =	0 see sheet enable tables see sheet inhibit tables	sec -		
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 #6) with (a) captured EGR sensor 2 temperature at start and with	> =	100 to 999 measured parameter	°C -	(a) - (b) with (a) captured EGR sensor 2 temperature at start and with (b) captured EGR sensor 1 temperature at start as reference temperature	=	20 measured parameter measured parameter	°C -	fail conditions exists for 0.1 s monitor runs with 0.1 s rate whenever enable conditions are met	В

Component / System	Fault Code	Monitor Strategy Description	Primary Malfunction Criteria		Threshol Logic and V	d alue	Secondary Parameters		Enable Conditions		Time Required	MIL Illum.
			(b) captured EGR sensor	=	measured	-	and					
					parameter							
			or				minimum engine-off time	>=	28800	sec		
							and					
			Path 2:				ambient temperature	>	-60.04	°C		
			(I(a) - (b)I (see Look-Up-	<=	100 to	°C	and Engine Running (see	=	TRUE	-		
			Table #6) with		999	-	parameter definition) for					
			(a) captured EGR sensor 2 temperature at start	=	measured parameter	-	time	>	0	sec		
			and with				and					
			(b) captured EGR sensor 1 temperature at start	=	measured parameter	-	engine post drive/ afterun	=	FALSE	-		
			and				and					
			(a) - (b) (see Look-Up- Table #9) with	>	20 to 999	°C	diagnostic performed in current dc and	=	FALSE	-		
			(a) captured EGR sensor 2 temperature at start	=	measured parameter	-	basic enable conditions met:	=	see sheet enable tables	-		
			and with				and					
			(b) captured EGR sensor 1 temperature at start	=	measured parameter	-	NO Pending or Confirmed DTCs:	=	see sheet inhibit tables	-		
			and									
			(status of block heater (see parameter definition)	=	FALSE	-						
			or									

Component / System	Fault Code	Monitor Strategy Description	Primary Malfunction Criteria		Thresh Logic and	old Value	Secondary Parameters	l	Enable Conditions	6	Time Required	MIL Illum.
			status of sun-load detection (see parameter definition)))	=	FALSE	-						
Exhaust Gas Recirculation (EGR) Temperature Sensor 2 Circuit High Voltage	P041D	Detects high voltage readings on the EGR cooler temperature circuit, indicating an OOR high condition on the EGR cooler temperature 2 circuit	voltage of EGR temperature sensor 1	>	4.838	V	(fail conditions exists for 5 s monitor runs 0.05 s rate whenever enable conditions are met	В
			same as				time since engine start	>	0	sec		
			EGR sensor 1 temperature	<	-50	°C	and					
							engine coolant temperature and	>	-60.04	°C		
							ambient temperature and	>	-60.04	°C		
							ambient pressure and (>	20	kPa		
							setpoint valve position of exhaust-gas recirculation	>	-100	%		
							setpoint valve position of exhaust-gas recirculation) and	<	200	%		

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Component / System	Fault Code	Monitor Strategy Description	Primary Malfunction Criteria	Threshold Logic and Value	Secondary Parameters		Enable Conditions	Time Required	MIL Illum.
System	Code	Description	Criteria	Logic and Value	Parameters Engine Running (see parameter definition) and current injection quantity and (valve position of EGR cooler bypass and valve position of EGR cooler bypass)) for time and basic enable conditions met: and NO Pending or Confirmed DTCs:		Conditions TRUE - 0 mm^3 -100 % -100 % 200 % 0 sec see sheet enable tables - see sheet inhibit tables -	Required	IIIum.
Exhaust Gas Recirculation (EGR) Temperature Sensor 2 Circuit Low Voltage	P041C	Detects low voltage readings on the EGR cooler temperature circuit, indicating an OOR low condition on the EGR cooler temperature 2 circuit	voltage of EGR temperature sensor 1 same as	< 0.4642 V	(time since engine start	>	tables 0 sec	fail conditions exists for 5 s monitor runs 0.05 s rate whenever enable conditions are met	В
							4 05 2 6		

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Component /	Fault	Monitor Strategy	Primary Malfunction	Threshold	Secondary		Enable		Time	MIL
System	Code	Description	Criteria	Logic and Value	Parameters		Conditions		Required	Illum.
			EGR sensor 1 temperature	> 220 °C	and					
					engine coolant temperature and	<	199.96	°C		
					ambient temperature	>	-60.04	°C		
					and ambient pressure	>	20	kPa		
					and (-		
					setpoint valve position of exhaust-gas recirculation	>	-100	%		
					and setpoint valve position of exhaust-gas recirculation	<	200	%		
) and					
					Engine Running (see parameter definition) and (=	TRUE	-		
					valve position of EGR cooler bypass and	>	-100	%		
					valve position of EGR cooler bypass and	<	200	%		
					basic enable conditions met:	=	see sheet enable tables	-		
					and					
					NO Pending or Confirmed DTCs:	=	see sheet inhibit tables	-		

Component /	Fault	Monitor Strategy	Primary Malfunction	Threshold	Secondary	Enable		Time	MIL
System	Code	Description	Criteria	Logic and Value	Parameters	Condition	S	Required	Illum.
NMHC Catalyst	P0420	Detects insufficient	Calculated HC conversion	< 0.2000 -				fail conditions	B
Efficiency Below	1 0 120	conversion rate in	rate	0.2000				exists for more	
Threshold Bank 1		oxidation catalyst.						than 0.1 seconds	
		Actual conversion rate						monitor runs once	
		is compared to a						per driving cycle	
		conversion rate						with 0.1 s rate	
		indication of how much						conditions are	
		HC is converted in the						met	
		oxidation catalyst.						mot	
		,							
					(
					Modeled HC mass	> 140	g		
					converted in the				
					oxidation catalyst since				
					monitor start				
					ano				
					average HC mass flow	> 0.0009	g/sec		
					and				
					simulated heat quantity in	> 0	kJ		
					oxidation catalyst				
					and				
					anu particulata filtar				
					regeneration	- IRUE	-		
					and				
					no reset condition for				
					evaluation is active				
					therefore				
					(
					regeneration was not	= TRUE	-		
					aborted to assure that				
					HC conversion was not				
					disturbed				
1		l			and				

Component / System	Fault Code	Monitor Strategy Description	Primary Malfunction Criteria	Threshold Logic and Value	Secondary Parameters		Enable Conditions	5	Time Required	MIL Illum.
					evaluation took place one time step before (to ensure P0420 has not already completed)	=	FALSE	-		
) and there has been sufficient	_	TDUE			
					HC integrated in order to evaluate the monitor conversion efficiency.		MOL	-		
					means (set condition					
					particulate filter regeneration and	=	TRUE	-		
					measured temperature upstream of the oxidation catalyst	>	249.96	°C		
					and) and					
					(engine speed	>	700	rpm		
					and engine speed)	<	3400	rpm		
					and diagnostic performed in current dc	=	FALSE	-		
					reset condition which becomes False under following conditions	=	FALSE	-		

COMMON SECTION 1 OF 3 SECTIONS

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Component / System	Fault Code	Monitor Strategy Description	Primary Malfunction Criteria	Lo	Threshol gic and V	d ′alue	Secondary Parameters		Enable Conditions		Time Required	MIL Illum.
							(converted HC mass in the oxidation catalyst during monitoring)	<	140	g		
							or particulate filter regeneration or	=	FALSE	-		
							regeneration was not aborted (to assure that HC conversion was disturbed) and	=	TRUE	-		
							NO Pending or Confirmed DTCs:)	=	see sheet inhibit tables	-		
							and basic enable conditions met:	=	see sheet enable tables	_		
Primary Fuel Sensor Performance	P0461	Detects an error in the primary fuel tank sensor performance by comparing the decrease of the fuel level for a certain driven mileage to a threshold.	(a) - (b)	>=	100	miles	Engine Running (see parameter definition)	=	TRUE	-	fail conditions exists for 0.02 s monitor runs 0.02 s rate whenever enable conditions are met	В
			with				for					

Component / System	Fault Code	Monitor Strategy Description	Primary Malfunction Criteria		Thresho Logic and V	ld /alue	Secondary Parameters		Enable Conditions		Time Required	MIL Illum.
			(a) total vehicle distance	=	measured parameter	-	time	>=	60	sec		
			and with (b) change in mileage	=	calculated parameter	-	and diagnosis tester connected	=	FALSE			
			and				and fuel transfer pump active	=	FALSE			
			(c) - (d) with	<	4.21	%	means (
			(c) maximum volume of fuel reached in primary tank during driving cycle	=	measured parameter	-	, filtered fuel volume in primary tank	>	1724.58	%		
			and with		measured	_	and	<	0	%		
			fuel reached in primary tank during driving cycle		parameter		secondary tank		0	70		
							for time	>=	0	sec		
							and		·			
							cumulative transfer pump on time in current ignition cycle) and	>	0	sec		
							fuel level zone 3	=	TRUE			
							means (
							, filtered fuel volume in primary tank and	<	144.63	%		
							filtered fuel volume in secondary tank	>	0	%		

COMMON SECTION 1 OF 3 SECTIONS

12 OBDG09 Engine Diagnostics

Component / System	Fault Code	Monitor Strategy Description	Primary Malfunction Criteria	Lo	Threshol gic and V	d alue	Secondary Parameters		Enable Conditions		Time Required	MIL Illum.
) or fuel level zone 4 means	=	TRUE			
							(filtered fuel volume in primary tank and	<	144.63	%		
							filtered fuel volume in secondary tank)	<=	0	%		
							and basic enable conditions met:	=	see sheet enable tables	-		
							NO Pending or Confirmed DTCs:	=	see sheet inhibit tables	-		
Fuel Level Sensor 1 Circuit High	P0463	Detects high voltage readings in the fuel level sensor circuit, indicating an OOR high condition on the fuel level sensor circuit	voltage of fuel level sensor 1	>	4.8	V	ignition on	=	TRUE	-	fail conditions exists for 24 s test performed continuously 0.1 s rate	В
			same as fuel level	<	0	%	and basic enable conditions met:	=	see sheet enable tables	-		

Component /	Fault Code	Monitor Strategy	Primary Malfunction		Thresho	old Value	Secondary Parameters		Enable		Time Required	MIL
- Oyotom	0000	Decomption	ontona		ogio ana	Value	T didiliotoro		Contaitionio	_	Roquilou	internit.
Fuel Level Sensor 1 Circuit Low	P0462	Detects low voltage readings in the fuel level sensor circuit, indicating an OOR low condition on the fuel level sensor circuit	voltage of fuel level sensor 1	<	0.2	V	ignition on	=	TRUE	-	fail conditions exists for 24 s test performed continuously 0.1 s rate	В
			same as fuel level	^	100	%	and basic enable conditions met:	=	see sheet enable tables	-		
	D 0 400				=	0/	(
Exhaust Gas Recirculation (EGR) Position Sensor Performance	P046C	betects in range EGR valve position errors by comparing desired EGR position to actual EGR valve position	controller deviation of EGR valve calculated out of difference between desired and actual value	>	5.00	%	offset learning of EGR actuator active	=	FALSE		tail conditions exists for 8 s monitor runs with 0.02 s rate whenever enable conditions are	В
			or controller deviation of EGR valve calculated out of difference between desired and actual value	<	-5.00	%	and offset learning in the previous driving cycle was complete	=	TRUE		met	
							and					
							engine speed (see Look- Up-Table #87) and	>	600 to 850	rpm		
							duty cycle of the Intake Air Heater output and	<	5	%		
							battery voltage and	>=	11	V		

Component / System	Fault Code	Monitor Strategy Description	Primary Malfunction Criteria	Threshold Logic and Value	Secondary Parameters		Enable Conditions		Time Required	MIL Illum.
					EGR Valve	=	ACTIVE	-		
					EGR Valve Jammed	=	FALSE	-		
					and NO Pending or Confirmed DTCs:	=	see sheet inhibit tables	-		
					and basic enable conditions met:	=	see sheet enable tables	-		
Cooling Fan Speed Output Circuit	P0480	This diagnostic checks the circuit for electrical integrity during operation.	The ECM detects that the commanded state of the driver and the actual state of the control circuit do not match		(fail conditions exists for 3 s test performed continuously 0.02	В
					battery voltage for	>	11	V	STate	
					time and	>	3	sec		
					battery voltage for	<	655.34	V		
					time)	>	3	sec		
					and starter is active cranking	=	FALSE	-		
					for time and	>	3	sec		
					and ignition on	=	TRUE	-		

Component / System	Fault Code	Monitor Strategy Description	Primary Malfunction Criteria	Threshold Logic and Value	Secondary Parameters		Enable Conditions		Time Required	MIL Illum.
					and basic enable conditions met:	=	see sheet enable tables	-		
									feil een ditiere	
		the circuit for electrical integrity during operation.	commanded state of the driver and the actual state of the control circuit do not match.		(exists for 1 s test performed continuously 0.02 s rate	
					battery voltage for	>	11	V		
					time and	>	3	sec		
					battery voltage for	<	655.34	V		
					time)	>	3	sec		
					and starter is active cranking	=	FALSE	-		
					for time and	>	3	sec		
					and ignition on	=	TRUE	-		
					and basic enable conditions met:	=	see sheet enable tables	-		

Component / System	Fault Code	Monitor Strategy Description	Primary Malfunction Criteria	L	Thresho ogic and	old Value	Secondary Parameters		Enable Conditions	;	Time Required	MIL Illum.
Cooling Fan System Performance	P0483	Detects inability to control fan speed to desired RPM	fan speed difference between actual and commanded value or fan speed difference between actual and commanded value	<=	-500 500	rpm rpm	PWM of fan driver output and (>=	45.01	%	fail conditions exists for 120 s monitor runs with 0.1 s rate whenever enable conditions are met	В
							fan speed	<	5320	rpm		
							fan speed	>	400	rpm		
) and					
							engine coolant temperature and	>	69.96	°C		
							fan drive speed rate of change and	<	2000	rpm		
							fan speed weight factor	>	0.59	factor		
							calculated out of ((a) * (b) * (c) * (d) with					
							(a) factor based on input shaft stability (see Look- Up-Table #35)	=	0 to 1	factor		
							and with (b) factor based on intake air temperature (see Look-Up-Table #37)	=	0 to 1	factor		
							and with (c) factor based on engine coolant temperature (see Look- Up-Table #36) and with	=	0 to 1	factor		

Component / System	Fault Code	Monitor Strategy Description	Primary Malfunction Criteria	L	Thresho ogic and \	ld /alue	Secondary Parameters		Enable Conditions		Time Required	MIL Illum.
							(d) factor based on fan drive speed (see Look- Up-Table #34)) and basic enable conditions	=	0 to 1 see sheet	factor		
							met:		enable tables			
Cooling Fan Speed High	P0495	Detects a locked fan. When fan speed control solenoid is off, the fan speed should follow accessory drive input speed plus some slip.	fan speed (see Look-Up- Table #38)	>	400 to 1500	rpm	fluid volume in Clutch (see Look-Up-Table #39)	<	0.005 to 0.0115	I	fail conditions exists for 0.02 s monitor runs with 0.1 s rate whenever enable conditions are met	В
			for Error counter (800 counts is equivalent to 80 sec)	>=	800	counts	or Maximum allowed clutch pump out time when {	>=	600 to 65534	sec		
							fan speed and	>	1500	rpm		
							PWM of fan driver output	<=	45.00	%		
							and ambient pressure and	>	55.5	kPa		
							intake air temperature and	>	-40.04	°C		
							time since engine off and (>	0	sec		

Component /	Fault	Monitor Strategy	Primary Malfunction	Threshold	Secondary		Enable		Time	MIL
System	Code	Description	Criteria	Logic and value	Parameters		Conditions	100 100	Required	illum.
					Up-Table #87)	>	850 850	rpm		
					time	>	0	sec		
) } and basic enable conditions met:	=	see sheet enable tables	-		
Exhaust Gas Recirculation (EGR) Motor Control Circuit 1 Low Voltage	P0489	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	Ξ	ACTIVE	-	fail conditions exists for 3 s monitor runs with 0.005 s rate whenever enable	В
					and (conditions are met	
					battery voltage	>	11	V		
					for					
					time	>	3	sec		
					battery voltage	<	655.34	V		
					for					
					time	>	3	sec		
)					
					and starter is active cranking	=	FALSE	-		
					for					
					time	>	3	sec		
					and					
Component /	Fault	Monitor Strategy	Primary Malfunction	Threshold	Secondary		Enable		Time	MIL
---	-------	---	--	-----------------	--	---	-------------------------------	-----	--	-------
System	Code	Description	Criteria	Logic and value	basic enable conditions met:	=	see sheet enable tables	-	Requirea	inum.
Exhaust Gas Recirculation (EGR) Motor Control Circuit 1 High Voltage	P0490	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	=	ACTIVE	-	fail conditions exists for 3 s monitor runs with 0.005 s rate whenever enable conditions are met	В
					battery voltage	>	11	V		
					time and	>	3	sec		
					battery voltage for	<	655.34	V		
					time)	>	3	sec		
					and starter is active cranking	=	FALSE	-		
					for time and	>	3	sec		
					basic enable conditions met:	=	see sheet enable tables	-		

Component /	Fault	Monitor Strategy	Primary Malfunction		Threshol	d	Secondary		Enable		Time	MIL
System	Code	Description	Criteria		Logic and V	alue	Parameters		Conditions		Required	Illum.
Exhaust Gas Recirculation (EGR) Control Position Not Learned	P049D	Detects adaptation values of EGR cooling bypass valve that are not plausible. Compares the difference between the maximum and minimum adaptation values to a threshold.	Path 1:				offset learning is active	=	TRUE	-	fail conditions exists for 0.005 s monitor runs with 0.005 s rate whenever enable conditions are met	В
			(a) - (b) with	>	30.00	%	active under following conditions (
			(a) maximum learned offset value for EGR valve	=	calculated parameter	-	engine coolant temperature	>=	5.06	°C		
			and with (b) minimum learned offset value for EGR valve	=	calculated parameter	-	and engine coolant temperature	<=	123.06	°C		
			or)					
			Path 2:				and					
			((
			learned offset value for EGR valve in the present driving cycle	>	23.33	%	battery voltage	>=	10	V		
			or				and					
			learned offset value for EGR valve in the present driving cycle)	<	-23.33	%	battery voltage)	<=	30	V		
							and					
							EGR sweep has ended - no movement in EGR valve and	=	TRUE	-		
							engine post drive/ afterun	=	TRUE	-		
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Component / System	Fault Code	Monitor Strategy Description	Primary Malfunction Criteria		Threshold Logic and Va	l Ilue	Secondary Parameters		Enable Conditions		Time Required	MIL Illum.
							and engine was running during last driving cycle	=	TRUE	-		
							means engine speed during last driving cycle	=	0	rpm		
							and NO Pending or Confirmed DTCs:	=	see sheet inhibit tables	-		
							and basic enable conditions met:	=	see sheet enable tables	-		
		Detects a jammed EGR valve during opening or closing the	Path 1:				Path 1:				fail conditions exists for 0.005 s monitor runs with	
		valve.	EGR valve stuck during opening means	=	TRUE	-	EGR valve is opening or	=	TRUE	-	whenever enable conditions are met	
			((a) + (b) with	>=	20.00732	%	Path 2: EGR valve is closing and	=	TRUE	-		
			(a) position of EGR valve	=	measured parameter	-	engine post drive/ afterun	=	TRUE	-		
			and with (b) learned offset value of EGR valve in the previous driving cycle	=	measured parameter	-	and offset learning active	=	TRUE	-		
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Component /	Fault	Monitor Strategy	Primary Malfunction		Threshol	d	Secondary	Enable	Time	MIL
System	Code	Description	Criteria		Logic and V	alue	Parameters	Conditions	Required	Illum.
			or (a) - (c)	<=	0.012207	%	and basic enable conditions met:	see sheet - enable tables		
			with (a) position of EGR valve	=	measured parameter	-				
			and with (c) position of EGR valve of previous process cycle	=	measured parameter	-				
) for time	>	5	sec				
			or							
			Path 2:							
			EGR valve stuck during closing means	=	TRUE	-				
			(
			position of EGR valve with	<=	(a) * (b)	-				
			(a) reference position of the EGR valve in open position	=	measured parameter	-				
			and with (b) factor for EGR valve close position	=	0.5	factor				
			or (c) - (d) with	>	0.024414	%				

Component / System	Fault Code	Monitor Strategy Description	Primary Malfunction Criteria		Threshol Logic and V	d 'alue	Secondary Parameters	(Enable Conditions	i	Time Required	MIL Illum.
			 (c) position of EGR valve and with (d) position of EGR valve of previous process cycle) for time 	= ~ ~	measured parameter measured parameter	- Sec						
Idle Speed Too High	P0507	Detects an idle speed governor that is unable to achieve the desired idle speed and the idle speed is too high.	engine speed	>	minimum value of (a) OR (b + (b * c))		engine speed (see Look- Up-Table #87) and	>=	600 to 850	rpm	fail conditions exists for 20 s monitor runs with 0.1 s rate whenever enable conditions are met	В
			and with (b) minimum idle speed setpoint	=	calculated	-	engine coolant temperature and	<	122.96	°C		
			and with (c) factor for calculation of engine speed interval	=	24.00	%	engine coolant temperature) and	>	-7.04	°C		
							idle speed controller active and vehicle speed and	=	TRUE 1.86	- mph		

Component / System	Fault Code	Monitor Strategy Description	Primary Malfunction Criteria		Threshold Logic and Va	l alue	Secondary Parameters		Enable Conditions		Time Required	MIL Illum.
							no other torque demanding function active and	=	TRUE	-		
							setpoint torque of the speed controller and	>	0	Nm		
							engine speed and	>	300	rpm		
							basic enable conditions met:	=	see sheet enable tables	-		
							and NO Pending or Confirmed DTCs:	=	see sheet inhibit tables	-		
Idle Speed Too Low	P0506	Detects an idle speed governor that is unable to achieve the desired idle speed and the idle speed is too low	engine speed	<	maximum value of (a) OR (b - (b * c))		engine speed (see Look- Up-Table #87)	>=	600 to 850	rpm	fail conditions exists for 20 s monitor runs with 0.1 s rate whenever enable conditions are	В
			with				and				met	
			(a) minimum engine speed	=	300	rpm	engine coolant	<	122.96	°C		
			(b) minimum idle speed setpoint	=	calculated parameter	-	temperature and					
			and with				engine coolant temperature	>	-7.04	°C		
			(c) factor for calculation of engine speed interval	=	24.00	%)					

Component / System	Fault Code	Monitor Strategy Description	Primary Malfunction Criteria	L	Threshol ogic and V	d alue	Secondary Parameters		Enable Conditions		Time Required	MIL Illum.
							and idle speed controller active and	=	TRUE	-		
							vehicle speed	<	1.86	mph		
							no other torque demanding function active	=	TRUE	-		
							setpoint torque of the speed controller and	>	0	Nm		
							engine speed and	>	300	rpm		
							basic enable conditions met:	=	see sheet enable tables	-		
							and NO Pending or Confirmed DTCs:	=	see sheet inhibit tables	-		
Cooling Fan Speed Sensor Circuit	P0526	This diagnostic checks the circuit for electrical integrity during operation.	period is too long to measure and	>	0.209	sec	engine speed	>	550	rpm	fail conditions exists for 3 s monitor runs with 0.020 s rate whenever enable	В
			(current state of the signal received from fan is low or	=	TRUE	-	(PWM of fan driver output for	>	45.00	%	conditions are met	

Component /	Fault	Monitor Strategy	Primary Malfunction		Threshold		Secondary		Enable		Time	MIL
System	Code	Description	Criteria	L	ogic and Va	lue	Parameters		Conditions		Required	Illum.
			received from fan is high	=	TRUE	-	time)	>	30	sec		
							and					
							basic enable conditions met:	=	see sheet enable tables	-		
							and					
							NO Pending or Confirmed DTCs:	=	see sheet inhibit tables	-		
Exhaust Gas Temperature (EGT) Sensor 1 Circuit High Voltage	P0546	Detects high voltage readings on the EGT 1 circuit, indicating an OOR high condition on the EGT 1 circuit	temperature sensor voltage upstream of oxidation catalyst	>	2.2066	V	NO Pending or Confirmed DTCs:	=	see sheet inhibit tables	-	fail conditions exists for 3 s monitor runs 0.050 s rate whenever enable conditions are	В
			same as				for				met	
			temperature upstream of oxidation catalyst	>	1000	°C	time	>	0	sec		
							ignition on	_	TRUE	_		
							and		INCL			
							basic enable conditions met:	=	see sheet enable tables	-		

Component /	Fault	Monitor Strategy	Primary Malfunction		Thresho	ld	Secondary		Enable		Time	MIL
System	Code	Description	Criteria	L	ogic and \	/alue	Parameters		Conditions		Required	Illum.
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	temperature sensor voltage upstream of oxidation catalyst	<	0.6544	V	NO Pending or Confirmed DTCs:	=	see sheet inhibit tables	-	fail conditions exists for 3 s monitor runs 0.050 s rate whenever enable conditions are met	В
			temperature upstream of oxidation catalyst	<	-50	°C	time	>	0	sec	mer	
							and ignition on and	=	TRUE	-		
							basic enable conditions met:	=	see sheet enable tables	-		
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	=	TRUE	-	fail conditions exists for 90 s monitor runs with 0.005 s rate	Special C
							and input circuit active and	=	TRUE	-	conditions are met	
							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	L	Thresho Logic and	old Value	Secondary Parameters		Enable Conditions		Time Required	MIL Illum.
Cruise Control Set Switch Circuit	P0568	Set switch state indicates problem with the circuit	Set Switch CAN message in high / active state	=	TRUE	_	ignition on and input circuit active and basic enable conditions met and NO Pending or Confirmed DTCs:	=	TRUE TRUE see sheet enable tables see sheet inhibit tables	-	fail conditions exists for 90 s monitor runs with 0.005 s rate whenever enable conditions are met	Special C
Cruise Control Input Circuit	P0575	Cruise control CAN communication monitoring	amount of errors in consecutive frames with number of consecutive frames	>=	3	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

Component / System	Fault Code	Monitor Strategy Description	Primary Malfunction Criteria	Threshold Logic and Value	Secondary Parameters		Enable Conditions	Time Required	MIL Illum.
Brake Pedal Position Sensor - Circuit Low Voltage	P057C	Brake pedal voltage below a calibrated threshold for a calibrated period of time	Brake pedal position sensor voltage	< 0.25 V	ignition on and Inhibit Status (no inhibiting faults) (No pending or stored DTC)	=	TRUE - see sheet - inhibit tables	fail conditions exists for 0.5 s monitor runs 0.01 s rate whenever enable conditions are met	A
Brake Pedal Position Sensor - Circuit High Voltage	P057D	Brake pedal voltage above a calibrated threshold for a calibrated period of time	Brake pedal position sensor voltage	> 4.75 V	ignition on and Inhibit Status (no inhibiting faults) (No pending or stored DTC)	=	TRUE - see sheet - inhibit tables	fail conditions exists for 0.5 s monitor runs 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.
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 and basic enable conditions met:	= TRUE - see sheet - enable tables	fail conditions exists for 0.01 s monitor runs with 0.01 s rate whenever enable conditions are met	A
Control Module Not Programmed	P0602	Detects if the ECM is programmed.	ECM not programmed	= TRUE -	ignition on and engine pre drive and basic enable conditions met:	 TRUE - TRUE - see sheet - enable tables 	fail conditions exists for 0.01 s test performed once per driving cycle during ECU initialization	A

	Component / System	Fault Code	Monitor Strategy Description	Primary Malfunction Criteria	Threshold Logic and Value	Secondary Parameters		Enable Conditions		Time Required	MIL Illum.
Cont Inter	trol Module nal Performance	P0606	Monitors that ECM is operating correctly at proper voltage. All internal hardware modules are communicating correctly.	SPI communication, data transfer lost	= TRUE ·	basic enable cond	and tions = met:	 TRUE see sheet enable tables 	-	fail conditions exists for 0.5 s test performed continuously with 0.01 s rate	A
				faults detected in the SPI communication	> 184 cou	ints ignitio	n on =	TRUE	-		
				IC Internal		basic enable cond	and tions - met:	see sheet enable tables	-	fail conditions	
						NO Pendi Confirmed D	ng or - TCs:	see sheet inhibit tables	-	0.64 s monitor runs once per trip during pre drive at least twice every 0.08s rate whenever enable conditions are met	
										twice every 0 rate whenev enable condit are met	.08s /er tions

Component / System	Fault Code	Monitor Strategy Description	Primary Malfunction Criteria		Threshol Logic and V	d alue	Secondary Parameters		Enable Conditions		Time Required	MIL Illum.
		· · · · · ·	internal supply voltage	<	4.2	V	ignition on	=	TRUE	-		
			or				and					
			internal supply voltage	>	5.25	V	counter of reactivation	>=	2	count		
							attempt of power output			s		
							stage					
							basic enable conditions	=	see sheet	-	fail conditions	
							met:		enable		exists for 0.08s	
									tables		monitor runs once	
							and				drive at least	
							NO Pending or	=	see sheet	-	twice every 0.08s	
							Confirmed DTCs:		inhibit		rate whenever	
									tables		are met	
			(a) - (b)	>	50	us	programmed energizing	=	IRUE	-	tail conditions	
							been read back				0.15 s	
			·u								monitor runs with	
				_	magaured		means	~-	0		whenever enable	
			time for fuel injection	-	parameter	-	time for fuel injection	/-	0	-	conditions are	
					P						met	
			and with									
			(b) programmed	_	measured			_				
			energizing time for fuel	-	parameter	-	time for fuel injection has	_	INUE	-		
			injection				been read back					
							means					
			I I				means					

Component /	Fault	Monitor Strategy	Primary Malfunction		Thresh	bld	Secondary		Enable		Time	MIL
System	Code	Description	Criteria	L	ogic and	Value	Parameters		Conditions		Required	Illum.
							measured energizing time for fuel injection and	>=	0	-		
							engine speed	>	1200	rpm		
							and					
							rail pressure	>	20000	kPa		
							and					
							engine test active via diagnosis tester and	=	FALSE	-		
							basic enable conditions	=	see sheet	-		
							met:		enable tables			
			Dath 4:						1000	100.000	feil conditions	
			Path 1:				engine speed	>	1200	rpm	exists for at least	
			(angle for pre injection quantity or	<	-32.98	degrees	engine test active via diagnosis tester and	=	FALSE	-	0.5 s monitor runs with 0.01 s rate	
			angle for pre injection quantity	>	102.99	degrees	basic enable conditions met:	=	see sheet enable tables	-	wnenever enable conditions are met	
)									
			or									
			Path 2:									
			(
			angle for main injection quantity or	<	-32.98	degrees						
			angle for main injection quantity)	>	40.52	degrees						
			or									
			Path 3:									
I		l	(l							I	

Component / System	Fault Code	Monitor Strategy Description	Primary Malfunction Criteria		Thresho Logic and	old Value	Secondary Parameters	Enal Condi	ble tions	Time Required	MIL Illum.
			angle for post injection quantity 1 or angle for post injection quantity 1) or Path 4: (angle for post injection quantity 2 or angle for post injection quantity 2) or Path 5: (angle for post injection quantity 3 or angle for post injection quantity 3 or angle for post injection quantity 3)		-360.00 -67.00 -83.00 40.52 -83.00 0.00	degrees degrees degrees degrees degrees degrees					
			(energizing times of the correction value for pre injection quantity (see Look- Up-Table #47) or energizing times of the correction value for pre injection quantity (see Look- Up-Table #46)	<	-500 to - 50 50 to 500	us	redundant engine speed calculation and engine test active via diagnosis tester and	>= 120 = FAL	00 rpm SE -	fail conditions exists for at least 0.5 s monitor runs with 0.04 s rate whenever enable conditions are met	

Component / System	Fault Code	Monitor Strategy Description	Primary Malfunction Criteria	L	Thresho ogic and	old Value	Secondary Parameters		Enable Conditions		Time Required	MIL Illum.
)				basic enable conditions met:	=	see sheet enable tables	-		
			redundant post injection quantity 2 calculation	^	130	mm^3	engine test active via diagnosis tester and change in injection operation mode requested and basic enable conditions met:	=	FALSE TRUE see sheet enable tables	-	fail conditions exists for at least 0.2 s monitor runs with 0.04 s rate whenever enable conditions are met	
			averaged torque effective energizing time per cylinder (see Look-Up-Table #48)	>	200 to 6000	us	fuel system is in fuel cut off	=	TRUE	-		
			and activation counter (intervention) of the surge damper	>=	72	counts	for time and	>	0.65	sec	fail conditions exists for at least 0.2 s monitor runs with	
							redundant engine speed calculation and general engine speed demand and	>	2040 FALSE	rpm -	0.04 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.
					external drag torque demand and	=	FALSE	-		
					external transmission torque demand and	=	FALSE	-		
					cruise control active or	=	FALSE	-		
					brake pedal status	=	TRUE	-		
					redundant brake pedal status)	=	TRUE	-		
					for time	>	2.8	sec		
) and (
					pedal position or	=	0	%		
					redundant calculation of pedal position	=	0	%		
					for time)	>	0.02	sec		
					and (
					redundant engine speed calculation after start detected and	>	120	rpm		
					redundant engine speed calculation at start	>	1080	rpm		
					and					

Component / System	Fault Code	Monitor Strategy Description	Primary Malfunction Criteria	L	Thresho ogic and V	ld /alue	Secondary Parameters		Enable Conditions		Time Required	MIL Illum.
							basic enable conditions met:	=	see sheet enable tables	-		
			redundant averaged wave correction quantity for pre injection or	>=	5	mm^3	redundant engine speed calculation and	>=	1200	rpm		
			redundant averaged wave correction quantity for main injection or	>=	5	mm^3	engine test is active via diagnosis tester and	=	FALSE	-	fail conditions exists for at least 0.5 s	
			redundant averaged wave correction quantity for post injection 2	>=	5	mm^3	basic enable conditions met:		see sheet enable tables	-	monitor runs with 0.04 s rate whenever enable conditions are met	
			or redundant averaged wave correction quantity for post injection 3	>=	5	mm^3						
			(rail pressure or	<=	16000	kPa	(redundant voltage of rail pressure sensor or	<	0.19	V	fail conditions exists for 0.120 s monitor runs with 0.01 s rate	
			rail pressure	>=	204000	kPa	redundant voltage of rail pressure sensor) and	>	4.81	V	whenever enable conditions are met	
							delay time and redundant calculation of	>	2.1 TRUF	sec		
							injections active		OL			

Component / Fa System Co	ault ode	Monitor Strategy Description	Primary Malfunction Criteria	L	Thresho ogic and N	old Value	Secondary Parameters		Enable Conditions		Time Required	MIL Illum.
							and redundant engine speed calculation and engine test active via diagnosis tester and basic enable conditions met:	> =	1000 FALSE see sheet enable tables	rpm -		
			internal supply voltage	<	4.2	V	ignition	=	on	-		
			internal supply voltage	>	5.25	V	basic enable conditions met:	=	see sheet enable tables	_	fail conditions exists for 0.05 s test performed continuously with 0.01 s rate	
			WDA (watch dog) shut off due to under voltage means	=	TRUE	-	shut off path test active and	=	FALSE	-	fail conditions exists for 0.01 s monitor runs with	
			internal supply voltage	<	4.2	V	battery voltage for	>	8	V	0.01 s rate whenever enable conditions are	
							time and WDA (watch dog) line active	=	TRUE	sec	met	

Component / System	Fault Code	Monitor Strategy Description	Primary Malfunction Criteria	Threshold Logic and Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
					and basic enable conditions met:	= see sheet - enable tables		
			WDA (watch dog) shut off due to overvoltage means internal supply voltage	= TRUE -	shut off path test active and WDA (watch dog) line active and basic enable conditions met:	= FALSE - = TRUE - = see sheet - enable tables	fail conditions exists for 0.01 s monitor runs with 0.01 s rate whenever enable conditions are met	
			WDA (watch dog) shut off due to internal security error	= TRUE -	shut off path test active and WDA (watch dog) line active and basic enable conditions met:	= FALSE - = TRUE - = see sheet - enable tables	fail conditions exists for 0.01 s monitor runs with 0.01 s rate whenever enable conditions are met	

Component / System	Fault Code	Monitor Strategy Description	Primary Malfunction Criteria	Threshold Logic and Value	Secondary Parameters	Enable Conditions	5	Time Required	MIL Illum.
			WDA (watch dog) shut off because of corrupt question- and-answer communication	= TRUE -	ignition and WDA (watch dog) line active and shut off path test active and basic enable conditions met:	 = on = TRUE = FALSE = see sheet enable tables 	-	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 and basic enable conditions met: and NO Pending or Confirmed DTCs:	 on see sheet enable tables see sheet inhibit tables 	-	fail conditions exists for more than 0.16 s monitor runs at least twice every 0.08 s rate whenever enable conditions are met	

Component / System	Fault Code	Monitor Strategy Description	Primary Malfunction Criteria		Threshol Logic and V	ld /alue	Secondary Parameters		Enable Conditions		Time Required	MIL Illum.
			redundant, independent algorithm for plausibility fault of accelerator pedal signal for safety reasons:								fail conditions exists for 0.28 s monitor runs with 0.04 s rate	
			Path 1:				ignition		on	-	conditions are	
			(maximum (a) (b)) - 2 * (maximum (c) (b))	>	0.29	V	and				met	
			with				basic enable conditions met:	=	see sheet enable tables	-		
			(a) voltage accelerator pedal 1	=	measured parameter	-	and					
			and with				engine test active via diagnosis tester	=	FALSE	-		
			(b) lower limit for accelerator pedal voltage	=	0.8	V	and					
			and with				Input signal fault present	=	FALSE	-		
			(c) voltage accelerator pedal 2	=	measured parameter	-	and					
			and (ADC fault present	=	FALSE	-		
			voltage accelerator pedal 1	>	1.4498	V						
			or voltage accelerator pedal 2	>	1.4498	V						
) or									
			Path 2:		0.44	. <i>.</i>						
			(maximum (a) (b)) - 2 * (maximum (c) (b)) with	>	0.41	V						

Component / System	Fault Code	Monitor Strategy Description	Primary Malfunction Criteria		Threshol Logic and V	d 'alue	Secondary Parameters	(Enable Conditions		Time Required	MIL Illum.
			 (a) voltage accelerator pedal 1 and with (b) lower limit for accelerator pedal voltage and with (c) voltage accelerator pedal 2 and (voltage accelerator pedal 1 or voltage accelerator pedal 2 	= = <= <=	measured parameter 0.8 measured parameter 1.4498 1.4498	- - V V						
) no response to an injection request processor internal	=	TRUE	-	ignition and basic enable conditions met: and NO Pending or Confirmed DTCs:	=	on see sheet tables see sheet inhibit tables	-	fail conditions exists for more than 0.16 s monitor runs at least twice every 0.08 s rate whenever enable conditions are met	

Component / Svstem	Fault Code	Monitor Strategy Description	Primary Malfunction Criteria	Threshold Logic and Value	Secondary Parameters		Enable Conditions	Time Required	MIL Illum.
			no response to shut-off path test processor internal	= TRUE -	ignition and basic enable conditions met: and NO Pending or Confirmed DTCs:	=	on - see sheet - enable tables see sheet - inhibit tables	fail conditions exists for more than 184 events monitor runs at least twice every 0.08 s rate whenever enable conditions are met	
			no response to hardware activation request processor internal	= TRUE -	ignition and basic enable conditions met: and NO Pending or Confirmed DTCs:	=	on - see sheet - enable tables see sheet - inhibit tables	fail conditions exists for more than 98 events monitor runs at least twice every 0.08 s rate whenever enable conditions are met	

Component / System	Fault Code	Monitor Strategy Description	Primary Malfunction Criteria	L	Thresho ogic and	old Value	Secondary Parameters		Enable Conditions		Time Required	MIL Illum.
			no response from processor operative system processor internal	=	TRUE	-	ignition and basic enable conditions met: and NO Pending or Confirmed DTCs:	-	on see sheet tables see sheet inhibit tables	-	fail conditions exists for more than 2 events monitor runs at least twice every 0.08 s rate whenever enable conditions are met	
			Path 1: repetitions of injection shut-off path test or Path 2: (number of a powerstage test too few and number of cylinders)	>=	184 2 8	counts counts	ignition and injection shut-off path test and basic enable conditions met:		on ACTIVE see sheet enable tables	-	fail conditions exists for more than 0.12 s monitor runs at least twice every 0.08 s rate whenever enable conditions are met	

Component / System	Fault Code	Monitor Strategy Description	Primary Malfunction Criteria	L	Thresho ogic and \	ld /alue	Secondary Parameters		Enable Conditions		Time Required	MIL Illum.
			prevention of the execution of the shut-off path test	=	TRUE		ignition and injection shut-off path test and basic enable conditions met:	=	on ACTIVE see sheet enable tables	-	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	Bytes	ignition and basic enable conditions met:	=	on see sheet enable tables	-	fail conditions exists for more than 10 events monitor runs at least twice every 0.08 s rate whenever enable conditions are met	

Component / Fault System Code	t Monitor Strategy Description	Primary Malfunction Criteria	Threshold Logic and Value	Secondary Parameters	Enable Conditions	Time MI Required IIIu	IIL um.
		ECM detects interruption in the SPI communication processor internal	= TRUE -	ignition and basic enable conditions met:	= on -	fail conditions exists for more than 2 events monitor runs at least twice every 0.08 s rate whenever enable conditions are met	
		ECM detects plausibility error of the communication between controller and the monitoring module (2 processors in ECU) processor internal	= TRUE -	ignition and basic enable conditions met:	= on -	fail conditions exists for more than 5 events monitor runs at least twice every 0.08 s rate whenever enable conditions are met	

Component / System	Fault Code	Monitor Strategy Description	Primary Malfunction Criteria	Threshold Logic and Val		old Value	Secondary Parameters	Enable Conditions			Time Required	MIL Illum.
			redundant filtered supply voltage to injector chip 1 or redundant filtered supply voltage to injector chip 1	<	3.10 3.50	V V	ignition and battery voltage and basic enable conditions met:	II A II	on 8 see sheet enable tables	- V -	fail conditions exists for 0.5 s monitor runs with 0.01 s rate whenever enable conditions are met	
			redundant filtered supply voltage to injector chip 2 or redundant filtered supply voltage to injector chip 2	<	3.10 3.50	V V	ignition and battery voltage and basic enable conditions met:	= ^ =	on 8 see sheet enable tables	- V -	fail conditions exists for 0.5 s monitor runs with 0.01 s rate whenever enable conditions are met	
			internal injector driver chip 1 error IC internal	=	TRUE	-	Engine Running and basic enable conditions met:	=	TRUE see sheet enable tables	-	fail conditions exists for more than 10 events monitor runs with 0.01 s rate whenever enable conditions are met	

Component /	Fault	Monitor Strategy	Primary Malfunction		Thresh	old	Secondary		Enable		Time	MIL
System	Code	Description	Criteria	L	logic and	value	Parameters		Conditions	_	Required	illum.
			internal injector driver chip 2 error IC internal	=	TRUE	-	Engine Running and basic enable conditions met:	=	TRUE see sheet enable tables	-	fail conditions exists for more than 10 events monitor runs with 0.01 s rate whenever enable conditions are met	
			piezo injector actuator internal feedback voltage or piezo injector actuator internal feedback voltage	<	0 33	V V	main injection and basic enable conditions met:	-	ACTIVE see sheet enable tables		fail conditions exists for more than 10 events monitor runs with 0.01 s rate whenever enable conditions are met	

Component / System	Fault Code	Monitor Strategy Description	Primary Malfunction Criteria		Thresh Logic and	old Value	Secondary Parameters		Enable Conditions		Time Required	MIL Illum.
			Path 1: engine speed or	^	1500	rpm	injection cut off demand from ECM internal monitoring and basic enable conditions met:	=	TRUE see sheet enable tables	-	fail conditions exists for 0.2 s test performed continuously with 0.02 s	
			Path 2: engine speed	>	1600	rpm						
			security torque limitation request due to implausible air system control requests	=	TRUE	-	ignition and basic enable conditions met:	=	on see sheet enable tables	-	fail conditions exists for more than 533 events test performed continuously with 0.01 s	
			security torque limitation request due to implausible rail pressure request	=	TRUE	-	ignition and basic enable conditions met:	=	on see sheet enable tables	-	fail conditions exists for more than 533 events test performed continuously with 0.01 s	

Component / Faul System Code	t Monitor Strategy e Description	Primary Malfunction Criteria		Threshold Logic and Va	i alue	Secondary Parameters		Enable Conditions		Time Required	MIL Illum.
		security torque limitation request due to implausible quantity setpoint control requests	=	TRUE	-	ignition and basic enable conditions met:	=	on see sheet enable tables	-	fail conditions exists for more than 533 events test performed continuously with 0.01 s	
		indicated torque with (a) modeled inner engine torque and with (b) torque tolerance offset (see Look-Up-Table #45) and with (c) torque of engine speed controller and with (d) torque of surge damper control	> = =	(a) + (b) + (c) + (d) calculated parameter 11.71875 to 99.60937 5 calculated parameter calculated parameter	- %	Engine Running (see parameter definition) and basic enable conditions met:	=	TRUE see sheet enable tables	-	fail conditions exists for more than 0.5 s monitor runs with 0.04 s rate whenever enable conditions are met	

Component / System	Fault Code	Monitor Strategy Description	Primary Malfunction Criteria		Thresh Logic and	old Value	Secondary Parameters		Enable Conditions		Time Required	MIL Illum.
			voltage of charging switch or voltage of charging switch if buffer of a bank is not charged completely, or not at all	>	210	V	ECM is in startup before injections are released and basic enable conditions met:	=	TRUE see sheet enable tables	-	fail conditions exists for more than 0.05 s monitor runs with 0.01 s rate whenever enable conditions are met	
			error at startup of DC/DC converter of one bank	=	TRUE	-	ignition and DC/DC converter is in startup and basic enable conditions met:		on TRUE see sheet enable tables	-	fail conditions exists for 0.01 s monitor runs with 0.01 s rate whenever enable conditions are met	
			DC/DC converter cannot be switched off.	=	TRUE	-	ignition and basic enable conditions met:	=	on see sheet enable tables	-		

Component / System	Fault Code	Monitor Strategy Description	Primary Malfunction Criteria		Thresho Logic and V	ld /alue	Secondary Parameters		Enable Conditions	,	Time Required	MIL Illum.
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	>=	0.295	Sec	ignition and basic enable conditions met:	=	on see sheet enable tables	-	fail conditions exists for 0.01 s test performed continuously 0.01 s	A
			voltage at ADC test voltage input or voltage at ADC test voltage input	< ,	4.73	V	ignition and basic enable conditions met:	=	on see sheet enable tables	-	fail conditions exists for at least 0.15 s test performed continuously 0.01 s	
			(a) - (b) with (a) voltage accelerator pedal signal 2 at internal ADC and with	> =	0.15 measured parameter	-	ignition and (counter for steady state detection of the internal AD converter	=	on 4	- event s	fail conditions exists for at least 0.12 s monitor runs with 0.01 s rate whenever enable conditions are met	

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Component /	Fault	Monitor Strategy	Primary Malfunction	Threshold	Secondary		Enable		Time	MIL
System	Code	Description	Criteria	Logic and Value	Parameters	C	onditions		Required	Illum.
			(b) voltage accelerator pedal signal 2 at external ADC	= measured - parameter	means					
					(a) - (b) with	<=	0.06	V		
					(a) voltage accelerator pedal signal 2 at internal ADC	= r F	measured parameter	-		
					and with (b) voltage of the	= r	measured	-		
					accelerator pedal signal 2 at the external ADC	þ	parameter			
					or	_				
					detection of the external AD converter means	>=	4	event s		
					(c) - (d) with	<=	64.45	V		
					(c) voltage accelerator pedal signal 2 at external ADC	= r F	measured parameter	-		
					and with					
					accelerator pedal signal 2 at the internal ADC	– 1	parameter	-		
) and					
					basic enable conditions met:	= s	see sheet enable tables	-		
4		4								, P

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Component /	Fault	Monitor Strategy	Primary Malfunction		Threshol	d	Secondary		Enable		Time	MIL
System	Code	Description	Criteria		Logic and V	alue	Parameters		Conditions		Required	Illum.
			(ratio metric correction factor or	<	0.62	factor	ignition and basic enable conditions met:	=	on see sheet enable tables	-	fail conditions exists for at least 0.15 s test performed continuously 0.01 s	
			ratio metric correction factor)	>	0.74	factor						
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.	l(a) - (b) with (a) redundant calculated engine speed and with (b) engine speed	=	400 calculated parameter measured parameter	rpm -	redundant calculated engine speed and engine synchronization and basic enable conditions met:	=	600 TRUE see sheet enable tables	-	fail conditions exists for more than 8 events monitor runs with 0.04 s rate whenever enable conditions are met	В
Component /	Fault	Monitor Strategy	Primary Malfunction		Thresho	old	Secondary		Enable		Time	MIL
---	-------	--	---	----	------------	--------	--	---	-------------------------------	---	--	--------
System	Code	Description	Criteria	L	ogic and N	Value	Parameters		Conditions		Required	Illum.
Control Module Long Term Memory Performance	P062F	Each data block of memory is read for a check sum error and flags if a fault is found.	EEPROM sector reports faults regarding:				ignition	=	on	-	fail conditions exists for 0.01 s test performed continuously at the 0.01 s rate	A
			unable to erase or change whole EEPROM sector	=	TRUE	-	and					
			or				basic enable conditions met:	=	see sheet enable tables	-		
			read order is not successfully accomplished for more than amount of blocks or	=	3	-						
			amount of write errors in current block	=	3	counts						
5 Volt Reference 1 Circuit	P0641	Sensor supply voltage circuitry determines if faults related to maintaining the voltage level exist.	sensor supply voltage 1	<=	4.6	V	ignition on	=	TRUE	-	fail conditions exists for 0.1 s test performed continuously 0.01s rate	A
							and basic enable conditions met:	=	see sheet enable tables	-		

Component / System	Fault Code	Monitor Strategy Description	Primary Malfunction Criteria	L	Thresho ogic and	old Value	Secondary Parameters		Enable Conditions		Time Required	MIL Illum.
5 Volt Reference 2 Circuit	P0651	Sensor supply voltage circuitry determines if faults related to maintaining the voltage level exist.	sensor supply voltage 2		4.6	V	ignition on and basic enable conditions met:	=	TRUE see sheet enable tables	-	fail conditions exists for 0.1 s test performed continuously 0.01s rate	В
5 Volt Reference 3 Circuit	P0697	Sensor supply voltage circuitry determines if faults related to the voltage level present at the sensor supply voltage exist.	sensor supply voltage 3	<=	4.6	V	ignition on and basic enable conditions met:	=	TRUE see sheet enable tables	-	fail conditions exists for 0.1 s test performed continuously 0.01s rate	В
5 Volt Reference 4 Circuit	P06A3	Sensor supply voltage circuitry determines if faults related to the voltage level present at the sensor supply voltage exist.	sensor supply voltage 4	<=	4.6	V	ignition on	=	TRUE	-	fail conditions exists for 1.0 s test performed continuously 0.01s rate	В

Component / System	Fault Code	Monitor Strategy Description	Primary Malfunction Criteria	Threshold Logic and Value	Secondary Parameters		Enable Conditions		Time Required	MIL Illum.
					and basic enable conditions met:	=	see sheet enable tables	-		
5 Volt Reference 5 Circuit	P06D2	Sensor supply voltage circuitry determines if faults related to the voltage level present at the sensor supply voltage exist.	sensor supply voltage 5	<= 4.6 V	ignition on	=	TRUE	-	fail conditions exists for 0.1 s test performed continuously 0.01s rate	В
					and basic enable conditions met:	=	see sheet enable tables	-		
Malfunction Indicator Lamp (MIL) Control Circuit	P0650	This diagnostic checks the MIL circuit for electrical integrity during operation.	The ECM detects that the commanded state of the driver and the actual state of the control circuit do not match.		lamp is commanded on	=	TRUE	-	fail conditions exists for 3 s monitor runs with 0.01 s rate whenever enable	A (no MIL)
					and ignition and	=	on	-	conditions are met	
					t battery voltage for time	>	11 3	V sec		

and			mum.
battery voltage < 655.34 for time > 3) and	V sec		
basic enable conditions = see sheet met: enable tables	-		
The ECM detects that the commanded state of the driver and the actual state of the control circuit do not match.		fail conditions exists for 2 s monitor runs with 0.01 s rate whenever enable conditions are	
ignition = on and (-	met	
battery voltage > 11 for	V		
time > 3 and battery voltage < 655.34	sec V		
for time > 3	sec		
) and			
basic enable conditions = see sheet met: enable tables	-		

Component / System	Fault Code	Monitor Strategy Description	Primary Malfunction Criteria	Threshold Logic and Value	Secondary Parameters		Enable Conditions		Time Required	MIL Illum.
Jystem		Description	The ECM detects that the commanded state of the driver and the actual state of the control circuit do not match.		circuit active at low current and ignition and (battery voltage for time and battery voltage for time and battery voltage for time and battery voltage	= = ^ ~ ~ =	TRUE on 11 3 655.34 3 see sheet enable tables	- V sec V sec	fail conditions exists for 0.2 s monitor runs with 0.01 s rate whenever enable conditions are met	
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	= > =	TRUE 0.25 TRUE	- sec -	fail conditions exists for 1 s monitor runs once per trip with 0.25 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.
					basic enable conditions met	=	see sheet enable tables	-		
					and NO Pending or Confirmed DTCs:	=	see sheet inhibit tables	-		
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	>= <= >= >= >=	11 655.34 650 14.9161 120 0 FALSE	V V rpm mph Nm %	fail conditions exist for more than 30 s monitor runs with 0.01 s rate whenever enable conditions are met	В

COMMON SECTION 1 OF 3 SECTIONS

12 OBDG09 Engine Diagnostics

Component /	Fault Code	Monitor Strategy	Primary Malfunction	Threshold	Secondary Parameters		Enable		Time Required	MIL
System	Code	Description	Criteria	Logic and value	selected gear position is neutral) and no validation fault in the transmission shift lever position received via CAN from TCM and basic enable conditions: and NO Pending or Confirmed DTCs:	=	FALSE TRUE see sheet enable tables see sheet inhibit tables	-	Kequirea	inum.
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	>= <= <=	11 655.34 7000 TRUE	V V rpm	fail conditions exist for more than 30 s monitor runs with 0.01 s rate whenever enable conditions are met	В

COMMON SECTION 1 OF 3 SECTIONS

12 OBDG09 Engine Diagnostics

Component / System	Fault Code	Monitor Strategy Description	Primary Malfunction Criteria	Threshold Logic and Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
					or selected gear position is neutral)	= TRUE -		
					, and no validation fault in the transmission shift lever position received via CAN from TCM and	= TRUE -		
					basic enable conditions met:	= see sheet - enable tables		
					and NO Pending or Confirmed DTCs:	= see sheet - inhibit tables		
Traction Control Input Signal	P0856	Detects a failure when a certain number of Traction Control System torque request messages within a defined message group checksum or rolling count values are incorrect	Error counter for Traction Control torque request message group	>= 3 counts	Traction Control Torque Request CAN Message Received	= TRUE -	fault exists for 1 message group ; monitor runs whenever enable conditions are met.	Special C
					and no rolling count or protection errors on CAN Frame \$1C7 and	= TRUE -		
					ignition on and	= TRUE -		

Component / Svstem	Fault Code	Monitor Strategy Description	Primary Malfunction Criteria	Threshold Logic and Value	Secondary Parameters		Enable Conditions		Time Required	MIL Illum.
					basic enable conditions met:	=	see sheet enable tables	-		
					and NO Pending or Confirmed DTCs:	=	see sheet inhibit tables	-		
Reductant Pump High Control Circuit Low Voltage	P1043	Detects a short circuit to ground on the high side of the Reductant Pump Control Circuit	The ECM detects that the commanded state of the driver and the actual state of the control circuit do not match.		battery voltage	<	10.5	V	fail conditions exists for 3 s monitor runs with 0.010 s rate whenever enable conditions are	A
					OR	-	0	000	met	
					battery voltage and	>	11	V		
					NO Pending or Confirmed DTCs	=	see sheet inhibit tables	-		
					basic enable conditions met:	=	see sheet enable tables	-		
Reductant Pump High Control Circuit High Voltage	P1044	Detects a short circuit to battery on the high side of the Reductant Pump Control Circuit	The ECM detects that the commanded state of the driver and the actual state of the control circuit do not match.		battery voltage	<	10.5	V	fail conditions exists for 3 s monitor runs with 0.010 s rate whenever enable	В
					for time	<	3	sec	conditions are met	
					battery voltage	>	11	V		

Component / System	Fault Code	Monitor Strategy Description	Primary Malfunction Criteria	Threshold Logic and Value	Secondary Parameters		Enable Conditions		Time Required	MIL Illum.
					and ((SCR system waiting for shut down in afterrun	=	TRUE	-		
					OR SCR system in standby in afterun	=	TRUE	-		
					ignition on	=	TRUE	-		
					, NO Pending or Confirmed DTCs	=	see sheet inhibit tables	-		
					basic enable conditions met:	=	see sheet enable tables	-		
Reductant Purge Valve High Control Circuit High Voltage	P1046	Detects a short circuit to battery on the high side of the Reductant Purge Valve Control	The ECM detects that the commanded state of the driver and the actual state of the control circuit do not match		((fail conditions exists for 3 s monitor runs with 0.010 s rate	В
		Circuit			ECU Initialization tasks in progress)	=	FALSE	-	conditions are met	
					ECU Initialization tasks in progress	=	IRUE	-		
)		I	Sec		
					((Battery voltage	>	10.5	V		
					for time	>	3	sec		
			COMMON	NSECTION Page 154	of 491		10	F 3 S	ECTIONS	

Deducted biseder Detects a short sizurit The FOM detects that the Here Here	OR tery voltage > 11) and Pending or = see sl rmed DTCs inhii tabl e conditions = see sl met: enal	1 V heet - bit les		
Deductors D1048 Detects a obstinization The ECM datasts that the Image: Construction of the con) and Pending or = see sl rmed DTCs inhil tabl e conditions = see sl met: enal	heet - ibit les		
Deductort injector Detecto a short sireuit The ECM detects that the Image: Comparison of the compa	e conditions = see sl met: enal	haat		
Deductant Injector D1049 Detecto a chart airquit The COM detects that the	UGBJ	ble les		
Reductant Injector D1049 Detecto a chart circuit The ECM detects that the				
High Control Circuit Low Voltage ECU Initialization Injector Control Circuit Low Voltage ECU Initialization Injector Control Circuit Injector Cont	((ion tasks in = FAL progress) OR (ion tasks in = TRL progress for time > 1) ((tery voltage > 10. for time > 3 OR tery voltage > 11))	SE - JE - sec .5 V sec 1 V	fail conditions exists for 3 s monitor runs with 0.010 s rate whenever enable conditions are met	A

System Code Description Criteria Logic and Value Parameters Conditions Required	Illum.
hasic enable conditions = see shoot	
met: enable tables	
Reductant Injector P1049 Detects a short circuit The ECM detects that the commanded state of the actual state of the actual state of the control Circuit do not match. fail conditions exists for 3 s monitor runs with 0.010 s rate whenever enable conditions are match. High Voltage = FALSE - fail conditions exists for 3 s monitor runs with 0.010 s rate whenever enable conditions are match. CCU Initialization tasks in progress for time > 1 sec - OR - - - - - OB -	A

Component / System	Fault Code	Monitor Strategy Description	Primary Malfunction Criteria	Threshold Logic and Value	Secondary Parameters		Enable Conditions		Time Required	MIL Illum.
Exhaust Aftertreatment Fuel Injector Control Circuit Shorted	P10CC	Electronic out-put driver circuitry determines circuit integrity on the diesel dosing valve control circuit.	The ECM detects that the commanded state of the driver and the actual state of the control circuit do not match.		engine pre drive	=	FALSE	-	fail conditions exists for more than 0.5 s monitor runs with 0.1 s rate whenever enable	В
					for time	>	1	sec	conditions are met	
					and battery voltage	>	11	V		
					for time	>	3	sec		
					and	2	655 34	V		
					for		000.04	v		
					time and	>	3	sec		
					starter is active cranking	=	FALSE	-		
					time	>	3	sec		
					basic enable conditions met:	=	see sheet enable tables	-		
Exhaust Aftertreatment Fuel Injector High Control Circuit Low Voltage	P10CD	Electronic out-put driver circuitry determines circuit integrity on the diesel dosing valve control circuit.	The ECM detects that the commanded state of the driver and the actual state of the control circuit do not match.		engine pre drive for time and	=	FALSE 1	sec	fail conditions exists for more than 3.0 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.
.,					battery voltage	>	11	V		
					for					
					time	>	3	sec		
					and					
					battery voltage	<	655.34	V		
					for					
					time	>	3	sec		
					and					
					starter is active cranking	=	FALSE	-		
					for					
					time	>	3	sec		
					and					
					basic enable conditions	=	see sheet	-		
					met:		enable tables			
							labics			
Exhaust Aftertreatment	P10CE	Detects high voltage	The ECM detects that the		engine pre drive	=	EAL SE	-	fail conditions	B
Fuel Injector High	TIUDE	readings on the diesel	commanded state of the		engine pre anve		TALOL		exists for more	D
Control Circuit High		dosing valve high side	driver and the actual state						than 3.0 s	
Voltage		powerstage or high	of the control circuit do not						monitor runs with	
		indicating an OOR							whenever enable	
		high condition on the							conditions are	
		diesel dosing valve							met	
		actuator circuit								
					for		4			
					time	>	1	sec		
					and battery voltage		11	V		
					for	-	11	v		
					time	>	3	sec		
					and		-			
I I										

Component / System	Fault Code	Monitor Strategy Description	Primary Malfunction Criteria		Threshold Logic and Va	lue	Secondary Parameters		Enable Conditions		Time Required	MIL Illum.
					-		battery voltage for time and starter is active cranking for	V / =	655.34 3 FALSE	V sec		
							time and	>	3	sec		
							met:	=	enable tables	-		
Charge Air Cooler Temperature Sensor Performance	P111C	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)	<=	35	°C	fail conditions exists for 0.1 s monitor runs once per trip with 0.1 s rate whenever enable conditions are met	В
			(a) - (b) (see Look-Up- Table #5) with	>	100 to 999	°C	with (a) captured charge air cooler downstream temperature at start	=	measured parameter	-		
			(a) captured charge air cooler downstream temperature at start	=	measured parameter	-	and with					
			and with				(b) captured charge air cooler upstream temperature at start as reference temperature	=	measured parameter	-		

Component /	Fault	Monitor Strategy	Primary Malfunction		Threshol	d	Secondary		Enable		Time	MIL
System	Code	Description	Criteria		Logic and Va	alue	Parameters		Conditions		Required	Illum.
			(b) captured charge air cooler upstream temperature at start	=	measured parameter	-	and					
							minimum engine-off time	>=	28800	sec		
							and					
			or				ambient temperature	>	-60.04	°C		
			Path 2:				and					
			(engine speed (see Look- Up-Table #87)	>	600 to 850	rpm		
			(a) - (b) (see Look-Up- Table #5)	<=	100 to 999	°C	for					
			with				time	>	0	sec		
			(a) captured charge air cooler downstream temperature at start	=	measured parameter	-	and					
			and with				engine post drive/ afterun	=	FALSE	-		
			(b) captured charge air cooler upstream temperature at start	=	measured parameter	-	and					
			and				diagnostic performed in current dc	=	FALSE	-		
			(a) - (b) (see Look-Up- Table #8)	>	35 to 999	°C	and					
			with				basic enable conditions met:	=	see sheet enable tables	-		
			(a) captured charge air cooler downstream temperature at start	=	measured parameter	-	and					
			and with				NO Pending or Confirmed DTCs:	=	see sheet inhibit tables	-		

Component / System	Fault Code	Monitor Strategy Description	Primary Malfunction Criteria		Threshol Logic and V	d alue	Secondary Parameters	(Enable Conditions	;	Time Required	MIL Illum.
			(b) captured charge air cooler upstream temperature at start and	=	measured parameter	-						
			status of block heater (see parameter definition)	=	FALSE	-						
			status of sun-load detection (see parameter definition)	=	FALSE	-						
)									
Intake Air Temp Sensor 1 to Fuel Temp Sensor 1 Not Plausible	P112A	Detects bias Fuel Temperature Sensor or Intake Air Temperature Sensor by comparing the measured temperature at start.	Path 1:				minimum engine-off time	>=	28800	Sec	fail conditions exists for 0.1 s monitor runs once per trip with 0.1 s rate whenever enable conditions are met	В
			(a) - (b) (see Look-Up- Table #4) where	>	100 to 999	°C	and	>	-60 04	°C		
			(a) captured intake air temperature at start	=	measured parameter	-	and		00.01	Ū		
			and (b) captured fuel temperature at start	=	measured parameter	-	Engine Running (see parameter definition) for	=	TRUE	-		
			or				time and	>	0	sec		

Component /	Fault	Monitor Strategy	Primary Malfunction		Thresho	ld (also	Secondary		Enable		Time	MIL
System	Code	Description	Criteria		Logic and v	alue	Parameters		Conditions		Required	IIIum.
			Path 2: (engine post drive/ afterun and	=	FALSE	-		
			(a) - (b) (see Look-Up- Table #4) where	<=	100 to 999	°C	diagnostic performed in current dc and	=	FALSE	-		
			(a) captured intake air temperature at start	=	measured parameter	-	basic enable conditions met:	=	see sheet enable tables	-		
			and				and					
			(b) captured fuel temperature at start	=	measured parameter	-	NO Pending or Confirmed DTCs:	=	see sheet inhibit tables	-		
			and									
			(a) - (b) (see Look-Up- Table #7) where	>	20 to 999	°C						
			(a) captured intake air temperature at start	=	measured parameter	-						
			and									
			(b) captured fuel temperature at start	=	measured parameter	-						
			and (
			status of block heater (see parameter definition)	=	FALSE	-						
			or									
			status of sun-load detection (see parameter definition)	=	FALSE	-						
))									

Component / System	Fault Code	Monitor Strategy Description	Primary Malfunction Criteria		Threshol Logic and V	d 'alue	Secondary Parameters		Enable Conditions		Time Required	MIL Illum.
Exhaust Gas Temperature Sensors 3-4 Not Plausible	P113A	Detects biased SCR catalyst temperature sensor by comparing SCR catalyst temperature sensor to the particulate filter temperature sensor after an engine off soak time	(a) - (b) (see Look-Up- Table #63)	^	30 to 999	C	Power on reset by ignition on	=	TRUE	-	fail conditions exists for 0.01 s monitor runs with 0.01 s rate whenever enable conditions are met	В
			and with				Engine Running (see parameter definition)	=	TRUE	-		
			(a) captured downstream SCR catalyst temperature at start	=	measured parameter	-	for time	>	0	sec		
			(b) captured downstream Particulate Filter catalyst temperature at start	=	measured parameter	-	Engine off soak time	>=	28800	sec		
							ambient temperature and	>	-60.04	°C		
							NO Pending or Confirmed DTCs:	=	see sheet inhibit tables	-		
							basic enable conditions met:	=	see sheet enable tables	-		
HO2S Performance - Signal High During Moderate Load Bank 1 Sensor 2	P11AF	Compare the pressure compensated O2 concentration sensor signal with a threshold	Pressure compensated O2 concentration	>	(a) + (b)	factor	engine speed	<	2600.00	rpm	fail conditions exists for more than 1.0 s monitor runs with 0.1 s rate whenever enable	В

Component / System	Fault Code	Monitor Strategy Description	Primary Malfunction Criteria	Threshold Logic and Value		ld /alue	Secondary Parameters		Enable Conditions	\$	Time Required	MIL Illum.
-,			where				engine speed	>	1200	rom	conditions are	
			(a) Filtered calculated O2 concentration based on injection quantity, air mass and fuel density	=	Please see the general descriptio n for details of this calculated O2 concentrat ion	factor	Inner combusted quantity	<	180	mm^3 /rev	met	
			(b) Positive O2 concentration margin	=	0.05	factor	Inner combusted quantity	>	36	mm^3 /rev		
							Air mass per cylinder	<	1166.67	g/rev		
							Air mass per cylinder	>	611.11	g/rev		
							Status of binary lambda					
							signal valid	=	TRUE	-		
							for time	>	0.5	sec		
							integrated air mass since all other release conditions are fulfilled for O2 plausibility	>	2.5	g	This monitor runs once per trip	
							battery voltage	>	1.1	V		
							Deceleration fuel cut-off	=	FALSE	-		
							Injection active	=	IRUE	-		
							calculated oxygen concentration	<=	(a) + (b)	factor		
							concentration where	>=	(a) - (b)	lactor		
							(a) random start calculated Oxygen concentration	=	measure variable	factor		
							(b) tolerance range of calculated Oxygen concentration	=	0.1	factor		
							for time	>	0.1	sec		
							engine speed	<	4500	rpm		

Component / System	Fault Code	Monitor Strategy Description	Primary Malfunction Criteria		Threshol Logic and V	d alue	Secondary Parameters		Enable Conditions	i	Time Required	MIL Illum.
							engine speed ambient temperature ambient temperature ambient pressure ambient pressure NO Pending or Confirmed DTCs: basic enable conditions met:		600 122.96 -45.04 110 50 see sheet inhibit table see sheet enable tables	rpm ℃ kPa kPa -		
HO2S Performance - Signal Low During Moderate Load Bank 1 Sensor 2	P11B2	Compare the pressure compensated O2 concentration sensor signal with a threshold	Pressure compensated O2 concentration	V	(a) - (b)	factor	engine speed	<	2600.00	rpm	fail conditions exists for more than 1.0 s monitor runs with 0.1 s rate whenever enable	
			where (a) Filtered calculated O2 concentration based on injection quantity, air mass and fuel density	=	Please see the general descriptio n for details of this calculated O2 concentrat ion	factor	engine speed Inner combusted quantity	> <	1200 180	rpm mm^3 /rev	conditions are met	
			(b) Negative O2 concentration margin	=	0.1	factor	Inner combusted quantity Air mass per cylinder Air mass per cylinder	> < >	36 1166.67 611.11	mm^3 /rev g/rev g/rev		

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Component /	Fault	Monitor Strategy	Primary Malfunction	Threshold	Secondary		Enable		Time	MIL
System	Code	Description	Criteria	Logic and Value	Parameters		Conditions		Required	Illum.
					Status of binary lambda signal valid	_	TRUE		This monitor runs once per trip	
					for time	>	0.5	sec		
					integrated air mass since	>	2.5	а 0		
					all other release conditions are fulfilled for O2 plausibility		2.0	9		
					battery voltage	>	1.1	V		
					Deceleration fuel cut-off	=	FALSE	-		
					Injection active	=	TRUE	-		
					calculated oxygen concentration	<=	(a) + (b)	factor		
					calculated oxygen concentration where	>=	(a) - (b)	factor		
					(a) random start calculated Oxygen concentration	=	measured parameter	-		
					(b) tolerance range of calculated Oxygen concentration	=	0.1	factor		
					for time	>	0.1	sec		
					engine speed	<	4500	rpm		
					engine speed	>	600	rpm		
					ambient temperature	<	122.96	°C		
					ambient temperature	>	-45.04	°C		
					ambient pressure	<	110	kPa		
					ambient pressure	>	50	kPa		
					NO Pending or Confirmed DTCs:	=	see sheet inhibit table	-		
					basic enable conditions met:	=	see sheet enable tables	-		

Component /	Fault	Monitor Strategy	Primary Malfunction	n Threshold		Secondary		Enable		Time	MIL	
System	Code	Description	Criteria		Logic and Va	alue	Parameters		Conditions		Required	Illum.
HO2S Current Performance Bank 1 Sensor 2	P11B5	Compares the ratio of valid lambda signal time to total time with a threshold	ratio of valid lambda signal time to total time: (a) / (b)	<	0.1	ratio	NOx sensor's heater temperature has reached the set point	=	TRUE	-	fail conditions exists for more than 20 s monitor runs with 0.02 s rate	В
			where				for time	>	120	sec	whenever enable	
			(a) time for which valid lambda signal received over CAN	=	measured parameter	-	Enabling Downstream NOx sensor heater diagnosis (please see the definition)	=	TRUE	-	conditions are met	
			(b) total time for which diagnosis is enabled	=	calculated parameter	-	Reciprocal lambda change : (a) - (b) (see Look-Up-Table #42)	<=	0.1 to 22	factor		
							where (a) Reciprocal lambda	=	measured parameter	-		
							(b) Filtered reciprocal lambda	=	calculated parameter	-		
							for time	>	5	sec		
							time for which diagnosis is enabled	>=	20	sec		
							NO Pending or Confirmed DTCs:	=	see sheet inhibit tables	-		
							basic enable conditions met:	=	see sheet enable tables	-		

Component /	Fault	Monitor Strategy	Primary Malfunction	Threshold	Secondary		Enable		Time	MIL
System	Code	Description	Criteria	Logic and Value	Parameters		Conditions	;	Required	Illum.
NOx Sensor Performance - Signal High Bank 1 Sensor 1	P11CB	Detects a high deviation of the measured NOx sensor concentration from the modeled Nox concentration	Filtered NOx concentration deviation from model	> 0.70 -	The signal of the NOx sensor is ready	=	TRUE	-	fault exists for more than 10 s; monitor runs at 0.1 s once per trip	В
					Normal Mode (Particulate Filter Regeneration not active)	=	TRUE	-		
					for time		15	sec		
					ambient pressure	>=	75.0	kPa		
					ambient pressure	<=	106	kPa		
					ambient temperature	>=	-7.04	°C		
					ambient temperature	<=	37.96	°C		
					filtered modeled Nox concentration percent positive deviation (see Look-Up-Table #68)	<=	0.050 to 0.075	-		
					filtered modeled Nox concentration percent negative deviation (see Look-Up-Table #69)	>=	0.050 to 0.075	-		
					for time	>	2	sec		
					time since start	>	30	sec		
					engine coolant temperature	>=	68.96	°C		
					engine coolant temperature	<=	123.06	°C		

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 enable range for the plausibility check of the NOx sensor upstream from the SCR (see Look- Up-Table #80)	>0	0 to 1	-		
					Fuel Injection pattern (see Look-Up-Table #81)	=	0 to 58	-		
							24 = pilot			
							1 main			
							56 = pilot 2 pilot 1			
							main			
							58 = pilot 2 pilot 1			
							main,			
							post 2			
							26 = pilot 1 main,			
							post 2			
							0 = all off			
					vehicle speed	>=	(overrun) 37.29	mph		
					for time	>	1	sec		
					Engine speed and injection quantity enable range for the plausibility check of the NOx sensor upstream from the SCR (see Look-Up-Table #71)	≠0	0 to 1	-		
					for time	>	0.5	sec		

Component / System	Fault Code	Monitor Strategy Description	Primary Malfunction Criteria	Threshold Logic and Value	Secondary Parameters		Enable Conditions		Time Required	MIL Illum.
					Diagnostic has not already completed this driving cycle NO Pending or Confirmed DTCs	=	FALSE see sheet inhibit tables	-		
					basic enable conditions met:	=	see sheet enable tables	-		
NOx Sensor Performance - Signal Low Bank 1 Sensor 1	P11CC	Detects a high deviation of the measured NOx sensor concentration from the modeled Nox concentration	Filtered NOx concentration deviation from model (see Look-Up-Table #79)	< -0.70 to 0.33	The signal of the NOx sensor is ready	=	TRUE	-	fault exists for more than 10 s; monitor runs at 0.1 s once per trip	В
					Normal Mode (Particulate Filter Regeneration not active)	=	TRUE	-		
					for time	>	15	sec		
					ambient pressure	>=	76	kPa		
					ambient pressure	<=	106	kPa		
					ambient temperature	>=	-7.04	°C		
					ambient temperature	<=	37.96	°C		
					filtered modeled Nox concentration percent positive deviation (see Look-Up-Table #68)	<=	0.050 to 0.075	-		
					concentration percent negative deviation (see Look-Up-Table #69)	<=	0.030 10	-		

Component / F System C	Fault Code	Monitor Strategy Description	Primary Malfunction Criteria	Threshold Logic and Value	Secondary Parameters		Enable Conditions	i	Time Required	MIL Illum.
					for time		0			
					time since start		2	sec		
					engine coolant	>=	68.96	°C		
					temperature		00.00	0		
					engine coolant	<=	123.06	°C		
					temperature	>0	0 to 1	_		
					enable range for the	-0	0101	_		
					plausibility check of the					
					NOx sensor upstream					
					Up-Table #80)					
					, , , , , , , , , , , , , , , , , , , ,					
					Fuel Injection pattorn		0 to 59			
					(see Look-Up-Table #81)		0 10 56	-		
					· · · · · · · · · · · · · · · · · · ·					
							24 = pilot			
							i mam			
							56 = pilot			
							2, pilot 1,			
							main			
							58 = pilot			
							2, pilot 1,			
							main,			
							p03t 2			
							26 = pilot			
							1 main,			
							post 2			
							0 = all off			
							(overrun)			
					vehicle speed	>=	37.29	mph		
1 1					for time	>	1	sec		

Component / System	Fault Code	Monitor Strategy Description	Primary Malfunction Criteria	Threshold Logic and Value	Secondary Parameters		Enable Conditions		Time Required	MIL Illum.
					Engine speed and injection quantity enable range for the plausibility check of the NOx sensor upstream from the SCR (see Look-Up-Table #72)	≠0	0 to 1	-		
					for time Diagnostic has not already completed this	> =	0.5 FALSE	sec -		
					driving cycle NO Pending or Confirmed DTCs	=	see sheet inhibit tables	-		
					basic enable conditions met:	=	see sheet enable tables	-		
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	> 0.9 ratio	Sufficient number of valid and invalid NOx status time (sum of valid and invalid Nox status for diagnostic determination)	>=	20	Sec	fault exists for more than 5 s; monitor runs at 0.1 s when enable conditions are met	В
					and Engine Running (see parameter definition)	=	TRUE	-		
					for time (required for the NOx sensor to give valid response) and	>	20	sec		
					Upstream NoX sensor detects a lean A/F mixture and	=	TRUE	-		

Component /	Fault	Monitor Strategy	Primary Malfunction	Threshold	Secondary		Enable		Time	MIL
System	Code	Description	Criteria	Logic and Value	Parameters		Conditions		Required	Illum.
					Valid NOx signal from CAN is received (no Nox sensor communication failures)	=	TRUE	-		
					or					
					following conditions for time:	>	45	sec		
					battery voltage	>=	11	V		
					battery voltage	<=	655.34	V		
					SCR upstream temperature	>=	94.96	°C		
					SCR upstream temperature	<=	3003.56	°C		
					Engine Running (see parameter definition)	=	TRUE	-		
					for time (required for the NOx sensor to give valid response) and	>	20	sec		
					Lambda signal is in steady state condition (see Look-Up-Table #30)	<=	0.3 to 10	-		
					for time	>=	5	sec		
					Inhibit Status (no inhibiting faults) (No pending or stored DTC)	=	see sheet inhibit tables	-		
					basic enable conditions met:	=	see sheet enable tables	-		

Component /	Fault	Monitor Strategy	Primary Malfunction	Threshold	Secondary Parameters		Enable		Time	MIL
System Nov Sonoor Current		Description	Criteria Datio of valid to invalid		Parameters Sufficient number of volid	<u> </u>	Conditions	000	foult eviete for	nium.
Performance Bank1 Sensor 2	FIDC	feedback performance of downstream NoX sensor	downstream Nox sensor status time count	> 0.9 Tallo	and invalid downstream NOx sensor status time (sum of valid and invalid Nox status for diagnostic determination)	~-	20	360	more than 5 s; monitor runs at 0.1 s when enable conditions are met	Б
					and Engine Running (see parameter definition) for time (required for the NOx sensor to give valid response) and Downstream NoX sensor detects a lean A/F mixture and Valid NOx signal from CAN is received (no Nox	= > = =	TRUE 20 TRUE TRUE	- sec -	met	
					sensor communication failures) or following conditions for time:	>	120	sec		
					battery voltage battery voltage	>= <=	655.34	V		
					SCR downstream temperature	>=	94.96	°C		
					SCR downstream temperature	<=	3003.56	°C		
					parameter definition)	_	INUE	-		
					for time (required for the NOx sensor to give valid response)	>	20	sec		

Component / System	Fault Code	Monitor Strategy Description	Primary Malfunction Criteria	Threshold Logic and Value	Secondary Parameters		Enable Conditions		Time Required	MIL Illum.
					and Downstream Lambda signal is in steady state condition (measured lambda signal - filtered lambda signal) (see Look-Up-Table #29)	<=	0.2 to 3.2	-		
					for time Inhibit Status (no inhibiting faults) (No pending or stored DTC) basic enable conditions met:	>= = =	5 see sheet inhibit tables see sheet enable tables	sec -		
Injector 1 Control Circuit Shorted	P1224	Electronic out-put driver circuitry determines that the injector circuit is shorted.	The ECM detects that the commanded state of the driver and the actual state of the control circuit do not match.		Engine Running (see parameter definition)	=	TRUE	-	fail conditions exists for more than 0.5 s monitor runs with 0.01 s rate	A
Injector 2 Control	P1227		The ECM detects that the		Engine Running (see	=	TRUE		whenever enable conditions are met	Δ
Circuit Shorted	1 1227	driver circuitry determines that the injector circuit is shorted.	commanded state of the driver and the actual state of the control circuit do not match.		parameter definition)	_	INUE	-	exists for more than 0.5 s monitor runs with 0.01 s rate whenever enable conditions are met	~

Component / System	Fault Code	Monitor Strategy Description	Primary Malfunction Criteria	Threshold Logic and Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
Injector 3 Control Circuit Shorted	P122A	Electronic out-put driver circuitry determines that the injector circuit is shorted.	Electronic out-put driver circuitry determines that the injector circuit is shorted.		Engine Running (see parameter definition)	= TRUE -	fail conditions exists for more than 0.5 s monitor runs with 0.01 s rate whenever enable conditions are met	A
Injector 4 Control Circuit Shorted	P1233	Electronic out-put driver circuitry determines that the injector circuit is shorted.	Electronic out-put driver circuitry determines that the injector circuit is shorted.		Engine Running (see parameter definition)	= TRUE -	fail conditions exists for more than 0.5 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 5 Control Circuit Shorted	P1236	Electronic out-put driver circuitry determines that the injector circuit is shorted.	Electronic out-put driver circuitry determines that the injector circuit is shorted.		Engine Running (see parameter definition)	= TRUE -	fail conditions exists for more than 0.5 s monitor runs with 0.01 s rate whenever enable conditions are met	A
Injector 6 Control Circuit Shorted	P1239	Electronic out-put driver circuitry determines that the injector circuit is shorted.	Electronic out-put driver circuitry determines that the injector circuit is shorted.		Engine Running (see parameter definition)	= TRUE -	fail conditions exists for more than 0.5 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 7 Control Circuit Shorted	P1242	Electronic out-put driver circuitry determines that the injector circuit is shorted.	Electronic out-put driver circuitry determines that the injector circuit is shorted.		Engine Running (see parameter definition)	=	TRUE	-	fail conditions exists for more than 0.5 s monitor runs with 0.01 s rate whenever enable conditions are met	A
Injector 8 Control Circuit Shorted	P1247	Electronic out-put driver circuitry determines that the injector circuit is shorted.	Electronic out-put driver circuitry determines that the injector circuit is shorted.		Engine Running (see parameter definition)	=	TRUE	-	fail conditions exists for more than 0.5 s monitor runs with 0.01 s rate whenever enable conditions are met	A
Intake Air Flow Valve Control Circuit Shorted	P122C	Electronic out-put driver circuitry determines circuit integrity on the intake air flow valve.	The ECM detects that the commanded state of the driver and the actual state of the control circuit do not match.		(battery voltage for time and	>	11 3	V sec	fail conditions exists for 3 s monitor runs with 0.005 s rate whenever enable conditions are met	В

Component / System	Fault Code	Monitor Strategy Description	Primary Malfunction Criteria	Lo	Threshol gic and V	ld /alue	Secondary Parameters		Enable Conditions		Time Required	MIL Illum.
							battery voltage for time)	< >	655.34 3	V sec		
							, and starter is active cranking	=	FALSE	-		
							for time and	>	3	sec		
							Throttle Valve Actuator Solenoid Control Circuit and	=	ACTIVE	-		
							basic enable conditions met:	=	see sheet enable tables	-		
Diesel Intake Air Flow Position Sensor Exceeded Learning Limit	P122D	Detects adaptation values of throttle valve that are not plausible. Compares the difference between the maximum and minimum adaptation values to a threshold.	throttle valve control deviation calculated out of difference between desired and actual value	<	-10	%	throttle valve controller bypass is active	=	FALSE	-	fail conditions exists for 10.05 s monitor runs once per driving cycle with 0.005 s rate whenever enable conditions are met	В
			or throttle valve control deviation calculated out of difference between desired	>	10	%	and throttle valve is driven to a mechanical stop	=	FALSE	-		
			מויע מכונומו אמועש				and throttle valve is detected as frozen	=	FALSE	-		

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Component / System	Fault Code	Monitor Strategy Description	Primary Malfunction Criteria	Lo	Thresho ogic and	old Value	Secondary Parameters		Enable Conditions		Time Required	MIL Illum.
							means charge air cooler temperature	>	199.96	°C		
							offset learning for the throttle valve was successful in the previous driving cycle and	=	TRUE	-		
							engine post drive/ afterun	=	TRUE	-		
							and basic enable conditions met:	=	see sheet enable tables	-		
							and NO Pending or Confirmed DTCs:	=	see sheet inhibit tables	-		
		Detects implausible learned offset values.	Path 1:				(fail conditions exists for 0.005 s monitor runs once	
			learned throttle valve offset position at open or closed position or	<	-20	%	engine temperature	>=	4.96	°C	per driving cycle with 0.005 s rate whenever enable conditions are	
			learned throttle valve offset position at open or closed position	>	20	%	engine temperature	<=	123.06	°C	met	
			Path 2:				and					
Component /	Fault	Monitor Strategy	Primary Malfunction		Thresh	old	Secondary		Enable		Time	MIL
-------------	-------	------------------	--	-----	---------	-------	---	----	------------	-----	----------	--------
System	Code	Description	Criteria	Log	gic and	Value	Parameters	(Conditions	6	Required	Illum.
			difference between the maximum and minimum positions learned at closed position	>	30	%	(
			or Path 3:				battery voltage	>=	8	V		
			difference between the maximum and minimum positions learned at open position	>	30	%	and					
							battery voltage)	<=	30	V		
							and					
							Throttle Valve is not frozen consisting of:					
							(
							charge air cooler temperature or if	>=	-2.04	°C		
							charge air cooler temperature then	<	-2.04	°C		
							charge air cooler temperature for	>	-1.04	°C		
							time		10	sec		
)					
							and					
							engine speed	=	0	rpm		
							and engine post drive/ afterun	=	TRUE	-		
							and					

Component / System	Fault Code	Monitor Strategy Description	Primary Malfunction Criteria	Threshold Logic and Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
					basic enable conditions met:	= see sheet - enable tables		
Intake Air Flow Valve Control Circuit 2 High Voltage	P122F	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 battery voltage for time) and starter is active cranking for time and Throttle Valve Actuator Solenoid Control Circuit and basic enable conditions met:	 > 11 V > 3 sec < 655.34 V > 3 sec = FALSE - > 3 sec = ACTIVE - = see sheet enable tables 	fail conditions exists for 3 s monitor runs with 0.005 s rate whenever enable conditions are met	В

Component / System	Fault Code	Monitor Strategy Description	Primary Malfunction Criteria	Threshold Logic and Value	Secondary Parameters		Enable Conditions		Time Required	MIL Illum.
System Intake Air Flow Valve Control Circuit 2 Low Voltage	Code P122E	Description Electronic out-put driver circuitry determines circuit integrity on the intake air flow valve.	Criteria The ECM detects that the commanded state of the driver and the actual state of the control circuit do not match.	Logic and Value	Parameters (battery voltage for time and battery voltage for time) and starter is active cranking for time and Throttle Valve Actuator Solenoid Control Circuit and basic enable conditions met:		Conditions 11 3 655.34 3 FALSE 3 ACTIVE see sheet enable tables	V sec - sec -	Required fail conditions exists for 3 s monitor runs with 0.005 s rate whenever enable conditions are met	B
Fuel Pressure	P125A	Electronic out-put	The ECM detects that the		(fail conditions	A
Regulator 2 High Control Circuit Low Voltage		driver circuitry determines circuit integrity on the pressure control valve circuit.	commanded state of the driver and the actual state of the control circuit do not match.		battery voltage for	>	11	V	exists for 0.5 s monitor runs with 0.01 s rate whenever enable conditions are met	

Component / Svstem	Fault Code	Monitor Strategy Description	Primary Malfunction Criteria	Threshold Logic and Value	Secondary Parameters		Enable Conditions		Time Required	MIL Illum.
					time	>	3	sec		
					and					
					battery voltage	<	655.34	V		
					for					
					time	>	3	sec		
)					
					and ignition on	_	трис			
					ignition on	-	IRUE	-		
					hasic enable conditions	=	see sheet	_		
					met:		enable			
							tables			
Fuel Pressure	P125B	Electronic out-put	The ECM detects that the		(fail conditions	В
Regulator 2 High		driver circuitry	commanded state of the						exists for 0.1 s	
Voltage		integrity on the fuel	of the control circuit do not						0.1s rate	
		pressure regulator 2	match.						whenever enable	
		nigh control circuit.							conditions are met	
					battery voltage	>	11	V		
					for					
					time	>	3	sec		
					and					
					battery voltage	<	655.34	V		
					tor		3	800		
							5	360		
					and					
					engine post drive/ afterun	=	TRUE	-		
					and basic enable conditions	=	soo shoot	_		
					met:	_	enable			
							tables			
l		I					4.0			

COMMON SECTION 1 OF 3 SECTIONS

Component / System	Fault Code	Monitor Strategy Description	Primary Malfunction Criteria	Threshold Logic and Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
Fuel Rail Pressure Performance	P128E	Actual rail pressure is compared to fixed absolute value to detect low or high rail pressure conditions.	rail pressure (see Look-Up- Table #57)	< 0 to kPa 15000	(fail conditions exists for 2 s monitor runs with 0.02 s rate whenever enable conditions are	A
					state machine rail pressure control transitioning pressure control valve mode or	= TRUE -	met	
					state machine rail pressure control transitioning to coupled pressure control mode (rail pressure is controlled by metering unit and pressure control valve)	= TRUE -		
					or state machine rail pressure control equal transitioning to metering unit pressure control mode) and	= TRUE -		
					basic enable conditions met:	= see sheet - enable tables		
					and NO Pending or Confirmed DTCs:	= see sheet - inhibit tables		

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Component /	Fault	Monitor Strategy	Primary Malfunction	Threshold	Secondary	Enable	Time MI
System	Code	Description	Criteria	Logic and Value	Parameters	Conditions	Required Illu
			rail pressure (see Look-Up- Table #62)	< 0 to kPa 15000	(state machine rail pressure control equal to pressure control valve or	= TRUE -	fail conditions exists for 2 s monitor runs with 0.02 s rate whenever enable conditions are met
					state machine rail pressure control equal coupled pressure control (rail pressure is controlled by metering unit and pressure control valve)) and	= TRUE -	
					basic enable conditions met: and	= see sheet - enable tables	
					NO Pending or Confirmed DTCs:	= see sheet - inhibit tables	
			rail pressure (see Look-Up- Table #60)	< 0 to kPa 15000	state machine rail pressure control equal to metering unit control mode and basic enable conditions met: and	= TRUE - = see sheet - enable tables	fail conditions exists for 2 s monitor runs with 0.02 s rate whenever enable conditions are met

Component / System	Fault Code	Monitor Strategy Description	Primary Malfunction Criteria		Thresh Logic and	old Value	Secondary Parameters		Enable Conditions		Time Required	MIL Illum.
							NO Pending or Confirmed DTCs:	=	see sheet inhibit tables	-		
			rail pressure	>	215000	kPa	(state machine rail pressure control transitioning pressure control valve mode or state machine rail pressure control transitioning to coupled pressure control mode (rail pressure is controlled by metering unit and pressure control valve) 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	

Component / System	Fault Code	Monitor Strategy Description	Primary Malfunction Criteria		Threshol Logic and V	d alue	Secondary Parameters		Enable Conditions		Time Required	MIL Illum.
Jystem			rail pressure	>	2150000	kPa	(state machine rail pressure control equal to 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 1.01 s. monitor runs with 0.02 s rate whenever enable conditions are met	
			rail pressure	>	215000	kPa	state machine rail pressure control equal to metering unit control mode and basic enable conditions met: and	=	TRUE see sheet enable tables	-	fail conditions exists for 1.01 s. monitor runs with 0.02 s rate whenever enable conditions are met	

Component / System	Fault Code	Monitor Strategy Description	Primary Malfunction Criteria	I	Threshol Logic and V	d alue	Secondary Parameters		Enable Conditions		Time Required	MIL Illum.
							NO Pending or Confirmed DTCs:	=	see sheet inhibit tables	-		
Cylinder 1 Injection Timing Retarded	P12B3	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 0.01 s monitor runs with 0.01 s rate whenever enable conditions are met	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 (
			with (a) maximum injection energizing time (see Look-	=	353.2 to 670.8	us	fuel temperature and	>=	0.06	°C		
			(b) offset of the maximum filtered energizing time (see Look-Up-Table #23)	=	10 to 16	us	fuel temperature)	<=	79.96	°C		
)				and					
		l	for				engine temperature	>	49.96	°C		

Component / System	Fault Code	Monitor Strategy Description	Primary Malfunction Criteria	Threshold Logic and Value	Secondary Parameters		Enable Conditions		Time Required	MIL Illum.
			rail pressure point (see Look-Up-Table #21)	= 30000 to kPa 90000	and	>	10	V		
					sallery voltage		10	v		
					combustion chamber is not cold off means					
					time since last combustion (see Look- Up-Table #90) and	>=	5 to 30	sec		
					number of samples to discard prior to evaluating results and	>	0	-		
					intake manifold pressure	>	75	kPa		
					and accelerator pedal position and	<	0.05	%		
					Fuel system status	=	Fuel cut off	-		
					time and	>	0	sec		
					(engine speed and	>	(b) - (a)	-		
					engine speed with	<	(a) + (c)	-		
					(a) value of engine speed	=	30	rpm		
					and with (b) minimum engine speed and with	=	950	rpm		

Component /	Fault	Monitor Strategy	Primary Malfunction	Threshold	Secondary		Enable		Time	MIL
System	Code	Description	Criteria	Logic and Value	Parameters		Conditions		Required	Illum.
					(c) maximum engine speed)	=	1850	rpm		
					current gear (see Look- Up-Table #89) and	=	0 to 1	-		
					vehicle speed and	>	0	mph		
					rail pressure deviation from setpoint calculated out of difference between desired and actual value	<	2200	kPa		
					and					
					rail pressure is stable for at least and	>	0.1	sec		
					no gear change is occurred and	=	TRUE	-		
					4 wheel mode and	=	FALSE	-		
					basic enable conditions met:	=	see sheet enable tables	-		
					and					
					NO Pending or Confirmed DTCs:	=	see sheet inhibit tables	-		

Component / System	Fault Code	Monitor Strategy Description	Primary Malfunction Criteria		Thresho Logic and V	ld /alue	Secondary Parameters		Enable Conditions		Time Required	MIL Illum.
Cylinder 2 Injection Timing Retarded	P12B5	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 0.01 s monitor runs with 0.01 s rate whenever enable conditions are met	В
		Detects a fault when the corrected energizing time exceeds the allowed limit.	corrected energizing time for the rail pressure calibration points and cylinder 2	>	(a) - (b)	-	and					
			with				fuel temperature	>=	0.06	°C		
			(a) maximum injection energizing time (see Look- Up-Table #22)	=	353.2 to 670.8	us	and					
			and with (b) offset of the maximum filtered energizing time (see Look-Up-Table #23)	=	10 to 16	us	fuel temperature)	<=	79.96	°C		
)				and					
			for				engine temperature	>	49.96	°C		
			rail pressure point (see	=	30000 to	kPa	and					
			Look-up-1able #21)		90000		battery voltage	>	10	V		
							and combustion chamber is not cold off means time since last combustion (see Look-	>=	5 to 30	sec		
1		I	l				Up-Table #90)					

Component / System	Fault Code	Monitor Strategy Description	Primary Malfunction Criteria	Threshold Logic and Value	Secondary Parameters		Enable Conditions		Time Required	MIL Illum.
					and					
					number of samples to	>	0	-		
					evaluating results					
					and					
					intake manifold pressure	>	75	kPa		
					and					
					accelerator pedal	<	0.05	%		
					position					
					and		Evel and			
					Fuel system status	=	Fuel cut off	-		
					for					
					time	>	0	sec		
					and					
					(
					engine speed	>	(b) - (a)	-		
					anu engine speed	<	(a) + (c)	-		
					with		(u) · (0)			
					(a) value of engine speed	=	30	rpm		
					and with	_	050			
					(b) minimum engine speed	=	950	rpm		
					and with					
					(c) maximum engine	=	1850	rpm		
					speed					
					and					
					current gear (see Look-	=	0 to 1	-		
					Up-Table #89)					
					and vehicle speed	>	0	mnh		
					and	-	U	прп		
					and					

Component / System	Fault Code	Monitor Strategy Description	Primary Malfunction Criteria	Threshold Logic and Value	Secondary Parameters		Enable Conditions		Time Required	MIL Illum.
					rail pressure deviation from setpoint calculated out of difference between desired and actual value	<	2200	kPa		
					and rail pressure is stable for at least and	>	0.1	sec		
					no gear change is occurred and	=	TRUE	-		
					4 wheel mode and	=	FALSE	-		
					basic enable conditions met:	=	see sheet enable tables	-		
					and NO Pending or Confirmed DTCs:	=	see sheet inhibit tables	-		
Cylinder 7 Injection Timing Retarded	P12BF	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 0.01 s monitor runs with 0.01 s rate whenever enable conditions are met	В

Component /	Fault	Monitor Strategy	Primary Malfunction		Thresho	ld	Secondary		Enable		Time	MIL
System	Code	Description	Criteria	-	Logic and \	/alue	Parameters	(Conditions	;	Required	Illum.
		Detects a fault when the corrected energizing time exceeds the allowed limit.	corrected energizing time for the rail pressure calibration points and cylinder 3	>	(a) - (b)	-	and					
			\ with				fuel temperature	>=	0.06	°C		
			(a) maximum injection energizing time (see Look- Up-Table #22)	=	353.2 to 670.8	US	and					
			and with (b) offset of the maximum filtered energizing time (see Look-Up-Table #23)	=	10 to 16	us	fuel temperature	<=	79.96	Ĵ		
)				and					
			for				engine temperature	>	49.96	°C		
			rail pressure point (see Look-Up-Table #21)	=	30000 to 90000	kPa	and					
							battery voltage	>	10	V		
							and					
							combustion chamber is not cold off means					
							time since last combustion (see Look- Up-Table #90) and	>=	5 to 30	sec		
							number of samples to discard prior to evaluating results and	>	0	-		
							intake manifold pressure	>	75	kPa		
							and accelerator pedal position	<	0.05	%		

Component / System	Fault Code	Monitor Strategy Description	Primary Malfunction Criteria	Threshold Logic and Value	Secondary Parameters		Enable Conditions	;	Time Required	MIL Illum.
					and					
					Fuel system status	=	Fuel cut off	-		
					for					
					time	>	0	sec		
					and					
					(
					engine speed	>	(b) - (a)	-		
					and					
					engine speed	<	(a) + (c)	-		
					with					
					(a) value of engine speed	=	30	rpm		
					and with					
					(b) minimum engine	=	950	rom		
					speed					
					and with					
					(c) maximum engine	=	1850	rpm		
					speed					
					and					
					current gear (see Look-	=	0 to 1	-		
					Up-Table #89)					
					and					
					vehicle speed	>	0	mph		
					and					
					rail pressure deviation	<	2200	kPa		
					out of difference between					
					desired and actual value					
					and					
					rail pressure is stable for	>	0 1	sec		
					at least	-	0.1	000		
					and					
					no gear change is occurred	=	TRUE	-		

Component /	Fault	Monitor Strategy	Primary Malfunction		Threshold	1	Secondary		Enable		Time	MIL
System	Code	Description	Criteria	L	logic and Va	lue	Parameters		Conditions		Required	Illum.
							and 4 wheel mode and basic enable conditions met:	=	FALSE see sheet enable tables	-		
							and NO Pending or Confirmed DTCs:	H	see sheet inhibit tables	-		
Cylinder 8 Injection Timing Retarded	P12C1	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 0.01 s monitor runs with 0.01 s rate whenever enable conditions are met	В
		Detects a fault when the corrected energizing time exceeds the allowed limit.	corrected energizing time for the rail pressure calibration points and cylinder 4 (>	(a) - (b)	-	and (
			with (a) maximum injection energizing time (see Look- Up-Table #22)	=	353.2 to 670.8	us	fuel temperature and	>=	0.06	°C		
			and with				fuel temperature	<=	79.96	°C		

Component / System	Fault Code	Monitor Strategy Description	Primary Malfunction Criteria		Thresho Logic and V	ld /alue	Secondary Parameters		Enable Conditions		Time Required	MIL Illum.
			(b) offset of the maximum filtered energizing time (see Look-Up-Table #23)	=	10 to 16	us)					
)				and					
			for	_	20000 to	kDo	engine temperature	>	49.96	°C		
			Look-Up-Table #21)	-	90000	кга	anu battery voltage	>	10	V		
							ballery voltage	-	10	v		
							and combustion chamber is not cold off means					
							time since last combustion (see Look- Up-Table #90) and	>=	5 to 30	sec		
							number of samples to discard prior to evaluating results and	>	0	-		
							intake manifold pressure	>	75	kPa		
							and accelerator pedal position and	<	0.05	%		
							Fuel system status	=	Fuel cut off	-		
							time and	>	0	sec		
							(engine speed and	>	(b) - (a)	-		
							engine speed	<	(a) + (c)	-		

Component / System	Fault Code	Monitor Strategy Description	Primary Malfunction Criteria	Threshold Logic and Value	Secondary Parameters		Enable Conditions		Time Required	MIL Illum.
					with	-		-		
					(a) value of engine speed	=	30	rpm		
					and with					
					(b) minimum engine	=	950	rpm		
					and with					
					(c) maximum engine speed)	=	1850	rpm		
					and					
					current gear (see Look- Up-Table #89) and	=	0 to 1	-		
					vehicle speed	>	0	mph		
					and		0	mpri		
					rail pressure deviation from setpoint calculated out of difference between desired and actual value	<	2200	kPa		
					and					
					rail pressure is stable for at least	>	0.1	sec		
					and		TOUE			
					no gear change is occurred and	=	IRUE	-		
					4 wheel mode	=	FALSE	_		
					and		17.202			
					basic enable conditions met:	=	see sheet enable tables	-		
					and					

Component / System	Fault Code	Monitor Strategy Description	Primary Malfunction Criteria	L	Threshold ogic and Va	d alue	Secondary Parameters		Enable Conditions		Time Required	MIL Illum.
					-		NO Pending or Confirmed DTCs:	=	see sheet inhibit tables	-		
Cylinder 4 Injection Timing Retarded	P12B9	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 0.01 s monitor runs with 0.01 s rate whenever enable conditions are met	В
		Detects a fault when the corrected energizing time exceeds the allowed limit.	corrected energizing time for the rail pressure calibration points and cylinder 5 (>	(a) - (b)	-	and (
			with				fuel temperature	>=	0.06	°C		
			(a) maximum injection energizing time (see Look- Up-Table #22) and with	=	353.2 to 670.8	us	and fuel temperature	<=	79.96	°C		
			(b) offset of the maximum filtered energizing time (see Look-Up-Table #23)	=	10 to 16	us)			-		
)				and					
) for rail pressure point (see	=	30000 to	kPa	engine temperature and	>	49.96	°C		
			LOOK-Up-I аріе #21)		90000		battery voltage	>	10	V		

Component /	Fault	Monitor Strategy	Primary Malfunction	Threshold	Secondary	E	Enable		Time	MIL
System	Code	Description	Criteria	Logic and value	Parameters	Col	naitions	_	Required	llium.
					and combustion chamber is not cold off means					
					time since last combustion (see Look- Up-Table #90) and	>= 5	5 to 30	sec		
					number of samples to discard prior to evaluating results and	>	0	-		
					intake manifold pressure and	>	75	kPa		
					accelerator pedal position and	<	0.05	%		
					Fuel system status for	= F	Fuel cut off	-		
					time and (>	0	sec		
					engine speed and	> (I	(b) - (a)	-		
					engine speed with	< (a	a) + (c)	-		
					(a) value of engine speed and with	=	30	rpm		
					(b) minimum engine speed and with	=	950	rpm		
					(c) maximum engine speed)	=	1850	rpm		
					and					

Component /	Fault	Monitor Strategy	Primary Malfunction	Threshold	Secondary		Enable		Time	MIL
System	Code	Description	Criteria	Logic and Value	Parameters		Conditions		Required	Illum.
					current gear (see Look- Up-Table #89)	=	0 to 1	-		
					vehicle speed	>	0	mph		
					and		Ũ	mpn		
					rail pressure deviation from setpoint calculated out of difference between desired and actual value	<	2200	kPa		
					and					
					rail pressure is stable for at least and	>	0.1	sec		
					no gear change is occurred and	=	TRUE	-		
					4 wheel mode	=	FALSE	-		
					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		ld /alue	Secondary Parameters		Enable Conditions		Time Required	MIL Illum.
Cylinder 5 Injection Timing Retarded	P12BB	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 0.01 s monitor runs with 0.01 s rate whenever enable conditions are met	В
		Detects a fault when the corrected energizing time exceeds the allowed limit.	corrected energizing time for the rail pressure calibration points and cylinder 6 (>	(a) - (b)	-	and					
			with				fuel temperature	>=	0.06	°C		
			(a) maximum injection energizing time (see Look- Up-Table #22)	=	353.2 to 670.8	US	and					
			and with (b) offset of the maximum filtered energizing time (see Look-Up-Table #23)	=	10 to 16	us	fuel temperature)	<=	79.96	°C		
)				and					
			for				engine temperature	>	49.96	°C		
			rail pressure point (see	=	30000 to	kPa	and					
			LOOK-OP-TADIE #21)		90000		battery voltage	>	10	V		
							and combustion chamber is not cold off means time since last combustion (see Look- Up-Table #90)	>=	5 to 30	sec		

Component / System	Fault Code	Monitor Strategy Description	Primary Malfunction Criteria	Threshold Logic and Value	Secondary Parameters		Enable Conditions		Time Required	MIL Illum.
					and					
					number of samples to	>	0	-		
					evaluating results					
					and					
					intake manifold pressure	>	75	kPa		
					and					
					accelerator pedal	<	0.05	%		
					position					
					and		Evel and			
					Fuel system status	=	Fuel cut off	-		
					for					
					time	>	0	sec		
					and					
					(
					engine speed	>	(b) - (a)	-		
					anu engine speed	<	(a) + (c)	-		
					with		(u) · (0)			
					(a) value of engine speed	=	30	rpm		
					and with	_	050			
					(b) minimum engine speed	=	950	rpm		
					and with					
					(c) maximum engine	=	1850	rpm		
					speed					
					and					
					current gear (see Look-	=	0 to 1	-		
					Up-Table #89)					
					and vehicle speed	>	0	mnh		
					and	-	U	прп		
					and					

Component / System	Fault Code	Monitor Strategy Description	Primary Malfunction Criteria	Threshold Logic and Value	Secondary Parameters		Enable Conditions		Time Required	MIL Illum.
					rail pressure deviation from setpoint calculated out of difference between desired and actual value	<	2200	kPa		
					and rail pressure is stable for at least and	>	0.1	sec		
					no gear change is occurred and	=	TRUE	-		
					4 wheel mode and	=	FALSE	-		
					basic enable conditions met:	=	see sheet enable tables	-		
					and NO Pending or Confirmed DTCs:	=	see sheet inhibit tables	-		
Cylinder 6 Injection Timing Retarded	P12BD	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 0.01 s monitor runs with 0.01 s rate whenever enable conditions are met	В

Component /	Fault	Monitor Strategy	Primary Malfunction		Thresho	ld	Secondary		Enable		Time	MIL
System	Code	Description	Criteria	-	Logic and \	/alue	Parameters	(Conditions		Required	Illum.
		Detects a fault when the corrected energizing time exceeds the allowed limit.	corrected energizing time for the rail pressure calibration points and cylinder 7	>	(a) - (b)	-	and					
			\ with				fuel temperature	>=	0.06	°C		
			(a) maximum injection energizing time (see Look- Up-Table #22)	=	353.2 to 670.8	US	and					
			and with (b) offset of the maximum filtered energizing time (see Look-Up-Table #23)	=	10 to 16	US	fuel temperature	<=	79.96	ĴĊ		
)				and					
			for				engine temperature	>	49.96	°C		
			rail pressure point (see Look-Up-Table #21)	=	30000 to 90000	kPa	and					
							battery voltage	>	10	V		
							and					
							combustion chamber is not cold off means					
							time since last combustion (see Look- Up-Table #90) and	>=	5 to 30	sec		
							number of samples to discard prior to evaluating results and	>	0	-		
							intake manifold pressure	>	75	kPa		
							and accelerator pedal position	<	0.05	%		

Component / System	Fault Code	Monitor Strategy Description	Primary Malfunction Criteria	Threshold Logic and Value	Secondary Parameters		Enable Conditions	;	Time Required	MIL Illum.
					and					
					Fuel system status	=	Fuel cut	-		
					for		OII			
					time	>	0	sec		
					and					
					(
					engine speed	>	(b) - (a)	-		
					and onging speed	_	(2) + (2)			
					engine speed with		(a) + (c)	-		
					(a) value of engine speed	=	30	rpm		
					(h) minimum onging	_	050	rom		
					(b) minimum engine speed	_	950	трп		
					and with					
					(c) maximum engine	=	1850	rpm		
)					
					and					
					current gear (see Look-	=	0 to 1	-		
					Up-Table #89) and					
					vehicle speed	>	0	mph		
					and					
					rail pressure deviation	<	2200	kPa		
					out of difference between					
					desired and actual value					
					and					
					rail pressure is stable for	>	0.1	sec		
					at least					
					no gear change is	=	TRUE	-		
					occurred					

Component /	Fault	Monitor Strategy	Primary Malfunction		Threshold	b	Secondary		Enable		Time	MIL
System	Code	Description	Criteria	L	Logic and Va	alue	Parameters		Conditions		Required	Illum.
							and 4 wheel mode and basic enable conditions met:	=	FALSE see sheet enable tables	-		
							and NO Pending or Confirmed DTCs:	=	see sheet inhibit tables	-		
Cylinder 3 Injection Timing Retarded	P12B7	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	(corrected energizing time	>	(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
		the corrected energizing time exceeds the allowed limit.	for the rail pressure calibration points and cylinder 8 ((
			with (a) maximum injection energizing time (see Look-	=	353.2 to 670.8	us	fuel temperature and	>=	0.06	°C		
			Up-Table #22) and with				fuel temperature	<=	79.96	°C		

Component / System	Fault Code	Monitor Strategy Description	Primary Malfunction Criteria		Thresho Logic and V	ld /alue	Secondary Parameters		Enable Conditions		Time Required	MIL Illum.
			(b) offset of the maximum filtered energizing time (see Look-Up-Table #23)	=	10 to 16	us)					
)				and					
			for	_	20000 to	kDo	engine temperature	>	49.96	°C		
			Look-Up-Table #21)	-	90000	кга	anu battery voltage	>	10	V		
							ballery voltage	-	10	v		
							and combustion chamber is not cold off means					
							time since last combustion (see Look- Up-Table #90) and	>=	5 to 30	sec		
							number of samples to discard prior to evaluating results and	>	0	-		
							intake manifold pressure	>	75	kPa		
							and accelerator pedal position and	<	0.05	%		
							Fuel system status	=	Fuel cut off	-		
							time and	>	0	sec		
							(engine speed and	>	(b) - (a)	-		
							engine speed	<	(a) + (c)	-		

Component / System	Fault Code	Monitor Strategy Description	Primary Malfunction Criteria	Threshold Logic and Value	Secondary Parameters		Enable Conditions		Time Required	MIL Illum.
					with					
					(a) value of engine speed	=	30	rpm		
					and with					
					(b) minimum engine	=	950	rpm		
					speed and with					
					(c) maximum engine speed)	=	1850	rpm		
					and					
					current gear (see Look- Up-Table #89) and	=	0 to 1	-		
					vehicle speed	>	0	mph		
					and					
					rail pressure deviation from setpoint calculated out of difference between desired and actual value	<	2200	kPa		
					and					
					anu rail pressure is stable for		0.1	800		
					at least	-	0.1	360		
					no gear change is	=	TRUE	_		
					occurred					
					4 wheel mode	=	FALSE	-		
					and					
					basic enable conditions met:	=	see sheet enable tables	-		
					and					

Component / System	Fault Code	Monitor Strategy Description	Primary Malfunction Criteria	I	Threshol Logic and V	d alue	Secondary Parameters		Enable Conditions		Time Required	MIL Illum.
							NO Pending or Confirmed DTCs:	=	see sheet inhibit tables	-		
Cylinder 1 Injection Timing Advanced	P12B4	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	(corrected eneraizing time	<	(a) + (b)	_	environmental temperature	>	-7.04	°C	fail conditions exists for more than 0.01 s monitor runs with 0.01 s rate whenever enable conditions are met	В
		the corrected energizing time falls below the allowed limit.	for the rail pressure calibration points and cylinder 1		(a) · (b)		unu (
			with				fuel temperature	>=	0.06	°C		
			(a) minimum injection energizing time and with	=	107.2	us	and fuel temperature	<=	79.96	°C		
			(b) offset of the minimum filtered energizing time (see Look-Up-Table #24)	=	56 to 123.2	us)					
)				and					
			for				engine temperature	>	49.96	°C		
			rail pressure point (see	=	30000 to	kPa	and					
					30000		battery voltage	>	10	V		
							and					

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Component /	Fault	Monitor Strategy	Primary Malfunction	Threshold	Secondary		Enable		Time	MIL
System	Code	Description	Criteria	Logic and Value	Parameters		Conditions	;	Required	Illum.
					combustion chamber is not cold off means					
					time since last combustion (see Look- Up-Table #90) and	>=	5 to 30	sec		
					number of samples to discard prior to evaluating results and	>	0	-		
					intake manifold pressure	>	75	kPa		
					and accelerator pedal	<	0.05	%		
					position and					
					Fuel system status for	=	Fuel cut off	-		
					time and	>	0	sec		
					engine speed	>	(b) - (a)	-		
					engine speed	<	(a) + (c)	-		
					(a) value of engine speed	=	30	rpm		
					and with	_	950	rom		
					speed and with	-	300	ιμπ		
					(c) maximum engine speed)	=	1850	rpm		
					current gear (see Look- Up-Table #89)	=	0 to 1	-		

1 OF 3 SECTIONS

Component /	Fault	Monitor Strategy	Primary Malfunction	Threshold	Secondary		Enable		Time	MIL
System	Code	Description	Criteria	Logic and Value	Parameters		Conditions		Required	Illum.
					and					
					vehicle speed	>	0	mph		
					and reit processor deviation		2200	kD a		
					from setpoint calculated		2200	кга		
					out of difference between					
					desired and actual value					
					and					
					rail pressure is stable for	>	0.1	sec		
					at least and					
					no gear change is	=	TRUE	-		
					occurred					
					and					
					4 wheel mode	=	FALSE	-		
					anu basic enable conditions	_	saa shaat	_		
					met:	_	enable	-		
							tables			
					and					
					NO Pending or	=	see sheet	-		
					Confirmed DTCs:		inhibit			
							lables			

Component / System	Fault Code	Monitor Strategy Description	Primary Malfunction Criteria	Threshold Logic and Value		ld /alue	Secondary Parameters	Enable Conditions			Time Required	MIL Illum.
Cylinder 2 Injection Timing Advanced	P12B6	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	(environmental temperature	>	-7.04	°C	fail conditions exists for more than 0.01 s monitor runs with 0.01 s rate whenever enable conditions are met	В
		Detects a fault when the corrected energizing time falls below the allowed limit.	corrected energizing time for the rail pressure calibration points and cylinder 2 (<	(a) + (b)	-	and					
			with				fuel temperature	>=	0.06	°C		
			(a) minimum injection energizing time and with	=	107.2	US	and fuel temperature	<=	79.96	°C		
			(b) offset of the minimum filtered energizing time (see Look-Up-Table #24)	=	56 to 123.2	us)			-		
)				and					
			for				engine temperature	>	49.96	°C		
			rail pressure point (see Look-Up-Table #21)	=	30000 to 90000	kPa	and					
							battery voltage	>	10	V		
							and					
							combustion chamber is not cold off means					
							time since last combustion (see Look- Up-Table #90) and	>=	5 to 30	sec		

Component / System	Fault Code	Monitor Strategy Description	Primary Malfunction Criteria	Threshold Logic and Value	Secondary Parameters		Enable Conditions		Time Required	MIL Illum.
					number of samples to discard prior to evaluating results and	>	0	-		
					intake manifold pressure	>	75	kPa		
					and accelerator pedal position and	<	0.05	%		
					Fuel system status	=	Fuel cut off	-		
					time and	>	0	sec		
					(engine speed and	>	(b) - (a)	-		
					engine speed with	<	(a) + (c)	-		
					(a) value of engine speed	=	30	rpm		
					and with (b) minimum engine speed and with	=	950	rpm		
					(c) maximum engine speed)	=	1850	rpm		
					and current gear (see Look- Up-Table #89)	=	0 to 1	-		
					vehicle speed and	>	0	mph		

Component / System	Fault Code	Monitor Strategy Description	Primary Malfunction Criteria	Threshold Logic and Value	Secondary Parameters		Enable Conditions		Time Required	MIL Illum.		
					rail pressure deviation from setpoint calculated out of difference between desired and actual value	<	2200	kPa				
					and rail pressure is stable for at least and	>	0.1	sec				
					no gear change is occurred and	=	TRUE	-				
					4 wheel mode	=	FALSE	-				
					and basic enable conditions met:	=	see sheet enable tables	-				
					and NO Pending or Confirmed DTCs:	=	see sheet inhibit tables	-				
Cylinder 7 Injection Timing Advanced	P12C0	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 0.01 s monitor runs with 0.01 s rate whenever enable conditions are met	В		
Component /	Fault	Monitor Strategy	Primary Malfunction		Thresho	ld	Secondary		Enable		Time	MIL
-------------	-------	---	---	---	-------------------	-------	---	----	------------	-----	----------	--------
System	Code	Description	Criteria		Logic and \	/alue	Parameters		Conditions	5	Required	Illum.
		Detects a fault when the corrected energizing time falls below the allowed limit.	corrected energizing time for the rail pressure calibration points and cylinder 3 (<	(a) + (b)	-	and (
			with				fuel temperature	>=	0.06	°C		
			(a) minimum injection energizing time	=	107.2	us	and		70.00	*0		
			(b) offset of the minimum filtered energizing time (see Look-Up-Table #24)	=	56 to 123.2	us	juei temperature	<=	79.96			
)				and					
			for				engine temperature	>	49.96	°C		
			rail pressure point (see Look-Up-Table #21)	=	30000 to 90000	kPa	and					
							battery voltage	>	10	V		
							and combustion chamber is not cold off means					
							time since last combustion (see Look- Up-Table #90) and	>=	5 to 30	sec		
							number of samples to discard prior to evaluating results and	>	0	-		
							intake manifold pressure	>	75	kPa		
							and accelerator pedal position and	<	0.05	%		

Component / System	Fault Code	Monitor Strategy Description	Primary Malfunction Criteria	Threshold Logic and Value	Secondary Parameters		Enable Conditions		Time Required	MIL Illum.
					Fuel system status	=	Fuel cut off	-		
					for		0			
					time	>	0	sec		
					and (
					engine speed	>	(b) - (a)	-		
					and					
					engine speed	<	(a) + (c)	-		
					with					
					(a) value of engine speed	=	30	rpm		
					and with					
					(b) minimum engine	=	950	rpm		
					speed and with					
					(c) maximum engine	=	1850	rpm		
					speed					
) and					
					current gear (see Look-	=	0 to 1	-		
					Up-Table #89)					
					and		0	ma m h		
					venicle speed	>	0	mpn		
					rail pressure deviation	<	2200	kPa		
					from setpoint calculated			-		
					out of difference between desired and actual value					
					and					
					rail pressure is stable for	>	0.1	sec		
					at least					
					and		TOUS			
					no gear change is occurred	=	IRUE	-		
					and					

Component / System	Fault Code	Monitor Strategy Description	Primary Malfunction Criteria	L	Threshold ogic and Va	d alue	Secondary Parameters		Enable Conditions		Time Required	MIL Illum.
							4 wheel mode and basic enable conditions met: and NO Pending or Confirmed DTCs:	=	FALSE see sheet tables see sheet inhibit tables	-		
Cylinder 8 Injection Timing Advanced	P12C2	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 falls below the allowed limit.	(corrected energizing time for the rail pressure calibration points and cylinder 4	<	(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	>=	0.06	°C		
			 (a) minimum injection energizing time and with (b) offset of the minimum filtered energizing time (see Look-Up-Table #24) 	=	107.2 56 to 123.2	us us	and fuel temperature)	<=	79.96	°C		
)				and					

Component /	Fault	Monitor Strategy	Primary Malfunction		Threshol	d	Secondary		Enable Conditions		Time Required	MIL
System	Coue	Description	Criteria		Logic and V	aiue	Farameters		conultions		Required	mum.
) for rail pressure point (see	=	30000 to	kPa	engine temperature and	>	49.96	°C		
			LOOK-OP-TABLE #2T)		90000		battery voltage	>	10	V		
							and					
							combustion chamber is not cold off means					
							time since last	>=	5 to 30	sec		
							Up-Table #90) and					
							number of samples to discard prior to evaluating results and	>	0	-		
							intake manifold pressure	>	75	kPa		
							and accelerator pedal	<	0.05	%		
							and					
							Fuel system status	=	Fuel cut off	-		
							time	>	0	sec		
							and (
							engine speed and	>	(b) - (a)	-		
							engine speed	<	(a) + (c)	-		
							אונה (a) value of engine speed	=	30	rpm		
							and with					

Component /	Fault	Monitor Strategy	Primary Malfunction	Threshold	Secondary		Enable		Time	MIL
System	Code	Description	Criteria	Logic and Value	Parameters		Conditions		Required	Illum.
					(b) minimum engine speed and with	=	950	rpm		
					(c) maximum engine speed) and	=	1850	rpm		
					current gear (see Look- Up-Table #89) and	=	0 to 1	-		
					vehicle speed and	>	0	mph		
					rail pressure deviation from setpoint calculated out of difference between desired and actual value	<	2200	kPa		
					and					
					rail pressure is stable for at least and	>	0.1	sec		
					no gear change is occurred and	=	TRUE	-		
					4 wheel mode and	=	FALSE	-		
					basic enable conditions met:	=	see sheet enable tables	-		
					and NO Pending or Confirmed DTCs:	=	see sheet inhibit tables	-		

Component / System	Fault Code	Monitor Strategy Description	Primary Malfunction Criteria		Thresho Logic and \	ld /alue	Secondary Parameters		Enable Conditions		Time Required	MIL Illum.
Cylinder 4 Injection Timing Advanced	P12BA	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	(environmental temperature	>	-7.04	°C	fail conditions exists for more than 0.01 s monitor runs with 0.01 s rate whenever enable conditions are met	В
		operating point. Detects a fault when the corrected energizing time falls below the allowed limit.	corrected energizing time for the rail pressure calibration points and cylinder 5	<	(a) + (b)	-	and					
			with				fuel temperature	>=	0.06	°C		
			(a) minimum injection energizing time and with	=	107.2	US	and fuel temperature	<=	79.96	°C		
			(b) offset of the minimum filtered energizing time (see Look-Up-Table #24)	=	56 to 123.2	US)		10.00	0		
)				and					
			for				engine temperature	>	49.96	°C		
			rail pressure point (see	=	30000 to	kPa	and					
					50000		battery voltage	>	10	V		
							and					
							combustion chamber is not cold off means					
							time since last combustion (see Look- Up-Table #90) and	>=	5 to 30	sec		

Component / System	Fault Code	Monitor Strategy Description	Primary Malfunction Criteria	Threshold Logic and Value	Secondary Parameters		Enable Conditions		Time Required	MIL Illum.
					number of samples to discard prior to evaluating results and	>	0	-		
					intake manifold pressure	>	75	kPa		
					and accelerator pedal	<	0.05	%		
					position and					
					Fuel system status	=	Fuel cut off	-		
					for time	>	0	sec		
					and (
					engine speed	>	(b) - (a)	-		
					engine speed	<	(a) + (c)	-		
					with (a) value of engine speed	=	30	rpm		
					and with		0.50			
					(b) minimum engine speed and with	=	950	rpm		
					(c) maximum engine	=	1850	rpm		
) and					
					current gear (see Look- Up-Table #89)	=	0 to 1	-		
					and vehicle speed	>	0	mph		
					and					

Component / System	Fault Code	Monitor Strategy Description	Primary Malfunction Criteria	Threshold Logic and Value	Secondary Parameters		Enable Conditions		Time Required	MIL Illum.
					rail pressure deviation from setpoint calculated out of difference between desired and actual value	<	2200	kPa		
					and rail pressure is stable for at least and	>	0.1	sec		
					no gear change is occurred and	=	TRUE	-		
					4 wheel mode	=	FALSE	-		
					and basic enable conditions met:	=	see sheet enable tables	-		
					and NO Pending or Confirmed DTCs:	=	see sheet inhibit tables	-		
Cylinder 5 Injection Timing Advanced	P12BC	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 0.01 s monitor runs with 0.01 s rate whenever enable conditions are met	В

Component /	Fault	Monitor Strategy	Primary Malfunction		Thresho	ld	Secondary		Enable		Time	MIL
System	Code	Description	Criteria	I	Logic and \	/alue	Parameters		Conditions	;	Required	Illum.
		Detects a fault when the corrected energizing time falls below the allowed limit.	corrected energizing time for the rail pressure calibration points and cylinder 6 (v	(a) + (b)	-	and (0		
			with				tuel temperature	>=	0.06	Ĵ		
			(a) minimum injection energizing time	=	107.2	us	and	-	70.00	°C		
							tuer temperature	<=	79.90	C		
			(b) offset of the minimum filtered energizing time (see Look-Up-Table #24)	=	56 to 123.2	US)					
)				and					
			, for				engine temperature	>	49.96	°C		
			rail pressure point (see Look-Up-Table #21)	=	30000 to 90000	kPa	and			C		
							battery voltage	>	10	V		
							and					
							combustion chamber is					
							means					
							time since last combustion (see Look- Up-Table #90) and	>=	5 to 30	sec		
							number of samples to discard prior to evaluating results and	>	0	-		
							intake manifold pressure	>	75	kPa		
							and					
							accelerator pedal position	<	0.05	%		
		l					and					

Component / System	Fault Code	Monitor Strategy	Primary Malfunction Criteria	Threshold	Secondary Parameters		Enable		Time Required	MIL
Oystein	0000	Description	ontena		Fuel system status	=	Fuel cut	-	Required	
							off			
					for					
					time	>	0	sec		
					and					
					(
					engine speed	>	(b) - (a)	-		
					and					
					engine speed	<	(a) + (c)	-		
					with					
					(a) value of engine speed	=	30	rpm		
					and with					
					(b) minimum ongino	_	050	rom		
					(b) minimum engine	_	900	ipin		
					and with					
					(c) maximum engine	=	1850	rpm		
					speed					
)					
					and		01.4			
					Current gear (see Look-	=	0 to 1	-		
					and					
					vehicle speed	>	0	mph		
					and					
					rail pressure deviation	<	2200	kPa		
					from setpoint calculated					
					out of difference between					
					desired and actual value					
					and					
					rail pressure is stable for	>	0.1	sec		
					at least					
					anu no gear changa ia	_				
					occurred	-	INUE	-		
					and					

Component / System	Fault Code	Monitor Strategy Description	Primary Malfunction Criteria	L	Threshold ogic and Va	d alue	Secondary Parameters		Enable Conditions		Time Required	MIL Illum.
							4 wheel mode and basic enable conditions met: and NO Pending or Confirmed DTCs:	=	FALSE see sheet tables see sheet inhibit tables	-		
Cylinder 6 Injection Timing Advanced	P12BE	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 falls below the allowed limit.	(corrected energizing time for the rail pressure calibration points and cylinder 7	<	(a) + (b)	-	environmental temperature and	>	-7.04	°C	fail conditions exists for more than 0.01 s monitor runs with 0.01 s rate whenever enable conditions are met	В
			with				fuel temperature	>=	0.06	°C		
			 (a) minimum injection energizing time and with (b) offset of the minimum filtered energizing time (see Look-Up-Table #24) 	=	107.2 56 to 123.2	us us	and fuel temperature)	<=	79.96	°C		
)				and					

Component /	Fault	Monitor Strategy	Primary Malfunction		Threshol	d	Secondary		Enable Conditions		Time Required	MIL
System	Coue	Description	Cilteria		Logic and V	aiue	Farameters		contaitions		Required	mum.
) for rail pressure point (see	=	30000 to	kPa	engine temperature and	>	49.96	°C		
			LUUK-Op-Table #21)		90000		battery voltage	>	10	V		
							and					
							combustion chamber is not cold off means					
							time since last	>=	5 to 30	sec		
							Up-Table #90) and					
							number of samples to discard prior to evaluating results and	>	0	-		
							intake manifold pressure	>	75	kPa		
							and accelerator pedal	<	0.05	%		
							and					
							Fuel system status	=	Fuel cut off	-		
							time	>	0	sec		
							and (
							engine speed and	>	(b) - (a)	-		
							engine speed	<	(a) + (c)	-		
							אונה (a) value of engine speed	=	30	rpm		
							and with					

Component /	Fault	Monitor Strategy	Primary Malfunction	Threshold	Secondary		Enable		Time	MIL
System	Code	Description	Criteria	Logic and Value	Parameters		Conditions		Required	Illum.
					(b) minimum engine speed and with	=	950	rpm		
					(c) maximum engine speed) and	=	1850	rpm		
					current gear (see Look- Up-Table #89) and	=	0 to 1	-		
					vehicle speed and	>	0	mph		
					rail pressure deviation from setpoint calculated out of difference between desired and actual value	<	2200	kPa		
					and					
					rail pressure is stable for at least and	>	0.1	sec		
					no gear change is occurred and	=	TRUE	-		
					4 wheel mode and	=	FALSE	-		
					basic enable conditions met:	=	see sheet enable tables	-		
					and NO Pending or Confirmed DTCs:	=	see sheet inhibit tables	-		

Component / System	Fault Code	Monitor Strategy Description	Primary Malfunction Criteria		Thresho Logic and \	ld /alue	Secondary Parameters		Enable Conditions		Time Required	MIL Illum.
Cylinder 3 Injection Timing Advanced	P12B8	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	(environmental temperature	>	-7.04	°C	fail conditions exists for more than 0.01 s monitor runs with 0.01 s rate whenever enable conditions are met	В
		operating point. Detects a fault when the corrected energizing time falls below the allowed limit.	corrected energizing time for the rail pressure calibration points and cylinder 8	<	(a) + (b)	-	and (
			with				fuel temperature	>=	0.06	°C		
			(a) minimum injection energizing time and with	=	107.2	US	and fuel temperature	<=	79.96	°C		
			(b) offset of the minimum filtered energizing time (see Look-Up-Table #24)	=	56 to 123.2	us)			Ū		
)				and					
			for rail pressure point (see	=	30000 to	kPa	engine temperature and	>	49.96	°C		
			LOOK-UP-1 able $\#21$)		90000		battery voltage	>	10	V		
							and combustion chamber is not cold off means					
							time since last combustion (see Look- Up-Table #90) and	>=	5 to 30	sec		

Component / System	Fault Code	Monitor Strategy Description	Primary Malfunction Criteria	Threshold Logic and Value	Secondary Parameters		Enable Conditions		Time Required	MIL Illum.
					number of samples to discard prior to evaluating results and	>	0	-		
					intake manifold pressure	>	75	kPa		
					and accelerator pedal	<	0.05	%		
					position and					
					Fuel system status	=	Fuel cut off	-		
					for time	>	0	sec		
					and (
					engine speed	>	(b) - (a)	-		
					engine speed	<	(a) + (c)	-		
					with (a) value of engine speed	=	30	rpm		
					and with		0.50			
					(b) minimum engine speed and with	=	950	rpm		
					(c) maximum engine	=	1850	rpm		
) and					
					current gear (see Look- Up-Table #89)	=	0 to 1	-		
					and vehicle speed	>	0	mph		
					and					

Component / System	Fault Code	Monitor Strategy Description	Primary Malfunction Criteria	Threshold Logic and Value	Secondary Parameters		Enable Conditions		Time Required	MIL Illum.
					rail pressure deviation from setpoint calculated out of difference between desired and actual value	<	2200	kPa		
					and rail pressure is stable for at least and	>	0.1	sec		
					no gear change is occurred and	=	TRUE	-		
					4 wheel mode and	=	FALSE	-		
					basic enable conditions met:	=	see sheet enable tables	-		
					and NO Pending or Confirmed DTCs:	=	see sheet inhibit tables	-		
Cold Start Emission Reduction Control System	P1400	Detects problems resulting in improper delivery of fuel for catalvst light off and	Path 1:		engine operating mode	=	exhaust warm-up	state bit mask	fail conditions exists for 20 revs test performed continuously 0.01	В
		aftertreatment system preparation	Post Injection 2 is prohibited due to exceeding the allowed number of injections (see general description for details)	= TRUE -	which means:				s rate	
			or		Cold Start Injection Monitoring	=	ENABLE D	-		

Component / System	Fault Code	Monitor Strategy Description	Primary Malfunction Criteria	Threshold Logic and Value	Secondary Parameters		Enable Conditions		Time Required	MIL Illum.
					engine operating mode state transition	=	FALSE	-		
			Path 2: Post Injection 2 is prohibited due to collision (overlap) with Main Injection and Post Iniection 1 (see or	= TRUE -						
			Path 3: Injector circuit or activation errors (setpoint deviation) occurred when the injector was being energized (see	= TRUE -						
Exhaust Gas Recirculation (EGR) Motor Control Circuit Shorted	P1407	Electronic out-put driver circuitry determines circuit integrity on the EGR solenoid.	The ECM detects that the commanded state of the driver and the actual state of the control circuit do not match.		EGR Solenoid Control Circuit and (battery voltage	=	ACTIVE	- V	fail conditions exists for 3 s monitor runs with 0.005 s rate whenever enable conditions are met	В
					for time	>	3	sec		
					and battery voltage for	<	655.34	V		
					time)	>	3	sec		
					and starter is active cranking	=	FALSE	-		

Component / System	Fault Code	Monitor Strategy Description	Primary Malfunction Criteria	L	Threshold ogic and Va	l Ilue	Secondary Parameters		Enable Conditions		Time Required	MIL Illum.
							for time and basic enable conditions met:	>	3 see sheet enable tables	sec		
EGR Cooling Bypass Rationality	P140A	Detects adaptation values of EGR cooling bypass valve that are not plausible. Compares the difference between the maximum and minimum adaptation values to a threshold.	Path 1: difference between the max and min EGR cooler	>	50	%	active cleaning mode of EGR cooler bypass valve - no movement in EGR cooling bypass valve and	=	FALSE	-	fail conditions exists for 0.01 s monitor runs with 0.01 s rate whenever enable conditions are met	В
			bypass valve offset values or Path 2: learned offset value for EGR cooler bypass valve in the present driving cycle or learned offset value for EGR cooler bypass valve in the present driving cycle or	>	16.00	%	engine post drive/ afterun and (battery voltage and battery voltage	= >= <=	TRUE 10 30	- V V		

Component /	Fault	Monitor Strategy	Primary Malfunction		Thresh	old	Secondary		Enable		Time	MIL
System	Code	Description	Criteria		Logic and	Value	Parameters		Conditions		Required	Illum.
			mean value for EGR cooling bypass valve offset learned at the open end during the current driving cycle over multiple open-close cycles	>	13.00	%	and					
			or				(
			mean value for EGR cooling bypass valve offset learned at the open end during the current driving cycle over multiple open-close cycles	V	-16.00	%	engine coolant temperature	>=	5.06	°C		
							and					
							engine coolant temperature))	<=	123.06	°C		
							or					
							offset learning active or	=	TRUE	-		
							diagnosis tester present	=	FALSE	-		
							and					
							completion of offset learning and	=	TRUE	-		
							basic enable conditions met:	=	see sheet enable tables	-		
							and					
							NO Pending or Confirmed DTCs:	=	see sheet inhibit tables	-		
1	1	1		l			I I					

Component /	Fault	Monitor Strategy	Primary Malfunction		Threshol	ld	Secondary		Enable		Time	MIL
System	Code	Description	Criteria		Logic and V	alue	Parameters		Conditions		Required	Illum.
		Detects a jammed EGR cooling bypass valve during opening or closing the valve.	Path 1:				EGR cooler bypass valve is opening	=	TRUE	-		
			EGR cooler bypass valve stuck during opening which means	=	TRUE	-	or EGR cooler bypass valve is closing	=	TRUE	-		
			(and					
			(a) + (b)	>=	75.01	%	engine post drive/ afterun	=	TRUE	-		
			with (a) position of the ECD		maggurad		and	_				
			(a) position of the EGR cooling bypass valve	=	parameter	-	onset learning active	=	TRUE	-		
			and with				and					
			(b) learned offset value of EGR cooler bypass valve in the previous driving cycle	=	calculated parameter	-	basic enable conditions met:	=	see sheet enable tables	-		
			or									
			(a) - (b) with	<=	0.99	%						
			(a) position of the EGR cooling bypass valve	=	measured parameter	-						
			and with (b) position of the EGR	=	calculated	_						
			cooling bypass valve of the previous process cycle		parameter							
			for time	>	5	sec						
			or									
-	•	•	•									•

Component /	Fault	Monitor Strategy	Primary Malfunction		Threshol	ld /aluo	Secondary Parameters	Enable	Time	MIL
System	Code	Description	Path 2 [,]	-	Logic and V	aiue	Falailleteis	Conditions	Required	mum.
			EGR cooler bypass valve stuck during closing which means (=	TRUE	-				
			position of the EGR cooling bypass valve with	<	(a) * (b)	-				
			(a) reference position of the EGR cooling bypass valve in open position	=	calculated parameter	-				
			and with							
			(b) calibrateable factor of the EGR cooling bypass valve close position	=	0.15	factor				
			or							
			(a) - (b)	>=	0.02	%				
			with	-	0.02	70				
			(a) position of the EGR cooling bypass valve	=	calculated parameter	-				
			a a d suith							
			(b) position of the EGR cooling bypass valve of the previous process cycle	=	calculated parameter	-				
			, for time	>	5	sec				
					J					

Component / System	Fault Code	Monitor Strategy Description	Primary Malfunction Criteria	L	Thres	hold d Value	Secondary Parameters		Enable Condition	s	Time Required	MIL Illum.
Exhaust Gas Recirculation Slow Response-Increasing Flow	P140B	Detects a negative slow response by comparing expected system dynamics with actual value	average negative gradient of the air mass - calculated by accumulating control deviation (deviation between desired and actual value) over a sampling time and dividing result by sampling time	>=	0.28	g/rev	(fail conditions exists for 15 s monitor runs with 0.1s rate whenever enable conditions are met	В
							Engine speed	<=	2000	rpm		
							and Engine aroud	\	1200			
								/-	1300	трп		
							and					
							(
							injection quantity	<=	260	mm^3 /rev		
							and		100	10		
							injection quantity	>=	100	/rev		
							and					
							ambient pressure	>	74.8	kPa		
							engine coolant temperature and	>	69.96	°C		
							ambient temperature	>	-7.04	°C		
							and					
							EGR control is in closed loop and	=	TRUE	-		
							EGR control is active	=	TRUE	-		
							exhaust gas system regeneration mode	=	FALSE	-		

Component /	Fault	Monitor Strategy	Primary Malfunction	Threshold	Secondary	Enable		Time	MIL
System	Code	Description	Criteria	Logic and Value	Parameters	Conditions		Required	Illum.
					and				
					Engine is running	= TRUE	-		
					for				
					for time	> 0	sec		
					and				
					(
					desired delta air mass	< -0.01	g/sec		
					flow				
					desired delte air mass	> 01	a/200		
					flow	-0.1	g/sec		
)				
					and				
					difference of the air mass	< 0	g/rev		
)				
					for				
					for time	> 0.1	sec		
					and				
					basic enable conditions	= see sheet	-		
					met.	tables			
					and				
					NO Pending or	= see sheet	-		
					Confirmed DTCs:	inhibit			
						lables			

Component / System	Fault Code	Monitor Strategy Description	Primary Malfunction Criteria	Threshold Logic and Value	Secondary Parameters	C	Enable Conditions	6	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	>= 0.28 g/rev	(fail conditions exists for 15 s monitor runs with 0.1s rate whenever enable conditions are met	В
					Engine speed	<=	2000	rpm		
					Engine speed	>=	1300	rpm		
) and					
					injection quantity	<=	260	mm^3 /rev		
					injection quantity	>=	100	mm^3 /rev		
					and ambient pressure	>	74.8	kPa		
					and engine coolant temperature and	>	69.96	°C		
					ambient temperature	>	-7.04	°C		
					EGR control is in closed loop and	=	TRUE	-		
					EGR control is active and	=	TRUE	-		
					exhaust gas system regeneration mode and	=	FALSE	-		

Component / System	Fault Code	Monitor Strategy Description	Primary Malfunction Criteria	Threshold Logic and Value	Secondary Parameters		Enable Conditions		Time Required	MIL Illum.
					Engine is running	=	TRUE	-		
					for					
					for time		0	sec		
					and					
					(
					desired delta air mass	<	0.1	g/sec		
					flow					
					desired delta air mass	>	0.01	a/sec		
					flow		0.01	9,000		
)					
					and					
					difference of the air mass	<	0	g/rev		
)					
					for					
					for time	>	0.2	sec		
					and					
					basic enable conditions	=	see sheet	-		
					met:		enable			
							tables			
					and					
					NO Pending or	=	see sheet	-		
					Confirmed DTCs:		inhibit tablaa			
							lables			
Exhaust Gas	P140E	Electronic out-put	The ECM detects that the		EGR Solenoid Control	=	ACTIVE	-	fail conditions	В
Motor Control Circuit 2		determines circuit	driver and the actual state		Circuit				monitor runs with	
High Voltage		integrity on the EGR	of the control circuit do not						0.005 s rate	
		solenoid.	match.		and				whenever enable	
					anu /				met	
					(hattery voltage	>	11	V		
1					Sallery Vollage			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	>	3	sec		
					battery voltage	<	655.34	V		
					for					
					time	>	3	sec		
					and					
					starter is active cranking	=	FALSE	-		
					for					
					time	>	3	sec		
					and	_	aaa ahaat			
					met:	-	enable	-		
							tables			
Exhaust Gas	P140D	Electronic out-put	The ECM detects that the		EGR Solenoid Control	=	ACTIVE	-	fail conditions	В
Recirculation (EGR) Motor Control Circuit 2		driver circuitry determines circuit	commanded state of the driver and the actual state		Circuit				exists for 3 s monitor runs with	
Low Voltage		integrity on the EGR	of the control circuit do not						0.005 s rate	
		Solenoid.			and				conditions are	
					(44	N/	met	
					battery voltage for	>	11	V		
					time	>	3	sec		
					and		055.04			
					battery voltage for	<	655.34	V		
					time	>	3	sec		
)					
					and	I				

COMMON SECTION 1 OF 3 SECTIONS

Component / System	Fault Code	Monitor Strategy Description	Primary Malfunction Criteria	Threshold Logic and Value	Secondary Parameters		Enable Conditions		Time Required	MIL Illum.
					starter is active cranking	=	FALSE	-		
					for					
					time	>	3	sec		
					and					
					basic enable conditions	=	see sheet	-		
					met.		tables			
Exhaust Gas	P140F	Electronic out-put	The ECM detects that the		EGR Solenoid Control	=	ACTIVE	-	fail conditions	В
Recirculation (EGR) Motor Current		driver circuitry determines circuit	commanded state of the driver and the actual state		Circuit				exists for 2 s monitor runs with	
Performance		integrity on the EGR	of the control circuit do not						0.005 s rate	
		solenoid.	match.		and				whenever enable conditions are	
					(met	
					battery voltage	>	11	V		
					for					
					time	>	3	sec		
					batterv voltage	<	655.34	V		
					for			-		
					time	>	3	sec		
)					
					and starter is active cranking	_				
					Starter is active crarking	-	FALSE	-		
					for					
					time	>	3	sec		
					basic enable conditions	=	see sheet	-		
					met:		enable			
							tables			
	-	=					4.0		FOTIONO	

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Component / System	Fault Code	Monitor Strategy Description	Primary Malfunction Criteria	Threshold Logic and Value	Secondary Parameters		Enable Conditions		Time Required	MIL Illum.
Exhaust Gas Recirculation (EGR) Cooler Bypass Valve Control Circuit 2 Low Voltage	P1411	Electronic output driver circuitry determines circuit integrity on the EGR cooler bypass solenoid.	The ECM detects that the commanded state of the driver and the actual state of the control circuit do not match.		(fail conditions exists for 3 s monitor runs with 0.01 s rate whenever enable conditions are	В
					battery voltage for	>	11	V	met	
					time and	>	3	sec		
					battery voltage for	<	655.34	V		
					time)	>	3	sec		
					and starter is active cranking	=	FALSE	-		
					for time	>	3	sec		
					and EGR Cooling Bypass	=	ACTIVE	-		
					Solenoid Control Circuit					
					and basic enable conditions met:	=	see sheet enable tables	-		
Exhaust Gas Recirculation (EGR) Cooler Bypass Valve Control Circuit 2 High Voltage	P1412	Electronic output driver circuitry determines circuit integrity on the EGR cooler bypass solenoid.	The ECM detects that the commanded state of the driver and the actual state of the control circuit do not match.		(fail conditions exists for 3 s monitor runs with 0.01 s rate whenever enable conditions are	В
					battery voltage for	>	11	V	met	
	•	•					4.0			

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Component / System	Fault Code	Monitor Strategy	Primary Malfunction Criteria	Threshold	Secondary Parameters		Enable Conditions		Time Required	MIL
Oystem	oouc	Description	ontena	Logic and Value	time	>	3	sec	Required	mann.
					and					
					battery voltage	<	655.34	V		
					for					
					time	>	3	sec		
)					
					and					
					starter is active cranking	=	FALSE	-		
					for					
					time	>	3	sec		
					and		C C			
					EGR Cooling Bypass	=	ACTIVE	-		
					Solenoid Control Circuit					
					and					
					basic enable conditions	=	see sheet	_		
					met:		enable			
							tables			
Exhaust Gas	P1413	Electronic output	The ECM detects that the		(/			fail conditions	В
Recirculation (EGR)		driver circuitry	commanded state of the						exists for 3 s	
Cooler Bypass Valve		determines circuit	driver and the actual state						0.01 s rate	
		cooler bypass	match.						whenever enable	
		solenoid.							conditions are	
		-			battery voltage	>	11	V	met	
		This failure detects a short between the two			for					
		output circuits								
					time	>	3	sec		
					and	l				
					battery voltage	<	655.34	V		
					for 		2			
					time	>	3	sec		

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Component / System	Fault Code	Monitor Strategy Description	Primary Malfunction Criteria	Threshold Logic and Value	Secondary Parameters		Enable Conditions		Time Required	MIL Illum.
) and starter is active cranking for time and EGR Cooling Bypass Solenoid Control Circuit and basic enable conditions met:	= > =	FALSE 3 ACTIVE see sheet enable tables	- sec -		
Exhaust Gas Recirculation (EGR) Cooler Bypass Valve Current Performance	P1414	Electronic output driver circuitry determines circuit integrity on the EGR cooler bypass solenoid.	The ECM detects that the commanded state of the driver and the actual state of the control circuit do not match.	N SECTION Page 246	(battery voltage for time and battery voltage for time) and starter is active cranking for time and	> < > = >	11 3 655.34 3 FALSE 3	V sec v sec sec	fail conditions exists for 2 s monitor runs with 0.01 s rate whenever enable conditions are met	В

Component / System	Fault Code	Monitor Strategy Description	Primary Malfunction Criteria		Threshold Logic and Va	l Ilue	Secondary Parameters		Enable Conditions		Time Required	MIL Illum.
							EGR Cooling Bypass Solenoid Control Circuit and basic enable conditions met:	=	ACTIVE see sheet enable tables	-		
Closed Loop Diesel Particulate Filter (DPF) Regeneration Control At Limit - Stage 1 Temperature Too Low	P144B	Detects insufficient exhaust temperature. Actual inner controller ratio and temperature readings are compared to desired controller ratio and temperature values as an indication of an insufficient exhaust gas temperature.	commanded control value of the inner control loop of the temperature controller	>=	0.99	-	current engine operating point is suitable for monitoring deviation of exhaust gas temperature control - depending on engine speed and injection quantity (see Look-Up-Table #25)	=	0 to 1		fail conditions exists for 300 s monitor runs with 0.1 s rate whenever enable conditions are met	В
			and deviation from the temperature setpoint for inner control loop (with	>	maximum of (a) and (b+(c-d))	-	for time and release of the exhaust gas temperature outer loop control monitoring	>	0 TRUE	sec		
			 (a) limitation of the temperature threshold and with (b) temperature threshold value for maximum deviation 	=	100 100	°C °C	means (active operation mode of the inner control loop	=	TRUE	-		

Component /	Fault	Monitor Strategy	Primary Malfunction	Threshold	Secondary	Enable		Time	MIL
System	Code	Description	Criteria	Logic and Value	Parameters	Conditio	ns	Required	Illum.
					means (particulate filter	= TRUE	-		
					regeneration and				
					temperature before oxidation catalyst and temperature after particulate filter and	> 99.96	°C		
					temperature before oxidation catalyst and temperature after particulate filter or	< 649.96	°C		
					temperature before oxidation catalyst and temperature after particulate filter for activated post injection)	< 649.96	°C		
)				
					and status maximum governor deviation means	= TRUE			
					vehicle speed and	<= 124.30	mph		
					Relative accelerator pedal position for	> 3.00	%		
					time and	> 1	sec		
					basic enable conditions met:	= see she enable tables	et -		

Component / System	Fault Code	Monitor Strategy Description	Primary Malfunction Criteria		Thresho Logic and \	old Value	Secondary Parameters		Enable Conditions		Time Required	MIL Illum.
							and NO Pending or Confirmed DTCs:	=	see sheet inhibit tables	-		
Closed Loop Diesel Particulate Filter (DPF) Regeneration Control At Limit - Stage 1 Temperature Too High	P144C	Detects excessive exhaust temperature. Actual inner controller ratio and temperature readings are compared to desired controller ratio and temperature values as an indication of an excessive exhaust gas temperature.	commanded control value of the inner control loop of the temperature controller	<=	0	-	current engine operating point is suitable for monitoring deviation of exhaust gas temperature control - depending on engine speed and injection quantity (see Look-Up-Table #26)	=	0 to 1	-	fail conditions exists for 300 s monitor runs with 0.1 s rate whenever enable conditions are met	В
			and deviation from the temperature setpoint for inner control loop	<	minimum of (a) and (b-(c-d))		for time	>	0	sec		
			(with				and release of the exhaust gas temperature outer loop control monitoring	=	TRUE	-		
			(a) limitation of the temperature threshold and with	=	-100	°C	means (
			(b) temperature threshold value for minimum deviation	=	100	°C	active operation mode of the inner control loop means (=	TRUE	-		

Component /	Fault	Monitor Strategy	Primary Malfunction	Threshold	Secondary		Enable		Time	MIL
System	Code	Description	Criteria	Logic and Value	Parameters		Conditions		Required	Illum.
					particulate filter regeneration and	=	TRUE	-		
					temperature before oxidation catalyst and temperature after particulate filter and	>	99.96	Ĵ		
					temperature before oxidation catalyst and temperature after particulate filter or	<	649.96	°C		
					temperature before oxidation catalyst and temperature after particulate filter for activated post injection)) and	<	649.96	C°		
					status maximum governor deviation means	=	TRUE			
					vehicle speed and	<=	124.30	mph		
					Relative accelerator pedal position for	>	3.00	%		
					time and	>	1	sec		
					basic enable conditions met:	=	see sheet enable tables	-		
					and					

Component / System	Fault Code	Monitor Strategy Description	Primary Malfunction Criteria	L	Thresho ogic and	old Value	Secondary Parameters		Enable Conditions		Time Required	MIL Illum.
							NO Pending or Confirmed DTCs:	=	see sheet inhibit tables	-		
TCM Engine Speed Request Signal Message Counter Incorrect	P150C	Detects implausible engine speed request information received from the TCM	Path 1:		-		ignition on and	=	TRUE	-	fail conditions exists for 0.01 s test performed continuously 0.01 s	A
			time since last message from transmission was received with	>=	7	counts	basic enable conditions met:	=	see sheet enable tables	-		
			number of consecutive frames	=	12	counts	NO Pending or Confirmed DTCs:	=	see sheet inhibit tables	-		
) or				and No rolling count or protection value errors. (sliding window errors) on CAN frame	=	TRUE	-		
			Path 2:									
			(internal calculated checksum value for transmission is not equal the received value	=	TRUE	-						
			and number of fault results) or Path 3:	>	15	counts						
1	-	-					- 		1.0	- 2 6		

Component / System	Fault Code	Monitor Strategy Description	Primary Malfunction Criteria	L	Thresho ogic and	old Value	Secondary Parameters		Enable Conditions		Enable Time Conditions Required		Time Required	MIL Illum.
			time since last frame of validation protection was received from transmission	>	0.08	sec								
Power Take Off	P1591	If the number of communication errors in a calibrated number of frames exceeds a threshold a permanent error is detected	Number of errors in window	>=	4	counts	Number of frames received Can Bus Initialized consisting of: ignition on for time battery voltage battery voltage	>= > > <	10 TRUE 3 9.8 65.34	count s sec V V	fail conditions exists for 0.05 s monitor runs with 0.05 s rate whenever enable conditions are met	Special C		
Throttle Sensor Communication Circuit Performance	P16A2	Detects an error in the throttle sensor communication.	throttle valve position sensor communication circuit disturbed due to noise or wrong CRC (cyclic redundancy check)	=	TRUE	-	ignition on and basic enable conditions met: and	=	TRUE see sheet enable tables	-	fail conditions exists for 8 s test performed continuously 0.005 s rate	В		
Component / System	Fault Code	Monitor Strategy Description	Primary Malfunction Criteria	L	Thresho ogic and	old Value	Secondary Parameters		Enable Conditions		Time Required	MIL Illum.		
--	---------------	--	---	----	---------------------	--------------	---	---	--------------------------------	---	---	---------------		
							NO Pending or Confirmed DTCs:	=	see sheet inhibit tables	-				
Throttle Sensor Communication Circuit High Voltage	P16A1	Detects high voltage readings on the throttle valve sensor communication circuit, indicating an OOR high condition on the throttle sensor communication circuit	sensor communication circuit voltage	>=	3	V	ignition on	=	TRUE	-	fail conditions exists for 5 s test performed continuously 0.005 s rate	В		
							and basic enable conditions met: and	=	see sheet enable tables	-				
							NO Pending or Confirmed DTCs:	=	see sheet inhibit tables	-				
Throttle Sensor Communication Circuit Low Voltage	P16A0	Detects low voltage readings on the throttle valve sensor communication circuit, indicating an OOR low condition on the throttle valve sensor communication circuit	sensor communication circuit voltage	<=	1.45	V	ignition on	=	TRUE	-	fail conditions exists for 5 s test performed continuously 0.005 s rate	В		
	I	I					anu							

Component / System	Fault Code	Monitor Strategy Description	Primary Malfunction Criteria	L	Thresho ogic and	ld /alue	Secondary Parameters		Enable Conditions	5	Time Required	MIL Illum.
					0		basic enable conditions met: and NO Pending or	=	see sheet enable tables see sheet	-		
							Confirmed DTCs:		inhibit tables			
Diesel Particulate Filter (DPF) Low Efficiency	P2002	Detects a DPF that is leaking particulates means it exceeds a PM threshold.	differential pressure of particulate filter (see Look- Up-Table #52)	<	0.8 to 10.7	kPa	particulate filter regeneration and	=	TRUE	-	fail conditions exists for 20 s monitor runs 0.1 s rate whenever enable conditions are met	В
							ر particulate filter surface temperature and	>=	99.96	°C		
							particulate filter surface temperature)	<=	399.96	°C		
							exhaust-gas volume flow in the particulate filter	>	500	m^3/h		
							and time since last successful regeneration	<=	1200	sec		
							and distance since last regeneration of particulate trap and	<=	30.175	miles		

Component / System	Fault Code	Monitor Strategy Description	Primary Malfunction Criteria	L	Thres ogic an	hold d Value	Secondary Parameters		Enable Conditions		Time Required	MIL Illum.
							basic enable conditions met: and NO Pending or Confirmed DTCs:	=	see sheet enable tables see sheet inhibit tables	-		
Reductant Injector Performance	P202E	This diagnostic checks the Reductant Injector performance during operation.	Number of times the ECM detects that the commanded state of the Reductant Injector driver and the actual state of the control circuit do not match.	>	10	counts	Flag for successful measurement of current in opening phase of Reductant Injector	=	TRUE	-	fault exists for more than 80 injection events; monitor runs with 0.100 s rate whenever enable conditions are met	A
							Reductant Dosing System Metering control substate of Pressure control state (see definition)	=	TRUE	-		
							Calculated Reductant Injector coil temperature	>=	-6.64	°C		
							Calculated Reductant Injector coil temperature	<=	99.96	°C		
							(battery voltage battery voltage) (>= <=	11 655.34	V V		

Component / System	Fault Code	Monitor Strategy Description	Primary Malfunction Criteria	L	Threshold ogic and Va	l Ilue	Secondary Parameters		Enable Conditions		Time Required	MIL Illum.
							Reductant Dosing System pump relative pressure Reductant Dosing System pump relative pressure)	>=	350 650	kPa kPa		
							ambient pressure	>=	0	kPa		
							ambient pressure)	<=	130	kPa		
							NO Pending or Confirmed DTCs	=	see sheet inhibit tables	-		
							(_	0			
							ambient temperature	>	-30.04	кРа °С		
) basic enable conditions met:	=	see sheet enable tables	-		
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	>	2.2066	∨ °C	ignition on and basic enable conditions met:	=	TRUE see sheet enable	-	fail conditions exists for 3 s monitor runs 0.050 s rate whenever enable conditions are met	A
									tables			

Component / Svstem	Fault Code	Monitor Strategy Description	Primary Malfunction Criteria		Threshol Logic and V	d alue	Secondary Parameters		Enable Conditions		Time Required	MIL Illum.
					<u> </u>							
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	<	0.6544	V	ignition on	=	TRUE	-	fail conditions exists for 3 s monitor runs 0.050 s rate whenever enable conditions are met	В
			temperature downstream of oxidation catalyst	<	- 50	°C	basic enable conditions met:	=	see sheet enable tables	-		
Reductant Level Sensor 1 Performance	P203B	Reductant level plausibility check error from CAN	CAN message: Reductant Level Plausibility Check Error from Reductant tank level evaluation module	=	TRUE	-	ignition on	=	TRUE	-	fail conditions exists for more than 5 s monitor runs with	В
			which means				basic enable conditions met:	=	see sheet enable tables	-	whenever enable conditions are met	
			(measured tank level sensor 2 voltage after 1.5 ms since a test impulse was applied	=	0.0 to 1.7	V						
			measured tank level sensor 1 voltage after 1.5 ms since a test impulse was applied) or (=	1.71 to 3.56	V						

Component / System	Fault Code	Monitor Strategy Description	Primary Malfunction Criteria	Threshold Logic and Value	Secondary Parameters	Enable Conditions		Time Required	MIL Illum.
			measured tank level sensor 3 voltage after 1.5 ms since a test impulse was applied measured tank level sensor 1 voltage after 1.5 ms since a test impulse was applied) or (measured tank level	= 0.0 to 1.7 V = 1.71 to V 3.56 = 0.0 to 1.7 V					
			sensor 3 voltage after 1.5 ms since a test impulse was applied measured tank level sensor 2 voltage after 1.5 ms since a test impulse was applied	= 1.71 to V 3.56					
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.		((ECU Initialization tasks in progress) OR (ECU Initialization tasks in progress ((Battery voltage for time	= FALSE = TRUE > 10.5 > 3	- - V sec	fail conditions exists for 3 s monitor runs with 0.010 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 Conditior	s	Time Required	MIL Illum.
					OR Battery voltage) basic enable conditions met:	> 11 = see shee enable tables	V t -		
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.		((ECU Initialization tasks in progress) OR (ECU Initialization tasks in progress ((Battery voltage for time OR Battery voltage)) basic enable conditions met:	 FALSE TRUE 10.5 3 11 see shee enable tables 	- V sec V	fail conditions exists for 2 s monitor runs with 0.010 s rate whenever enable conditions are met	A

Component / System	Fault Code	Monitor Strategy Description	Primary Malfunction Criteria	Lo	Thresho ogic and	old Value	Secondary Parameters		Enable Conditions		Time Required	MIL Illum.
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.				((ECU Initialization tasks in progress) OR	=	FALSE	-	fail conditions exists for 3 s monitor runs with 0.010 s rate whenever enable conditions are met	A
							(ECU Initialization tasks in progress ((=	TRUE	-		
							Battery voltage	>	10.5	V		
							for time	>	3	sec		
							OR Battery voltage)	>	11	V		
) basic enable conditions met:	=	see sheet enable tables	-		
Reductant Pump Pressure Sensor Performance	P204B	pressure difference between baro pressure and unfiltered Reductant	Unfiltered Reductant Pump Module Pressure	>	50	kPa	Reductant filling state in the pressure line	<=	0	%	fail conditions exists for more than 0.6 sec monitor runs with 0.01 s rate	A
		pressure					status of SCR control state (please see the definition)	=	No Pressure Control	-	whenever enable conditions are met	
							State of the defrosting check of pressure line (please see the definition)	=	TRUE	-		

Component / System	Fault Code	Monitor Strategy Description	Primary Malfunction Criteria	L	Thresho ogic and \	ld /alue	Secondary Parameters		Enable Conditions		Time Required	MIL Illum.
							ambient pressure ambient temperature NO Pending or Confirmed DTCs: basic enable conditions met:	> > = =	0 -30.04 see inhibit tables see sheet enable tables	kPa °C -		
Reductant Pump Pressure Sensor Circuit Low	P204C	Measured reductant pump pressure sensor signal low voltage	Reductant pump pressure sensor signal same as: reductant pump pressure	v v	0.41	V kPa	ignition on NO Pending or Confirmed DTCs: basic enable conditions met:	=	TRUE see sheet inhibit tables see sheet enable tables	-	fail conditions exists for more than 0.4 sec. monitor runs with 0.01 s rate whenever enable conditions are met	A
Reductant Pump Pressure Sensor Circuit High	P204D	Measured reductant pump pressure sensor signal high voltage	Reductant pump pressure sensor signal same as: reductant pump pressure	>	4.8	V kPa	ignition on NO Pending or Confirmed DTCs: basic enable conditions met:	=	TRUE see sheet inhibit tables see sheet enable tables	-	fail conditions exists for more than 0.4 sec. monitor runs with 0.01 s rate whenever enable conditions are met	A

Component /	Fault	Monitor Strategy	Primary Malfunction	Threshold			old	Secondary	Enable			Time	MIL
System	Code	Description	Criteria		Log	gic and	Value	Parameters		Conditions		Required	Illum.
Reductant System Performance Bank 1	P204F	Unsuccessful reductant pressure build up	Reductant Pump Module Pressure	<		350	kPa	status of SCR control sub state (please see the definition)	=	PRESSU RE BUILDUP	-	fail conditions exists for more than 1 event monitor runs with 0.1 s rate	A
								Reductant Defrost check (please see the definition))	=	TRUE	-	whenever enable conditions are met	
								ambient pressure	>	0	kPa		
								ambient temperature	>	-30.04	°C		
								number of pressure build up attempts (>=	3	count s		
								system pressurizes in pressure buildup and ventilation states	>	10	count s		
								Dwell time in Pressure Build up substate)	>=	10	sec		
								NO Pending or Confirmed DTCs:	=	see sheet inhibit tables	-		
								basic enable conditions met:	=	see sheet enable tables	-		
Reductant Tank Temperature Sensor Performance	P205B	Path 1:										fail conditions exists for more than 0.5 sec monitor runs with 0.1 s rate whenever enable conditions are met	В

Component /	Fault	Monitor Strategy	Primary Malfunction		Threshol	d	Secondary		Enable		Time	MIL
System	Code	Description	Criteria		Logic and V	alue	Parameters		Conditions		Required	Illum.
		The temperature difference between reductant tank temperature and diesel fuel temperature are compared to an upper threshold after sufficient engine-off	(a) - (b)	~	34.96	°C	ignition on	=	TRUE	-		
		duration										
			where				status of SCR control state (please see the definition)	=	No Pressure control	-		
			(a) Reductant tank temperature	=	measured parameter	-	Engine off Time	>	28800	sec		
			(b) fuel temperature	=	measured parameter	-	time since start	>	6	sec		
							Max [(a), (b), (c)] - Min [(a), (b), (c)] where	<=	6.96	°C		
							(a) Oxidation Catalyst upstream temperature	=	measured parameter	-		
							(b) fuel temperature	=	measured parameter	-		
							(c) Particulate filter downstream temperature	=	measured parameter	-		
							NO Pending or Confirmed DTCs:	=	see sheet inhibit tables	-		

Component / Fa System Co	ault Monitor Strategy ode Description	Primary Malfunction Criteria	Threshold Logic and Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
				basic enable conditions met:	= see sheet enable tables		
	Path 2: OR The temperature difference between reductant tank temperature and diesel fuel temperature are compared to a lower threshold after sufficient engine-off duration	(a) - (b)	< -35.04 °C	ignition on status of SCR control state (please see the definition)	= TRUE = No Pressure control	fail conditions exists for more than 0.5 sec monitor runs with 0.01 s rate whenever enable conditions are met	
		where (a) Reductant tank temperature	= measured - parameter	Engine off Time time since start	> 28800 se > 6 se		
		(b) fuel temperature	= measured - parameter	Max [(a), (b), (c)] - Min [(a), (b), (c)]	<= 6.96 °(
				where (a) Oxidation Catalyst upstream temperature	= measured · parameter		
				(b) fuel temperature	= measured parameter		
				(c) Particulate filter downstream temperature	= measured · parameter		

Component / System	Fault Code	Monitor Strategy Description	Primary Malfunction Criteria	L	Thresho ogic and \	ld /alue	Secondary Parameters		Enable Conditions		Time Required	MIL Illum.
							NO Pending or Confirmed DTCs:	=	see sheet inhibit tables	-		
							basic enable conditions met:	=	see sheet enable tables	-		
Reductant Tank Temperature Sensor Circuit High	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	hex	basic enable conditions met:	=	see sheet enable tables	-	fault exists for more than 3 seconds; monitor runs at 1 s whenever enable conditions are	A
			Corresponds to a temperature of Corresponds to a resistance of	<= >=	-55.0 1200	°C kOhm	and No rolling count or protection value errors. (sliding window errors) in the CAN frame	=	TRUE	-	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	hex	basic enable conditions met:	Ξ	see sheet enable tables	-	fault exists for more than 6 seconds; monitor runs at 1 s whenever enable conditions are met	В

Component /	Fault	Monitor Strategy	Primary Malfunction		Threshol	d	Secondary		Enable		Time	MIL
System	Code	Description	Criteria		Logic and V	alue	Parameters	(Conditions		Required	Illum.
			Corresponds to a temperature of Corresponds to a	>=	160.0 0.153	°C kOhm						
			resistance of									
			Corresponds to a voltage of	<=	0.270	V						
			or				No rolling count or protection value errors. (sliding window errors) in the CAN frame	=	TRUE	-		
			Path2 [.]									
			Raw value of the CAN message for the Reductant Tank Temperature	=	0x3FF	hex						
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 5s monitor runs with 0.1 s rate whenever enable conditions are met	В
			or integrated heat quantity of exhaust gas temperature sensor 1	>	(a) / (b) * (c) / (d) * (e) * (g)	-	for time	>	1500	sec		
			with				and					
			(a) exhaust gas mass flow	=	calculated parameter	-	time since start	>	327	sec		
			and with				and					
					2 600	a la	anu					
	I				3.000	g/s	(

Component /	Fault	Monitor Strategy	Primary Malfunction		Thresh	old	Secondary		Enable		Time	MIL
System	Code	Description	Criteria	L	ogic and	Value	Parameters		Conditions		Required	Illum.
			and with				exhaust-gas temperature sensor 1	>	-60.04	°C		
			(c) heat capacity	=	1050	J/Kg/°C	and					
			and with				exhaust-gas temperature sensor 1	<	1999.96	°C		
			(d) factor	=	1000	kW/°C)					
			and with				and					
			(e) correction factor for heat flow quantity depending on exhaust gas mass flow for temperature sensor 1	=	1	factor	change in exhaust-gas temperature sensor 1	<	7	K		
							for					
			and with				time	=	5	sec		
			(f) minimum permissible temperature deviation for exhaust gas temperature sensor 1	=	-100	°C	and					
			and with				engine operation point suitable for diagnostic (see Look-Up-Table #31)	=	0 to 255	-		
			(g) maximum permissible temperature deviation for exhaust gas temperature sensor 1	=	100	°C	for					
							time	>=	0.050	Sec		
							and	-	0.000	000		
							change in modeled exhaust-gas temperature sensor 1 and (>	4	°C		
							heat quantity for exhaust gas temperature sensor 1 and	>	10	kJ		

COMMON SECTION 1 OF 3 SECTIONS

Component / System	Fault Code	Monitor Strategy Description	Primary Malfunction Criteria		Threshol Logic and V	d ′alue	Secondary Parameters		Enable Conditions		Time Required	MIL Illum.
							heat quantity for exhaust gas temperature sensor 1)	<	12	kJ		
							and					
							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 5s monitor runs with 0.1 s rate whenever enable conditions are met	В
			or				for					
			integrated heat quantity of exhaust gas temperature sensor 2 with	>	(a) / (b) * (c) / (d) * (e) * (g)		time	>	1500	sec		
			(a) exhaust gas mass flow	=	calculated parameter	-	time since start	>	327	sec		
			and with				and					
			(b) factor	=	3.600	g/s	(
			and with			Ŭ	exhaust-gas temperature sensor 2	>	-60.04	°C		
l		l	(c) heat capacity	=	1050	J/Kg/°C	and					

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1 OF 3 SECTIONS

Component / System	Fault Code	Monitor Strategy Description	Primary Malfunction Criteria		Thresh Logic and	old Value	Secondary Parameters		Enable Conditions		Time Required	MIL Illum.
		· · · ·	and with				exhaust-gas temperature	<	1999.96	°C		
			(d) factor	_	1000		sensor 2					
			and with		1000		, and					
			(e) correction factor for heat flow quantity depending on exhaust gas mass flow for temperature sensor 2	=	1	factor	change in exhaust-gas temperature sensor 2	<	7	К		
			and with				101 timo	_	5			
			(f) minimum permissible temperature deviation for exhaust gas temperature sensor 2	=	-100	°C	and	_	3	500		
			and with				engine operation point suitable for diagnostic (see Look-Up-Table #31)	=	0 to 255	-		
			(g) maximum permissible temperature deviation for exhaust gas temperature sensor 2	=	100	°C	for					
							time and	>=	0.05	sec		
							change in modeled exhaust-gas temperature sensor 2 and	>	4	°C		
							heat quantity for exhaust gas temperature sensor 2 and	>	10	kJ		
							heat quantity for exhaust gas temperature sensor 2)	<	12	kJ		

Component / System	Fault Code	Monitor Strategy Description	Primary Malfunction Criteria		Threshol Logic and V	d 'alue	Secondary Parameters		Enable Conditions		Time Required	MIL Illum.
							and basic enable conditions met:	=	see sheet enable tables	-		
							and NO Pending or Confirmed DTCs:	=	see sheet inhibit tables	-		
Exhaust Temperature Sensor 3 Performance	P242B	Detects a fault in the exhaust temperature sensor 3 performance by comparing the heat quantity on the sensor position to a threshold.	integrated heat quantity of exhaust gas temperature sensor 3	<	(a) / (b) * (c) / (d) * (e) * (f)		exhaust gas system regeneration mode	=	FALSE		fail conditions exists for 5s monitor runs with 0.1 s rate whenever enable conditions are met	В
			or				for					
			integrated heat quantity of exhaust gas temperature sensor 3	>	(a) / (b) * (c) / (d) * (e) * (g)		time	>	1500	sec		
			with (a) exhaust gas mass flow	=	calculated parameter	-	and time since start	>	327	sec		
			and with				and					
			(b) factor	=	3.600	a/s	and (
			and with			3	exhaust-gas temperature sensor 3	>	-60.04	°C		
			(c) heat capacity	=	1050	J/Kg/°C	and					
			and with				exhaust-gas temperature sensor 3	<	1999.96	°C		
			(d) factor	=	1000	kW/°C)					
						ao 270 /			1.0	E 2 6	ECTIONS	

System Code Description Criteria Logic and Value Perameters Conditions Required III Image: System	Component /	Fault	Monitor Strategy	Primary Malfunction		Thresh	old	Secondary		Enable		Time	MIL
(e) correction factor for heat flow quantity depending on exhaust gas mass flow for temperature sensor 3 = 1 factor change in exhaust-gas < 7 K and with (f) minimum permissible temperature deviation for exhaust gas temperature sensor 3 = -100 °C and = 5 sec and with (f) minimum permissible temperature deviation for exhaust gas temperature sensor 3 = -100 °C and = 0 to 255 - (g) maximum permissible temperature dayation for exhaust gas temperature sensor 3 = 100 °C for = 0 to 255 - (g) maximum permissible temperature dayation for exhaust gas temperature sensor 3 = 100 °C for = 0.05 sec (heat quantity for exhaust gas temperature sensor 3 = 100 °C for = 0.05 sec (heat quantity for exhaust gas temperature sensor 3 > 10 kJ kJ gas temperature sensor 3 = 10 kJ	System	Code	Description	Criteria	L	ogic and	Value	Parameters		Conditions		Required	Illum.
and with = -100 *C and and with engine operation point sensor 3 = 0 to 255 - and with engine operation point (g) maximum permissible temperature deviation for exhaust gas temperature sensor 3 = 100 *C for - (g) maximum permissible temperature deviation for exhaust gas temperature sensor 3 = 100 *C for - - (heat quantity for exhaust gas temperature sensor 3 = 100 *C for - - (heat quantity for exhaust gas temperature sensor 3 = 100 kJ - 10 kJ (heat quantity for exhaust gas temperature sensor 3 3 - 10 kJ				(e) correction factor for heat flow quantity depending on exhaust gas mass flow for temperature sensor 3	=	1	factor	change in exhaust-gas temperature sensor 3 for	<	7	К		
(1) minimum permissible temperature deviation for exhaust gas temperature sensor 3 = -100 *C and and with and with = 100 *C engine operation point suitable for diagnostic (see Look-Up-Table #31) (g) maximum permissible temperature deviation for exhaust gas temperature sensor 3 = 100 *C for with = 100 *C for				and with		100		time	=	5	sec		
and with engine operation point suitable for diagnostic (see Look-Up-Table #31) = 0 to 255 - (g) maximum permissible temperature deviation for exhaust gas temperature sensor 3 = 100 °C for - Lime sensor 3 = 0.05 sec - - Lime sensor 3 - 0.05 sec Lime sensor 3 - - - Lime sensor 3 - 4 K Lime sensor 3 - - - Lime sensor - - <t< td=""><td></td><td></td><td></td><td>(f) minimum permissible temperature deviation for exhaust gas temperature sensor 3</td><td>=</td><td>-100</td><td>°C</td><td>and</td><td></td><td></td><td></td><td></td><td></td></t<>				(f) minimum permissible temperature deviation for exhaust gas temperature sensor 3	=	-100	°C	and					
(g) maximum permissible temperature deviation for exhaust gas temperature sensor 3 = 100 °C for (g) maximum permissible temperature deviation for exhaust gas temperature sensor 3 = 100 °C for (g) maximum permissible exhaust gas temperature sensor 3 = 100 °C for (g) maximum permissible exhaust gas temperature sensor 3 = 0.05 sec (g) maximum permissible exhaust-gas temperature sensor 3 = 0.05 sec (g) maximum permissible exhaust-gas temperature sensor 3 = 0.05 sec (g) maximum permissible exhaust-gas temperature sensor 3 = 0.05 sec (g) maximum permissible exhaust-gas temperature sensor 3 = 0.05 sec (g) maximum permissible exhaust-gas temp				and with				engine operation point suitable for diagnostic (see Look-Up-Table #31)	=	0 to 255	-		
Image: Sec of the sec of				(g) maximum permissible temperature deviation for exhaust gas temperature sensor 3	=	100	°C	for					
change in modeled change in modeled exhaust-gas temperature sensor 3 and (heat quantity for exhaust gas temperature sensor 3 and heat quantity for exhaust 3 and heat quantity for exhaust 3 3 3 4 KJ 3 4 KJ 3 4 KJ 3 4 KJ 3 4 KJ 3 4 KJ 3 4 KJ 3 4 KJ 3 4 KJ 3 4 KJ 5 10 KJ 3 4 5 10 KJ 3 4 5 10 KJ 5 10 KJ 10 10 10 10 10 10 10 10 10 10								time	>=	0.05	sec		
heat quantity for exhaust gas temperature sensor 3 and heat quantity for exhaust gas temperature sensor 3 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0								change in modeled exhaust-gas temperature sensor 3 and (>	4	К		
heat quantity for exhaust < 12 kJ gas temperature sensor 3)								heat quantity for exhaust gas temperature sensor 3	>	10	kJ		
and								heat quantity for exhaust gas temperature sensor 3) and	<	12	kJ		

Component / System	Fault Code	Monitor Strategy Description	Primary Malfunction Criteria		Threshol Logic and V	d 'alue	Secondary Parameters		Enable Conditions		Time Required	MIL Illum.
		Decomption					basic enable conditions met:	=	see sheet enable tables			
							NO Pending or Confirmed DTCs:	=	see sheet inhibit tables	-		
Exhaust Temperature Sensor 4 Performance	P246F	Detects a fault in the exhaust temperature sensor 4 performance by comparing the heat quantity on the sensor position to a threshold.	integrated heat quantity of exhaust gas temperature sensor 4	<	(a) / (b) * (c) / (d) * (e) * (f)		exhaust gas system regeneration mode	=	FALSE		fail conditions exists for 5s monitor runs with 0.1 s rate whenever enable conditions are met	В
			or				for					
			integrated heat quantity of exhaust gas temperature sensor 4	>	(a) / (b) * (c) / (d) * (e) * (g)		time	>	1500	sec		
			with (a) exhaust gas mass flow	=	calculated parameter	-	and time since start	>	327	sec		
			and with				and					
			(b) factor	=	4.600	g/s	(
			and with				exhaust-gas temperature sensor 4	>	-60.04	°C		
			(c) heat capacity and with	=	1050	J/Kg/°C	and exhaust-gas temperature	<	1999.96	°C		
			(d) factor	=	1000	kW/°C	sensor 4)					
			and with				and					

Component /	Fault	Monitor Strategy	Primary Malfunction		Thresh	old	Secondary		Enable		Time	MIL
System	Code	Description	Criteria	L	ogic and	Value	Parameters		Conditions		Required	Illum.
			(e) correction factor for heat flow quantity depending on exhaust gas mass flow for temperature sensor 4	=	1	factor	change in exhaust-gas temperature sensor 4 for	<	7	К		
			and with				time	=	5	sec		
			(f) minimum permissible temperature deviation for exhaust gas temperature sensor 4	=	-100	°C	and					
			and with				engine operation point suitable for diagnostic (see Look-Up-Table #31)	=	0 to 255	-		
			(g) maximum permissible temperature deviation for exhaust gas temperature sensor 4	=	100	°C	for					
							time	>=	0.05	sec		
							and			°.		
							change in modeled exhaust-gas temperature sensor 4 and (>	4	°C		
							heat quantity for exhaust gas temperature sensor 4 and	>	10	kJ		
							heat quantity for exhaust gas temperature sensor 4) and	<	12	kJ		

Component / System	Fault Code	Monitor Strategy Description	Primary Malfunction Criteria	Lo	Threshold gic and Va	d alue	Secondary Parameters		Enable Conditions		Time Required	MIL Illum.
							basic enable conditions met:	=	see sheet enable tables	-		
							and NO Pending or Confirmed DTCs:	=	see sheet inhibit tables	-		
Reductant 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	>	6	sec	(Reductant Pump Warm- up status where the Warm-up state is defined as: (No Pressure control state (please see the definition)	=	FALSE	-	fault exists for more than 0.3 s; monitor runs at 0.1 s whenever enable conditions are met	В
							SCR Engine State (please see the definition) ((Remaining defrosting time of the tank Remaining defrosting time of the tank)	= > <=	ON 0 120	- sec sec		

Component / System	Fault Code	Monitor Strategy Description	Primary Malfunction Criteria	Threshold Logic and Value	Secondary Parameters		Enable Conditions		Time Required	MIL Illum.
					Reductant Defrost check (please see the definition)	=	TRUE	-		
					ambient temperature	>	-6.64	°C		
) basic enable conditions met:	=	see sheet enable tables	-		
Reductant Pump Control Circuit	P208A	Detects an open circuit or an overtemperature condition in the Reductant Pump Control Circuit	The ECM detects that the commanded state of the driver and the actual state of the control circuit do not match.		((fail conditions exists for 6.2 s monitor runs with 0.010 s rate whenever enable conditions are	В
					Battery voltage	<	10.5	V	met	
					OR		5	Sec		
					Battery voltage)) ((>	11	V		
					SCR system waiting for shut down in afterrun	=	TRUE	-		
					OR SCR system in standby in afterun	=	TRUE	-		
) ignition	=	FALSE	-		
					ر NO Pending or Confirmed DTCs	=	see sheet inhibit tables	-		
-	-	-			- (101		4.0			1

Component / System	Fault Code	Monitor Strategy Description	Primary Malfunction Criteria	Threshold Logic and Value	Secondary Parameters		Enable Conditions		Time Required	MIL Illum.
					basic enable conditions met:	=	see sheet enable tables	-		
Reductant Pump Control Circuit High Voltage	P208D	Detects a short circuit to battery in the Reductant Pump Control Circuit	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 OR Battery voltage)) and NO Pending or Confirmed DTCs basic enable conditions met:	< < >	10.5 3 11 see sheet inhibit tables see sheet enable tables	V sec V	fail conditions exists for 3 s monitor runs with 0.010 s rate whenever enable conditions are met	A
Reductant Purge Valve Control Circuit	P20A0	Detects an open circuit in the Reductant Purge Valve Control Circuit	The ECM detects that the commanded state of the driver and the actual state of the control circuit do not match.		((ECU Initialization tasks in progress) OR	=	FALSE	-	fail conditions exists for 3 s monitor runs with 0.010 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.
					(ECU Initialization tasks in progress for time)	= >	TRUE 1	sec		
					((Battery voltage for time OR Battery voltage	> > >	10.5 3 11	V sec V		
)) and NO Pending or Confirmed DTCs basic enable conditions met:	н	see sheet inhibit tables see sheet enable tables	-		
Reductant Purge Valve Performance	P20A1	This diagnostic checks the Reductant Purge valve performance during operation by detecting a lack of reduction of reductant pressure	Difference between reductant pump pressure at beginning and end of pressure reduction phase	< 50 kPa	(Reductant Dosing System state pressure reduction Reductant Dosing System pump relative pressure to initiate test	= >=	TRUE 350	- kPa	fault exists for more than 1 s monitor runs with 0.100 s rate whenever enable conditions are met	A

Component / System	Fault Code	Monitor Strategy Description	Primary Malfunction Criteria	Threshold Logic and Value	Secondary Parameters	condary Enable rameters Conditions			Time Required	MIL Illum.
) AND ((
					Time attempting to reduce dosing pressure	>=	5	sec		
					AND Reductant Dosing System pump relative pressure after attempting to reduce pressure	>	50	kPa		
) OR Reductant Dosing System pump relative pressure after attempting	<=	50	kPa		
) (
					ambient pressure	>	0	kPa		
					ambient temperature	>	-100.04	°C		
					, NO Pending or Confirmed DTCs	=	see sheet inhibit tables	-		
					basic enable conditions met:	=	see sheet enable tables	-		

Component /	Fault	Monitor Strategy	Primary Malfunction	Threshold	Secondary		Enable		Time	MIL
System	Code	Description	Criteria	Logic and Value	Parameters		Conditions		Required	Illum.
Reductant Purge Valve Control Circuit Low Voltage	P20A2	Detects a short circuit to ground on the Reductant Purge Valve Control Circuit	The ECM detects that the commanded state of the driver and the actual state of the control circuit do not match.		((fail conditions exists for 2 s monitor runs with 0.010 s rate whenever enable	A
					ECU Initialization tasks in progress) OR (=	FALSE	-	conditions are met	
					ECU Initialization tasks in progress	=	TRUE	-		
					for time)	>	1	sec		
					Battery voltage	>	10.5	V		
					for time	>	3	sec		
					Battery voltage))	>	11	V		
					and NO Pending or Confirmed DTCs	=	see sheet inhibit tables	-		
					basic enable conditions met:	=	see sheet enable tables	-		

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	are

Component / System	Fault Code	Monitor Strategy Description	Primary Malfunction Criteria		Threshol Logic and V	d alue	Secondary Parameters		Enable Conditions	5	Time Required	MIL Illum.
Reductant Heater 1 Performance	P20BA	Reductant tank temperature is used to verify heating has occurred	temperature difference of current Reductant temperature and start temperature at beginning of the monitoring cycle				((fault exists for more than 1 event; monitor runs at 0.01 s once per trip whenever enable	В
			(a) - (b)	<	0.56	°C	Reductant tank heating active	=	TRUE	-	conditions are met	
			where				for time	>	0	sec		
			(a) filtered current tank temperature	=	measured parameter	-)					
			(b) tank temperature captured at the beginning of current monitoring cycle	=	measured parameter	-	Remaining measured quantity of reducing agent in [%]	>=	62.66	%		
							(filtered current tank temperature) (<	-16.04	°C		
							Vehicle speed	>=	3.11	mph		
							for time) (>	1	sec		
							for time since ignition on) (>	60	sec		
							time counter for activation of tank heater (see Look-Up-Table #86)) (ice detection by tank temperature difference:	>=	1000 to 32767	sec		

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Component / System	Fault Code	Monitor Strategy Description	Primary Malfunction Criteria	Threshold Logic and Value	Secondary Parameters		Enable Conditions		Time Required	MIL Illum.
					(a) - (b)	<=	-0.14	°C		
					(a) filtered current tank temperature	=	measured parameter	-		
					(b) tank temperature captured at the beginning of current monitoring cycle	=	measured parameter	-		
					, NO Pending or Confirmed DTCs:	=	see sheet inhibit tables	-		
					basic enable conditions met	=	see sheet enable tables	-		
Exhaust Aftertreatment Fuel Injector Control Circuit	P20CB	Electronic out-put driver circuitry determines circuit integrity on the exhaust aftertreatment fuel injector control circuit.	The ECM detects that the commanded state of the driver and the actual state of the control circuit do not match.		engine pre drive	=	FALSE	-	fail conditions exists for more than 3 s monitor runs with 0.1 s rate whenever enable conditions are met	В
					for					
					time	>	1	sec		
					and battery voltage	>	11	V		
					for			-		
					time	>	3	sec		
					and battery voltage	<	655 34	V		
					for					

Component / System	Fault Code	Monitor Strategy Description	Primary Malfunction Criteria	Lo	Thresho ogic and \	ld /alue	Secondary Parameters		Enable Conditions		Time Required	MIL Illum.
							time and starter is active cranking for time	> = >	3 FALSE 3	sec		
							and basic enable conditions met:	=	see sheet enable tables	-		
Exhaust Aftertreatment Fuel Injector Performance	P20CC	Detects high exhaust temperatures in order to protect the engine	oxidation catalyst downstream temperature - oxidation catalyst upstream temperature	>	300	°C	(fail conditions exists for 180 s test performed continuously 0.1 s rate	A
			OR				oxidation catalyst upstream temperature	<	50	°C		
			particulate filter downstream temperature - SCR downstream temperature	>	300	°C	for time	>	10	sec		
) AND (
							time since last successful regeneration	>	900	sec		
) AND ((

Component /	Fault	Monitor Strategy	Primary Malfunction	Threshold	Secondary		Enable		Time	MIL
System	Code	Description	Criteria	Logic and Value	Parameters		Conditions		Required	Illum.
					Normal Mode (Particulate Filter Regeneration not active)	=	TRUE	-		
					OR Exhaust Gas Temperature (Active) Management Mode	=	TRUE	-		
					for time	>	300	sec		
) AND (
					time since the end of the last tip cleaning request of the Exhaust Aftertreatment Fuel Injector)	>	300	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	Code	Description	Criteria	Logic and Value	Parameters		Conditions		Required	Illum.
Exhaust Aftertreatment Fuel Injector Control Circuit Low Voltage	P20CD	Electronic out-put driver circuitry determines circuit integrity on the exhaust aftertreatment	The ECM detects that the commanded state of the driver and the actual state of the control circuit do not match.		engine pre drive	=	FALSE	-	fail conditions exists for more than 3.0 s monitor runs with 0.1 s rate	В
		fuel injector control circuit.			for				whenever enable conditions are met	
					time	>	1	sec		
					and battery voltage	>	11	V		
					for time	>	3	sec		
					and battery voltage	<	655.34	V		
					for time	>	3	sec		
					and starter is active cranking	=	FALSE	-		
					for time	>	з	Sec		
					and	-		300		
					basic enable conditions met:	=	see sheet enable tables	-		
)							

Component / System	Fault Code	Monitor Strategy Description	Primary Malfunction Criteria	Threshold Logic and Value	Secondary Parameters		Enable Conditions		Time Required	MIL Illum.
Exhaust Aftertreatment Fuel Injector Control Circuit High Voltage	P20CE	Detects high voltage readings on the diesel dosing valve low side powerstage, indicating an OOR high condition on the diesel dosing valve powerstage	The ECM detects that the commanded state of the driver and the actual state of the control circuit do not match.		engine pre drive	=	FALSE	-	fail conditions exists for more than 3.0 s monitor runs with 0.1 s rate whenever enable conditions are	В
					for time	>	1	sec	met	
					and battery voltage for	>	11	V		
					time and	>	3	sec		
					for time	>	3	sec		
					and starter is active cranking for	=	FALSE	-		
					time and	>	3	sec		
					basic enable conditions met:	=	enable tables	-		

Component /	Fault	Monitor Strategy	Primary Malfunction	Threshold		d aluo	Secondary Enable Parameters Conditions		Time Required	MIL		
Exhaust Cas	DODEO	Description	Dath 1:	-	Logic and Vo		minimum ongino off time	\	28800	600	fail conditions	D
Temperature (EGT)	FZUEZ	exhaust temperature	raul I.				minimum engine-on time	/-	20000	Sec	exists for 0.050 s	Б
Sensors 1-2 not		sensors by comparing									monitor runs with	
plausible		the upstream and									0.050 s rate	
		downstream oxidation									whenever enable	
		catalyst temperature									conditions are	
		sensors after a									met	
		calibrated engine off										
		SUAK UITIE										
					100 to	°C	and					
			((a) - (b)) (see Look-Op- Table #32)		999	C	and					
			with				ambient temperature	>	-60.04	°C		
			(a) captured oxidation	=	measured	-	and					
			catalyst downstream		parameter							
			temperature at start									
			and with				Engine Running (see	=	TRUE	-		
							parameter definition)					
			(b) captured oxidation	=	measured	-	for					
			catalyst upstream		parameter							
			temperature at start as									
			or				time	>	0	sec		
			Path 2:				and		-			
			(engine post drive/ afterun	=	FALSE	-		
			.,									
			(a) - (b) (see Look-Up- Table #32)	<=	100 to	°C	and					
			with		333		diagnostic performed in	=	FALSE	-		
							current dc		171202			
			(a) captured oxidation	=	measured	-	and					
			catalyst downstream		parameter							
			temperature at start									
			and with				hasic enable conditions	=	see sheet	_		
							met:		enable			
									tables			
I			I				I I					

Reductant Pressure P20E8 Compare Reductant task and task reference temperature and = Meductant Pressure = Metering = Metering = Metering = Metering fail conditions exists for more with store or smoother metering control = Metering Metering <th>Component / System</th> <th>ime MIL juired Illum.</th>	Component / System	ime MIL juired Illum.										
Reductant Pressure P20E8 Compare Reductant tank pressure with lower thresholds under metering control Reductant Pressure P20E8 Compare Reductant tank pressure with lower thresholds under metering control Reductant Pressure S 400 KPa status of SCR control sub state (please see the definition) = Metering - tan 400, monitor runs with state for some metering control												
Reductant Pressure too LowP20E8Compare Reductant tank pressure with lower thresholds under metering controlReductant Pump Module Pressure< 400KPastatus of SCR control sub status of SCR control sub 												
and with (b) captured oxidation catalyst upstream temperature at start as reference temperature and status of block heater= measured parameter-Reductant Pressure too LowP20E8Compare Reductant tank pressure with lower thresholds under metering controlReductant Pump Module Pressure< 400												
Image: Section of the section of th												
Reductant Pressure too LowP20E8Compare Reductant tank pressure with lower thresholds under metering controlReductant Pump Module Pressure< 400kPastatus of SCR control sub state (please see the definition)= Metering controlfail conditions exists for more than 60.0 s monitor runs with												
0.1 s rate	Reductant Pressure too Low	nditions A for more 60.0 s runs with s rate										
status byte in substate = Running whenever enable METERING CONTROL conditions are met		er enable ions are net										
Dwell time in Metering > 1 sec control substate												
ambient pressure >= 0 KPa												
NO Pending or = see sheet - Confirmed DTCs: inhibit tables												
Component / System	Fault Code	Monitor Strategy Description	Primary Malfunction Criteria	Lo	Threshologic and V	ld /alue	Secondary Parameters		Enable Conditions		Time Required	MIL Illum.
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							basic enable conditions met:	=	see sheet enable tables	-		
		Path 1:									fail conditions	
Reductant Pressure too High	P20E9	Compare Reductant tank pressure with upper threshold under metering control	Reductant Pump Module Pressure	>	650	kPa	status of SCR control sub state (please see the definition)	=	Metering control	-	exists for more than 10 s monitor runs with 0.1 s rate whenever enable	A
							status byte in substate METERING CONTROL	=	Running	-	conditions are met	
							Dwell time in Metering control substate	>	1	sec		
							ambient pressure	>=	0	kPa		
							ambient temperature NO Pending or Confirmed DTCs:	>=	-30.04 see inhibit tables	°C -		
							basic enable conditions met:	=	see sheet enable tables	-		
		Path 2:									fail conditions	
		Or Reductant tank pressure high	Unfiltered Reductant Pump Module Pressure	>	795	kPa	ambient pressure ambient temperature basic enable conditions met:	> > =	0 -30.04 see sheet enable tables	kPa °C -	exists for more than 1 s monitor runs with 0.1 s rate whenever enable conditions are met	

Component /	Fault	Monitor Strategy	Primary Malfunction		Threshol	ld	Secondary		Enable		Time	MIL
System	Code	Description	Criteria		Logic and V	alue	Parameters		Conditions		Required	Illum.
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	factor	NO Pending or Confirmed DTCs:	=	see sheet inhibit tables	-	fail conditions exists for more than 1 event monitor runs with 0.01 s rate whenever enable conditions are	A
			(a) measured SCR catalyst efficiency	=	calculated parameter	-	ior time	-	300	560	met	
			(b) offset-corrected modeled SCR catalyst efficiency (please see the general description for details)	=	calculated parameter	-	Status of NOx signal of upstream NOx sensor (please see the definition)	=	Active	-		
							for time	>	60	sec		
							Status of NOx signal of downstream NOx sensor (please see the definition)	=	Active	-		
							for time	>	60	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	=	330	sec		
							(b) Turn on delay time 2 of status metering strategy)	=	20	sec		

Component /	Fault	Monitor Strategy	Primary Malfunction	Threshold	Secondary		Enable		Time	MIL
System	Code	Description	Criteria	Logic and Value	Parameters		Conditions	i	Required	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	>	0.5	sec		
					(b) delay time the status of disabling SCR Efficiency monitoring	>	80	sec		
					or					
					integrated upstream NOx	>=	0	g		
)					
					Status of pre controlled dosing (please see the definition)	=	FALSE	-		
					for time	>	(a) + (b)			
					(a) Debounce time after pre controlled dosing off	=	0.5	sec		
					(b) Delay time after pre controlled dosing off	=	180	sec		
					or integrated upstream NOx	>=	0	a		
)		-	3		
						1			I	

Component /	Fault	Monitor Strategy	Primary Malfunction	Threshold	Secondary		Enable		Time	MIL
System	Code	Description	Criteria	Logic and Value	Parameters		Conditions	\$	Required	Illum.
					Decrease of Reductant load level (please see the definition)	=	FALSE	-		
					for time)	>	200	sec		
					(Average slow filtered	<=	0.20	alsec		
					NOx mass flow upstream SCR		0.20	y/sec		
					for time	>	0.5	sec		
					Monitor disable time based on average NOx mass flow and the time (see Look-Up-Table #85)	>	0 to 120	Sec		
)					
					following conditions for time: ((>	15	sec		
					Delta SCR temperature (see Look-Up-Table #84)	<=	29.96 to 59.96	°C		
					or					
					Delta SCR temperature	>	524.96	°C		
					Delta SCR temperature	<	199.96			
					Initialization time of temperature gradient calculation)	<	2.5	sec		
					or Delta SCR temperature or	<	229.96	°C		

Component / System	Fault Code	Monitor Strategy Description	Primary Malfunction Criteria	Threshold Logic and Value	Secondary Parameters		Enable Conditions	i	Time Required	MIL Illum.
					Delta SCR temperature	>	499.96	°C		
					for time)	>	10	sec		
					(HC load in SCR catalyst	<=	0.76	_		
					or	-	0.70			
					HC load in SCR catalyst	>	0.76	-		
					PM Filter Regeneration	=	TRUE	-		
)					
					ambient pressure	>=	74.8	kPa		
					ambient temperature	>=	-7.04	°C		
)					
					Stuck reductant dosing valve fault was healed	=	FALSE	-		
					last particulate filter regeneration successful	=	TRUE	-		
)					
					(
					State of the NH3 slip detection	=	FALSE	-		
					integrated upstream NOx during SCR adaptation plausibility check active	>=	20	g		
					Status of the SCR adaptation plausibility check active (please see the definition)	=	FALSE	-		

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SystemCodeDescriptionCriteriaLogic and ValueParametersConditionsRequiredItum. A	Component /	Fault	Monitor Strategy	Primary Malfunction	Threshold	Secondary		Enable		Time	MIL
Image: Solution of the sector of the sect	System	Code	Description	Criteria	Logic and Value	Parameters		Conditions	5	Required	Illum.
SCR NOX Catalyst Efficiency Below Threshold Bank 1 was performed this drive cycle (engine speed (engine speed (e						for time	>	600	sec		
SCR NOX Catalysts = FALSE - Efficiency Below Threshold Ban X was - - Or the short of the)					
Efficiency Below Fricency Below Threshold Bank 1 was " performed this drive oycle ((SCR NOx Catalyst	=	FALSE	_		
Threshold Bank 1 was performed this drive cycle (engine speed <= 3000 rpm engine speed <= 3000 rpm for time > 0 sec) SCR estimated current Pacuctan tota (see Lock-Up-Table #73) SCR estimated current Reductant tota (see Lock-Up-Table #73) Release of efficiency Release of efficiency Release of efficiency Release of efficiency adaptation but without Reductant tip (please see the definition)) (((((((((((((Efficiency Below		TALOL			
performed this direction cycle (engine speed >= 1000 rpm engine speed <=						Threshold Bank 1 was					
$\left \begin{array}{c} \text{engine speed} \\ e$						cvcle					
$\left \begin{array}{ccccc} \left(\begin{array}{c} & & & & & \\ & & & & \\ & & & & \\ & & & & \\ & & & & \\ & & & & \\ & & & & \\ & & & & \\ & & & & \\ & & & \\ & & & & \\ & & & \\ & & & $.,					
engine speed >= 1000 rpm engine speed <=						(
engine speed <=						engine speed	>=	1000	rpm		
for time > 0 sec SCR estimated current Reductant load (see Look-Up-Table #75) >= 0.1 to g SCR estimated current Reductant load (see Look-Up-Table #75) <=						engine speed	<=	3000	rpm		
SCR estimated current Reductant load (see Look-Up-Table #75) >= 0.1 to 1.69 g SCR estimated current Reductant load (see Look-Up-Table #75) <=						for time	>	0	sec		
SCR estimated current Reductant load (see Look-Up-Table #75) >= 0.1 to g SCR estimated current Reductant load (see Look-Up-Table #73) <=)					
Reductant load (see Look-Up-Table #75) 1.69 SCR estimated current Reductant load (see Look-Up-Table #73) <= 0.3 to g						SCR estimated current	>=	0 1 to	a		
Look-Up-Table #75) SCR estimated current Reductant load (see Look-Up-Table #73) <= 0.3 to g						Reductant load (see		1.69	9		
SCR estimated current Reductant load (see Look-Up-Table #73) <=						Look-Up-Table #75)					
Reductant load (see Look-Up-Table #73) 1.85 Release of efficiency monitoring with active adaptation but without Reductant slip (please see the definition) = TRUE)						SCR estimated current	<=	0.3 to	q		
Look-Up-Table #73) Release of efficiency monitoring with active adaptation but without Reductant slip (please see the definition)) with Enable Reductant Quality (a) - (b) (a) - (b) (a) - (b) (a) - (b) (b) (c)						Reductant load (see		1.85	U		
Release of efficiency monitoring with active adaptation but without Reductant slip (please see the definition) = TRUE -) with Enable Reductant Quality check delay = TRUE - ((a) - (b) <=						Look-Up-Table #73)					
Release of efficiency monitoring with active adaptation but without Reductant slip (please see the definition)) with Enable Reductant Quality check delay ((a) - (b) <= 99.96 °C for time > 0 sec											
monitoring with active adaptation but without Reductant slip (please see the definition)) with Enable Reductant Quality check delay ((a) - (b) <= 99.96 °C for time > 0 sec						Release of efficiency	=	TRUE	-		
adaptation but without Reductant slip (please see the definition)) with Enable Reductant Quality ((a) - (b) (a) - (b) (a) - (b) (a) - (b) (b) (c) (c) </td <td></td> <td></td> <td></td> <td></td> <td></td> <td>monitoring with active</td> <td></td> <td></td> <td></td> <td></td> <td></td>						monitoring with active					
see the definition)) with Enable Reductant Quality check delay ((a) - (b) <= 99.96 °C for time > 0 sec						Reductant slip (please					
((((((((((((() (() ((((((() (() (() (see the definition)					
<pre>with Enable Reductant Quality check delay (((a) - (b) <= 99.96 °C for time > 0 sec</pre>)					
Enable Reductant Quality check delay ((a) - (b) <= 99.96 °C for time > 0 sec						with					
<pre>check delay</pre>						Enable Reductant Quality	=	TRUE	-		
((a) - (b) <= 99.96 °C for time > 0 sec						check delay					
(a) - (b) <= 99.96 °C for time > 0 sec						(
for time > 0 sec						(a) - (b)	<=	99.96	°C		
						for time	>	0	sec		

COMMON SECTION 1 OF 3 SECTIONS

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Component /	Fault	Monitor Strategy	Primary Malfunction	Threshold	Secondary		Enable		Time	MIL
System	Code	Description	Criteria	Logic and Value	Parameters		Conditions	5	Required	Illum.
					or					
					(a) - (b)	>=	-0.04	°C		
					for time	>	0	sec		
					(a) unstream SCR					
					catalyst temperature					
					(b) downstream SCR					
					catalyst temperature					
)					
					(
					Difference between	<=	0.05 to	a		
					nominal and estimated		0.2	0		
					Reductant (see Look-Up-					
					Table #77)					
					Difference between	>=	-0.5	g		
					nominal and estimated					
					Status of pre controlled	_	FALSE	_		
					dosing (please see the		TALOL	_		
					definition)					
					,					
					for time	>	0	sec		
					Integrated NOx mass	>	1.25	g		
					upstream SCR					
					for time	>	1	sec		
					Downstream SCR	>=	289.96	°C		
					catalyst temperature		000.00	•		
					Downstream SCR	<=	209.96	Ĵ		
					Filtered and delayed	>=	750	nnm		
					unstream NOx raw		750	ppm		
					emission					
					Filtered and delayed	<=	175	ppm		
					upstream NOx raw					
					emission					
					Filtered and delayed NOx	<=	0.170	g/sec		
					raw emission mass flow					
					upstream of SCR					
		1		8	I I					

Component /	Fault	Monitor Strategy	Primary Malfunction	Threshold	Secondary		Enable		Time	MIL
System	Code	Description	Criteria	Logic and Value	Parameters		Conditions	S	Required	Illum.
					Filtered and delayed NOx raw emission mass flow upstream of SCR	>=	0.02	g/sec		
					Filtered exhaust gas mass flow	<=	152.78	g/sec		
					Filtered exhaust gas mass flow	>=	69.44	g/sec		
					MAP for valid engine operation points for SCR efficiency monitoring (1 = Active) (see Look-Up- Table #82)	=	0 to 1	factor		
					for time	>	0	sec		
					Inverse calculated accelerator pedal value	>	2.00	%		
					for time	>	0	sec		
					EWMA Operation EWMA fast initialization mode:					
					filter coefficient for fast initialization	=	0.4	factor		
					number of SCR efficiency measurements for fast initialization mode	>=	2	count		
					EWMA Rapid Response mode:		0.15	factor		
					catalyst efficiency	-	0.10	factor		
					(a) - (b) (a) measured SCR catalyst efficiency	<	0.01	factor		

COMMON SECTION 1 OF 3 SECTIONS

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Component / System	Fault Code	Monitor Strategy Description	Primary Malfunction Criteria	Threshold Logic and Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
					(b) offset-corrected modeled SCR catalyst efficiency (please see the general description for details) offset-corrected modeled SCR catalyst efficiency (please see the general description for details)	> 0 factor		
					filter coefficient for Rapid Response mode	= 0.15 factor		
					number of SCR efficiency measurements for Rapid Response mode	>= 6 count		
					EWMA filtered value too small in Fast Init. And Rapid Response modes:			
					EWMA filtered delta SCR catalyst efficiency of (a) - (b) (a) measured SCR catalyst efficiency (b) offset-corrected modeled SCR catalyst efficiency (please see the general description for details)	< 0 factor		
					EWMA stabilized mode:			
					filter coefficient for stabilized mode number of SCR efficiency measurements for stabilized mode	= 0.1 factor = 1 count		

Component / System	Fault Code	Monitor Strategy Description	Primary Malfunction Criteria		Threshol Logic and V	d alue	Secondary Parameters		Enable Conditions		Time Required	MIL Illum.
							basic enable conditions met:	=	see sheet enable tables	-		
Exhaust Nox Concentration High - Unknown Reason	P2BAD	Compare EWMA filtered NOx conversion efficiency of SCR catalyst with a threshold value	EWMA filtered delta SCR catalyst efficiency of (a) - (b)	<	0	factor	NO Pending or Confirmed DTCs:	=	see sheet inhibit tables	-	fail conditions exists for more than 1 event monitor runs with 0.01 s rate whenever enable	A
			where (a) measured SCR catalyst efficiency	=	calculated parameter	-	for time	>	300	sec	conditions are met	
			(b) offset-corrected modeled SCR catalyst efficiency (please see the general description for details)	=	calculated parameter	-	Status of NOx signal of upstream NOx sensor (please see the definition)	=	Active	-		
			uetalis)				for time	>	60	sec		
							Status of NOx signal of downstream NOx sensor (please see the definition)	=	Active	-		
							for time	>	60	sec		
							Release of dosing strategy (please see the definition)	=	TRUE	-		
							for time (a) Turn on delay time 1 of status metering strategy	>=	(a) + (b) 330	sec sec		

Component / System	Fault Code	Monitor Strategy Description	Primary Malfunction Criteria	Threshold Logic and Value	Secondary Parameters	Enable Condition	S	Time Required	MIL Illum.
					(b) Turn on delay time 2 of status metering strategy)	20	sec		
					Status for disabling SCR Efficiency monitoring following an SCR Adaptation completion (please see the definition)	= FALSE	-		
					for time	> (a) + (b)	sec		
					(a) Debounce time after pre controlled dosing over	> 0.5	sec		
					(b) delay time the status of disabling SCR Efficiency monitoring	> 80	sec		
					or integrated upstream NOx)	>= 0	g		
					(Status of pre controlled dosing (please see the definition)	= FALSE	-		
					for time	> (a) + (b)			
					(a) Debounce time after pre controlled dosing off	= 0.5	sec		
					(b) Delay time after pre controlled dosing off	= 180	sec		
					or integrated upstream NOx	>= 0	g		

Component / System	Fault Code	Monitor Strategy Description	Primary Malfunction Criteria	Threshold Logic and Value	Secondary Parameters		Enable Conditions	5	Time Required	MIL Illum.
) (Decrease of Reductant		FALSE	_		
					load level (please see the definition)					
					for time)	>	200	sec		
					Average slow filtered NOx mass flow upstream SCR	<=	0.200	g/sec		
					for time Monitor disable time	>	0.5 0 to 120	sec		
					based on average NOx mass flow and the time (see Look-Up-Table #85)		010120	560		
					ر for time with ((>	15	sec		
					Delta SCR temperature (see Look-Up-Table #84)	<=	29.96 to 59.96	°C		
					or Delta SCR temperature	>	524.96	°C		
					Delta SCR temperature	<	199.96	°C		
					or					
					Initialization time of temperature gradient calculation)	<	2.5	sec		
					or Delta SCR temperature or	<	229.96	°C		

Component /	Fault	Monitor Strategy	Primary Malfunction	Threshold	Secondary		Enable		Time	MIL
System	Code	Description	Criteria	Logic and Value	Parameters		Conditions		Required	Illum.
					Delta SCR temperature	>	499.96	°C		
					for time		10	sec		
)					
					, (
					HC load in SCR catalyst	<=	0.76	-		
							011.0			
					or					
					HC load in SCR catalyst	>	0.76	-		
					DM Filter Degeneration	_				
					Pivi Filler Regeneration	-	IRUE	-		
)					
					(
					ambient pressure	>=	74.8	kPa		
					ambient temperature	>=	-7.04	°C		
)					
					(
					Active operation mode	¥	0	sec		
					for time	>	0	sec		
					exhaust gas mass flow	>=	-327.68	g/sec/		
					change per second			sec		
					and and and an and flour		207.07			
					exnaust gas mass flow change per second	<=	327.67	g/sec/		
					onango por occorra			000		
					for time	>	0	sec		
					Upstream NOx mass flow	>=	-0.32768	g/sec/		
					change per second			sec		
					I Instream NOx mass flow	<=	0.3267	a/sec/		
					change per second		0.0201	sec		
					for time	>	0	sec		
					Stuck reductant dosing	=	FALSE	-		
					valve fault was healed					

Component /	Fault	Monitor Strategy	Primary Malfunction	Threshold	Secondary		Enable		Time	MIL
System	Code	Description	Criteria	Logic and Value	Parameters		Conditions	5	Required	Illum.
					last particulate filter regeneration successful)	=	TRUE	-		
					(State of the NH3 slip detection	=	FALSE	-		
					integrated upstream NOx during SCR adaptation plausibility check active	>=	20	g		
					Status of the SCR adaptation plausibility check active (please see the definition)	=	FALSE	-		
					for time)	>	600	sec		
					Reductant Delivery performance completed this drive cycle	=	FALSE	-		
					(
					engine speed	>=	1000	rpm		
					engine speed	<=	3000	rpm		
					tor time	>	0	sec		
					SCR estimated current Reductant load (see Look-Up-Table #75)	>=	0.1 to 1.69	g		
					SCR estimated current Reductant load (see Look-Up-Table #73)	<=	0.3 to 1.85	g		

Component / System	Fault Code	Monitor Strategy Description	Primary Malfunction Criteria	Threshold Logic and Value	Secondary Parameters		Enable Conditions		Time Required	MIL Illum.
					Release of efficiency monitoring with active adaptation but without Reductant slip (please see the definition)	=	TRUE	-		
) with Enable Reductant Quality	=	TRUE	-		
					((a) - (b)	<=	99.96	°C		
					for time or	>	0	sec		
					(a) - (b)	>=	-0.04	°C		
					for time	>	0	sec		
					(a) upstream SCR catalyst temperature	=	measured parameter	-		
					(b) downstream SCR catalyst temperature	=	measured parameter	-		
)					
					Difference between nominal and estimated Reductant (see Look-Up- Table #77)	<=	0.05 to 0.2	g		
					Difference between nominal and estimated Reductant	>=	-0.5	g		
					Status of pre controlled dosing (please see the definition)	=	FALSE	-		

Component /	Fault	Monitor Strategy	Primary Malfunction	Threshold	Secondary		Enable		Time	MIL
System	Code	Description	Criteria	Logic and value	Parameters		Conditions	S	Required	llium.
					for time	>	0	sec		
)					
					Integrated NOv mass	>	1 25	a		
					unstream SCR		1.20	9		
					for time	>	1	Sec		
							1	300		
					Downstream SCR	>=	289.96	°C		
					catalyst temperature					
					Downstream SCR	<=	209.96	°C		
					catalyst temperature					
					Filtered and delayed	<=	750	ppm		
					upstream NOx raw					
					emission					
					Filtered and delayed	>=	175	ppm		
					upstream NOx raw					
					emission					
					Filtered and delayed NOx	<=	0.170	g/sec		
					raw emission mass flow					
					upstream of SCR					
					Filtered and delayed NOx	>=	0.02	g/sec		
					raw emission mass flow					
					upstream of SCR					
					Filtered exhaust gas	<=	152.78	g/sec		
					mass flow					
					Filtered exhaust gas	>=	69.44	g/sec		
					mass flow					
					MAP for valid engine	=	0 to 1	factor		
					operation points for SCR					
					efficiency monitoring (see					
				1	Look-Up-Table #82)					
				1	for time	>	0	sec		
					Inverse calculated	>	2.00	%		
				1	accelerator pedal value					
				1						
					for time	>	0	sec		
						4				

Component / System	Fault Code	Monitor Strategy Description	Primary Malfunction Criteria	L	Threshold ogic and Va	lue	Secondary Parameters		Enable Conditions	Time Required	MIL Illum.
							basic enable conditions met:	=	see sheet - enable tables		
Accelerator Pedal Position (APP) Sensor 1 Circuit Low Voltage	P2122	Detects low voltage readings on the APP circuit, indicating an OOR low condition on the APP 1 circuit	voltage of acceleration pedal sensor 1 same as	<=	0.785	V	ignition on and	=	TRUE -	fail conditions exists for 0.19 s monitor runs with 0.01 s rate whenever enable conditions are met	A
			acceleration pedal position	<=	-3.3	%	basic enable conditions met: and	=	see sheet - enable tables		
							NO Pending or Confirmed DTCs:	-	see sheet - inhibit tables		
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	>=	4.75	V	ignition on	=	TRUE -	fail conditions exists for 0.19 s monitor runs with 0.01 s rate whenever enable conditions are met	A
			acceleration pedal position	>=	103.3	%	basic enable conditions met: and	=	see sheet - enable tables		

Component / System	Fault Code	Monitor Strategy Description	Primary Malfunction Criteria	Threshold Logic and Value			Secondary Parameters	Enable Conditions			Time Required	MIL Illum.
							NO Pending or Confirmed DTCs:	=	see sheet inhibit tables	-		
Accelerator Pedal Position (APP) Sensor 2 Circuit Low Voltage	P2127	Detects low voltage readings on the APP circuit, indicating an OOR low condition on the APP 2 circuit	voltage of acceleration pedal sensor 2	<=	0.308	V	ignition on	=	TRUE	-	fail conditions exists for 0.19 s monitor runs with 0.01 s rate whenever enable conditions are met	A
			acceleration pedal position	<=	-6.6	%	basic enable conditions met:	=	see sheet enable tables	-		
							NO Pending or Confirmed DTCs:	=	see sheet inhibit tables	-		
Accelerator Pedal Position (APP) Sensor 2 Circuit High Voltage	P2128	Detects high voltage readings on the APP circuit, indicating an OOR high condition on the APP 2 circuit	voltage of acceleration pedal sensor 2 same as	>=	2.315	V	ignition on and	=	TRUE	-	fail conditions exists for 0.19 s monitor runs with 0.01 s rate whenever enable conditions are met	A
			acceleration pedal position	>=	106.6	%	basic enable conditions met: and	=	see sheet enable tables	-		

Component / System	Fault Code	Monitor Strategy Description	Primary Malfunction Criteria		Threshol Logic and V	d alue	Secondary Parameters		Enable Conditions		Time Required	MIL Illum.
							NO Pending or Confirmed DTCs:	=	see sheet inhibit tables	-		
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 #14) with (a) voltage of acceleration	>	0.12 to 0.18 measured	V	ignition on and basic enable conditions	=	TRUE	-	fail conditions exists for 0.2 s monitor runs with 0.01 rate whenever enable conditions are met	A
			pedal position sensor 1		parameter	-	met:		enable tables			
			and with (b) factor between sensor raw values	=	2	factor	and NO Pending or Confirmed DTCs:	=	see sheet inhibit tables	-		
			and with (c) minimum voltage and with	=	0.450	V						
			(d) redundant voltage of acceleration pedal (from pedal position sensor 2)	=	calculated parameter	-						
Injector Positive Voltage Control Circuit Group 1	P2146	ECM Electronic out- put driver circuitry determines if faults (open/short/no load) exist on injector charging bank #1.	The ECM detects that the commanded state of the driver and the actual state of the control circuit do not match.				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
							and fuel system status	=	no fuel cut off	-	conditions are met	

Component / System	Fault Code	Monitor Strategy Description	Primary Malfunction Criteria	Threshold Logic and Value	Secondary Parameters		Enable Conditions		Time Required	MIL Illum.
Injector Positive Voltage Control Circuit Group 2	P2149	ECM Electronic out- put driver circuitry determines if faults (open/short/no load) exist on injector charging bank #2.	The ECM detects that the commanded state of the driver and the actual state of the control circuit do not match.		Engine Running (see parameter definition) and fuel system status	=	TRUE no fuel cut off	-	fail conditions exists for more than 0.04 s monitor runs with 0.01 s rate whenever enable conditions are met	A
Injector Positive Voltage Control Circuit Group 3	P2152	ECM Electronic out- put driver circuitry determines if faults (open/short/no load) exist on injector charging bank #3.	The ECM detects that the commanded state of the driver and the actual state of the control circuit do not match.		Engine Running (see parameter definition) and fuel system status	=	TRUE no fuel cut off	-	fail conditions exists for more than 0.04 s monitor runs with 0.01 s rate whenever enable conditions are met	A
Injector Positive Voltage Control Circuit Group 4	P2155	ECM Electronic out- put driver circuitry determines if faults (open/short/no load) exist on injector charging bank #4.	The ECM detects that the commanded state of the driver and the actual state of the control circuit do not match.		Engine Running (see parameter definition) and fuel system status	=	TRUE no fuel cut off	-	fail conditions exists for more than 0.04 s monitor runs with 0.01 s rate whenever enable conditions are met	A

Component / System	Fault Code	Monitor Strategy	Primary Malfunction Criteria		Thresho	ld /alue	Secondary Parameters		Enable Conditions		Time Required	MIL Illum
- Cyclom										_		
Reductant Level Sensor 1 Circuit Low	P203C	CAN message: Discrete level sensor level 1 short to ground error	Reductant Tank Level 1 Error Status	=	1	-	ignition on	=	TRUE	-	fail conditions exists for more than 3 sec. monitor runs with	A
			(tank level sensor 1 voltage directly measured after a test impulse was applied)	<	(0.17)	V	battery voltage	>	8	V	0.01 s rate whenever enable conditions are met	
							basic enable conditions met:	=	see sheet enable tables	-		
Reductant Level Sensor 2 Circuit Low	P21AA	CAN message: Discrete level sensor level 2 short to ground error	Reductant Tank Level 2 Error Status	=	1	-	ignition on	=	TRUE	-		
			(tank level sensor 2 voltage directly measured after a test impulse was applied)	<	(0.17)	V	battery voltage	>	8	V		
							basic enable conditions met:	=	see sheet enable tables	-		
Reductant Level Sensor 3 Circuit Low	P21AF	CAN message: Discrete level sensor level 3 short to ground error	Reductant Tank Level 3 Error Status	=	1	-	ignition on	=	TRUE	-		
			(tank level sensor 3 voltage directly measured after a test impulse was applied)	<	(0.17)	V	battery voltage	>	8	V		

Component / System	Fault Code	Monitor Strategy Description	Primary Malfunction Criteria	I	Thresho Logic and \	ld /alue	Secondary Parameters		Enable Conditions		Time Required	MIL Illum.
							basic enable conditions met:	=	see sheet enable tables	-		
Reductant Lovel		Path 1:									fail conditions	Δ
Reductant Level Sensor 2 Circuit High	P21AB	Patn 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 0.01 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	=	2	-	ignition on	=	TRUE	-		
			(measured tank level sensor 2 voltage after 1.5 ms since a test impulse was applied)	>	(4.74)	V	battery voltage basic enable conditions met:	>	8 see sheet enable tables	-		

Component / System	Fault Code	Monitor Strategy Description	Primary Malfunction Criteria	1	Thresho Logic and V	ld /alue	Secondary Parameters		Enable Conditions		Time Required	MIL Illum.
Cycloni		Decemption			logio ana i	ando	T uluillotoro				Requireu	
Reductant Level Sensor 3 Circuit High	P21B0	Path 1:										
		CAN message: Discrete level sensor 3 open load error	Reductant Tank Level 3 Error Status	=	3	-	ignition on	=	TRUE	-		
			(measured tank level sensor 3 voltage after 1.5 ms since a test impulse was	>	(3.56)	V	battery voltage	>	8	V		
			(measured tank level sensor 3 voltage after 1.5 ms since a test impulse was applied)	<	(4.74)	V	basic enable conditions met:	=	see sheet enable tables	-		
		Path 2:										
		CAN message: Discrete level sensor 3 short to battery error	Reductant Tank Level 3 Error Status	=	2	-	ignition on	=	TRUE	-		
			(measured tank level sensor 3 voltage after 1.5 ms since a test impulse was	>	(4.74)	V	battery voltage	>	8	V		
			applied)				basic enable conditions met:	=	see sheet enable tables	-		
Reductant Level Sensor 1 Circuit High	P203D	Path 1:										

Component / System	Fault Code	Monitor Strategy Description	Primary Malfunction Criteria	l	Thresho ogic and \	ld /alue	Secondary Parameters		Enable Conditions		Time Required	MIL Illum.
		CAN message: Discrete level sensor 1 open load error	Reductant Tank Level 1 Error Status	=	3	-	ignition on	=	TRUE	-		
			(measured tank level sensor 1 voltage after 1.5 ms since a test impulse was applied)	>	(3.56)	V	battery voltage	>	8	V		
			(measured tank level sensor 1 voltage after 1.5 ms since a test impulse was applied)	<	(4.74)	V	basic enable conditions met:	=	see sheet enable tables	-		
		Path 2: CAN message: Discrete level sensor 1 short to battery error	Reductant Tank Level 1 Error Status	=	2	-	ignition on	=	TRUE	-		
			(measured tank level sensor 1 voltage after 1.5 ms since a test impulse was	>	(4.74)	V	battery voltage	>	8	V		
			applied)				basic enable conditions met:	=	see sheet enable tables	-		
NOx Sensor Circuit	P2200	Detects a failure when	Open circuit NOx signal	=	TRUE	-	battery voltage	<=	655 34	V	fail conditions	Δ
Bank 1 Sensor 1	1 2200	open circuit status message from NOx sensor is received continuously for a time period	error		HUL	-	Sallery Voltage	-	000.04	v	exists for more than 3 sec. monitor runs with 0.01 s rate whenever enable conditions are	
							battery voltage	>= <=	11.0 3003 56	v °C	met	
							temperature	•	0000.00	5		

Component / System	Fault Code	Monitor Strategy Description	Primary Malfunction Criteria	Threshold Logic and Value	Secondary Parameters		Enable Conditions		Time Required	MIL Illum.
					SCR upstream temperature no pending or confirmed faults Status of Start stop condition. (Quick Key	>= = =	94.96 See Sheet Inhibit Table TRUE	°C - -		
					Cycle Delay) (20 sec) Time since Quick Ignition Off-On Cycle Can Bus Initialized (CAN Bus is Active) consisting of:	>= =	20 TRUE	sec -		
					ignition on for time battery voltage battery voltage	= >= > <	TRUE 3 9.8 655.34	- sec V V		
		Detects a failure when open circuit status message from binary lambda sensor is received continuously for a time period	Open circuit binary lambda signal error	= TRUE -	battery voltage	<=	655.34	V	fail conditions exists for more than 3 sec. monitor runs with 0.01 s rate whenever enable	
					battery voltage SCR upstream temperature SCR upstream temperature no pending or confirmed faults	>= <= >= =	11.0 3003.56 94.96 See Sheet Inhibit Table	V °C -	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.
					Status of Start stop condition. (Quick Key Cycle Delay) (20 sec)	=	TRUE	-		
					Time since Quick Ignition	>=	20	sec		
					Can Bus Initialized (CAN Bus is Active) consisting of:	=	TRUE	-		
					ignition on	=	TRUE	-		
					for time	>=	3	sec		
					battery voltage	>	9.8	V		
					battery voltage	<	655.34	V		
		Detects a failure when open circuit status message from linear lambda sensor is received continuously for a time period	Open circuit linear lambda signal error	= TRUE -	battery voltage	<=	655.34	V	fail conditions exists for more than 3 sec. monitor runs with 0.01 s rate whenever enable conditions are	
					battery voltage	>=	11.0	V	met	
					SCR upstream temperature	<=	3003.56	°C		
					SCR upstream temperature	>=	94.96	°C		
					no pending or confirmed faults	=	See Sheet Inhibit Table	-		
					Status of Start stop condition. (Quick Key Cycle Delay) (20 sec)	=	TRUE	-		
					Time since Quick Ignition Off-On Cycle	>=	20	sec		
					Can Bus Initialized (CAN Bus is Active)	=	TRUE	-		

Component / System	Fault Code	Monitor Strategy Description	Primary Malfunction Criteria	Threshold Logic and Value	Secondary Parameters		Enable Conditions		Time Required	MIL Illum.
					consisting of: ignition on for time battery voltage battery voltage	= >= > <	TRUE 3 9.8 655.34	- sec V V		
		Detects a failure when short circuit status message from NOx sensor is received continuously for a time period	Short Circuit Nox signal error	= TRUE -	battery voltage SCR upstream temperature SCR upstream temperature no pending or confirmed faults Status of Start stop condition. (Quick Key Cycle Delay) (20 sec) Time since Quick Ignition Off-On Cycle	>= <= = >=	11.0 3003.56 94.96 See Sheet Inhibit Table TRUE 20	V °C - - sec	fail conditions exists for more than 3 sec. monitor runs with 0.01 s rate whenever enable conditions are met	
					Can Bus Initialized (CAN Bus is Active) consisting of: ignition on for time battery voltage battery voltage	= = >= > <	TRUE 3 9.8 655.34	- sec V V		

Component /	Fault	Monitor Strategy	Primary Malfunction	Th	reshold	Secondary		Enable		Time	MIL
System	Code	Description	Criteria	Logic	and Value	Parameters		Conditions		Required	Illum.
		Detects a failure when short circuit status message from binary lambda sensor is received continuously for a time period	Short Circuit binary lambda signal error	= TR	UE -	battery voltage	>=	11.0	V	fail conditions exists for more than 3 sec. monitor runs with 0.01 s rate whenever enable	
						SCR upstream	<=	3003.56	°C	met	
						SCR upstream temperature	>=	94.96	°C		
						no pending or confirmed faults	=	See Sheet Inhibit Table	-		
						Status of Start stop condition. (Quick Key Cycle Delay) (20 sec)	=	TRUE	-		
						Time since Quick Ignition Off-On Cycle	>=	20	sec		
						Can Bus Initialized (CAN Bus is Active) consisting of:	=	TRUE	-		
						ignition on	=	TRUE	-		
						for time	>=	3	sec		
						battery voltage	>	9.8	V		
						battery voltage	<	655.34	V		
		Detects a failure when short circuit status message from linear lambda sensor is received continuously for a time period	Short Circuit linear lambda signal error	= TR	UE -	battery voltage	>=	11.0	V	fail conditions exists for more than 3 sec. monitor runs with 0.01 s rate whenever enable conditions are	
						SCR upstream temperature	<=	3003.56	°C	met	

Component / System	Fault Code	Monitor Strategy Description	Primary Malfunction Criteria		Threshold Logic and Va	l alue	Secondary Parameters		Enable Conditions		Time Required	MIL Illum.
							SCR upstream temperature no pending or confirmed faults Status of Start stop condition. (Quick Key Cycle Delay) (20 sec)	>= =	94.96 See Sheet Inhibit Table TRUE	°C - -		
							Time since Quick Ignition Off-On Cycle Can Bus Initialized (CAN Bus is Active) consisting of:	>=	20 TRUE	sec		
							ignition on	=	TRUE	-		
							for time	>=	3	sec		
							battery voltage	>	9.8 655 34	V		
N0x Sensor Performance Bank 1 Sensor 1	P2201	If when transitioning from engine load to overrun, the rate at which the NOx concentration falls is slower than a calibrated threshold a fault is set.	Time it takes for the NOx concentration level to fall from 70% to 40% of the initial Nox concentration value	>	2.3	SEC	State of the NOx sensor dynamic monitoring state machine	=	Evaluate falling edge of NOx concentra tion signal	-	fail conditions exist for 1 event, test is performed in the 0.01 s rate when enable conditions are met	В
			or				and					
			Downstream NOx concentration	>	40% of Initial Nox Concentra tion Level		Injection quantity for current cylinder	<	2.0	mm^3 /rev		
			for time	>	5	sec	for time	<	1.05	sec		

Component / System	Fault Code	Monitor Strategy	Primary Malfunction Criteria		Thresho	ld Value	Secondary Parameters		Enable Conditions		Time Required	MIL Illum
eyötötili		Decemption			logio ana	- unu -	T uluitotoro				Roquirou	
N0x Sensor Circuit High Bank 1 Sensor 1	P2203	Detects an out of range high fault of the upstream NoX Sensor	Nox sensor signal (raw information received via CAN from Nox sensor)	>	2500	ppm	Valid NOx signal from CAN is received (no Nox sensor communication failures)	=	TRUE	-	fault conditions exists for more than 10 sec; monitor runs at 0.1 s when enable	В
							Engine Running (see parameter definition) for time	=	TRUE 20	- sec	conditions are met	
N0x Sensor Circuit Low Bank 1 Sensor 1	P2202	Detects an out of range low fault of the upstream NoX Sensor	Nox sensor signal (raw information received via CAN from Nox sensor)	<	-90	ppm	and Injection Quantity	>	8	mm^3 /rev		
							Nox sensor 1 ready status (see parameter definition)	=	TRUE	-		
Nox Sensor Heater Control Circuit Bank 1	P2205	Detects a failure when	Short Circuit Nox Heater signal error	=	TRUE	-	battery voltage	>=	11.0	V	fail conditions exists for more	A
Sensor 1		message from NOx sensor heater is received continuously for a time period									than 3 sec. monitor runs with 0.01 s rate whenever enable conditions are	
							SCR upstream temperature	<=	3003.56	°C	met	
							SCR upstream temperature	>=	94.96	°C		
							no pending or confirmed faults	=	See Sheet Inhibit Table	-		
							Status of Start stop condition. (Quick Key Cycle Delay) (20 sec)	=	TRUE	-		

Component / System	Fault Code	Monitor Strategy Description	Primary Malfunction Criteria	Threshold Logic and Value	Secondary Parameters		Enable Conditions		Time Required	MIL Illum.
					Time since Quick Ignition Off-On Cycle Can Bus Initialized (CAN Bus is Active) consisting of:	>=	20 TRUE	sec -		
					ignition on	=	TRUE	-		
					for time	>=	3	sec		
					battery voltage	>	9.8	V		
					battery voltage	<	655.34	V		
		Detects a failure when short circuit status message from NOx sensor heater is received continuously for a time period	Short Circuit Nox heater lambda signal error	= TRUE -	battery voltage	>=	11.0	V	fail conditions exists for more than 3 sec. monitor runs with 0.01 s rate whenever enable	
					SCR upstream	<=	3003.56	°C	met	
					SCR upstream	>=	94.96	°C		
					no pending or confirmed faults	=	See Sheet Inhibit Table	-		
					Status of Start stop condition. (Quick Key Cycle Delay) (20 sec)	=	TRUE	-		
					Time since Quick Ignition Off-On Cycle	>=	20	sec		
					Can Bus Initialized (CAN Bus is Active) consisting of:	=	TRUE	-		
					ignition on	=	TRUE	-		
					for time	>=	3	sec		
					battery voltage	>	9.8	V		
					battery voltage	<	655.34	V	I I	

Component / System	Fault Code	Monitor Strategy Description	Primary Malfunction Criteria	Thresh Logic and	old Value	Secondary Parameters		Enable Conditions		Time Required	MIL Illum.
N0x Heater Performance Bank 1 Sensor 1	P2209	Monitoring of the upstream NoX sensor signal readiness	Upstream Nox sensor readiness condition is not active	= TRUE	-	NoX sensor heater diagnosis enabled (dewpoint end is reached)	=	TRUE	-	fault conditions exists for more than 0.5 s; monitor runs at	В
						for time	>	150	sec	0.1 s when enable conditions are	
						battery voltage	>=	11.0 655 34	V	met	
						SCR upstream	>=	94.96	°C		
						temperature SCR upstream temperature	<=	3003.56	°C		
						engine speed	>=	600	rpm		
						engine speed	<=	5000	rpm		
						A delay time required for the NOx sensor to give valid response Valid NOx signal from CAN is received (no Nox sensor communication failures)	>	20 TRUE	-		
						basic enable conditions met:	=	see sheet enable tables	-		
						No Pending or Confirmed DTC	=	see sheet inhibit tables	-		
Barometric Pressure (BARO) Circuit Low	P2228	Detects low voltage readings on the ECM internal BARO circuit, indicating an OOR low condition on the BARO circuit.	voltage of barometric pressure sensor same as	<= 1.9738	V	ignition and	=	on	-	fail conditions exists for 0.8 s monitor runs 0.1 s rate whenever enable conditions are met	A

Component /	Fault	Monitor Strategy	Primary Malfunction		Thresho	old	Secondary	Enable		Time	MIL
System	Code	Description	Criteria	L	ogic and	Value	Parameters	Condition	S	Required	Illum.
			ambient pressure	<=	50	кРа	basic enable conditions met:	= see sheet enable tables			
Barometric Pressure (BARO) Circuit High	P2229	Detects high voltage readings on the ECM internal BARO circuit, indicating an OOR high condition on the BARO circuit.	voltage of barometric pressure sensor same as ambient pressure	> _=	4.8	V kPa	ignition and basic enable conditions met:	 on see sheet enable tables 	-	fail conditions exists for 0.8 s monitor runs 0.1 s rate whenever enable conditions are met	A

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Component /	Fault	Monitor Strategy	Primary Malfunction		Thresho	d	Secondary		Enable		Time	MIL
System	Code	Description	Criteria		Logic and V	/alue	Parameters		Conditions		Required	Illum.
Turbo Boost System Performance	P2263	Detects if the Turbocharger is severely over or under boosting based on MAP sensor output	manifold absolute pressure	>	350	kPa	ignition	=	on	-	fail conditions exists for 15 s test performed continuously 0.01 s rate	A
							and basic enable conditions met:	=	see sheet enable tables	-		
							and NO Pending or Confirmed DTCs:	=	see sheet inhibit tables	-		
			manifold absolute pressure (see Look-Up-Table #3)	<	40 to 155	kPa	ignition	=	on	-	fail conditions exists for 15 s test performed continuously 0.01	
							actuator position of throttle valve and	<=	5	%	s rate	
							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.
Fuel Pressure Regulator 2 Control Circuit	P2294	Electronic out-put driver circuitry determines circuit integrity on the pressure control valve circuit.	Electronic power stage circuitry determines open circuit on the fuel pressure regulator 2 control circuit.		battery voltage for time and battery voltage for time) and ignition on and basic enable conditions met:	> < > = =	11 3 655.34 3 TRUE see sheet enable tables	V sec - -	fail conditions exists for 0.75 s monitor runs with 0.01 s rate whenever enable conditions are met	A
			Electronic power stage circuitry determines over temperature on the fuel pressure regulator 2 control circuit.		battery voltage for time and battery voltage for time) and	~ ~ ~	11 3 655.34 3	V sec V sec	fail conditions exists for 1 s monitor runs with 0.01 s rate whenever enable conditions are met	A

Component / System	Fault Code	Monitor Strategy Description	Primary Malfunction Criteria	Threshold Logic and Value	Secondary Parameters		Enable Conditions		Time Required	MIL Illum.
					ignition on and basic enable conditions met:	=	TRUE see sheet enable tables	-		
Fuel Pressure Regulator 2 Control Circuit Low Voltage	P2295	Electronic out-put driver circuitry determines circuit integrity on the fuel pressure regulator control circuit.	The ECM detects that the commanded state of the driver and the actual state of the control circuit do not match.		battery voltage for time and battery voltage for time) and ignition on and basic enable conditions met:	∧ v ∧ = =	11 3 655.34 3 TRUE see sheet enable tables	V sec - -	fail conditions exists for 0.75 s monitor runs with 0.01 s rate whenever enable conditions are met	A
Fuel Pressure Regulator 2 Control Circuit High Voltage	P2296	Electronic out-put driver circuitry determines circuit integrity on the fuel pressure regulator control circuit.	The ECM detects that the commanded state of the driver and the actual state of the control circuit do not match.		battery voltage for time	>	11	V sec	fail conditions exists for 0.50 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.
---------------------------------------	---------------	---	---	------------------------------	---	---	--	----------	---	---------------
					and battery voltage for time) and ignition on and basic enable conditions met:	< , , , , , , , , , , , , , , , , , , ,	655.34 3 TRUE see sheet enable tables	V sec		
NOx Sensor Circuit Bank 1 Sensor 2	P229E	Downstream NOx sensor open circuit error via the CAN message	Open circuit error of downstream NOx sensor via CAN message	= TRUE -	Enabling Downstream NOx sensor heater diagnosis (please see the definition) basic enable conditions met:	=	TRUE see sheet enable tables	-	fail conditions exists for more than 3 s monitor runs with 0.1 s rate whenever enable conditions are met	A

Component / System	Fault Code	Monitor Strategy Description	Primary Malfunction Criteria	Threshold Logic and Value	Secondary Parameters		Enable Conditions		Time Required	MIL Illum.
		Open circuit error of the binary lambda signal of Downstream NOx sensor via the CAN message	Open circuit lambda binary error of downstream NOx sensor via CAN message	= TRUE -	Enabling Downstream NOx sensor heater diagnosis (please see the definition) basic enable conditions met:	=	TRUE see sheet enable tables	-	fail conditions exists for more than 3 s monitor runs with 0.1 s rate whenever enable conditions are met	
		Open circuit error of linear lambda signal of Downstream NOx sensor via the CAN message	Open circuit lambda linear error of downstream NOx sensor via CAN message	= TRUE -	Enabling Downstream NOx sensor heater diagnosis (please see the definition) basic enable conditions met:	=	TRUE see sheet enable tables	-	fail conditions exists for more than 3 s monitor runs with 0.1 s rate whenever enable conditions are met	

Component / Fai System Co	ult Monitor Strategy de Description	Primary Malfunction Criteria	Threshold Logic and Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
	Downstream NOx sensor short circuit error via the CAN message	Short circuit NOx signal error of downstream NOx sensor via CAN message	= TRUE -	Enabling Downstream NOx sensor heater diagnosis (please see the definition) basic enable conditions met:	= TRUE - = see sheet - enable tables	fail conditions exists for more than 3 s monitor runs with 0.1 s rate whenever enable conditions are met	
	Short circuit error of binary lambda signal of Downstream NOx sensor via the CAN message	Short circuit lambda binary error of downstream NOx sensor via CAN message	= TRUE -	Enabling Downstream NOx sensor heater diagnosis (please see the definition) basic enable conditions met:	= TRUE - = see sheet - enable tables	fail conditions exists for more than 3 s monitor runs with 0.1 s rate whenever enable conditions are met	

Component / System	Fault Code	Monitor Strategy Description	Primary Malfunction Criteria	L	Threshol ogic and V	d alue	Secondary Parameters		Enable Conditions		Time Required	MIL Illum.
		Short circuit error of linear lambda signal of Downstream NOx sensor via the CAN message	Short circuit lambda linear error of downstream NOx sensor via CAN message	=	TRUE	-	Enabling Downstream NOx sensor heater diagnosis (please see the definition) basic enable conditions met:	=	TRUE see sheet enable tables	-	fail conditions exists for more than 3 s monitor runs with 0.1 s rate whenever enable conditions are met	
NOx Sensor Performance - Signal Insufficient Peak Value Bank 1 Sensor 2	P229F	Compares Delta NOx concentration of downstream NOx sensor with a threshold	Maximum deviation of downstream NOx concentration from the state machine_5 and Maximum deviation of downstream NOx concentration from the state machine_5 and with	>=	0 Min [(a), [b)]	ppm	NO Pending or Confirmed DTCs: Status of NOx signal of upstream NOx sensor (please see the definition) for time Status of NOx signal of downstream NOx sensor (please see the definition) for time	= > = >	See sheet inhibit table TRUE 0.5 TRUE 0.5	- sec sec	fail conditions exists for more than 1 event monitor runs with 0.01s rate whenever enable conditions are met	B

Component /	Fault	Monitor Strategy	Primary Malfunction		Threshol	ld	Secondary		Enable		Time	MIL
System	Code	Description	Criteria		Logic and V	/alue	Parameters		Conditions	6	Required	Illum.
			(a) Limit value for Stuck in range check of downstream NOx concentration	=	500	ppm	exhaust gas massflow	>=	2.78	g/sec		
			(b) = (c) * (d)				engine speed	>	100	rpm		
			and with				for time	>	10	sec		
			(DPF Regeneration inactive	=	TRUE			
			(c) Weighting factor for calculating the peak limit value based on the SCR temperature and the NOx mass flow	=	32.767	factor	Status of the SCR adaptation plausibility check active (please see the definition)	=	FALSE	-		
			(d) Average upstream NOx concentration	=	measured parameter	ppm	for time	>	120	sec		
)				State of Reductant injection valve Component Protection (please see definition)	=	FALSE			
							for time (State machine_0 : starting state and waiting for low upstream NOx mass flow / concentration	>	120	sec		
							(Filtered upstream NOx mass flow	<	0.015	g/sec		
							Filtered NOx concentration	<	180	ppm		
							Exhaust mass flow rate	<	69.44	g/sec		
							for time)	<	2	sec		

Component / System	Fault Code	Monitor Strategy Description	Primary Malfunction Criteria	Threshold Logic and Value	Secondary Parameters	C	Enable onditions		Time Required	MIL Illum.
					State machine_1 : low upstream NOx mass flow /concentration reached					
					(Old State machine_0 :	=	TRUE			
					starting state and waiting for low upstream NOx mass flow / concentration					
					for time	>=	2	sec		
					Filtered upstream NOx mass flow	<	0.015	g/sec		
					Filtered NOx concentration	<	180	ppm		
					Exhaust mass flow rate	<	69.44	g/sec		
					captured minimum downstream NOx	= N p	Measured barameter	ppm		
					concentration in State machine_1)					
					State machine_2 : start Upstream NOx peak					
					(
					Old State machine_1 : low upstream NOx mass flow /concentration reached	=	TRUE	-		
					(
					Filtered upstream NOx mass flow or	>	0.015	g/sec		
					Filtered NOx concentration or	>	180	ppm		
					Exhaust mass flow message	>	69.44	g/sec		

Component / System	Fault Code	Monitor Strategy Description	Primary Malfunction Criteria	Threshold Logic and Value	Secondary Parameters		Enable Conditions		Time Required	MIL Illum.
) for time Absolute deviation of	< =	2 Measured	sec ppm		
					downstream NOx concentration: (a) - (b)		parameter			
					and with (a) Filtered downstream NOx concentration	=	Measured parameter	ppm		
					(b) captured minimum downstream NOx concentration in State machine_1)	=	Measured parameter	ppm		
					State machine_3 : Upstream NOx peak detection (
					` Old State machine_2 : start Upstream NOx peak	=	TRUE			
					for time	>=	2	sec		
					Filtered upstream NOx mass flow	>=	0.030	mg/se		
					Filtered NOx	>=	500	ppm		
					Exhaust mass flow rate	>=	77.78	g/sec		
					for time	>	2	sec		
					Absolute deviation of downstream NOx concentration: (a) - (b)	=	Measured parameter	ppm		
					and with					
					(a) Filtered downstream NOx concentration	=	Measured parameter	ppm		

COMMON SECTION 1 OF 3 SECTIONS

Component / System	Fault Code	Monitor Strategy Description	Primary Malfunction Criteria	Threshold Logic and Value	Secondary Parameters	En Cono	able litions	Time Required	MIL Illum.
					(b) captured minimum downstream NOx concentration in State machine_1)	= Mea para	isured ppm imeter		
					State machine_4 : delay for downstream NOx peak evaluation (
					Old State machine_3 : Upstream NOx peak detection	= TI	RUE		
					for time	>=	2 sec		
					Filtered and estimated NOx conversion efficiency of SCR catalyst	<= ().8 factor		
					Absolute deviation of downstream NOx concentration: (a) - (b)	= Mea para	isured ppm imeter		
					and with				
					(a) Filtered downstream NOx concentration	= Mea para	isured ppm imeter		
					(b) captured minimum downstream NOx concentration in State machine 1	= Mea para	isured ppm imeter		
					for time)	>	2 sec		
					State machine_5 : end of downstream NOx peak and evaluation (
					Old State machine_4 : delay for downstream NOx peak evaluation	= TI	RUE -		

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Component / System	Fault Code	Monitor Strategy Description	Primary Malfunction Criteria	Thresh Logic and	old Value	Secondary Parameters		Enable Conditions		Time Required	MIL Illum.
						for time Maximum deviation of downstream NOx concentration among different states of state machine	>= =	2 5	sec ppm		
						Average SCR catalyst temperature Average upstream NOx mass flow in state machine_3 and _4	>=	199.96 0.030	°C g/sec		
						Average upstream NOx concentration in state machine_3 and _4	>=	500	ppm		
						NO Pending or Confirmed DTCs:)	=	see sheet inhibit tables	-		
) basic enable conditions met:	=	see sheet enable tables	-		
NOx Sensor Circuit	P22A1	Detects an out of	Downstream Nox sensor	> 2500	ppm	Valid downstream NOx	=	TRUE	-	fault conditions	В
High Bank 1 Sensor 2		range high fault of the downstream NoX Sensor	signal (raw information received via CAN from Nox sensor)			signal from CAN is received (no Nox sensor communication failures)				exists for more than 10 sec; monitor runs at 0.1 s when enable conditions are	
						Engine Running (see parameter definition) (see Look-Up-Table #87)	=	600 to 850	rpm	met	
		8				for time	>	20	sec		

Component / System	Fault Code	Monitor Strategy Description	Primary Malfunction Criteria	L	Thresho ogic and	old Value	Secondary Parameters		Enable Conditions	i	Time Required	MIL Illum.
NOx Sensor Circuit Low Bank 1 Sensor 2	P22A0	Detects an out of range low fault of the downstream NoX Sensor	Downstream Nox sensor signal (raw information received via CAN from Nox sensor)	<	-90	ppm	Injection quantity Nox Bank 1 Sensor 2 ready (see parameter definition)	> =	8 TRUE	mm^3 /rev -		
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	-	Enabling Downstream NOx sensor heater diagnosis (please see the definition) basic enable conditions met:	=	TRUE see sheet enable tables	-	fail conditions exists for more than 3 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	-	Enabling Downstream NOx sensor heater diagnosis (please see the definition) basic enable conditions met:	=	TRUE see sheet enable tables	-	fail conditions exists for more than 3 s monitor runs with 0.1 s rate whenever enable conditions are met	

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Component / System	Fault Code	Monitor Strategy Description	Primary Malfunction Criteria	Threshold Logic and Value	Secondary Parameters		Enable Conditions		Time Required	MIL Illum.
N0x Heater Performance Bank 1 Sensor 2	P22A7	Monitoring of the downstream NoX sensor signal readiness	Downstream Nox sensor readiness condition is not active	= TRUE -	NoX sensor heater diagnosis enabled (dewpoint end is reached)	=	TRUE	-	fault conditions exists for more than 0.5 s; monitor runs at	В
					tor time	> <=	150 655 34	sec V	0.1 s when enable conditions are	
					battery voltage	>=	11.0	V	met	
					engine speed	>=	600	rpm		
					engine speed	<=	5000	rpm		
					SCR downstream	<=	3003.56	°C		
					SCR downstream temperature	>=	94.96	°C		
					delay time required for the NOx sensor to give valid response	>	20	sec		
					Valid NOx signal from CAN is received (no Nox sensor communication failures)	=	TRUE	-		
					basic enable conditions met:	=	see sheet enable tables	-		
					No Pending or Confirmed DTCs	=	see sheet inhibit tables	-		
Exhaust Gas Recirculation(EGR) Flow Excessive	P2413	Detects insufficient EGR flow. Actual MAF readings are compared to desired MAF values as an indication of how much EGR is flowing.	controller deviation of the air mass = actual minus desired value (see Look-Up- Table #3)	> (a)*(b) -	(fail conditions exists for 15 s monitor runs 0.02 s rate whenever enable conditions are met	В
			with		EGR controller is active	=	TRUE	-		

1 OF 3 SECTIONS

Component /	Fault	Monitor Strategy	Primary Malfunction		Threshol	d	Secondary		Enable		Time	MIL
System	Code	Description	Criteria	I	Logic and V	alue	Parameters		Conditions		Required	Illum.
			(a) minimum controllerdeviation(b) environmentalcorrection factor (see	=	-1.4 0.3 to 1	g/rev factor	and (
			Look-Up-Table #12)				VGT offset learning is active and	=	FALSE	-		
							Engine speed and	>=	575	rpm		
							Engine speed	<=	950	rpm		
							and injection quantity	>=	20	mm^3 /rev		
							and injection quantity	<=	72	mm^3 /rev		
							and throttle position	<	5	%		
							basic enable conditions met:	=	see sheet enable tables	-		
							and NO Pending or Confirmed DTCs:	=	see sheet inhibit tables	-		
) for for time	>=	1.5	sec		

Component / System	Fault Code	Monitor Strategy Description	Primary Malfunction Criteria	L	Threshol ogic and V.	d ′alue	Secondary Parameters		Enable Conditions		Time Required	MIL Illum.
Exhaust Gas High Temperature	P2428	Detects implausible temperatures in order to protect the engine	Any two of the following four conditions: ((a) and (b)) or ((a) and (c)) or ((a) and (d)) or ((b) and (c)) or ((b) and (d)) or ((c) and (d))				basic enable conditions met:	=	see sheet enable tables	-	fail conditions exists for 6 s test performed continuously 0.1 s rate	A
			with				and					
			(a) oxidation catalyst upstream temperature	>	799.96	°C	NO Pending or Confirmed DTCs:	=	see sheet inhibit tables	-		
			and with									
			(b) oxidation catalyst downstream temperature	>	799.96	°C						
			and with									
			(c) SCR downstream temperature and with	>	799.96	°C						
			(d) particulate filter downstream temperature	>	799.96	°C						
Exhaust Gas Temperature (EGT) Sensor 3 Circuit Low Voltage	P242C	SCR Catalyst downstream temperature low	voltage of SCR catalyst temperature sensor	<	0.65	V	((fail conditions exists for more than 5.0 sec. monitor runs with	A
i onago			same as				engine speed	<=	6000	rpm	0.1 s rate	
			SCR Catalyst temperature	<	-50	°C	engine speed	>=	0	rpm	whenever enable conditions are	
							current injection quantity	<=	800	mm^3	met	
							current injection quantity	>=	0	/rev mm^3 /rev		
							engine coolant	>	-50.04	°C		
							time since engine start	>	0	sec		

Component / System	Fault Code	Monitor Strategy Description	Primary Malfunction Criteria	L	Thresho ogic and	ld /alue	Secondary Parameters		Enable Conditions		Time Required	MIL Illum.
							exhaust-gas mass flow downstream of the exhaust manifold	>	0	g/sec		
) or SCR catalyst temperature)	>	-45.04	°C		
							for time	>	0	sec		
							NO Pending or Confirmed DTCs:	=	see sheet inhibit tables	-		
							basic enable conditions met:	=	see sheet enable tables	-		
Exhaust Gas Temperature (EGT) Sensor 3 Circuit High	P242D	SCR Catalyst downstream temperature high	voltage of SCR catalyst temperature sensor	>	2.21	V	((fail conditions exists for more than 5.0 sec.	A
voitage			same as				engine speed	<=	6000	rpm	0.1 s rate	
			SCR Catalyst temperature	>	1000	°C	engine speed	>=	0	rpm	whenever enable conditions are	
							current injection quantity	<=	800	mm^3	met	
							current injection quantity	>=	0	/rev mm^3		
							Coolant engine down stream temperature	>	-50.04	°C		
							time since engine start	>	0	sec		
							exhaust-gas mass flow downstream of the exhaust manifold)	>	0	g/s		
							or					

Component / System	Fault Code	Monitor Strategy Description	Primary Malfunction Criteria	Lo	Thresho ogic and	old Value	Secondary Parameters		Enable Conditions		Time Required	MIL Illum.
System	Code	Description	Griteria			Value	SCR catalyst temperature) for time NO Pending or Confirmed DTCs: basic enable conditions met:	>	-45.04 0 see sheet inhibit tables see sheet enable tables	°C -	Kequirea	mum.
Diesel Particulate Filter Differential Pressure Sensor Performance	P2453	Detects in range faults on the DPF differential pressures sensor.	change in differential pressure or	<	-1.0	kPa/s	(change in exhaust gas volume flow	>	0.10	m^3/s ec^2	fail conditions exists for 3 s test performed continuously 0.1 s rate	В
			change in differential pressure	>	1.0	kPa/s	or change in exhaust gas volume flow)	<	-0.10	m^3/s ec^2		
							and current exhaust gas volume flow	>	0.10	m^3/s ec		
							and basic enable conditions met: and	=	see sheet enable tables	-		

Component / System	Fault Code	Monitor Strategy Description	Primary Malfunction Criteria	L	Threshol ogic and V	d alue	Secondary Parameters		Enable Conditions		Time Required	MIL Illum.
							NO Pending or Confirmed DTCs:	=	see sheet inhibit tables	-		
			Path 1:				Engine State	=	After Run	-	fail conditions	
			differential pressure sensor	>	3.2	kPa	for time	>	35	sec	exists for 0.5 s monitor runs with 0.1 s rate	
							and basic enable conditions met:	=	see sheet enable tables	-	whenever enable conditions are met	
							and NO Pending or Confirmed DTCs:	=	see sheet inhibit tables	-		
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	voltage of differential pressure sensor	>	4.6664	V	ignition on	=	TRUE	-	fail conditions exists for 3 s test performed continuously 0.020 s rate	В
		UN CUIL	same as differential pressure	>	91.7	kPa	and basic enable conditions met:	=	see sheet enable tables	-		
1							 -{ 404		4.0			ļ

Component / System	Fault Code	Monitor Strategy Description	Primary Malfunction Criteria		Thresho Logic and	old Value	Secondary Parameters		Enable Conditions		Time Required	MIL Illum.
							and NO Pending or Confirmed DTCs:	=	see sheet inhibit tables			
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	< v	-4.2	V kPa	ignition on and basic enable conditions met: and NO Pending or Confirmed DTCs:	= =	TRUE see sheet tables see sheet inhibit tables	-	fail conditions exists for 3 s test performed continuously 0.020 s rate	В
Exhaust Gas (EGR) Cooler Performance	P2457	Performs a check of the EGR cooler performance by monitoring the EGR efficiency and comparing it to a threshold value	EGR cooler efficiency taking the ratio of the EGR cooler temperature downstream and the EGR cooler temperature upstream where	<	(a) + (b)	-	(fail conditions exists for 0.1 s monitor runs with 0.1 s rate whenever enable conditions are met	В

Component /	Fault	Monitor Strategy	Primary Malfunction	Threshold	ThresholdSecondaryEnableLogic and ValueParametersConditions			Time	MIL	
System	Coue	Description			Falailleteis	<u> </u>	4400	5	Kequileu	mum.
			(a)	= 0.03	engine speed	>=	1100	rpm		
			and		and					
			(b) (see Look-Up-Table	= -0.12 to 0	engine speed	<=	1800	rpm		
			#18)		,					
)					
					and					
					(
					injection quantity	>=	20	mm^3		
					and			/rev		
					anu inination averatitu		0.40			
					injection quantity	<=	240	mm^3		
) (//ev		
					, and					
							40.07			
					recirculated exhaust-gas	>=	16.67	g/sec		
					the FGR cooler					
					and					
					recirculated exhaust-gas	<=	40.28	g/sec		
					mass flow downstream of			Ũ		
					the EGR cooler					
)					
					and					
					EGR controller is active	=	TRUE			
					and DPF is not in					
					regeneration mode					
					and					
					(
					engine temperature	>=	69.96	°C		
					and					
					engine temperature	<=	122.96	°C		
)					
					and					
					(
					(a) - (b)	>=	210	°C		
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Component / System	Fault Code	Monitor Strategy Description	Primary Malfunction Criteria	Threshold Logic and Value	Secondary Parameters	Enable Conditions	;	Time Required	MIL Illum.
					with (a) filtered temperature upstream of EGR-cooler				
					and with				
					(b) engine temperature				
) and (
					actual valve position of exhaust-gas recirculation	>= 10.00	%		
					and				
) and				
					control value provided for EGR cooling bypass	<= 5.00	%		
) and				
					ambient pressure and	>= 74.8	kPa		
					(
					ambient temperature and	>= -7.04	°C		
					ambient temperature	<= 3003.56	°C		
) and				
					particulate filter regeneration	= FALSE	-		
					diagnostic performed in current dc and	= FALSE	-		

Component / System	Fault Code	Monitor Strategy Description	Primary Malfunction Criteria		Threshold Logic and Value	Secondary Parameters		Enable Conditions		Time Required	MIL Illum.
						NO Pending or Confirmed DTCs:) for time and basic enable conditions met:	= >=	see sheet inhibit tables 120 see sheet enable tables	- sec		
Diesel Particulate Filter Regeneration Frequency	P2459	Detects a DPF that is regeneration too frequently by comparing a threshold to a soot model.	soot mass in the particulate filter with (a) engine out soot mass flow in the exhaust-gas and with (b) delta time step and with (c) simulated maximum base soot mass from previous time step	>	minimumgof ((a) *(b) + (c))+ ((d) *(e)) or327.67measuredparametercalculatedparameter-measuredparameter-measuredparameter	particulate filter regeneration - transition false to true and last particulate filter regeneration successful or particulate filter regeneration must have been completed and basic enable conditions met:	=	TRUE TRUE TRUE see sheet enable tables	-	fail conditions exists for more than 1 event monitor runs 0.1 s rate whenever enable conditions are met	В

Component / Fau System Cod	It Monitor Strategy	Primary Malfunction Criteria	Threshold Logic and Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
		and with (d) factor for calculation of a soot mass value offset depending on the simulated maximal base soot mass (see Look-Up- Table #51) and with (e) factor for determination of correction factor for ash in the particulate filter	= 0 to 531 g = 1 factor	and NO Pending or Confirmed DTCs:	= see sheet - inhibit tables	Toquirou	
Exhaust Gas Recirculation (EGR) Cooler Bypass Valve Control Circuit	 5A Electronic output driver circuitry determines circuit integrity on the EGR cooler bypass solenoid. The faults of the output circuit, that are detected with this diagnosis, are an open circuit or an overtemperature of the integrated circuit within the ECM. 	The ECM detects that the commanded state of the driver and the actual state of the control circuit do not match.		(battery voltage for time and battery voltage for time) and starter is active cranking	 11 V 3 sec 655.34 V 3 sec = FALSE 	fail conditions exists for 3 s monitor runs with 0.01 s rate whenever enable conditions are met	В

Component / System	Fault Code	Monitor Strategy Description	Primary Malfunction Criteria	Threshold Logic and Value	Secondary Parameters		Enable Conditions		Time Required	MIL Illum.
					for time	>	3	sec		
					and EGR Cooling Bypass Solenoid Control Circuit	=	ACTIVE			
					and (
					open load diagnostics is triggered after offset learning of valve is completed or					
					tested for open load if the valve is jammed indicated by DTC's)	=	see sheet inhibit tables	-		
					, and basic enable conditions met:	=	see sheet enable tables	-		
Exhaust Gas Recirculation (EGR) Cooler Bypass Valve Control Circuit 1 Low Voltage	P245C	Electronic output driver circuitry determines circuit integrity on the EGR cooler bypass solenoid.	The ECM detects that the commanded state of the driver and the actual state of the control circuit do not match.		(fail conditions exists for 3 s monitor runs with 0.01 s rate whenever enable conditions are	В
					battery voltage for	>	11	V	met	
					time	>	3	sec		
					and battery voltage	<	655.34	V		
					for					

Component / System	Fault Code	Monitor Strategy Description	Primary Malfunction Criteria	Threshold Logic and Value	Secondary Parameters		Enable Conditions		Time Required	MIL Illum.
					time	>	3	sec		
)					
					and	_				
					starter is active crarking	-	FALSE	-		
					for					
					time	>	3	sec		
					EGR Cooling Bypass	=	ACTIVE	-		
					Solenoid Control Circuit					
					and					
					basic enable conditions	=	see sheet	-		
					met:		enable tables			
Exhaust Gas	P245D	Electronic output	The ECM detects that the		(fail conditions	В
Cooler Bypass Valve		driver circuitry determines circuit	commanded state of the driver and the actual state						exists for 3 s monitor runs with	
Control Circuit 1 High		integrity on the EGR	of the control circuit do not						0.01 s rate	
Voltage		solenoid.	maton.						conditions are	
					battery voltage	>	11	V	met	
					for		3	500		
					and		5	360		
					battery voltage	<	655.34	V		
					for					
					time	>	3	sec		
) and					
					starter is active cranking	=	FALSE	-		
					for					
					time	>	3	sec		
•	•		COMMO	N SECTION Page 347	of 491		1 C	F 3 S	ECTIONS	

Component / System	Fault Code	Monitor Strategy Description	Primary Malfunction Criteria	L	Threshol ogic and V	d alue	Secondary Parameters		Enable Conditions		Time Required	MIL Illum.
							and EGR Cooling Bypass Solenoid Control Circuit and basic enable conditions met:	=	ACTIVE see sheet enable tables	-		
Diesel Particulate Filter - Soot Accumulation	P2463	Detects high levels of soot in the DPF as indicated by the soot model.	soot mass in the particulate filter	^	69.6	g	ignition on and basic enable conditions met: and NO Pending or Confirmed DTCs:	-	TRUE see sheet enable tables see sheet inhibit tables	-	fail conditions exists for 30 s test performed continuously 0.1 s rate	A
Exhaust Gas Temperature (EGT) Sensor 4 Sensor Circuit Low Voltage	P2470	Detects low voltage readings on the EGT 4 circuit, indicating an OOR low condition on the EGT 4	particulate filter downstream temperature sensor voltage same as particulate filter downstream temperature	<	-60	°C	ignition on and basic enable conditions met:	=	TRUE see sheet enable tables	-	fail conditions exists for 3 s monitor runs 0.05 s rate whenever enable conditions are met	В

COMMON SECTION 1 OF 3 SECTIONS

Component / System	Fault Code	Monitor Strategy Description	Primary Malfunction Criteria	I	Thresho Logic and V	ld /alue	Secondary Parameters		Enable Conditions		Time Required	MIL Illum.
Exhaust Gas Temperature (EGT) Sensor 4 Circuit High Voltage	P2471	Detects high voltage readings on the EGT 4 circuit, indicating an OOR high condition on the EGT 4	particulate filter downstream temperature sensor voltage	^	2.2066	V	ignition on	=	TRUE	-	fail conditions exists for 3 s monitor runs 0.05 s rate whenever enable conditions are met	В
			particulate filter	>	999.6	°C	basic enable conditions	=	see sheet	-		
			downstream temperature				met:		enable tables			
E hand Que	D0 400				10.00	0/			7.04	*0		
Exhaust Gas Recirculation (EGR) Cooler Bypass Valve Current Performance	P2493	Detects a controller deviation in EGR cooling bypass valve. Actual deviation readings are compared to a threshold.	controller deviation of EGR cooling bypass valve actuator calculated out of difference between desired and actual value	>	10.00	%	engine coolant temperature	>	-7.04	Ĵ	tail conditions exists for 8 s monitor runs with 0.02 s rate whenever enable conditions are met	В
			or				and					
			controller deviation of EGR cooling bypass valve actuator calculated out of difference between desired and actual value	<	-10.00	%	offset learning of EGR cooling bypass valve actuator active	=	FALSE	-		
							and					
							offset learning in the previous driving cycle was complete and	=	TRUE	-		
							engine speed	>	100	rpm		
							and EGR Cooler Bypass Valve Actuator	=	ACTIVE	-		

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Component / Faul System Code	It Monitor Strategy e Description	Primary Malfunction Criteria	Threshold Logic and Va	l alue	Secondary Parameters		Enable Conditions		Time Required	MIL Illum.
					and basic enable conditions met: and NO Pending or Confirmed DTCs:	=	see sheet tables see sheet inhibit tables	-		
EGR Cooling Bypass Position Sensor Circuit Low Voltage	Detects low voltage readings on the EGR cooling bypass position circuit, indicating an OOR low condition on the EGR position circuit	voltage of EGR cooling bypass actuator position sensor same as EGR cooling bypass actuator position	< -22.5	V %	ignition on and NO Pending or Confirmed DTCs: and basic enable conditions met:	=	TRUE see sheet inhibit tables see sheet enable tables		fail conditions exists for 5 s test performed continuously 0.01 s rate when enable conditions are met	A

Component / System	Fault Code	Monitor Strategy Description	Primary Malfunction Criteria	L	Thresho ogic and	old Value	Secondary Parameters		Enable Conditions		Time Required	MIL Illum.
EGR Cooling Bypass Position Sensor Circuit High Voltage	P2495	Detects high voltage readings on the EGR cooling bypass position circuit, indicating an OOR high condition on the EGR position circuit	voltage of EGR cooling bypass actuator position sensor	>	4.8	V	ignition on	=	TRUE	-	fail conditions exists for 5 s test performed continuously 0.01 s rate when enable conditions are met	A
			same as EGR cooling bypass actuator position	>	114	%	and NO Pending or Confirmed DTCs: and	=	see sheet inhibit tables	-		
							basic enable conditions met:	=	see sheet enable tables	-		
Closed loop Reductant Injection Control at Limit-Flow too low	P249E	Detects an out of range low of the long term Reductant quantity adaptation factor	long term adaptation factor of Reductant quantity	<	0.41	-	long term adaptation triggered NO Pending or Confirmed DTCs basic enable conditions met:	=	TRUE see sheet inhibit tables see sheet enable tables	-	fault exists for more than 0.1 s; monitor runs at 0.1 s whenever enable conditions are met	В

Component / System	Fault Code	Monitor Strategy	Primary Malfunction Criteria		Threshold	d alue	Secondary Parameters		Enable Conditions		Time Required	MIL Illum
eyötötti		Decemption		_			T uluillotoro		Contaitionio		Required	
Closed loop Reductant Injection Control at Limit-Flow too high	P249D	Detects an out of range low of the long term Reductant quantity adaptation factor	long term adaptation factor of Reductant quantity	>	1.69	-	long term adaptation triggered	=	TRUE	-	fault exists for more than 0.1 s; monitor runs at 0.1 s whenever enable conditions	В
							NO Pending or Confirmed DTCs	=	see sheet inhibit tables	-	are met	
							basic enable conditions met:	=	see sheet enable tables	-		
Closed Loop Particulate Filter Regeneration Control At Limit - Temperature Too Low	P24A0	Detects insufficient HCI temperature. Temperature readings are compared to desired temperature values as an indication of an insufficient exhaust gas temperature.	commanded control value of the HCI temperature controller	>=	0	-	current engine operating point is suitable for monitoring deviation of exhaust gas temperature control - depending on engine speed and injection quantity (see Look-Up-Table #27)	=	0 to 1	-	fail conditions exists for 300 s monitor runs with 0.1 s rate whenever enable conditions are met	В
			and				for					
			deviation from the temperature setpoint for HCI control loop	>	maximum of (a) and (b+c)	-	time	>	180	sec		
			with				and					
			(a) temperature threshold value	=	100	°C	(
			and with				exhaust gas temperature control is active	=	TRUE	-		

Component / System	Fault Code	Monitor Strategy Description	Primary Malfunction Criteria		T Logi	hresho	old Value	Secondary Parameters		Enable Conditions		Time Required	MIL Illum.
			(b) temperature value for threshold of monitoring	=		0	°C	means					
			(c) basic temperature threshold value for monitoring	=		100	°C	temperature upstream of the oxidation catalyst and	>	229.96	°C		
								particulate filter temperature and	>	229.96	°C		
								particulate filter temperature or	<	719.96	°C		
								particulate filter temperature for activated post injection)	<	749.96	°C		
) and					
								release status means (=	TRUE	-		
								vehicle speed	>=	14.9161	mph		
								vehicle speed	<=	124.3008	mph		
								and					
								Actual time spent in coastdown mode and	<	60	sec		
								basic enable conditions met:	=	see sheet enable tables	-		

Component / System	Fault Code	Monitor Strategy Description	Primary Malfunction Criteria		Threshol Logic and V	d alue	Secondary Parameters		Enable Conditions		Time Required	MIL Illum.
							and NO Pending or Confirmed DTCs:	=	see sheet inhibit tables	-		
Closed Loop Particulate Filter Regeneration Control At Limit - Temperature Too High	P24A1	Detects excessive HCI temperature. Actual HCI controller ratio and temperature readings are compared to desired HCI controller ratio and temperature values as an indication of an excessive exhaust gas temperature.	commanded control value of the HCI temperature controller	<=	0.99	-	current engine operating point is suitable for monitoring deviation of exhaust gas temperature control - depending on engine speed and injection quantity (see Look-Up-Table #28)	Ξ	0 to 1	-	fail conditions exists for 300 s monitor runs with 0.1 s rate whenever enable conditions are met	В
			and deviation from the temperature setpoint for HCI control loop	<	minimum of (a) and (b+c-(d- e))	-	for time	>	180	sec		
			with (a)	=	-75	°C	and (
			and with (b) temperature value for threshold of monitoring	=	0	°C	exhaust gas temperature control is active	=	TRUE	-		
			with (c) basic temperature threshold value for monitoring and with		100	°C	means (temperature upstream of the oxidation catalyst	>	229.96	°C		

Component /	Fault	Monitor Strategy	Primary Malfunction	Threshold	Secondary	Enable	Time	MIL
System	Code	Description	Criteria	Logic and Value	Parameters	Conditions	Required	Illum.
			(d) temperature setpoint for exhaust gas system control loop	= calculated - parameter	and			
			and with (e) actual temperature for exhaust gas system control loop	= measured - parameter	(particulate filter temperature	> 229.96 °C		
					and (
					particulate filter temperature or	< 719.96 °C		
					particulate filter temperature for activated post injection	< 749.96 °C		
) and			
					release status means	= TRUE -		
					(N= 14.0404 mmh		
					venicle speed and	>= 14.9161 mpn		
					vehicle speed) and	<= 124.3008 mph		
					Actual time spent in coastdown mode and	< 60 sec		
					basic enable conditions met:	= see sheet - enable tables		
					and			

Component / System	Fault Code	Monitor Strategy Description	Primary Malfunction Criteria	Threshold Logic and Value	Secondary Parameters		Enable Conditions	Time Required	MIL Illum.
					NO Pending or Confirmed DTCs:	=	see sheet - inhibit tables		
ECM Power Relay Circuit Performance	P2510	Detects stuck power relay that is not responding to ECM commands to power down or a relay that is opening too early in power down. Stuck on is determined by timer values longer than possible if relay opened at end of after run.	counter value out of EEPROM for open the main relay	> 1 counts	ignition on and engine pre drive and basic enable conditions met:		TRUE-TRUE-see sheet enable conditions-	fail conditions exists for 0.02 s monitor runs once per driving cycle during predrive with 0.02 s rate whenever enable conditions are met	В

Component / System	Fault Code	Monitor Strategy Description	Primary Malfunction Criteria		Thresho Logic and	old Value	Secondary Parameters		Enable Conditions		Time Required	MIL Illum.
		Opening too soon is indicated by a lack of EEPROM write at the last after run.	sticky main relay is detected	=	TRUE	-	ignition off	=	TRUE	-	fail conditions exists for 0.02 s monitor runs once per driving cycle during predrive	
			time after request to open the main relay	>	1.4	sec	engine pre drive and	=	FALSE	-	with 0.02 s rate whenever enable conditions are	
							battery voltage and	>	0.5	V	met	
							basic enable conditions met:	=	see sheet enable conditions	-		
							and					
							NO Pending or Confirmed DTCs:	=	see sheet inhibit tables	-		
Transition Torque Request Signal Message Counter Incorrect	P2544	Detects implausible torque request information received from the TCM	Path 1:				ignition on	=	TRUE	-	fail conditions exist for 0.005 s test performed continuously	В
			amount of errors in consecutive frames received from TCM	>=	7	counts	and				0.005 s rate	
			with				new message received	=	TRUE	-		
			number of consecutive frames	>	15	counts	and					
			or				basic enable conditions met:	=	see sheet enable tables	-		
			Path 2:				and					

Component / System	Fault Code	Monitor Strategy Description	Primary Malfunction Criteria	L	Thresho ogic and	ld /alue	Secondary Parameters		Enable Conditions		Time Required	MIL Illum.
			number of protection value errors in TCM message	>	15	counts	NO Pending or Confirmed DTCs:	=	see sheet inhibit tables	-		
Turbocharger Boost Control Position Sensor Circuit Low Voltage	P2564	Detects low voltage readings on the turbo boost control position sensor circuit, indicating an OOR low condition on the circuit	voltage of boost pressure position sensor same as boost pressure position	<	0.15	ν	ignition on and basic enable conditions met:	=	TRUE see sheet enable tables	-	fail conditions exists for 5 s test performed continuously 0.01 s rate	A
Turbocharger Boost Control Position Sensor Circuit High Voltage	P2565	Detects high voltage readings on the turbo boost control position sensor circuit, indicating an OOR high condition on the circuit	voltage of boost pressure position sensor same as boost pressure position	>	4.750 95	ν	ignition on and basic enable conditions met:	=	TRUE see sheet enable tables	-	fail conditions exists for 5 s test performed continuously 0.01 s rate	A

Component /	Fault	Monitor Strategy	Primary Malfunction		Thresho	ld /alua	Secondary		Enable		Time Boguirod	MIL
System	Coue	Description	Criteria	L		alue	Parameters	_	Conditions	,	Required	mum.
Turbocharger Boost Control Position Sensor "A" Circuit Range/Performance - Stuck Low	P2598	Detects in range Turbo vane position errors by comparing desired vane position to actual vane position	turbo charger control deviation calculated out of difference between desired and actual value	>	15.00	%	engine speed and	>=	300	rpm	fail conditions exists for 10 s monitor runs with 0.02 s rate whenever enable conditions are met	В
							engine speed (see Look- Up-Table #87) for	>	600 to 850	rpm		
Turbocharger Boost Control Position Sensor "A" Circuit Range/Performance - Stuck High	P2599	Detects in range Turbo vane position errors by comparing desired vane position to actual vane position	turbo charger control deviation calculated out of difference between desired and actual value	<	-15.00	%	time (see Look-Up-Table #88) and	>	30 to 327.67	sec		
							engine coolant temperature and	>=	69.96	°C		
							engine coolant temperature) and (<=	122.96	°C		
							ambient temperature and	>=	-15.04	°C		
							ambient temperature)	<=	199.86	°C		
							and offset learning for turbo charger (VNT) actuator position sensor is active during idling	=	FALSE	-		

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Component / System	Fault Code	Monitor Strategy Description	Primary Malfunction Criteria	Threshold Logic and Value		Secondary Parameters		Enable Conditions		Time Required	MIL Illum.
						 in order to compensate sensor drift and valve aging the valve is closed and opened fully once in a driving cycle during engine idling, the read positions for opening and closing are averaged and used for the calculation of offset drift of the valve 					
						and offset learned since last clearing of fault code memory and	=	TRUE	-		
						basic enable conditions met:	=	see sheet enable tables	-		
						MIL not illuminated for DTCs:	=	see sheet inhibit tables	-		
Control Module Ignition Off Timer Performance	P2610	Detects a failure in the engine off timer calculation during ECM power up or afterrun, when the EOT timer IC is not responding	amount of retries in case of communication or bus error	> 5 col	ints	ignition and engine pre drive and	=	on	-	fail conditions exists for 0.01 s monitor runs once per driving cycle with 0.01 s rate whenever enable conditions are met	В
COMMON SECTION 1 OF 3 SECTIONS

Component / System	Fault Code	Monitor Strategy Description	Primary Malfunction Criteria		Threshol Logic and V	d alue	Secondary Parameters		Enable Conditions		Time Required	MIL Illum.
							basic enable conditions met:	=	see sheet enable tables	-		
		Detects a failure in the engine off timer if during the after run the internal SW timer and the EOT. A failure is detected when the respective timers are started after a calibration time then both are stopped, if the difference between the calculated timers is greatet that a threshold	Path 1:				time since engine post drive/ afterun	<	20	Sec	fail conditions exists for 0.01 s monitor runs once per driving cycle with 0.01 s rate whenever enable conditions are met	
			acquired stop counter time or	<	((a) - (b - c))*d	-	and engine post drive/ afterun	=	TRUE	-		
			ratn 2: acquired stop counter time	>	((a) + (b - c))*d	-	and basic enable conditions met:	=	see sheet enable tables	-		
			(where (a)	=	100	%						
I		l	and				 -{ 404					

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Component / System	Fault Code	Monitor Strategy Description	Primary Malfunction Criteria		Threshol Logic and V	d alue	Secondary Parameters		Enable Conditions		Time Required	MIL Illum.
			 (b) tolerance threshold and (c) correction factor and (d) system time since engine post drive/ afterun 	=	17.1875 7.5 calculated parameter	% ~						
		Detects an interrupted supply voltage.	permanent supply voltage is interrupted	=	TRUE		ignition and basic enable conditions met:	II II	on 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	
Fuel Injector Calibration Not Programmed	P268A	Detects un- programmed Injector Calibration Data (IQA) in ECM	Path 1: the checksum of the injector adjustment code words is correct	=	FALSE	-	engine pre drive and	=	TRUE	-	fail conditions exist for 1 s monitor runs once per driving cycle during predrive with 1 s rate	A

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

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

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

Component / System	Fault Code	Monitor Strategy Description	Primary Malfunction Criteria	Threshold Logic and Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
					basic enable conditions met:	= see sheet - enable tables		
					and NO Pending or Confirmed DTCs:	= see sheet - inhibit tables		
Cylinder 7 Injector Data Incorrect (IQA)	P2692	Detects a miss match in IQA values between ECM and GPCM	IQA (injection quantity adjustment) value of injector 7 transmitted via CAN from GPCM (glow plug module) match with the stored stored ECM value	= FALSE -	transmitted IQA data from GPCM (glow plug module) for cylinder 7 are valid	= TRUE -	fail conditions exist for 1 s test performed continuously with 1 s rate	A
					and basic enable conditions met:	= see sheet - enable tables		
					and NO Pending or Confirmed DTCs:	= see sheet - inhibit tables		
Cylinder 8 Injector Data Incorrect (IQA)	P2693	Detects a miss match in IQA values between ECM and GPCM	IQA (injection quantity adjustment) value of injector 8 transmitted via CAN from GPCM (glow plug module) match with the stored stored ECM value	= FALSE -	transmitted IQA data from GPCM (glow plug module) for cylinder 8 are valid and	= TRUE	fail conditions exist for 1 s test performed continuously with 1 s rate	A

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

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Component / System	Fault Code	Monitor Strategy Description	Primary Malfunction Criteria	L	Threshol ogic and V	d alue	Secondary Parameters		Enable Conditions		Time Required	MIL Illum.
							accelerator pedal position and engine speed and	>	10.00 6000	% rpm		
							engine speed and	>	1000	rpm		
							basic enable conditions met:	=	see sheet enable tables	-		
							and NO Pending or Confirmed DTCs:	=	see sheet inhibit tables	-		
CAN A BUS OFF	U0073	BUS A off monitoring	CAN A Bus-Off reported by CAN hardware	=	TRUE	-	ignition on and basic enable conditions met:	=	TRUE see sheet enable tables	-	fail conditions exists for 5 s test performed continuously 0.01 s rate	В
CAN B BUS OFF	U0074	BUS B off monitoring	CAN B Bus-Off reported by CAN hardware	Ξ	TRUE	-	ignition on and basic enable conditions met:	=	TRUE see sheet enable tables	-	fail conditions exists for 5 s test performed continuously 0.01 s rate	В

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Component / System	Fault Code	Monitor Strategy Description	Primary Malfunction Criteria	Thresh Logic and	old Value	Secondary Parameters		Enable Conditions		Time Required	MIL Illum.
Lost communications with Transmission Control System	U0101	Detects loss of communication between ECM (on- board control unit) and TCM (transmission control module)	time since last message from transmission was received	> 0.0625	sec	ignition on	=	TRUE	-	fail conditions exists for 10 s test performed continuously 0.01 s rate	В
						and basic enable conditions met:	=	see sheet enable tables	-		
						and NO Pending or Confirmed DTCs:	=	see sheet inhibit tables	-		
Glowplug Module CAN Frame 1	U0106	Glowplug Module CAN message #1 frame not received after the specified number of times	counts up when message is not received in the base time interval	> 5	counts	Can Bus Initialized (CAN Bus is Active) consisting of: ignition for time battery voltage battery voltage	= =	TRUE TRUE 3 9.8 655.34	- sec V V	fail condition exists for 10 s monitor runs with 0.02 s rate whenever enable conditions are met	В

Component / System	Fault Code	Monitor Strategy Description	Primary Malfunction Criteria	I	Thresho _ogic and	old Value	Secondary Parameters		Enable Conditions	5	Time Required	MIL Illum.
Lost Communication with Reductant Control Module	U010E	CAN frame not received after the specified number of times	counts up when message is not received in the base time interval (1.0 sec)	^	40	counts	CAN Bus is Active Can Bus Initialized (CAN Bus is Active) consisting of:	=	TRUE	-	fail conditions exists for more than 5 seconds ; monitor runs every 0.02 s whenever enable conditions are	A
							ignition for	=	TRUE	-	met.	
							time	>	5	sec		
							battery voltage	<	16	V		
							battery voltage	>	9	V		
		CAN message sliding window detection	DLS1 Sliding Window error counter	>=	8	counts	CAN Bus is Active	=	TRUE	-		
		Check of level sensor	within a number of message frames	=	9	counts	Can Bus Initialized (CAN Bus is Active) consisting of:					
							ignition for	=	TRUE	-		
							time	>	5	sec		
							battery voltage	<	16	V		
							battery voltage	>	9	V		
		CAN message sliding window detection	DLS2 Sliding Window error counter	>=	8	counts	CAN Bus is Active	=	TRUE	-		
		Check of temperature sensor	within a number of message frames	=	9	counts	Can Bus Initialized (CAN Bus is Active) consisting of:					
							ignition for	=	TRUE	-		
							time	>	5	sec		

Component / System	Fault Code	Monitor Strategy Description	Primary Malfunction Criteria	L	Threshogic and	old Value	Secondary Parameters		Enable Conditions		Time Required	MIL Illum.
							battery voltage battery voltage	< >	16 9	V V		
		CAN message sliding window detection	DLS3 Sliding Window error counter	>=	8	counts	CAN Bus is Active	=	TRUE	-		
		Check of error states	within a number of message frames	=	9	counts	Can Bus Initialized (CAN Bus is Active) consisting of:	_	TRUE	_		
							for time	>	5	sec		
							battery voltage	>	9	V		
Engine Out NOx Sensor Can Message #1	U029D	Detects a failure when a certain number of Engine Out NOx sensor relative NOx concentration messages within a defined message group checksum or rolling count values are incorrect	Error count for engine out NOx relative NOx concentration message group	>=	8	counts	Engine out NOx sensor CAN Message 1 Received	=	TRUE	-	fault exists for 1 message group ; monitor runs whenever enable conditions are met.	A
							and Inhibit Status (no inhibiting faults) (No pending or stored DTC)	=	FALSE	-		
							Engine out NOx sensor CAN Message 1 Enabled	=	TRUE	-		

Component / System	Fault Code	Monitor Strategy Description	Primary Malfunction Criteria	Threshold Logic and Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
					and No rolling count or protection value errors. (sliding window errors) and ignition	= TRUE - = TRUE -		
		Detects a failure when a certain number of Engine Out NOx sensor linear lambda messages within a defined message group checksum or rolling count values are incorrect	Error count for engine out NOx sensor status message group	>= 8 counts	Engine out NOx sensor CAN Message 1 Received and Inhibit Status (no inhibiting faults) (No pending or stored DTC) and Engine out NOx sensor CAN Message 1 Enabled and No rolling count or protection value errors. (sliding window errors) and ignition	= TRUE - = FALSE - = TRUE - = TRUE -	fault exists for 1 message group ; monitor runs whenever enable conditions are met.	

Engine out NOx counts up when message is sensor CAN message in the base counts are the base base counts are the base base base counts are the base	
#1 frame not received after the specified number of times time interval seconds ; monitor runs every 0.05 s whenever enable conditions are met. ignition = TRUE met. for ime > 3 sec battery voltage > 9.8 V V battery voltage <	
Engine out NOx Sensor CAN Message #2	
and Inhibit Status (no = FALSE - inhibiting faults) (No pending or stored DTC) and	
Engine out NOx sensor = TRUE - CAN Message 2 Enabled	
and No rolling count or = TRUE - protection value errors. (sliding window errors)	
and ignition = TRUE -	

Component / F System C	Fault Code	Monitor Strategy Description	Primary Malfunction Criteria	L	Thresho ogic and	old Value	Secondary Parameters		Enable Conditions		Time Required	MIL Illum.
		Detects a failure when a certain number of Engine Out NOx sensor linear lambda messages within a defined message group checksum or rolling count values are incorrect	Error count for engine out NOx linear lambda signal message group	>=	8	counts	Engine out NOx sensor CAN Message 2 Received	=	TRUE	-	fault exists for 1 message group ; monitor runs whenever enable conditions are met.	
							and Inhibit Status (no inhibiting faults) (No pending or stored DTC) and Engine out NOx sensor	=	FALSE	_		
							CAN Message 2 Enabled and No rolling count or protection value errors. (sliding window errors) and	=	TRUE	-		
		NOU General OAN					ignition	=	TRUE	-	fouth output for	
		NOX Sensor CAN Message #2 frame not received after the specified number of times	counts up when message is not received in the base time interval	>	5	counts	Can Bus Initialized (CAN Bus is Active) consisting of: ignition for time	=	TRUE	- - sec	rault exists for more than 20 seconds ; monitor runs every 0.05 s whenever enable conditions are met.	

Component / System	Fault Code	Monitor Strategy Description	Primary Malfunction Criteria	٦ Log	hresho ic and ۱	ld /alue	Secondary Parameters		Enable Conditions		Time Required	MIL Illum.
							battery voltage battery voltage	> <	9.8 18.1	V V		
Engine out Nox Sensor CAN Message #3		Engine out NOx sensor CAN message #3 frame not received after the specified number of times	counts up when message is not received in the base time interval	>	5	counts	Can Bus Initialized (CAN Bus is Active) consisting of:	=	TRUE	-	fault exists for more than 20 seconds ; monitor runs every 0.05 s whenever enable conditions are met.	
							for time battery voltage battery voltage	> <	3 9.8 18.1	sec V V		
		Detects a failure when a certain number of Engine Out NOx sensor oxygen concentration messages within a defined message group checksum or rolling count values are incorrect	Error count for engine out NOx oxygen concentration signal message group	>=	8	counts	Engine out NOx sensor CAN Message 3 Received	=	TRUE	-	fault exists for 1 message group ; monitor runs whenever enable conditions are met.	
							and Inhibit Status (no inhibiting faults) (No pending or stored DTC) and	=	FALSE	-		

Component / F System C	Fault Code	Monitor Strategy Description	Primary Malfunction Criteria	Th Logic	nreshold c and Value	Secondary Parameters		Enable Conditions		Time Required	MIL Illum.
						Engine out NOx sensor CAN Message 3 Enabled and No rolling count or protection value errors. (sliding window errors)	=	TRUE	-		
						and ignition	=	TRUE	-		
		Detects a failure when a certain number of Engine Out NOx sensor binary lambda messages within a defined message group checksum or rolling count values are incorrect	Error count for engine out NOx binary lambda signal message group	>=	8 counts	Engine out NOx sensor CAN Message 3 Received	=	TRUE	-	fault exists for 1 message group ; monitor runs whenever enable conditions are met.	
						and Inhibit Status (no inhibiting faults) (No pending or stored DTC) and	=	FALSE	-		
						Engine out NOx sensor CAN Message 3 Enabled and	=	TRUE	-		
						No rolling count or protection value errors. (sliding window errors) and	=	TRUE	-		
						ignition	=	TRUE	-		

Component / System	Fault Code	Monitor Strategy Description	Primary Malfunction Criteria	Lo	Thresho gic and	old Value	Secondary Parameters		Enable Conditions	i	Time Required	MIL Illum.
Engine out Nox Sensor CAN Message #4		Engine out NOx sensor CAN message #4 frame not received after the specified number of times	counts up when message is not received in the base time interval	>	25	counts	Can Bus Initialized (CAN Bus is Active) consisting of:	=	TRUE	-	fault exists for more than 20 seconds ; monitor runs every 0.05 s whenever enable conditions are met.	
							ignition for time	=	TRUE 3	- sec		
							battery voltage battery voltage	> <	9.8 18.1	V V		
		Detects a failure when a certain number of Engine Out NOx sensor heater resistance messages within a defined message group checksum or rolling count values are	Error count for engine out NOx heater resistance signal message group	>=	8	counts	Engine out NOx sensor CAN Message 4 Received	=	TRUE	-	fault exists for 1 message group ; monitor runs whenever enable conditions are met.	
		Incorrect					and Inhibit Status (no inhibiting faults) (No pending or stored DTC) and	=	FALSE	-		
							Engine out NOx sensor CAN Message 3 Enabled	=	TRUE	-		
							and No rolling count or protection value errors. (sliding window errors)	=	TRUE	-		
							I	1				

Component / System	Fault Code	Monitor Strategy Description	Primary Malfunction Criteria	Threshold Logic and Value	Secondary Parameters	Enable Conditio	ns	Time Required	MIL Illum.
					and ignition	= TRUE			
Engine out Nox Sensor CAN Message #5		Engine out NOx sensor CAN message #5 frame not received after the specified number of times	counts up when message is not received in the base time interval	> 25 count	Can Bus Initialized (CAN Bus is Active) consisting of: ignition for time battery voltage battery voltage	= TRUE = TRUE 3 > 9.8 < 18.1	sec V V	fault exists for more than 20 seconds ; monitor runs every 0.1 s whenever enable conditions are met.	
Downstream NOx Sensor Can Message #1	U029E	Detects a failure when a certain number of Post Catalyst NOx sensor relative NOx concentration messages within a defined message group checksum or rolling count values are incorrect	Error count for post catalyst NOx sensor relative NOx concentration message group	>= 8 count	 Post Catalyst NOx sensor CAN Message 1 Received and Inhibit Status (no inhibiting faults) (No pending or stored DTC) and 	= TRUE	-	fault exists for 1 message group ; monitor runs whenever enable conditions are met.	A

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Component / System	Fault Code	Monitor Strategy Description	Primary Malfunction Criteria	Threshold Logic and Value	Secondary Parameters		Enable Conditions		Time Required	MIL Illum.
					NOx sensor CAN Message 1 Enabled and No rolling count or protection value errors. (sliding window errors)	=	TRUE	-		
					and ignition	=	TRUE	-		
		Detects a failure when a certain number of Post Catalyst NOx sensor linear lambda messages within a defined message group checksum or rolling count values are incorrect	Error count for post catalyst NOx sensor status message group	>= 8 counts	Post Catalyst NOx sensor CAN Message 1 Received and Inhibit Status (no inhibiting faults) (No pending or stored DTC)	=	TRUE	-	fault exists for 1 message group ; monitor runs whenever enable conditions are met.	
					and NOx sensor CAN Message 1 Enabled and No rolling count or	=	TRUE	-		
					protection value errors. (sliding window errors) and ignition	=	TRUE			

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Component / System	Fault Code	Monitor Strategy Description	Primary Malfunction Criteria		TI Logi	hresho c and \	ld /alue	Secondary Parameters		Enable Conditions		Time Required	MIL Illum.
		Post Catalyst NOx sensor CAN message #1 frame not received after the specified number of times	counts up when message is not received in the base time interval	>		5	counts	Can Bus Initialized (CAN Bus is Active)	=	TRUE	-	fault exists for more than 21 seconds ; monitor runs every 0.05 s whenever enable conditions are	
								ignition for	=	TRUE	-	nici.	
								time		3	sec		
								battery voltage	>	9.8	V		
								battery voltage	<	18.1	V		
Post Catalyst NOx Sensor CAN Message #2		Detects a failure when a certain number of Post Catalyst NOx sensor error messages within a defined message group checksum or rolling count values are incorrect	Error count for post catalyst NOx sensor error status message group	>=		8	counts	Post Catalyst NOx sensor CAN Message 2 Received	=	TRUE		fault exists for 1 message group ; monitor runs whenever enable conditions are met.	
								and Inhibit Status (no inhibiting faults) (No pending or stored DTC) and	=	FALSE	-		
								NOx sensor CAN Message 2 Enabled and	=	TRUE	-		
								No rolling count or protection value errors. (sliding window errors)	=	TRUE	-		
								and ignition	=	TRUE	-		

Component / System	Fault Code	Monitor Strategy Description	Primary Malfunction Criteria	L	Thresho ogic and	old Value	Secondary Parameters	(Enable Conditions		Time Required	MIL Illum.
		Detects a failure when	Error count for post catalyst	>=	8	counts	Post Catalyst NOx	=	TRUF	_	fault exists for 1	
		a certain number of Post Catalyst NOx sensor linear lambda messages within a defined message group checksum or rolling count values are incorrect	NOx linear lambda signal message group		U		sensor CAN Message 2 Received		into L		message group ; monitor runs whenever enable conditions are met.	
							Inhibit Status (no inhibiting faults) (No pending or stored DTC) and	=	FALSE	-		
							NOx sensor CAN Message 2 Enabled and	=	TRUE	-		
							No rolling count or protection value errors. (sliding window errors)	=	TRUE	-		
							and ignition	=	TRUE	-		
		NOx Sensor CAN Message #2 frame not received after the specified number of times	counts up when message is not received in the base time interval	>	5	counts	Can Bus Initialized (CAN Bus is Active)	=	TRUE	-	fault exists for more than 21seconds ; monitor runs every 0.05 s	
							consisting of: ignition for time	=	TRUE 3	- sec	whenever enable conditions are met.	

Component / System	Fault Code	Monitor Strategy Description	Primary Malfunction Criteria	Log	Thresho gic and '	old Value	Secondary Parameters		Enable Conditions		Time Required	MIL Illum.
							battery voltage battery voltage	> <	9.8 18.1	V V		
Post Catalyst Nox Sensor CAN Message #3		Post Catalyst NOx sensor CAN message #3 frame not received after the specified number of times	counts up when message is not received in the base time interval	>	5	counts	Can Bus Initialized (CAN Bus is Active) consisting of: ignition	=	TRUE	-	fault exists for more than 21 seconds ; monitor runs every 0.05 s whenever enable conditions are met.	
							for time battery voltage battery voltage	> <	3 9.8 18.1	sec V V		
		Detects a failure when a certain number of Post Catalyst NOx sensor oxygen concentration messages within a defined message group checksum or rolling count values are incorrect	Error count for post catalyst NOx sensor oxygen concentration signal message group	>=	8	counts	Post Catalyst NOx sensor CAN Message 3 Received	=	TRUE	-	fault exists for 1 message group ; monitor runs whenever enable conditions are met.	
							and Inhibit Status (no inhibiting faults) (No pending or stored DTC) and NOx sensor CAN	=	FALSE	-		

Component / Faul System Cod	It Monitor Strategy e Description	Primary Malfunction Criteria	Threshold Logic and Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
				and No rolling count or protection value errors. (sliding window errors) and ignition	= TRUE - = TRUE -		
	Detects a failure when a certain number of Post Catalyst NOx sensor binary lambda messages within a defined message group checksum or rolling count values are incorrect	Error count for post catalyst NOx sensor binary lambda signal message group	>= 8 counts	Post Catalyst NOx sensor CAN Message 3 Received and Inhibit Status (no inhibiting faults) (No pending or stored DTC) and NOx sensor CAN Message 3 Enabled and No rolling count or protection value errors. (sliding window errors) and ignition	 TRUE - FALSE - TRUE - TRUE - TRUE - 	fault exists for 1 message group ; monitor runs whenever enable conditions are met.	

Component / System	Fault Code	Monitor Strategy Description	Primary Malfunction Criteria	Threshold Logic and Value	Secondary Parameters		Enable Conditions		Time Required	MIL Illum.
Post Catalyst Nox Sensor CAN Message #4		Post Catalyst NOx sensor CAN message #4 frame not received after the specified number of times	counts up when message is not received in the base time interval	> 25 counts	Can Bus Initialized (CAN Bus is Active) consisting of:	=	TRUE	-	fault exists for more than 20 seconds ; monitor runs every 0.05 s whenever enable conditions are met.	
					ignition for	=	TRUE	-		
					time		3	sec		
					battery voltage	>	9.8	V		
					battery voltage	<	18.1	V		
		Detects a failure when a certain number of Post Catalyst NOx sensor heater resistance messages within a defined message group checksum or rolling count values are incorrect	Error count for post catalyst NOx sensor heater resistance signal message group	>= 8 counts	Post Catalyst NOx sensor CAN Message 4 Received	=	TRUE	-	fault exists for 1 message group ; monitor runs whenever enable conditions are met.	
					and					
					Inhibit Status (no inhibiting faults) (No pending or stored DTC) and	=	FALSE	-		
					NOx sensor CAN Message 4 Enabled and	=	TRUE	-		
					No rolling count or protection value errors. (sliding window errors)	=	TRUE	-		
					and					
			COMMO	N SECTION Page 384	of 491		1 0)F 3 S	ECTIONS	

Component / System	Fault Code	Monitor Strategy Description	Primary Malfunction Criteria	Threshold Logic and Value		old Value	Secondary Parameters		Enable Conditions		Time Required	MIL Illum.
							ignition	=	TRUE	-		
Post Catalyst Nox Sensor CAN Message #5		Post Catalyst NOx sensor CAN message #5 frame not received after the specified number of times	counts up when message is not received in the base time interval	>	25	counts	Can Bus Initialized (CAN Bus is Active) consisting of: ignition for time battery voltage battery voltage	= = > <	TRUE TRUE 3 9.8 18.1	sec V V	fault exists for more than 21 seconds ; monitor runs every 0.1 s whenever enable conditions are met.	

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

Component / System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value		b	Secondary Parameters		Enable Condition	IS	Time Required	MIL Illum.
Charge Pump Over Voltage		measured voltage of charge pump is determined to be out of tolerance	Charge Pump Voltage	>=	Battery voltage at GPCM + 18	volts	Battery	<	19.9	volts	160ms (internal) + 75% failure rate over 4 seconds.	В
GPCM reverse polarity switch "high voltage drop"		Elecrtonic circuitry determines that the reverse polarity protection voltage drop is in range	Path 1 [Battery voltage at GPCM - mean glow plug voltage value] Path 2 (Battery voltage at GPCM - mean glow plug voltage value with charge pump off) - (Battery - mean glow plug voltage value with charge pump on) ie. delta from charge pump on to charge p	> V	2.3	volts	glow plugs are commanded Battery voltage at GPCM GP current P0671,P0672, P0675, P0676 Battery voltage at GPCM stable for 30ms	= ^ ^ U	On 6 60 Not set 2	volts amps amps volts	path1 6000ms, path2 10 seconds + 75% failure rate over 4 seconds.	В
GPCM running reset		Internal and external Watchdogs are monitored for interuption Monitor for undefined instruction code interupt Monitor for osolation stop detection	number of running resets or undefined instruction code detected or Osolation stop detection	>	9 events in a row		none				2 seconds (internal) + 75% failure rate over 4 seconds.	В
difference between internal and external value of battery voltage too high		GMLAN Battery voltage from ECM is compared to GPCM internal measured battery voltage	abs[GPCM internal measured battery voltage - GMLAN Battery voltage]	'>	3	volts	glow plugs are commanded GMLAN battery signal glow command message Battery voltage at GPCM RPM RPM	= = ~ <= <	On valid valid 6 10 400	volts	190ms (internal) + 75% failure rate over 4 seconds.	В

Component / System	Fault Code	Monitor Strategy Description	Malfunction Criteria		Threshold Value	l	Secondary Parameters		Enable Conditior	IS	Time Required	MIL Illum.
system basic chip VSUPLOW		monitor internal chip supply voltage	internal chip supply voltage	< =	5.8	volts	Intake Air Heater commanded Battery supply at GPCM	= >	On 9	volts	130ms (internal) + 75% failure rate over 4 seconds.	В
system basic chip (SBC) over temperature		measure temperature of the SBC	temperature of the high side switch inside the SBC	>	155	degC	Internal GPCM temperature	<	100	deg C	130ms (internal) + 75% failure rate over 4 seconds.	В
NOx sensor power supply fault		Electronic circuitry detects a failure in the NOx sensor power supply	Path1: DC/DC booster current. For Path 2: DC/DC booster current. Path 3: Voltage at main switch Path 4: (DC/DC Booster voltage - GPCM battery voltage)	> > > = =	25 640 > 60 amps by hardware protection (time varies with temperature) 0 ± 3	amps msec amps volts volts	Battery voltage at the GPCM Battery voltage at the GPCM	>	6 8 to 14	volts	6 seconds (internal) + 75% failure rate over 4 seconds.	В
DEF heater current not calibrated.		Checksum error between calculated and stored values	Checksums match	=	No		Ignition on				200ms (internal) + 75% failure rate over 4 seconds.	В

Component / System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value		old	Secondary Parameters		Enable Conditior	ıs	Time Required	MIL Illum.
glow plug open	P0671- P0678	Electronic circuitry determines a fault exists on GP circuit	Glow Plug Current and Voltage at glow plug pin	< >	4.25 and 6.0	A Volt	Ignition - glow plugs are commanded on P163E,P163D,P163C Supply voltage	= > >	On 5 not set 6	secs volts	130ms (internal) + 66% failure rate over 1.5 seconds.	В
glow plug short		Electronic circuitry determines a fault exists on GP circuit	Path 1: Glow Plug Current Path 2: Hardware over current	>	60 80	A	Ignition glow plug command over temperature condition over voltage condition abs[Battery supply at GPCM - IGN voltage at GPCM]	= = = = <	on false false 6.0	Volts	Condition 1 : 130ms, Condition 2: 260ms (internal) + 66%failure over 1.5 seconds.	В
glow plug high resistance		Electronic circuitry determines a fault exists on GP circuit	Glow Plug Resistance AND Glow Plug Current	>	1.0	Ohm	Ignition on Battery voltage at GPCM glow plugs are commanded on over temperature condition over voltage condition abs[Battery supply at GPCM - IGN voltage at GPCM]	= > = = <	on 7.0 on false false 7.0	volts	160ms (internal) + 66% failure over 1.5 seconds.	В
Glow plug low resistance		Electronic circuitry determines a fault exists on GP circuit	Glow Plug Resistance	<	250	mOhm	glow plugs are commanded on over temperature condition over voltage condition- abs[Battery supply at GPCM - IGN voltage at GPCM]	= = = <	on false false 7.0	volts	160ms (internal) + 66% failure over 1.5 seconds.	В

Component / System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value		l	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
Engine Calibration Information Not Programmed – GPCM	P160C	ECM monitors serial data from GPCM for P160C Error Message indicating GPCM is not programmed with injector trim values.	Glow Plug Control Module determines IQA data has <u>not</u> been programmed in the GPCM				Ignition	ON	200ms (internal) + 66% failure over 1.5 seconds.	A
Intake Air (IA) Heater Feedback Circuit	P154A	Electronic GPCM circuitry determines if faults related to the IA heater feedback circuit exist.	PATH1: IAH indicates its state is AND IAH current OR PATH2: IAH indicates its state is	>	OFF 20 ON	A	DTCs not active Path1 IAH Commanded and Battery Voltage at IAH OR Path2 IAH Commanded	P0640, P154B, P154D, P154C, P166B volts ON 8.6	650ms (internal) + 75% failure over 4 seconds.	В

Component / System	Fault Code	Monitor Strategy Description	Malfunction Criteria		Thresho Value	ld	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
Intake Air (IA) Heater Voltage Signal Circuit	P154B	Electronic GPCM circuitry determines if faults related to the voltage level present at the IA heater exist.	PATH1: IAH Battery voltage AND GPCM Battery Voltage GPCM Battery Voltage	> > <	16.0 9.5 14.0	Volt volts Volt	DTCs not active Path 1 IAH Commanded	P0640, P154D, = P154C, P166B ON	1s (internal) + 75% failure over 4 seconds.	В
			OR							
			PATH2: Voltage signal line IAH Battery voltage	>	1.5	Volt	Path 2 IAH Commanded	= OFF for more then		
				<	6.9	Volt	Path 3 DTCs not active	65 msec		
			PATH3: TAH Battery voltage AND	>	6.9 16.0	volt	IAH Commanded	= P064C,		
			GPCM IGN voltage AND GPCM Battery Voltage IAH Battery voltage	>	9.5	Volt		P154D, P154C, P166B ON		

Component / System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value			Secondary Parameters		Enable Condition	s	Time Required	MIL Illum.
Intake Air (IA) Heater Current Signal Circuit	P154C	Electronic GPCM circuitry determines if faults related to the IA heater current signal circuit or heater grid exist.	PATH1: IAH current IAH voltage signal feedback to GPCM	< >	20 0.9	Amps Volts	DTC's are not set IAH Commanded Battery Voltage at IAH GPCM Ignition voltage or	= > >=	P154B, P154D, P0640, P0154A ON 6.9 6.9	Volt Volt	up to 5000ms (internal) + 75% failure over 4 seconds.	В
			or PATH2: IAH current IAH voltage signal feedback to GPCM or PATH3:IAH current signal feedback to GPCM or	~ ~ ~ ^ ^ ^	20 0.9 4.96 20 500	Amps Volts Volts A mOhm	DTC's are not set IAH Commanded Battery Voltage at IAH GPCM Ignition voltage or IAH Command or DTC's are not set IAH Commanded	= > = =	P154B, P154D, P0640, P0154A ON 6.9 6.9 6.9	Volt Volt		
			PATH 4:IAH grid current IAH heater grid calculated resistance				Battery Voltage at IAH	>	P154B, P154D, P0640, P0154A ON 8.0	Volt		

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Component / I System (Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value		d	Secondary Parameters		Enable Condition	S	Time Required	MIL Illum.
System C	P154D	Description Electronic GPCM circuitry determines if faults related to the temperature feedback circuit of the IA heater exist.	PATH1: IAH temperature signal feedback line or PATH2: IAH temperature AND GMLAN signal "IntakeAirTemperature" or PATH3:IAH temperature signal feedback line or PATH4: IAH temperature signal	< > = >	-20 +20 (0.156) -20 +20 (0pen) 4.96	Volt °C °C	Parameters DTC's are not set IAH Commanded Battery Voltage at IAH PWM IAH IAH running time or DTC's are not set IAH Commanded Battery Voltage at IAH Engine General Status (engine sensor info) IntakeAirtemperature message from ECM or IAH Commanded act	1 A A A A A A A A A A A A A A A A A A A	Condition P154B, P0640, P0154A, P154C, P166B ON 11.0 90.0 2 P154B, P0640, P0154A, P154C, P166B ON 11.0 valid valid OFF ON P154B, P0640, P154A, P154C, P166B ON 11.0 valid valid	Volts % minut es Volts Volts Volts	Required 650ms (internal) + 75% failure over 4 seconds.	B

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GLOW PLUG SECTION 2 OF 3 SECTIONS

Component / System	Fault Code	Monitor Strategy Description	Malfunction Criteria	Threshold Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
Intake Air (IA) Heater Switch/Control Circuit	P0640	Electronic GPCM circuitry determines if faults related to the control circuit of the IA heater exist.	Activation Reply signal (digital response) from IAH	 high when heartbeat signal is activated 	DTC's are not set IAH Commanded	P154A = OFF	2000ms (internal) + 75% failure over 4 seconds.	В
Intake Air (IA) Heater Over Temperature	P166B	ECM monitors serial data from GPCM for P166B Error Message indicating GPCM detects IAH overtemperature	Internal Temperature of IAH module	> 80 °C	DTC's are not set IAH Commanded engine run time Battery Voltage at IAH	P154B,P1 54C, = P0640, > P154D sec < ON Volt 40 sec 6.9 Volt	650ms (internal) + 75% failure over 4 seconds.	В
Glow Plug Control Module Not Programed	P161A	ECM monitors serial data from GPCM for P161A. GPCM is configured as service part by calibration parameter	Glow Plug Control Module determines settings of configuration parameter located in calibration data set		IGNITION	= ON	200ms (internal) + 75% failure over 4.0 seconds.	В

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Component / System	Fault Code	Monitor Strategy Description	Malfunction Criteria		Threshol Value	d	Secondary Parameters		Enable Condition	s	Time Required	MIL Illum.
Glow Plug Module Primary Circuit	P163C	Electronic GPCM circuitry determines the voltage supply to GPCM is out of	PATH 1: Voltage supply to the GPCM	>	16.5	Volt	GPCM Ignition voltage or	~	9.0 14	Volts Volts	1000ms (internal) + 75% failure over 4.0	В
		range	or PATH 2: Voltage supply to GPCM	<	6.0	volts	GPCM Ignition voltage	> <	9.0 16	Volts Volts	seconds.	
			or	>	+/-5	volts	or					
			PATH 3: (IGN - Voltage supply to GPCM)				GPCM Voltage supply GPCM Ignition Voltage	> >	6.0 4.0	Volt Volt		
							or					
			or	>	+/-3	volts	GPCM supply voltage Engine speed	>	6 10< rpm >400	volts		
		PATH 4: (ECM reported voltage via CAN - Voltage supply to										
			GPCM)									
Glow Plug Module	P163D	Electronic GPCM circuitry	Path 1 glow plug	=	ON		Path 1: Key state (Ign 1)	=	OFF		1000ms (internal)	В
Secondary Circuit		signal voltage levels to GPCM are out of range	ECM				or		or		over 4.0 seconds.	
			or Path 2: Electronic	>	6.0	Volt	Path 2 GP commanded	=	Off			
			circuitry determines voltage at glow plug pin				or		or			
			or	>	1.5	Volts	Path 3 GP commanded	=	ON			
			Path 3: [GPCM ground - GP ground]				IAH dutycycle	=	675 0 or 100	%		

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Component / System	Fault Code	Monitor Strategy Description	Malfunction Criteria		Threshold Value	d	Secondary Parameters		Enable Conditior	າຣ	Time Required	MIL Illum.
Glow Plug Module Overtemperature	P163E	ECM monitors serial data from GPCM for P163E Error Message indicating GPCM detects GPCM overtemperature	GPCM Temperature	>	85	°C	GMLAN signal "coolant temperature"	<	60	°C	650ms (internal) + 75% failure over 4.0 seconds.	В
Reductant Heater 1 Control Circuit	P20B9	ECM monitors serial data from GPCM for P20B9 Error Message indicating GPCM detects reductant heater not connected to GPCM or an interruption	Active test function; Connected heater must discharge internal capicitor. Voltage at capacitor checked by GPCM				DTCs not set: reductan heater commanded: GPCM temperature GPCM battery supply voltage and	= V A V	P220B ON 123 7.0 16.0	°C Volts Volts	3440ms (internal) + 50% failure over 1.0 seconds.	В
Reductant Heater 1 Control Circuit Low Voltage	P20BB	ECM monitors serial data from GPCM for P20BB Error Message indicating GPCM detects reductant heater output shorted to ground or an overload condition	Path 1: Glow Plug Current or Path 2: Hardware over current	>	25 or 80	A	reductan heater commanded: GPCM temperature GPCM Battery supply voltage or reductan heater commanded: GPCM temperature GPCM Battery supply voltage	= < > < or = < > <	ON 123 7.0 16.5 or ON 123 7.0 16.5	°C Volts or °C Volts Volts	1000ms (internal) + 50% failure over 1.0 seconds.	В

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Component / System	Fault Code	Monitor Strategy Description	Malfunction Criteria		Threshol Value	d	Secondary Parameters		Enable Condition	าร	Time Required	MIL Illum.
Reductant Heater 1 Control Circuit High Voltage	P20BC	ECM monitors serial data from GPCM for P20BC Error Message indicating GPCM detects reductant heater to be shorted to battery	Electronic circuitry determines voltage at reductant heater pin	>	3.5	volts	reductan heater commanded:	=	OFF		2000ms (internal) + 50% failure over 1.0 seconds.	В
Reductant Heater 2 Control Circuit	P20BD	ECM monitors serial data from GPCM for P20BD Error Message indicating GPCM detects reductant heater not connected to GPCM or an interruption	Active test function; Connected heater must discharge internal capicitor. Voltage at capacitor checked by GPCM				DTCs not set: reductan heater commanded: GPCM temperature GPCM battery supply voltage and	= < > <	P20BF ON 123 7.0 16.0	°C Volts Volts	3440ms (internal) + 50% failure over 1.0 seconds.	В
Reductant Heater 2 Control Circuit Low Voltage	P20BF	ECM monitors serial data from GPCM for P20BF Error Message indicating GPCM detects reductant heater output shorted to ground or an overload condition	Path 1: Reductant Heater Plug Current or Path 2: Hardware over current	>	25 or 80	A	reductan heater commanded: GPCM temperature GPCM supply voltage KL30 or reductan heater commanded: GPCM temperature GPCM supply voltage KL30	= < > < 0r < > < < > < < < < < < < < < < < < < < <	ON 123 7.0 16.5 or ON 123 7.0 16.5	°C Volts Volts or °C Volts Volts	1000ms (internal) + 50% failure over 1.0 seconds.	В

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Component / System	Fault Code	Monitor Strategy Description	Malfunction Criteria		Threshol Value	d	Secondary Parameters		Enable Condition	าร	Time Required	MIL Illum.
Reductant Heater 2 Control Circuit High Voltage	P20C0	ECM monitors serial data from GPCM for P20C0 Error Message indicating GPCM detects reductant heater to be shorted to battery	Electronic circuitry determines voltage at reductant heater pin	>	3.5	volts	reductan heater commanded:	=	OFF		2000ms (internal) + 50% failure over 1.0 seconds.	В
Reductant Heater 3 Control Circuit	P20C1	ECM monitors serial data from GPCM for P20C1 Error Message indicating GPCM detects reductant heater not connected to GPCM or an interruption	Active test function; Connected heater must discharge internal capicitor. Voltage at capacitor checked by GPCM				DTCs not set: reductan heater commanded: GPCM temperature GPCM battery supply voltage and	V A V	P20C3 ON 123 7.0 16.0	°C Volts Volts	3440ms (internal) + 50% failure over 1.0 seconds.	В
Reductant Heater 3 Control Circuit Low Voltage	P20C3	ECM monitors serial data from GPCM for P20C3 Error Message indicating GPCM detects reductant heater output shorted to ground or an overload condition	Path 1: Glow Plug Current or Path 2: Hardware over current	>	25 or 80	A	reductan heater commanded: GPCM temperature GPCM supply voltage KL30 or reductan heater commanded: GPCM temperature GPCM supply voltage KL30	= < > < 0r < > < > < < > < <	ON 123 7.0 16.5 or ON 123 7.0 16.5	°C Volts Volts or °C Volts Volts	1000ms (internal) + 50% failure over 1.0 seconds.	В

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Component / System	Fault Code	Monitor Strategy Description	Malfunction Criteria		Threshol Value	d	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
Reductant Heater 3 Control Circuit High Voltage	P20C4	ECM monitors serial data from GPCM for P20C4 Error Message indicating GPCM detects reductant heater to be shorted to battery	Electronic circuitry determines voltage at reductant heater pin	>	3.5	volts	reductan heater commanded:	= OFF	2000ms (internal) + 50% failure over 1.0 seconds.	В
Nox Sensor Supply Voltage Circuit Bank 1 Sensor 1	P220A	ECM monitors serial data from GPCM for P220A Error Message indicating GPCM detects DC/DC booster output shorted to ground or shorted to battery	PATH 1:GPCM Electronic circuitry determines voltage at DC/DC booster output pin or PATH 2: DC/DC booster output current duration or PATH 3: DC/DC booster output current duration	> > > >	5.0 10 37.5 20	Volt A ms A µs	status DC/DC booster or status DC/DC booster or status Dc/DC booster	 OFF, power up procedure has started after reset ON ON 	5000ms (internal) + 50% failure over 1.0 seconds.	В

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Component / System	Fault Code	Monitor Strategy Description	Primary Malfunction Criteria	L	Threshold ogic and Va	lue	Secondary Parameters		Enable Conditions	Time Required	MIL Illum.
Fuel Temperature Sensor 2 Circuit Low	P0187	Detects low voltage readings in the fuel temperature sensor 2 circuit, indicating an OOR low condition on the fuel temperature sensor 2 circuit	voltage of fuel temperature sensor 2	<	0.5982	V	ignition on	=	TRUE -	fail conditions exists for 5 s test performed continuously 0.2 s rate	В
			same as fuel temperature	>	150	°C	and basic enable conditions met:	=	see - sheet enable tables		
Fuel Temperature Sensor 2 Circuit High	P0188	Detects high voltage readings in the fuel temperature sensor 2 circuit, indicating an OOR high condition on the in fuel temperature sensor 2 circuit	voltage of fuel temperature sensor 2	>	4.7456	V	ignition on	=	TRUE -	fail conditions exists for 5 s test performed continuously 0.2 s rate	В
			same as fuel temperature	<	-0.5	°C	and basic enable conditions met:	=	see - sheet enable tables		

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Component / System	Fault Code	Monitor Strategy Description	Primary Malfunction Criteria	L	Threshold ogic and Va	lue	Secondary Parameters		Enable Conditions	Time Requi	ed	MIL Illum.
Fuel Level Sensor 1 Circuit High	P0463	Detects high voltage readings in the fuel level sensor circuit, indicating an OOR high condition on the fuel level sensor circuit	voltage of fuel level sensor 1 same as fuel level	~ <	4.8 0	V %	ignition on and basic enable conditions met:	=	TRUE - see - sheet enable tables	fail cond exists for test perfo continuo 0.1 s r	tions 24 s rrmed pusly ate	В
Fuel Level Sensor 1 Circuit Low	P0462	Detects low voltage readings in the fuel level sensor circuit, indicating an OOR low condition on the fuel level sensor circuit	voltage of fuel level sensor 1 same as fuel level	v ,	0.2	V %	ignition on and basic enable conditions met:	=	See sheet enable tables	fail cond exists for test perfo continuo 0.1 s r	tions 24 s rmed ously ate	В
Primary Fuel Sensor Performance	P0461	Detects an error in the primary fuel tank sensor performance by comparing the decrease of the fuel level for a certain driven mileage to a threshold.	(a) - (b) with (a) total vehicle distance	>=	100 measured parameter	miles	Engine Running (see parameter definition) for time	=	TRUE -	fail cond exists for s monitor 0.02 s whene enab condition met	tions 0.02 runs rate ver e s are	В

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Component / System	Fault Code	Monitor Strategy Description	Primary Malfunction Criteria		Threshold Logic and Val	ue	Secondary Parameters		Enable Conditior	IS	Time Required	MIL Illum.
			and with (b) change in mileage	=	measured	-	and diagnosis tester	=	FALSE	-		
			and (c) - (d)	<	parameter 4.50	%	and fuel transfer pump active means	=	FALSE	-		
			with (c) maximum volume of fuel reached in primary tank during driving cycle	=	measured parameter	-	(filtered fuel volume in primary tank	>	88.80	%		
			and with (d) minimum volume of fuel reached in primary tank during driving cycle	=	measured parameter	-	and filtered fuel volume in secondary tank	<	6.61	%		
							for time	>=	300	sec		
							and cumulative transfer pump on time in current ignition cycle)	>	32767	sec		
							and fuel level zone 3 means	=	TRUE	-		
							(filtered fuel volume in primary tank and	<	99.93	%		
							filtered fuel volume in secondary tank)	>	1.32	%		
							or fuel level zone 4 means	=	TRUE	-		
							(filtered fuel volume in primary tank and	<	99.93	%		

Component /	Fault	Monitor Strategy	Primary Malfunction	Threshold	Secondary		Enable	Time	MIL
System	Code	Description	Criteria	Logic and value	filtered fuel volume in			Required	mum.
					secondary tank	~-	1.32 7	5	
					and				
					basic enable conditions	=	see -		
					met:		sheet enable tables		
					and				
					NO Pending or Confirmed DTCs:	=	see - sheet		
							inhibit		
							tables		
Fuel Pump Control Circuit	P0627	Electronic out-put driver circuitry determines that	The ECM detects that the commanded state of the		ignition	=	on -	fail conditions exists for 2 s	В
		the fuel lift pump circuit is open.	driver and the actual state of the control circuit do not match.					monitor runs 0.02 s rate whenever enable	
					and basic enable conditions	_	500	met	
					met:		sheet enable		
Applies GMT610							lables		
application only									

Component /	Fault	Monitor Strategy	Primary Malfunction	Threshold	Secondary	Enable	Time	MIL
Fuel Pump Control Circuit Low Applies GMT610 application only	P0628	Electronic out-put driver circuitry determines that the fuel lift pump circuit is shorted to ground.	The ECM detects that the commanded state of the driver and the actual state of the control circuit do not match.		and basic enable conditions met:	= on - = see - sheet enable tables	fail conditions exists for 1 s monitor runs 0.02 s rate whenever enable conditions are met	B
Fuel Pump Control Circuit High Applies GMT610 application only	P0629	Electronic out-put driver circuitry determines that the fuel lift pump circuit is shorted to voltage.	The ECM detects that the commanded state of the driver and the actual state of the control circuit do not match.		ignition and basic enable conditions met:	= on - = see - sheet enable tables	fail conditions exists for 0.5s monitor runs 0.02 s rate whenever enable conditions are met	В

Component /	Fault	Monitor Strategy	Primary Malfunction		Threshold	10	Secondary Paramotors		Enable Condition	<u> </u>	Time Required	MIL
System	Dutits	Description			-ogic and vall	Je J	Farameters			3	Required	mum.
Intake Air Temperature (IAT) Sensor 1 - Fuel Temperature Sensor 2 Not Plausible	P111D	Detects bias Fuel Temperature Sensor 2 or Intake Air Temperature Sensor by comparing the measured temperature at start.	Path 1:				minimum engine-off time	>=	28800	sec	fail conditions exists for 0.1 s monitor runs once per trip with 0.1 s rate whenever enable	В
			(a) - (b) (see Look-Up- Table #1)	>	100 to 999	°C	and				conditions are met	
			where (a) captured intake air temperature at start	=	measured parameter	-	ambient air temperature and	>	-60.04	°C		
			and	_	measured		Engine Running (see parameter definition) for	=	TRUE	-		
			temperature 2 at start		parameter	-	101					
Applies GMT610							time	>	0	sec		
application only			or Path 2:				and engine post drive/ afterun	=	FALSE	-		
			((a) - (b) (see Look-Up- Table #1) where	<=	100 to 999	°C	and diagnostic performed in current dc and	=	FALSE	-		
			(a) captured intake air temperature at start	=	measured parameter	-	basic enable conditions met:	=	see sheet enable tables	-		
			and (b) captured fuel temperature 2 at start	=	measured parameter	-	and NO Pending or Confirmed DTCs:	=	see sheet inhibit tables	-		
			and (a) - (b) (see Look-Up- Table #2) where	>	20 to 999	°C						

Component /	Fault	Monitor Strategy	Primary Malfunction		Threshold	lue	Secondary		Enable		Time	MIL
System	Code	Description	(a) captured intake air temperature at start and (b) captured fuel temperature 2 at start and (status of block heater (see parameter definition) or status of sun-load detection (see parameter definition))		reasured parameter measured parameter FALSE	- - -	Parameters		Conditio	ns	Kequired	inum.
PTO Engine Speed Request Signal Message Counter Incorrect	P1598	If the number of communication errors in a calibrated number of frames exceeds a threshold a permanent error is detected	Number of errors in window	>=	4	counts	Number of frames received Can Bus Initialized consisting of: ignition on for time battery voltage battery voltage	>=	10 TRUE 3 9.8 655.35	sec V V	fail conditions exists for 0.1 s monitor runs once per trip with 0.1 s rate whenever enable conditions are met	Special C

Component /	Fault	Monitor Strategy	Primary Malfunction		Threshold	Secondary		Enable		Time	MIL
System	Code	Description	Criteria		Logic and Value	Parameters		Condition	າຣ	Required	Illum.
Turbocharger Vane Position Slow Response - Decreasing Position	P168C	Detects slow responding turbo charger vanes. Actual positional readings are compared to desired values.	average positive gradient of the turbocharger vane commanded position - calculated by accumulating deviation between desired and actual value of vane	>=	9.99755859 %	(fail conditions exists for 15 s monitor runs with 0.1 s rate whenever enable conditions are	В
			position over a calibrated sampling time			turbocharger vane desired	>	0.61035	%/sec	met	
						position gradient and					
						turbocharger vane desired position gradient)	<	29.9072	%/sec		
						and control deviation of turbocharger vane position calculated out of difference between desired and actual value)	>	0	%		
						for time and	>	0.2	sec		
						engine speed and	>=	1000	rpm		
						engine speed)	<=	3000	rpm		
						and ambient pressure and	>	74.8	kPa		
						engine temperature and	>	69.96	°C		
						ambient air temperature and	>	-7.04	°C		

Component / System	Fault Code	Monitor Strategy Description	Primary Malfunction Criteria	Threshold Logic and Value	Secondary Parameters	Enable Conditio	e ns	Time Required	MIL Illum.
					basic enable conditions met: and NO Pending or Confirmed DTCs:	 see sheet enable tables see sheet enable tables 	-		
Turbocharger Vane Position Slow Response - Increasing Position	P168D	Detects slow responding turbo charger vanes. Actual positional readings are compared to desired values.	average negative gradient of the turbocharger vane commanded position - calculated by accumulating deviation between desired and actual value of vane position over a calibrated sampling time	>= 11.9995117 %	(turbocharger vane desired position gradient and turbocharger vane desired position gradient)	> -29.907 < -0.6104	%/sec	fail conditions exists for 15 s monitor runs with 0.1 s rate whenever enable conditions are met	В
					and control deviation of turbocharger vane position calculated out of difference between desired and actual value)) for time and (< 0 > 0.2	% sec		
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Component / System	Fault Code	Monitor Strategy Description	Primary Malfunction Criteria	I	Threshold ∟ogic and Va	lue	Secondary Parameters		Enable Conditior	າຣ	Time Required	MIL Illum.
System	Code	Description	Criteria		<u>-ogic and va</u>	lue	and engine speed) and ambient pressure and engine temperature and ambient air temperature and basic enable conditions met: and NO Pending or Confirmed DTCs:	<= > > =	3000 74.8 69.96 -7.04 see sheet enable tables see sheet enable tables	rpm kPa °C -	Required	<u>inum.</u>
Secondary Fuel Sensor Performance	P2066	Detects an error in the secondary fuel tank sensor performance by comparing the decrease of the fuel level for a certain driven mileage to a threshold.	(a) - (b) with (a) total vehicle distance and with (b) change in mileage and (c) - (d) with	< = = <	100 measured parameter measured parameter 2.64	miles - - %	Engine Running (see parameter definition) for time and diagnosis tester connected and fuel transfer pump active means	= >= =	TRUE 60 FALSE FALSE	- sec -	fail conditions exists for 0.02s monitor runs 0.02 s rate whenever enable conditions are met	В

Component /	Fault	Monitor Strategy	Primary Malfunction		Threshold		Secondary		Enable		Time Dogwirod	MIL
Jystem	Coue	Description	(c) maximum volume of fuel reached in secondary tank during driving cycle and with (d) minimum volume of fuel reached in secondary tank during driving cycle	=	measured parameter measured parameter	-	filtered fuel volume in primary tank	>	88.80	%	Requireu	indin.
			and filtered fuel volume in secondary tank	>	0	%	or filtered fuel volume in secondary tank for time	<	6.61 300	% sec		
							and cumulative transfer pump on time in current ignition cycle) and fuel level zone 1 means	>	32767	sec		
							filtered fuel volume in primary tank	>=	99.93	%		
							filtered fuel volume in secondary tank)	>=	1.32	%		
							and basic enable conditions met: and	=	see sheet enable tables	-		

Component / System	Fault Code	Monitor Strategy Description	Primary Malfunction Criteria	Lo	Threshold ogic and Va	l lue	Secondary Parameters		Enable Conditions	Time Required	MIL Illum.
					_		NO Pending or Confirmed DTCs:	=	see - sheet inhibit tables		
Fuel Level Sensor 2 Circuit Low	P2067	Detects low voltage readings in the fuel level sensor circuit, indicating an OOR low condition on the fuel level sensor circuit	voltage of fuel level sensor 2 same as fuel level	<	0.2	ν	ignition on and basic enable conditions met:	=	TRUE - see - sheet enable tables	fail conditions exists for 24 s test performed continuously 0.1 s rate	В
Fuel Level Sensor 2 Circuit High	P2068	Detects high voltage readings in the fuel level sensor circuit, indicating an OOR high condition on the fuel level sensor circuit	voltage of fuel level sensor 2 same as fuel level	>	4.8	V %	ignition on and basic enable conditions met:	=	TRUE - see - sheet enable tables	fail conditions exists for 24 s test performed continuously 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.
Fuel Transfer Pump Relay Control Circuit	P2632	Electronic out-put driver circuitry determines that the tank transfer pump circuit is open.	The ECM detects that the commanded state of the driver and the actual state of the control circuit do not match.		ignition on and basic enable conditions met:	= TRUE - = see - sheet enable tables	fail conditions exists for 3 s monitor runs 0.02 s rate whenever enable conditions are met	В
Fuel Transfer Pump Relay Control Circuit Low	P2633	Electronic out-put driver circuitry determines that the tank transfer pump circuit is shorted to ground.	The ECM detects that the commanded state of the driver and the actual state of the control circuit do not match.		ignition on and basic enable conditions met:	= TRUE - = see - sheet enable tables	fail conditions exists for 3 s monitor runs 0.02 s rate whenever enable conditions are met	В

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Component / System	Fault Code	Monitor Strategy Description	Primary Malfunction Criteria	Lo	Threshold gic and Va	l Ilue	Secondary Parameters		Enable Condition	s	Time Required	MIL Illum.
Fuel Transfer Pump Relay Control Circuit High	P2634	Electronic out-put driver circuitry determines that the tank transfer pump circuit is shorted to battery.	The ECM detects that the commanded state of the driver and the actual state of the control circuit do not match.				ignition on and basic enable conditions met:	=	See sheet enable tables	_	fail conditions exists for 3 s monitor runs 0.02 s rate whenever enable conditions are met	В
Fuel Transfer Pump Performance	P2636	Detects an error in the fuel tank transfer pump performance by comparing the decrease of the fuel level in both tanks.	Path 1: change in fuel volume in primary tank and change in fuel volume in secondary tank or Path 2: change in fuel volume in primary tank and change in fuel volume in secondary tank	< <	0.90 0.53 0.90 0.53	% %	(Engine Running (see parameter definition) and fuel transfer pump active means ((tiltered fuel volume in primary tank or	= =	TRUE TRUE 71.94	- -	fail conditions exists for 140s monitor runs 0.02 s rate whenever enable conditions are met	B

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Component /	Fault	Monitor Strategy	Primary Malfunction		Threshol	d	Secondary		Enable		Time	MIL
System	Code	Description	Criteria		Logic and V	alue	Parameters		Conditior	IS	Required	Illum.
			or Path 3:				filtered fuel volume in secondary tank and	>	6.61	%		
			change in fuel volume in primary tank	>=	0.90	%	time between activations of transfer pump	>	5	sec		
			and change in fuel volume in secondary tank	<	0.53	%	and and					
							fuel level zone 5 means (
							filtered fuel volume in primary tank and	<	99.93	%		
							filtered fuel volume in secondary tank))	>	1.32	%		
							vehicle speed	<=	0	mph		
							diagnosis tester and	=	FALSE	-		
							NO Pending or Confirmed DTCs:	=	see sheet inhibit tables	-		
) for time	>	20	sec		
							and basic enable conditions met:	=	see sheet enable tables	-		

Component /	Fault	Monitor Strategy	Primary Malfunction	tion Threshold Secondary Enable			Time	MIL				
Lost Communications With Auxiliary Heater Control Module	U0166	Fuel Operated Heater (FOH) Message not received for a specified number of times	counts up when message is not received in the base time interval	>	5	counts	Can Bus Initialized (CAN Bus is Active) consisting of:	_	TRUE	ns	fault exists for more than 10 seconds; monitor runs every 0.01 s whenever enable	Special C
Applice CMT640							for time	>=	3.00	sec	conditions are met.	
application only							battery voltage	<	27	V		

Parameter Definitions

Contains definitions of secondary parameters which are used in the parameter document. These secondary parameters conditions are shown in the respective physical parameters which define each condition.

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

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Component / System	State or Status	Description of State or Status found in 12OBDG09	Defined by:	Enable	Enable Values	Enable Units
Cycloni		which influences system	for	Logio	Valuoo	Units
			time	>	300	sec
			engine speed (see Look-Up-Table #14)	>	600 to 850	rpm
			time	>	600	sec
			(a) - (b)	>	4.5	°C
			(a) intake at temperature at start	=	measured parameter	-
			and with (b) minimum intake air temperature value for the comparison with the reference temperature during driving cycle	=	measured parameter	-
)			
		Status of Sun Load Detection time	active under following condition			
			(Vehicle speed	>	14.92	mph
			time	>	300	sec
			engine speed (see Look-Up-Table #14) for	>	600 to 850	rpm
			time	>	600	sec
			,			
ECM Operating States			processor operating permelly	-	TDUE	
			processor operating normally	_	INUE	-
			ignition	=	OFF	-
			processor powerup boot initialization	=	complete	-
			key off bookkeeping cleanup (accessory, post-wake-up, pre-sleep)	=	complete	-

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Parameter Definitions

Component / System	State or Status Sub-Grouping	Description of State or Status found in 12OBDG09	Defined by:	Enable Logic	Enable Values	Enable Units
		Engine Running (see Look-Up table #70)	ignition engine speed engine speed was at start	=	ON 100 850	- rpm rpm
		Engine Post-Drive/ Afterun	processor operating normally	=	TRUE	-
		also includes "engine stopping" during engine spin down	ignition key off bookkeeping cleanup	=	OFF in process	-
Engine Operating Modes	Exhaust Operating Mode	Normal Mode				
	focus					
		Particulate Filter Regeneration Mode				
		Particulate Filter Regen Service Mode				
		Exhaust Gas Temperature (Active) Management Mode also known as		=	Warm Up or Maintain Temperature	·
		Engine Operating Mode		=	Exhaust Warm-up	
Exhaust Gas Recirculation (EGR)		Exhaust Gas Recirculation (EGR) Control is enabled	EGR controller is active continuously with exceptions			

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		Description of State or				
Component /	State or Status	Status found in		Enable	Enable	Enable
System	Sub-Grouping	12OBDG09	Defined by:	Logic	Values	Units
			for failures detected			
			EGR controller is active			
			Overrun			
			Long Idle			
			Transmission Gear Shift			
			Cold Start			
			extreme temperature or pressure			
			Critical Regeneration Modes			
			Quarrun			
			Ovenuit			
			Gear Shifting			
			Overlong Idle			
			5			
			permanent control deviation			
			Demand of the drift compensation			
			System error			
			Error exhaust gas recirculation valve			
			Error throttle value			
			Engine Brake Status			
			Atmospheric pressure too low			
			Battery voltage too low			
			Switch-off coordinator			
			Environmental temperature too low			
			Environmental temperature too high			
			Engine temperature tee levu			
			Engine temperature too high			

Parameter Definitions

Component /	State or Status	Description of State or Status found in	Defined by:	Enable	Enable	Enable
System	Sub-Grouping	12080609	Cold start	LUGIC	values	Units
			Injection quantity too large			
			Operating-mode coordinator			
			Rich Idle			
			External control intervention			_
			Rich Idle Regen		_	
			Environmental Temperature too low in Regeneration			
			EGR Stroking			
			EGR controller is active in Overrun (warm exhaust system)			
			EGR controller is active in Overrun (Cold exhaust system)			
			AFS Faults			
			Request via SCR monitoring (NOx sensor plausibility check)			
			Atmospheric Pressure too low in Regeneration			
			Engine Temperature too low in Regeneration			
			Engine Temperature too high in Regeneration			
Engine Position Management		Engine Position Sync Complete	synchronization completed			
		·····-	consisting of:			
			crankshaft sensor pulses received			
			camshaft sensor pulse received			
		1	and aligned properly			

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Parameter Definitions

Component / System	State or Status Sub-Grouping	Description of State or Status found in 12OBDG09	Defined by:	Enable Logic	Enable Values	Enable Units
			or sync via crank only invoked then crankshaft rotations	>=	4	counts
Fuel System		Fuel System is in Fuel Shut Off	engine running	=	TRUE	-
		also known as Decel Fuel Shut Off or Over-Run	required actual engine torque -	< -	1 -	Nm -
		Status of Diesel Fuel Refill Detection	((
			Filtered total fuel volume available (a) Amount of fuel volume change that indicates a refueling event occurred	> =	(a) + (b) 25.26	- %
			(b) captured remaining diesel fuel volume under the following conditions	=	measured parameter	-
			Vehicle speed time	<= >	1.24 4	mph sec
			and			
			(Vehicle speed time))	<= >	1.24 30	mph sec
			or at initialization of Diesel fuel level	=	TRUE	-
Idle Speed Control		Idle Speed Controller Active	no overrides for:			
		"normal" low idle speed governor	Gear-Shift Harmonization			
			Intrusive Diagnosis Action Power Take Off or other working load handling			

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Component / System	State or Status Sub-Grouping	Description of State or Status found in 12OBDG09	Defined by:	Enable Logic	Enable Values	Enable Units
		Engine Idling Time Ratio	= (time accumulated at idle divided by time since engine start)			
NOx Sensor		Status of NOx signal of upstream NOx sensor				
			(
			following condition met for time:	>	30	sec
			Integrated heat quantity (see Look-Up-Table #1) NOx status signal received via CAN message (Please see	>= =	375 to 500 TRUE	kJ -
			for time	>	0.5	sec
			calculated lambda value based on air mass flow and injection quantity	>	0.9	-
			for time	>	0.5	sec
			engine speed	>	100	rpm
			for time	>	20	sec
			NO Penaing or Confirmed DTCs:	=	tables	-
		Status of NOx signal of downstream NOx sensor				
			following condition met for time:	>	30	sec
			Integrated heat quantity (see Look-Up-Table #2) NOx status signal received via CAN message (Please see the definition)	>= =	0 to 350 TRUE	kJ -
			for time	>	0.5	sec
			calculated lambda value based on air mass flow and injection quantity	>	0.9	-

Component / System	State or Status Sub-Grouping	Description of State or Status found in 12OBDG09	Defined by: for time engine speed for time NO Pending or Confirmed DTCs:))	Enable Logic > > =	Enable Values 0.5 100 20 see sheet inhibit tables	Enable Units sec rpm sec -
		Enabling Downstream NOx sensor heater diagnosis	(SCR Catalyst downstream temperature SCR Catalyst downstream temperature battery voltage battery voltage and Integrated heat quantity (see Look-Up-Table #2) for time) and for time NO Pending or Confirmed DTCs:	, , , , , , , , , , , , , , , , , , ,	94.96 3003.56 11 655.34 0 to 350 30 1 see sheet inhibit tables	°C °C V V kJ sec sec -
Rail Pressure Control System Operating States		Rail Control at ECM Start	reset condition or NO Pending or Confirmed DTCs:	= =	TRUE see sheet inhibit tables	-

Component / System	State or Status Sub-Grouping	Description of State or Status found in 12OBDG09	Defined by:	Enable Logic	Enable Values	Enable Units
		Rail Pre-Control (Just after	Rail Control at ECU Start	=	TRUE	-
		start)	and engine speed and	<=	300	rpm
			(rail pressure or	>=	15000	kPa
			(a) - (b) (a)Fuel Rail Pressure Setpoint	< =	5000 measured paramter	kPa -
			(b)Maximum Rail Pressure for last 10ms	=	measured paramter	-
)			
		Rail Control - PCV Closed Loop Control Only	(
		PCV = Pressure Control	Rail Pressure Precontrol (Just after start) and	=	TRUE	-
			Number of Crankshaft revolutions since entering Rail Pressure Precontrol	>=	10	revs
) or (
			state machine rail pressure control transitioning pressure control valve mode	=	TRUE	-
			and setpoint volume flow of the metering unit out of rail pressure control (see Look-Up-Table #6) or	>	60000 to 224000	mm^3/rev
			Fuel system pressure and high pressure pump outlet and	<	0	kPa
			engine status)	=	RUNNING	-

Component / System	State or Status Sub-Grouping	Description of State or Status found in 12OBDG09	Defined by:	Enable Logic	Enable Values	Enable Units
		Rail Control - Metering Unit Closed Loop Control	state machine rail pressure control equal transitioning to metering unit pressure control mode	=	TRUE	-
			and Controller for PCV not wound-up (large corrective control)	=	TRUE	-
		Rail Control - Metering Unit + PCV Closed Loop Control	state machine rail pressure control transitioning to coupled pressure control mode (rail pressure is controlled by metering unit and pressure control valve)	=	TRUE	-
			and (a) + (b) (see Look-Up-Table #7)	<	12 to 400	mm^3/rev
			(a)Torque Generating fuel injection quantity	=	calculated parametet	-
			(b)Non-I orque generating fuel injection quantity	=	calculated parametet	-
		Switchover Between	(
		Metering Unit + PCV Closed Loop Control to Metering Unit Closed Loop Control only				
			state machine rail pressure control equal to pressure control valve			
			or state machine rail pressure control transitioning pressure control valve mode)			
			and	_		
			(a) + (b) (a)Torque Generating fuel injection quantity	=	(c) + (a) calculated parameter	-
			(b)Non-Torque generating fuel injection quantity	=	calculated parameter	-

Component / System	State or Status Sub-Grouping	Description of State or Status found in 12OBDG09	Defined by:	Enable Logic	Enable Values	Enable Units
			(c) (see Look-Up-Table #7)	=	12 to 400	mm^3/rev
			(b)	=	12	mm^3/rev
			and NO Pending or Confirmed DTCs: or	=	see sheet inhibit tables	-
) state machine rail pressure control equal to metering unit control mode or state machine rail pressure control equal transitioning to			
			metering unit pressure control mode			
			and NO Pending or Confirmed DTCs:	=	see sheet inhibit tables	-
			Fuel system pressure and high pressure pump outlet and	<	0	kPa
			engine status)	=	RUNNING	-
) and NO Pending or Confirmed DTCs:)	=	see sheet inhibit tables	-
		Switchover between PCV or				
		Metering Unit closed loop control to Metering Unit + PCV Closed Loop Control				
			state machine rail pressure control equal to pressure control valve or	=	TRUE	-

0t	Otata an Otatua	Description of State or		Frickle	Frickle	
System	State or Status	12OBDG09	Defined by:	Logic	Values	Enable Units
			state machine rail pressure control equal coupled pressure control (rail pressure is controlled by metering unit and pressure control valve)	=	TRUE	-
			or state machine rail pressure control transitioning pressure control valve mode or	=	TRUE	-
			state machine rail pressure control equal transitioning to metering unit pressure control mode)	=	TRUE	-
			and (
			exhaust gas system regeneration mode)	!=	REGEN	-
			and NO Pending or Confirmed DTCs:	=	see sheet inhibit tables	-
		Switchover Between Metering Unit + PCV Closed Loop Control to PCV Closed Loop Control only				
			state machine rail pressure control equals coupled pressure control (rail pressure is controlled by metering unit and pressure control valve)	=	TRUE	-
			state machine rail pressure control transitioning to coupled pressure control mode (rail pressure is controlled by metering unit and pressure control valve))	=	TRUE	-
			and (a) + (b) (see Look-Up-Table #7) where	<	12 to 400	mm^3/rev
			(a)Torque Generating fuel injection quantity	=	calculated parameter	-

Component / System	State or Status Sub-Grouping	Description of State or Status found in 12OBDG09	Defined by:	Enable Logic	Enable Values	Enable Units
			(b)Non-Torque generating fuel injection quantity	=	calculated parameter	-
Regeneration of the Diesel Particulate Filter		Status thermal regeneration active				
			Reduced particle mass flow in simulation by thermal regeneration (a) * (b) * (c) (a) Correction factor for thermal soot burn-out dependent on lambda and oxygen mass flow (see Look-Up-Table #4)	> =	0 0 to 4.0	- factor
			 (b) Effect of temperature on regenerated particle mass (see Look-Up-Table #5) (c) Basis value of produced soot mass flow dependent on actual soot mass (see Look-Up-Table #3) 	=	0 to 2.97 0.02 to 0.29	- g/sec
SCR System	NOx Control System	Release of dosing of the				
	Reductant Dosing Strategy Active State	dosing strategy	status of SCR control state (please see the definition)	=	Metering Control	-
			Reductant dosing is released Deactivation of dosing to execute the NOx Offset test (Please see the definition)	= =	TRUE FALSE	-
			since start for time gradient of exhaust gas temperature since start for time Average temperature inside the SCR catalyst: SCR catalyst wall temperature Vehicle speed engine speed NO Pending or Confirmed DTCs:	>= < = > > > = > =	0.02 300 0.01 179.96 89.96 -0.62 400 see sheet inhibit tables	sec °C/sec °C °C °C mph rpm -

Component / System	State or Status Sub-Grouping	Description of State or Status found in 12OBDG09	Defined by:	Enable Logic	Enable Values	Enable Units
	NOx Control System Reductant Dosing Pressure Control System	State of Reductant Pressure Control System: Standby	ignition Dwell time in the state of standby	= <	on 5	sec
	States		NO Pending or Confirmed DTCs:	=	see sheet inhibit tables	-
		State of Reductant Pressure Control System: No Pressure control	Old SCR control state (please see the definition)	=	Stand by	-
			ignition Dwell time in the state of standby Dwell time in the state of no pressure control NO Pending or Confirmed DTCs:	= >= < =	on 5 2 see sheet inhibit tables	- sec -
		State of Reductant Pressure Control System: Pressure control	Old SCR control state (please see the definition)	=	NO Pressure Control	-
			ignition engine speed Dwell time in the state of no pressure control exhaust gas temperature Upstream SCR	= > >= >=	on 550 2 169.96	rpm sec °C
			(Reductant Defrost check (please see the definition) or	=	TRUE	-
			The component protection release of the heater control (please see the definition)	=	TRUE	-
			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	-

Component / System	State or Status Sub-Grouping	Description of State or Status found in 12OBDG09	Defined by:	Enable Logic	Enable Values	Enable Units
		State of Reductant Pressure Control System: Refilling Reductant in pressure line (substate of Pressure control)	SCR control state (please see the definition)	=	Pressure Control	-
) Reductant filling state in the pressure line and	<	50	%
			Reductant Pump Module Pressure	<	200	kPa
			Set-point duty cycle for Reductant dosing valve Set-point duty cycle for the Reductant Pump pressure Motor actuator	= =	100 40.00	% %
			NO Pending or Confirmed DTCs:	=	see sheet inhibit tables	-
		State of Reductant Pressure Control System: Pressure build up (substate of Pressure control)	SCR control state (please see the definition)	=	Pressure Control	-
) Reductant filling state in the pressure line or	>=	50	%
			Reductant Pump Module Pressure for time)	>= >	200 0.5	kPa sec
			Reductant Pump Module Pressure Set-point duty cycle for Reductant dosing valve Set-point duty cycle for the Reductant Pump pressure Motor actuator	< = =	350 0% 80.00	kPa % %
			NO Pending or Confirmed DTCs:	=	see sheet inhibit tables	-

		Description of State or				
Component /	State or Status	Status found in		Enable	Enable	Enable
System	Sub-Grouping	12OBDG09	Defined by:	Logic	Values	Units
		State of Reductant Pressure Control System: Ventilation (substate of Pressure control)	SCR control state (please see the definition)	=	Pressure Control	-
			Reductant Pump Module Pressure	<	350	kPa
			Dwell time in Pressure Build up substate	>	10	sec
			system pressurizes in pressure buildup and ventilation states	<	10	counts
			Set-point duty cycle for Reductant dosing valve	=	100	%
			Set-point duty cycle for the Reductant Pump pressure Motor actuator	=	80.00	%
			Dwell time in the sub state ventilation	<	0.23	sec
			NO Pending or Confirmed DTCs:	=	see sheet inhibit tables	-
		Otata of Deductorst Dressure	COD control state (shapes and the definition)		Dressering Oscietad	
		Control System: Metering control (substate of Pressure control)	SCR control state (please see the definition)	=	Pressure Control	-
			Reductant Pump Module Pressure	>=	350	kPa
			Set-point duty cycle for Reductant dosing valve	=	0	%
			NO Pending or Confirmed DTCs:	=	see sheet inhibit tables	-
		State of Reductant Pressure Control System: Pressure reduction	ignition	=	off	-
			dwell time in the state of pressure reduction	<	5	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	=	15.00	%
Parameter Definitions

Component / System	State or Status Sub-Grouping	Description of State or Status found in 12OBDG09	Defined by:	Enable Logic	Enable Values	Enable Units
			NO Pending or Confirmed DTCs:	=	see sheet inhibit tables	-
	SCR Engine State	SCR Engine State	Ignition on	=	TRUE	-
	required for operation		engine speed	>	550	rpm
	Reductant Dosing Strategy based on DPF Fload	Status fill level decrease (please see the definition)				
			Particulate Filter Regeneration demand on or	=	TRUE	-
			Reductant fill level of the SCR catalyst lowed to the target value under Particle filter Regeneration request (a) - (b) (a) Nominal value of Reductant fill level in the catalyst	>=	0	-
			(b) Estimated current Reductant load (c) Reductant Dosing quantity limitation	=	100	factor
			SCR catalyst temperature too high to convert Reductant under Particle filter Regeneration request Average temperature inside the SCR catalyst:	>	999.96	°C
	Reductant Heater and Defrost System Control States and Status					
		Reductant Defrost check	status of reductant tank heater temperature (please see the definition)	=	TRUE	-
			State of the defrosting check of pressure line (please see the definition)	=	TRUE	-
			State of the defrosting check of supply module (please see the definition)	=	TRUE	-

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12 OBDG09 Engine Diagnostics

Component /	State or Status	Description of State or Status found in	Defined by:	Enable	Enable	Enable
System	Sub-Grouping	120BDG09	Defined by:	Logic	values	Units
			duration, for which the conditions for a hydraulic release reset of pressure line heater circuit are satisfied	<=	1200	Sec
			ambient temperature	>	-4.04	°C
			Release heater pressure line	=	FALSE	-
			and			
			duration, for which the conditions for a hydraulic release reset of supply module heater circuit are satisfied	<=	1200	sec
			ambient temperature	>	-4 04	°C
			Release heater supply module	=	FALSE	-
)		-	
		Status of reductant tank	status of roductant tank boator, tomporaturo (ploaso soo			
		heater temperature	status of reductant tank neater temperature (please see			
			Reductant tank heat temperature at Standby state	>	-0.04	°C
			or			-
			Engine off Time	<	2147483647	sec
			Reductant tank heat temperature at Standby state	>	-9.04	°C
		State of the defrosting	State of the defrosting check of pressure line (please			
		check of pressure line	see the definition)			
			time since pressure line heating on under pressure line defrost mode	>=	0 to 3276.7	sec
			status of SCR control state (please see the definition)	=	No Pressure Control	-
			Pressure line defrost timer	=	0	sec
			or			
			ignition	=	on	sec
			engine speed (>	550	rpm
			Pressure line defrost check in last driving cycle	=	TRUE	-
			status of SCR control state (please see the definition)	=	No Pressure Control	-
			Engine off Time	>	0	sec
			NO Pending or Confirmed DTCs:	=	TRUE	-

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12 OBDG09 Engine Diagnostics

Component / System	State or Status Sub-Grouping	Description of State or Status found in 12OBDG09	Defined by:	Enable Logic	Enable Values	Enable Units
		State of the defrosting check of supply module	State of the defrosting check of supply module (please see the definition)			
			time since supply module heating on under supply module defrost mode	>=	0 to 3276.7	sec
			or status of SCR control state (please see the definition)	=	No Pressure Control	-
			Supply module defrost timer or	=	0	sec
			ignition	=	on	sec
			engine speed	>	550	rpm
			Pressure line defrost check in last driving cycle	=	TRUE	-
			status of SCR control state (please see the definition)	=	No Pressure Control	-
			Engine off Time	<	0	sec
			NO Pending or Confirmed DTCs:	=	TRUE	-
			Our set time for heading / not heading of header simulat		0 to 000	
		release of the heater control	Current time for heating / not heating of heater circuit 1 (tank)	>=	0 to 299	sec
			Reductant Defrost check (please see the definition)	=	FALSE	-
		Preliminary release of the heater control for the main state machine	Preliminary release of the heater control for the main state machine (please see the definition)			
) Current time for heating / not heating of heater circuit 1 (tank)	>=	0 to 3276	sec
			status of reductant tank heater defrost	=	FALSE	-
			status of reductant tank heater temperature (please see the definition)	=	FALSE	-
			State of the defrosting check of pressure line (please see the definition)	=	TRUE	-

Component /	State or Status	Description of State or Status found in		Enable	Enable	Enable
System	Sub-Grouping	12OBDG09	Defined by:	Logic	Values	Units
			State of the defrosting check of supply module (please see the definition)) or	=	TRUE	-
			ignition engine speed Engine off Time State of the defrosting check of pressure line (please see	= > <= =	on 550 0 TRUE	sec rpm sec -
			the definition) State of the defrosting check of supply module (please see the definition) and	=	TRUE	-
			if the following conditions were met in previous driving cycle	=	TRUE	-
			ignition	=	on	sec
			engine speed	>	550	rpm
			Engine off Time	<=	0	sec
			State of the defrosting check of pressure line (please see the definition)	=	IRUE	-
			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 #16) or	>=	0 to 14400	sec
			Requested heating time for Reductant tank heater (see Look Up-Table #17))	>=	0 to 3277	sec
			or ((Requested defrosting time for Reductant tank heater (see Look-Up-Table #16) or	>=	0 to 14400	sec

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

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

Component /	State or Status	Description of State or Status found in	Defined by:	Enable	Enable	Enable
System	Sub-Grouping	12080609	Requested heating time for supply module heater (see Look-	>=	0 to 3276 7	Sec
			Up-Table #21)		0.00210.1	000
			NO Pending or Confirmed DTCs:	=	see sheet inhibit tables	-
		Release of tank heater circuit	(
			Requested defrosting time for supply module heater (see Look-Up-Table #19)	>=	0 to 3276.7	sec
			Requested heating time for supply module heater (see Look- Up-Table #21))	>=	0 to 3276.7	sec
			or ((
			Requested defrosting time for Reductant tank heater (see Look-Up-Table #16) or	>=	0 to 14400	sec
			Requested heating time for Reductant tank heater (see Look Up-Table #17))	>=	0 to 3277	sec
			and			
			(Requested defrosting time for supply module heater (see Look-Up-Table #19)	>=	0 to 3276.7	sec
			or Requested heating time for supply module heater (see Look- Up-Table #21)))	>=	0 to 3276.7	sec
			or ((Requested defrosting time for pressure line heater (see Look-Up-Table #18) or	>=	0 to 3276.7	sec

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

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

Parameter Definitions

Component /	State or Status	Description of State or Status found in		Fnable	Enable	Enablo
System	Sub-Grouping	120BDG09	Defined by:	Logic	Values	Units
)) or ((Waiting time before tank heater released started with status of reductant tank heater temperature (please see the definition)	> =	32767 FALSE	sec
) and (
			status of reductant tank heater temperature (please see the definition)	=	TRUE	-
			Waiting time after tank heater release expired ()	>	0	Sec
	Reductant Tank Level System States and Status	status of Reductant tank level	Tank level > full (100%)	=	Full	-
			Warning (66.67%) < tank level < full (100%) Restriction (33.33%) < tank level < Warning (66.67%) Empty < tank level < Restriction (33.33%) Tank level < = 0.1%	= = =	OK Warning Restriction Empty	- - -
		Status of Reductant tank level reset when refilling is detected (please see the definition)	(
			time since potential Reductant refill detection is set and with (>=	12	sec
			Derivation of the PT1 filtered level signal (DT1) ignition on engine speed Vehicle speed time since engine started (a) Time period for a positive slope to detect refueling	>= = > = <= =	1.00 TRUE 550 6.22 (a) * (b) 12	%/sec - rpm mph sec

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12 OBDG09 Engine Diagnostics

		Description of State or				
Component /	State or Status	Status found in		Enable	Enable	Enable
System	Sub-Grouping	12OBDG09	Defined by:	Logic	Values	Units
			(b) Factor for the extension of the detection time for refueling	=	20	factor
			since the following conditions met:	=	TRUE	-
			Falling edge of ignition	=	TRUE	-
			Reductant Refill enabling conditions reset timers)))	=	TRUE	-
			or			
			time since potential Reductant refill detection is set and with	>=	8	sec
			Derivation of the PT1 filtered level signal (DT1) filter release for Reductant tank level calculation at ignition on on (Please see the definition) and with	>= =	1.00 TRUE	%/sec -
			(Frozen state is active during a certain warning level (please see the definition) and with	=	TRUE	-
			(Reductant tank Temperature	>=	-100.04	°C
			Reductant low warning level (Please see the definition)	>=	0	level
)))			
		Status of Reductant Tank	status of reductant tank level release (please see the			
		Level Release	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	-

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12 OBDG09 Engine Diagnostics

		Description of State or				
Component / System	State or Status Sub-Grouping	12OBDG09	Defined by:	Enable Logic	Enable Values	Enable Units
			Waiting time before tank heater released	<	32767	sec
			and	_	TDUE	
			definition)	-	TRUE	-
			Waiting time after tank heater release expired	>	0	sec
) Or (
			status of reductant tank heater temperature (please see the definition	=	FALSE	-
			Waiting time before tank heater released and	>=	32767	sec
			status of reductant tank heater temperature (please see the definition)	=	TRUE	-
			Waiting time after tank heater release expired))	>=	0	sec
			or Frozen state is active during a certain warning level (please see the definition)	=	TRUE	-
) Vehicle speed	>=	6.22	mph
			, or filter release for Reductant tank level calculation at ignition on on (Please see the definition)	=	TRUE	-
		Status of Filter release for reductant tank level calculation				
			Reductant tank Temperature	>=	-100.04	°C
			or Reductant low warning level (Please see the definition)	>=	0	-
			NO Pending or Confirmed DTCs:	=	TRUE	-
			Frozen state is active during a certain warning level (please see the definition)	=	TRUE	-

Component / System	State or Status	Description of State or Status found in 12OBDG09	Defined by:	Enable	Enable Values	Enable Units
- Of Storm			Bonnou sy:		Tuluoo	Onito
		Filter release for Reductant tank level calculation at Ignition on	ignition	=	on	-
		- <u>5</u>	Engine on timer is expired (please see the definition) Vehicle speed	= >=	FALSE 0.62	- mph
			Reductant low warning level (Please see the definition)	>=	49	level
			and with ((
			Raw Reductant tank level and with	>=	33.3	%
			Remaining Reductant quantity (a) - (b): (a) Tank level for reserve mode (Restriction level) in [g]	< =	(a) - (b) 2614	g
			(b) Tank level threshold range below Restriction threshold for ignition on refill detection release)	=	1015	g
			or Raw Reductant tank level and with	>=	66.7	%
			(Remaining Reductant quantity (a) - (b):	<	(a) - (b)	
			(a) Tank level for reserve mode (Warning level) in [g]	=	5279	g
			(b) Tank level threshold range below WARNING threshold for ignition on refill detection release)	=	1617	g
			Raw Reductant tank level and with	>=	100	%
			Remaining Reductant quantity (a) - (b):	>=	(a) - (b)	
			(a) Tank level for reserve mode (Warning level) in [g]	=	5279	g
			(b) Tank level threshold range below WARNING threshold for ignition on refill detection release))	=	1617	g

Component /	State or Status	Description of State or Status found in		Enable	Enable	Enable
System	Sub-Grouping	12OBDG09	Defined by:	Logic	Values	Units
		Otation of Defill data stion of	Obstance of D of III share there of D a share to a la factor of the			
		Status of Refill detection of Reductant tank	Status of Refill detection of Reductant tank (please see the definition)			
			Reductant tank level changed	=	TRUE	-
			((Et	
			Captured Reductant tank level at last tank level change	=	Empty	-
			Or	_	Destriction	
			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			
			((Cantured Reductant tank level at last tank level change	=	Warning	_
					Warning	
			Or Captured Reductant tank level at last tank level change	_	OK	
			Captured Reductant tank level at last tank level change	-	ÖK	-
)			
			and			
			(
			status of Reductant tank level (please see the definition)	=	Full	-
)			
			or			
			(

Component / System	State or Status Sub-Grouping	Description of State or Status found in 12OBDG09	Defined by:	Enable Logic	Enable Values	Enable Units
			Captured Reductant tank level at last tank level change	=	OK	-
			status of Reductant tank level (please see the definition)	=	Full	-
))			
		Engine on timer is expired	time since engine started	>=	(a) * (b)	sec
					12 20	sec -
			and with ((
			ignition	=	on	sec
			Vehicle speed	>=	6.22	mph
) or			
			Vehicle speed	>=	6.22	mph
			NO Pending or Confirmed DTCs:	=	TRUE	
			for time))	>	1	sec
			and with timer reset conditions			
			Falling edge of ignition	=	TRUE	-
			or Reductant Refill enabling conditions reset timers	=	TRUE	-
	Reducant Tank Level Low	Normal Operation OK: 0	Reductant tank level	=	Eull	-
	Warning States	decimal, normal operation		_	i uli	-
			and with			
			v Warning level or	<=	49	-

Component / System	State or Status Sub-Grouping	Description of State or Status found in 12OBDG09	Defined by:	Enable Logic	Enable Values	Enable Units
			(Previous warning level vehicle speed))	> <=	49 98.75	- mph
			or Reductant Quality state	>	0	-
	Warning_Leve1: 1 decimal,	Reductant tank level	<	Full	-	
		Warning level 1	Remaining mileage and with	>	1558.75	miles
			Warning level	<=	49	Warning level
		or				
			Previous warning level	>	49	Warning level
			vehicle speed	<=	98.75	mph
			and with Reductant Quality state	=	0	-
		Warning_Level2: 2 decimal,	Reductant tank level	<	Full	
		Warning level 2	Remaining mileage and with	<=	1558.75	miles
			(Warning level	<=	49	Warning
			or			
			(Previous warning level	>	49	Warning level
			vehicle speed))	<=	98.75	mph

12 OBDG09 Engine Diagnostics

Component / System	State or Status Sub-Grouping	Description of State or Status found in 12OBDG09	Defined by:	Enable Logic	Enable Values	Enable Units
			and with Reductant Quality state	=	0	-
					7	
		decimal, Warning level 3		<	Full	-
			Remaining mileage and with (>	855	miles
			Warning level	=	2	Warning level
			or Warning level	=	16	Warning level
			, and with initialization phase after Reductant refill event is active	=	TRUE	-
			Reductant Quality state	=	0	-
		Warning_Level4: 32 decimal, Warning level 4	Reductant tank level	<	Full	-
			Remaining mileage and with	<=	855	miles
			Warning level	<=	49	Warning level
			or (
			Previous warning level	>	49	Warning level
			vehicle speed))	<=	98.75	mph
			and with Reductant Quality state	=	0	-

System Sub-Grouping 120BDG09 Defined by: Logic Values Units Warning_Level5: 48 decimal, Warning level 5
Warning_Level5:48 decimal, Warning level 5 Reductant tank level < Full - Remaining mileage <= 628.75 miles and with (Warning level <= 49 Warning level level
Reductant tank level < Full - Remaining mileage <= 628.75 miles and with (Warning level <= 49 Warning level or
Remaining mileage <= 628.75 miles and with (Warning level <= 49 Warning level or
and with (Warning level <= 49 Warning level or
(Warning level <= 49 Warning level or
Warning level <= 49 Warning level or
level or
Or /
Previous warning level > 49 Warning
level
vehicle speed <= 98.75 mph
or
(Warning lovel – 48 Warning
level
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
initialization phase after Poductant refill event is active – TPLIE
or
Warning level < 49 Warning
level (
Failed Reductant system pressure build up = 1 -
)/ and with

Parameter Definitions

Component /	State or Status	Description of State or Status found in		Enable	Enable	Enable
System	Sub-Grouping	12OBDG09	Defined by:	Logic	Values	Units
			Reductant Quality state	=	0	-
		Warning_Level8: 80 decimal,Vehicle speed restriction mild	Warning level	=	80	Warning level
			initialization phase after Reductant refill event is active	=	TRUE	
			and with Reductant Quality state	=	0	
		Warning_Level10: 112 decimal,Vehicle speed	Warning level	=	112	Warning level
		restriction aggressive	initialization phase after Reductant refill event is active	=	TRUE	-
			and with Reductant Quality state	=	0	-
		Warning_Level12: 144 decimal, Vehicle speed	Warning level	=	144	Warning level
		restriction severe	initialization phase after Reductant refill event is active	=	TRUE	-
			and with Reductant Quality state	=	0	-
		Warning_Level14: 176 decimal, Vehicle speed restriction final	Warning level	=	176	Warning level
			initialization phase after Reductant refill event is active	=	TRUE	-
			and with Reductant Quality state	=	0	-

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

Parameter Definitions

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

Parameter Definitions Page 453 of 491

Component /	State or Status	Description of State or Status found in		Enable	Enable	Fnable
System	Sub-Grouping	12OBDG09	Defined by:	Logic	Values	Units
			Difference between the NOx mass of the sensor and of the model during third functional evaluation (see Look-Up-Table #9)	<=	-0.8 to -0.6	g
		Status of the SCR adaptation plausibility check active	(
			Status of NOx signal of downstream NOx sensor (please see the definition)	=	TRUE	-
			NOx concentration downstream SCR catalyst	>	15	ppm
			for time	>	3	sec
			Estimated SCR catalyst efficiency	>	0.3	factor
			for time	>	3	sec
			NOx concentration deviation between sensor reading and modeled NOx concentration downstream SCR catalyst	>	measured parameter	-
			for time	>	10	sec
			Time since when the Reductant load level adaptation and the plausibility have been locked	>=	600	sec
			Time since when the Reductant load level adaptation and the plausibility have been locked	>=	50	sec
			Integrated NOx mass since Reductant load level adaptation and plausibility have been locked)	>=	2	g
			Difference between nominal and estimated Reductant	<	0.125	g
			Difference between nominal and estimated Reductant	>=	-0.5	g
			Filtered Upstream NOx mass flow Filtered Upstream NOx mass flow	>= <=	10 500	mg/sec mg/sec
			(Upstream Nox mass flow difference : (a) - (b)	>=	0	mg/sec

12 OBDG09 Engine Diagnostics

		Description of State or				
Component /	State or Status	Status found in	Defined but	Enable	Enable	Enable
System	Sub-Grouping	120BDG09	Defined by:		values	Units
			and with	~-	500	mg/sec
			(a) Filtered Upstream NOx mass flow			
			(b) Filtered actual upstream NOx mass flow			
)			
			Status of pre controlled dosing (please see the definition)	=	FALSE	-
			Difference between nominal and estimated Reductant	<	0 125	n
					0.120	9
			Difference between nominal and estimated Reductant	>=	-0.5	g
					_	
			for time	>	5	sec
			HC load in SCR catalyst	<=	10	factor
			overall aging factor of the SCR catalyst	>=	0	factor
			for time	>	1	sec
			Temperature gradient of SCR	>=	-1	°C/sec
			Temperature gradient of SCR	<=	1	°C/sec
			for time	>	18	sec
			Integrated NOx mass flow after engine start	>=	5	a
			Release of Reductant dosing	=	active	-
			engine operating condition based on engine speed and	>	0 to 1	factor
			injection quantity (see Look-Up-Table #10)			
			Difference between nominal and estimated Reductant	>	-0.05	q
						Ū
			Reductant mass flow (see Look-Up-Table #8)	>	0 to 0.04	g
			Elapsed time of the fill level timer	>	20	sec
)			
		State of the NH3 (Ammonia)				
		slip detection				
			Reductant concentration downstream SCR	<	32767	ppm

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

12 OBDG09 Engine Diagnostics

Component / System	State or Status Sub-Grouping	Description of State or Status found in 12OBDG09	Defined by:	Enable Logic	Enable Values	Enable Units
			(Release plausibility timer active Integrated NOx raw emission since fill level adaptation and plausibility have been locked)	>= >=	50 2	sec g
		Status for disabling the SCR Efficiency monitor following an SCR Adaptation cycle completion				
			Maximum dosing quantity	<	0.6	g/sec
			or (a) - (b) (a) Reductant Dosing quantity (b) Maximum Reductant Dosing quantity	> = =	0 measured parameter calculated parameter	- -
			or (a) - (b) (a) Reductant Desired value (b) Reductant Dosing quantity limitation due to frozen tank	> = =	0 calculated parameter calculated parameter	-
		Request for pre controlled dosing				
			Filtered exhaust gas mass flow (a) Correction factor for the upper hysteresis threshold for filtered exhaust-gas mass flow, dependent on HC- contamination	> =	(a) * (b) 1	- factor
			(b) Upper nysteresis threshold for filtered exhaust-gas mass flow, dependent on thermal ageing	=	5040.00	g/sec

Component /	State or Statue	Description of State or Status found in		Enchlo	Enable	Frickle
System	Sub-Grouping	12OBDG09	Defined by:	Logic	Values	Enable Units
			and	U		
			Filtered NOx mass flow upstream SCR	>	(a) * (b)	-
			(a) Correction factor for the upper hysteresis threshold for	=	1	factor
			filtered exhaust-gas mass flow, dependent on HC-			
			contamination SCR		0.05	,
			(b) Upper hysteresis threshold for filtered exhaust-gas mass	=	0.25	g/s
			now, dependent on thermal ageing SCR			
			and			
			Engine coolant temperature	<	(a) + (b)	-
			(a) Lower hysteresis threshold for engine temperature	=	105.06	°C
			(b) Offset for lower hysteresis switch on threshold for engine	=	50	K
			temperature			
			Engine coolant temperature	>	108.06	°C
			and ambient pressure		(a) + (b)	
			(a) Upper hysteresis threshold for environment pressure	=	(a) + (b) 74 5	- kPa
			(a) opper hysteresis threshold for environment pressure	_	74.0	κια
			(b) Offset for upper hysteresis switch on threshold for	=	65.0	kPa
			environment pressure			
			or			
			ambient pressure	<	74.0	kPa
			and			
			Intake air temperature	_	(a) + (b)	- °C
			(a) Lower hysteresis switch on theshold for third an temperature	-	-0.54	C
			(b) Offset for upper hysteresis switch on threshold for inlet	=	49.5	°C
			air temperature		1010	C C
			or			
			Intake air temperature	<	-8.04	°C
)			
			and			
			and /			
			(ambient temperature	>=	-7 04	°C
			ambient pressure	>=	74.8	kPa

Component /	State or Status	Description of State or Status found in		Enable	Enable	Enable
System	Sub-Grouping	12OBDG09	Defined by:	Logic	Values	Units
			Selected temperature used for locking pre controlled mode	>=	209.96	°C
			Selected temperature used for locking pre controlled mode	<=	309.96	°C
			engine operation in normal mode	=	TRUE	-
			SCR Nox Catalyst Efficiency check was performed this drive cycle	=	FALSE	-
			Incorrect Reductant Composition check was performed this drive cycle	=	FALSE	-
			NO Pending or Confirmed DTCs:)	=	TRUE	-
			(((k) + (l) + (m)	>	75	
			(k) = (a) * (b) (a) entry condition for pre controlled dosing at sea level (see Look-Up-Table #13)	=	0 to 100	-
			(b) Altitude multiplier factor for sea level	=	measured paramter	-
			(I) = (c) * (d) * (e) (c) entry condition for online dosing at Mid level (see Look- Up-Table #12) (d) Multiplier to Mid Level enable speed load map (e) Altitude multiplier factor for medium altitude	= = =	0 to 100 1 measured paramter	- factor -
			(m) = (f) * (g) * (h) (f) Entry condition for online dosing at Hi level (see Look-Up- Table #11) (g) Multiplier to Hi Level enable speed load map (h) Altitude multiplier factor for high altitude	= = =	0 to 100 1 measured paramter	- factor -
) and Low pass filtered rNOxNSCDs signal)	>	2000	-

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

12 OBDG09 Engine Diagnostics

Component / State or S	Description of State or Status found in		Enchlo	Fneble	-
System Sub-Grou	iping 120BDG09	Defined by:	Logic	Values	Enable Units
		(a) filtered current tank temperature	=	measured paramter	-
		(b) tank temperature of the previous driving cycle	=	measured paramter	-
		temperature difference: (a) - (b) (a) tank temperature of the previous driving cycle	<= =	0 measured paramter	°C -
		(b) filtered current tank temperature	=	measured paramter	-
		temperature difference: (a) - (b) (a) tank temperature of the previous driving cycle	>= =	0 measured paramter	°C
		start tank temperature of current monitoring cycle from	=	measured paramter	-
		Eli Roiv (see demittor) Engine off Time This monitor was complete in the last driving cycle	<= =	2000 FALSE	sec
		(a) filtered current tank temperature difference: (a) - (b)	> =	-0.14 measured paramter	°C -
		(b) tank temperature captured at the beginning of current monitoring cycle	=	measured paramter	-
	State of Reductant injection valve Component Protection)) 1			
		status of SCR control sub state (please see the definition)	=	Metering control	-
		and with (
		PM Filter Regeneration Modeled Reductant injection valve tip temperature based on its coil temperature (see Look-Up-Table #15)	= >	not active 100.96 to 114.96	- C
		or (PM Filter Regeneration Reluctant dosing valve modeled temperature	= >	active 19.96	°C

Component / System	State or Status Sub-Grouping	Description of State or Status found in 12OBDG09	Defined by:	Enable Logic	Enable Values	Enable Units
)) or (status of SCR control sub state (please see the definition) and with (PM Filter Regeneration	<i>≠</i> =	Metering control	°
			Modeled Reductant Injection valve tip temperature based on its coil temperature (see Look-Up-Table #15)) or (PM Filter Regeneration Modeled Reductant injection valve tip temperature based on its coil temperature)))	>	active 19.96	°C
Turbo Charger		Turbocharger (VNT) wiping active	The Variable Nozzle Turbocharger Control has an intrusive mode where: VNT wiping is a sweep of the vane position control throughout its range of motion which is used to: avoid a binding of the VNT vanes due to soot accumulation during long idle operation with a cold engine.			

Table no. Fault Codes

Label (Internal Manufacturer Reference)

1 P0101

AFS_rAirThresCor_CUR

Intake Air Temperature (°C)	-100.04	-0.04	0.96	38.96	39.96	125.86
Correction Factor (factor)	0.05	0.05	0	0	0.05	0.05

2 P0101 AFS_r

AFS_rAirThresLo_MAP

Injection Qty (mm^3/rev) / Engine Speed (rpm)	0	950	1100	1650	2200	2750	3300	4400
4	0.75	0.75	0.8	0.8	0.8	0.8	0.8	0.8
8	0.75	0.75	0.8	0.8	0.8	0.8	0.8	0.8
14	0.75	0.75	0.8	0.8	0.8	0.8	0.8	0.8
80	0.75	0.75	0.8	0.8	0.8	0.8	0.8	0.8
120	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8
240	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8
280	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8
380	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8

3 P2263

Air_pPhysRngMinThresPIntkVUs_MAP

Injection Qty (mm^3/rev) / BARO (kPa)	60	65	70	75	82	95	100	140
0	400	450	500	550	650	750	800	1200
120	400	450	500	550	650	750	800	1200
160	450	500	550	600	700	800	850	1250
260	450	500	550	600	700	800	850	1250
280	525	575	625	675	768	875	925	1325
340	750	800	850	900	970	1100	1150	1550
480	750	800	850	900	970	1100	1150	1550
560	750	800	850	900	970	1100	1150	1550

4 P112A

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	100	100	100

5 P111C

Air_tDiffMaxHiTCACDs_CUR

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

6 P040F

Air_tDiffMaxHiTEGRClr2Ds_CUR

Engine Off Time (sec)	600	700	800	900	1000	2000	3000	4000	5000	8000	10000	18000	28799	28800	30000	32000
Delta Temperature (°C)	999	999	999	999	999	999	999	999	999	999	999	999	999	100	100	100

7 P112A

Air_tDiffMaxLoTAFS_CUR

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

8 P111C

Air_tDiffMaxLoTCACDs_CUR

Engine Off Time (sec)	600	700	800	900	1000	2000	3000	4000	5000	8000	17999	18000	28799	28800	30000	32000
Delta Temperature (°C)	999	999	999	999	999	999	999	999	999	999	999	999	999	35	35	35

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Look-Up Tables

Table no. Fault Codes

Label (Internal Manufacturer Reference)

40F

Air_tDiffMaxLoTEGRCIr2Ds_CUR

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

10 P0402

AirCtl_facEnvPresMaxDvt_CUR

BARO Pressure (kPa)	65	70	75	80	82.5	90	95	100
Correction Factor (factor)	2	2	2	1.833	1.75	1.3	1	1

11 P0401

AirCtl_facEnvPresMinDvt_CUR

BARO Pressure (kPa)	70	75	80	82.5	87.5	90	97.5	100
Correction Factor (factor)	0.6	0.6	0.6	0.8	0.867	0.9	1	1

12 P2413

AirCtl_facEnvPresMinDvtPwr_CUR

BARO Pressure (kPa)	50	54	58	62	66	70	75	78	82	86	90	94	97	102	106	110
Correction Factor (factor)	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.364	0.45	0.597	0.743	0.89	1	1	1	1

13 P0402

AirCtl_mMaxDvt_MAP

Injection Qty (mm^3/rev) / Engine Speed (rpm)	1200	1300	1400	1500	1600	1800	1850	2000
0	0.48	0.50	0.40	0.50	0.50	0.50	0.49	0.49
160	0.48	0.50	0.44	0.60	0.50	0.50	0.49	0.49
180	0.50	0.50	0.44	0.60	0.50	0.50	0.49	0.49
200	0.80	0.80	0.70	0.60	0.50	0.50	0.49	0.49
220	0.86	0.80	0.80	0.80	0.60	0.60	0.49	0.49
240	0.92	0.87	0.87	0.87	0.70	0.70	0.49	0.49
280	1.03	1.00	1.00	1.00	0.90	0.90	0.51	0.51
340	1.20	1.20	1.20	1.20	1.20	1.20	0.51	0.51

14 P2138 APP_uSync_CUR

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

15 P026A

CAClg_dmThresHi_CUR

Vehicle Speed (mph)	25.00	75.00
Mass Air Flow (g/s)	55.56	277.78

16 P008F

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	100	100	100

17 P008F

CEngDsT_tDiffMaxLo_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

Table no.	Fault Codes	Label (Internal Manufacturer Reference)
18	P2457	EGRClg_etaThresCorMFI_CUR
	Filtered EGR Mass Flow (g/sec)	16.67 22.22 33.33 38.89
	Correction Factor (factor)	0 -0.03 -0.09 -0.12
19	P0336	EpmCrS_facGapPlausHigh_CA
	_	8 5 8125 3 375 3 375
20	P0336	EpmCrS_facIncPlausHigh_CA
	-	2 1 8125 1 5 1 5
21	P12B3, P12B4, P12B5, P12B6, P12B7, P12B8, P12B9, P12BA, P12BB, P12BC, P12BD, P12BE, P12BF, P12C0, P12C1, P12C2	ETClb_pRailSet_CA
		0 1 2
	Rail Pressure Setpoint (kPa)	30000 70000 90000
22	P12B3, P12B4, P12B5, P12B6, P12B7, P12B8, P12B9, P12BA, P12BB, P12BC, P12BD, P12BE, P12BF, P12C0, P12C1, P12C2	ETClb_tiET_MAX_CA
		0 1 2
	Energizing Time (us)	670.8 384.4 353.2
23	P12B3, P12B4, P12B5, P12B6, P12B7, P12B8, P12B9, P12BA, P12BB, P12BC, P12BD, P12BE, P12BF, P12C0, P12C1, P12C2	ETClb_tiETOfsMax_CA
		0 1 2
	Energizing Time (us)	16 12 10
24	P12B3, P12B4, P12B5, P12B6, P12B7, P12B8, P12B9, P12BA, P12BB, P12BC, P12BD, P12BE, P12BF, P12C0, P12C1, P12C2	ETCIb_tiETOtsMin_CA
		0 1 2
	Energizing Time (us)	123.2 69.2 56
25	P144B	ETCtl_stPOpCtVILopMax_MAP

Injection Qty (mm^3/rev) / Engine Speed (rpm)		750	900	2250	3000
	0	0	1	1	,
	10	0	1	1	
1:	20	0	1	1	
1	60	0	0	0	(

Table no. Fault Codes

Label (Internal Manufacturer Reference)

26 P144C

ETCtl_stPOpCtVILopMin_MAP

Injection Qty (mm^3/rev) / Engine Speed (rpm)	750	900	2250	3000
0	0	1	1	1
40	0	1	1	1
120	0	1	1	1
160	0	0	0	0

27 P24A0

ETCtlHCI_stPOpCtVHCILopMaxInjMs_MAP

Injection Qty (mm^3/rev) / Engine Speed (rpm)	700	900	2250	3000
0	0	1	1	1
40	0	1	1	1
240	0	1	1	1
400	0	1	1	

28 P24A1

ETCtlHCI_stPOpCtVHCILopMinInjMs_MAP

mm^3/hub / rpm	700	900	2250	3000
0	0	1	1	1
10	0	1	1	1
60	0	1	1	1
100	0	1	1	1

29 P11DC

Exh_facLamStatNoCat2Ds_CUR

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

30 P11DB

Exh_facLamStatNSCDs_CUR

-	2	3	4	5	6	7	8	9	10	15	16
-	0.3	0.4	1.25	1.5	3.848	3.889	4	6.484	10	10	10

31 P2080, P2084, P242B, P246F

Exh_stPOpModPlausTMon_MAP

Injection Qty (mm^3/rev) / Engine Speed (rpm)	700	1000	1500	2000	3000	3300
(0 0	0	0	0	0	0
20	255	255	255	255	255	0
40	255	255	255	255	255	0
100	255	255	255	255	255	0
200	0 0	255	255	255	255	0
320	0 0	0	0	0	0	0

32 P20E2

Exh_tDiffMaxHiTOxiCatDs_CUR

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

33 P20E2

Exh_tDiffMaxLoTOxiCatDs_CUR

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

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Table no.	Fault Codes	Label (Internal	Manufac	turer Re	eference)													
34	P0483	FanCtl_facDiaD	rvSpd_Cl	UR														
	Fans Speed (rpm)	400	1523	1524	1600	2000	2400	2800	3200	3600	4000	4400	4800	5200	5600	6000	6400	6800
	factor (-)	0	0	1	1	1	1	1	1	0.9	0.8	0.7	0.6	0.4	0.2	0	0	0
35	P0483	FanCtl_facDiaDi	rvStab_C	UR														
	Input Shaft Speed (rpm)	-1600	-1200	-700	-400	0	400	700	1200	1600								
	factor (-)	0	0	0.6	1	1	1	0.6	0	0								
36	P0483	FanCtl_facDiaE	CT_CUR															
	ECT (°C)	-20.04	-7.04	19.96	68.96	69.96	79.96	99.96	104.96	124.96								
	factor (-)	0	0	0	0	0.6	0.95	1	0.95	0.9								
37	P0483	FanCtl_facDialA	T_CUR															
	IAT (°C)	-8.04	-7.04	-0.04	9.96	14.96	19.96	44.96	69.96	99.96								
38	P0495	FanCtl_nDiaHiS	pd_CUR	0.02	0.7	0.0	1		1	0.9								
	Fan Drive Speed (rpm)	400	1200	1500	1600	1800	2000	2400	2800	3200	3600	4000	4400	4800	5200	5600	6000	6800
	Fan Speed (rpm)	400	1200	1450	1500	1500	1500	1500	1500	1500	1500	1500	1500	1500	1500	1500	1500	1500
39	P0495	FanCtl_volClthD	ia_CUR															
	Fan Drive Speed (rpm)	400	600	800	1000	1200	1400	1600	1800	2000	2200	2400	2600	2800	3000	3200	3400	3600
	Clutch Fluid Vol (L)	0.005 (0.0055	0.006	0.0096	0.0096	0.0096	0.0096	0.0096	0.0096	0.0096	0.0096	0.0096	0.0096	0.0115	0.011	0.011	0.0105
40	P0263, P0266, P0269, P0272, P0275, P0278, P0281, P0284	FBC_qLimNeg_	MAP															
	ECT (°C) / Inj. Qty (mm^3/rev)	0	8	52	432	448	464	472	480									
	-40.04	0	0	-44	-44	-44	-44	-44	-44									
	103.96	0	0	-44	-44	-44	-44	-44	-44									

103:50	0	0	-44	-44	-44	-44	-44	-44
104.96	0	0	-44	-44	-44	-44	-44	-44
105.96	0	0	-44	-44	-44	-44	-44	-44
106.96	0	0	-44	-44	-44	-44	-44	-44
107.96	0	0	-44	-44	-44	-44	-44	-44
109.96	0	0	-44	-44	-44	-44	-44	-44
134.96	0	0	-44	-44	-44	-44	-44	-44

P0263, P0266, P0269, P0272, P0275, P0278, P0281, P0284 FBC_qLimPos_MAP 41

ECT (°C) / Inj. Qty (mm^3/rev)	0	8	52	432	448	464	472	480
-40.04	0	0	44	44	44	44	44	44
103.96	0	0	44	44	44	44	44	44
104.96	0	0	44	44	44	44	44	44
105.96	0	0	44	44	44	44	44	44
106.96	0	0	44	44	44	44	44	44
107.96	0	0	44	44	44	44	44	44
109.96	0	0	44	44	44	44	44	44
134.96	0	0	44	44	44	44	44	44

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Table no. Fault Codes

Label (Internal Manufacturer Reference)

42 P11B5

Hegn_facLamDiaFdbk_CUR

Filtered Reciprocal Lambda (-)	1	3	5	6	8	9	10	16
Reciprocal Lamda Change (-)	0.1	0.2	5	7.696	11	12.968	20	22

45 P0606

MoFCoOfs_rTrqPtdOfs_MAP

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

46 P0606

MoFInjQnt_tiZFCETMax_CUR

Rail Pressure (kPa)	20000	30400	70400	90400	120000	120800
Energizing Time (us)	500	500	300	256	50	50

47 P0606

MoFInjQnt_tiZFCETMin_CUR

Rail Pressure (kPa)	20000	30400	70400	90400	120000	120800
Energizing Time (us)	-500	-500	-300	-256	-50	-50

48 P0606

MoFOvR_tiLimET_CUR

Engine Speed (rpm)	0	2000	2040	4000
Energizing Time (us)	6000	6000	200	200

49 P0299

PCR_pMaxDvt_MAP

Injection Qty (mm^3/rev) / Engine Speed (rpm)	0	1300	1500	1600	1800	2000	2500	3000
140	17.5	17.5	17.5	17.5	20	25	25	25
160	20	20	20	20	22.5	25	25	25
200	22.5	22.5	22.5	22.5	22.5	25	25	25
240	25	25	25	22.5	25	27.5	27.5	27.5
280	27.5	27.5	27.5	27.5	27.5	28	28	28
320	30	30	30	30	30	30	30	30
360	35	35	35	35	35	35	35	35
400	40	40	40	40	40	40	40	40

50 P0234

PCR_pMinDvt_MAP

Injection Qty (mm^3/rev) / Engine Speed (rpm)	0	1500	1600	1700	1800	2000	2500	3000
140	-12.5	-12.5	-12.5	-13.1	-13.8	-15	-30	-35
160	-12.5	-12.5	-13	-14.8	-16.5	-20	-30	-35
200	-12.5	-12.5	-15	-17.5	-20	-25	-30	-35
240	-17.5	-20	-22.5	-24.4	-26.3	-30	-30	-35
280	-20	-20	-27.5	-28.1	-28.8	-30	-30	-35
320	-20	-20	-25	-30	-30	-30	-30	-35
360	-22.5	-22.5	-27.5	-30	-30	-30	-30	-35
400	-25	-25	-30	-30	-30	-30	-30	-35

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Table no. Fault Codes

Label (Internal Manufacturer Reference)

51 P2459

PFIt_mSotThresRgnFreq_CUR

Soot Mass Difference (g)	0	5	10	20	30	45
Soot model factor (g)	0	59	118	236	354	531

52 P2002

PFlt_pDiffCharMonMin_MAP

Min. Soot Mass (g) / Exhaust Vol Flow in DPF (m^3/h)	500	700	900	1300	1800	2500	3000	3250
0	0.8	1.3	1.7	2.8	4.4	7.3	9.6	10.7
5	0.8	1.3	1.7	2.8	4.4	7.4	9.6	10.7
10	0.8	1.3	1.7	2.8	4.4	7.4	9.6	10.7
20	0.8	1.3	1.7	2.8	4.4	7.4	9.6	10.7
30	0.8	1.3	1.7	2.8	4.4	7.4	9.6	10.7
50	0.8	1.3	1.7	2.8	4.4	7.4	9.6	10.7
70	0.8	1.3	1.7	2.8	4.4	7.4	9.6	10.7
90	0.8	1.3	1.7	2.8	4.4	7.4	9.6	10.7

57 P128E

Rail_pCPCFltMin_CUR

Engine Speed (rpm)	0	200	300	400	500	540	590	700	800	1000	1200	1650	2000	3000	4000	5000
Fuel Rail Pressure (kPa)	0	0	0	0	0	0	15000	15000	15000	15000	15000	15000	15000	15000	15000	15000

58 P0087

Rail_pMeUnDvtMax_CUR

Engine Speed (rpm)	0	540	590	650	1000	1200	1400	1600	1800	2000	2300	2400	3200	3400	3800	4000
Fuel Rail Pressure (kPa)	80000	80000	11000	11000	11000	11000	11000	11000	11000	11000	11000	11000	11000	11000	11000	11000

59 P0088

Rail_pMeUnDvtMin_CUR

Engine Speed (rpm)	0	540	590	650	1000	1200	1400	1600	1800	2000	2300	2400	3200	3400	3800	4000
Fuel Rail Pressure (kPa)	-80000	-80000	-20000	-20000	-20000	-20000	-20000	-20000	-20000	-20000	-20000	-20000	-20000	-20000	-20000	-20000

60 P128E Rail_pMeUnFltMin_CUR

Engine Speed (rpm)	0	200	300	400	500	540	590	700	800	1000	1200	1650	2000	3000	4000	5000
Fuel Rail Pressure (kPa)	0	0	0	0	0	0	15000	15000	15000	15000	15000	15000	15000	15000	15000	15000

61 P0087

Rail_pPCVDvtMax_CUR

Engine Speed (rpm)	0	540	590	800	1000	1200	1400	1600	1800	2000	2300	2400	3200	3400	3800	4000
Fuel Rail Pressure (kPa)	80000	80000	11000	11000	11000	11000	11000	11000	11000	11000	11000	11000	11000	11000	11000	11000

62 P128E

Rail_pPCVFltMin_CUR

Engine Speed (rpm)	0	200	300	400	500	540	590	700	800	1000	1200	1650	2000	3000	4000	5000
Fuel Rail Pressure (kPa)	0	0	0	0	0	0	15000	15000	15000	15000	15000	15000	15000	15000	15000	15000

63 P113A

SCR_tDiffMaxHiUCatDsT_CUR

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

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Table no. Fault Codes

Label (Internal Manufacturer Reference)

68 P11CB, P11CC

SCRChk_facMaxStyNOxUsPlaus_GMAP

Injection Qty (mm^3/rev) / Engine Speed (rpm)	1100	1200	1300	1350	1400	1450	1500	1600	1650	2000
60	0.07495117	0.075	0.075	0.075	0.075	0.05	0.05	0.05	0.05	0.05
80	0.07495117	0.075	0.075	0.075	0.075	0.05	0.05	0.05	0.05	0.05
100	0.07495117	0.075	0.075	0.075	0.075	0.05	0.05	0.05	0.05	0.05
120	0.07495117	0.075	0.075	0.075	0.075	0.05	0.05	0.05	0.05	0.05
140	0.07495117	0.075	0.075	0.075	0.075	0.05	0.05	0.05	0.05	0.05
160	0.07495117	0.075	0.075	0.075	0.075	0.05	0.05	0.05	0.05	0.05
180	0.07495117	0.075	0.075	0.075	0.075	0.05	0.05	0.05	0.05	0.05
200	0.07495117	0.075	0.075	0.075	0.075	0.05	0.05	0.05	0.05	0.05
220	0.07495117	0.075	0.075	0.075	0.075	0.05	0.05	0.05	0.05	0.05
240	0.07495117	0.075	0.075	0.075	0.075	0.05	0.05	0.05	0.05	0.05

69 P11CB, P11CC

SCRChk_facMinStyNOxUsPlaus_GMAP

Injection Qty (mm^3/rev) / Engine Speed (rpm)	1100	1200	1300	1350	1400	1450	1500	1600	1650	2000
60	0.07495117	0.075	0.075	0.075	0.075	0.05	0.05	0.05	0.05	0.05
80	0.07495117	0.075	0.075	0.075	0.075	0.05	0.05	0.05	0.05	0.05
100	0.07495117	0.075	0.075	0.075	0.075	0.05	0.05	0.05	0.05	0.05
120	0.07495117	0.075	0.075	0.075	0.075	0.05	0.05	0.05	0.05	0.05
140	0.07495117	0.075	0.075	0.075	0.075	0.05	0.05	0.05	0.05	0.05
160	0.07495117	0.075	0.075	0.075	0.075	0.05	0.05	0.05	0.05	0.05
180	0.07495117	0.075	0.075	0.075	0.075	0.05	0.05	0.05	0.05	0.05
200	0.07495117	0.075	0.075	0.075	0.075	0.05	0.05	0.05	0.05	0.05
220	0.07495117	0.075	0.075	0.075	0.075	0.05	0.05	0.05	0.05	0.05
240	0.07495117	0.075	0.075	0.075	0.075	0.05	0.05	0.05	0.05	0.05

71 P11CB

SCRChk_idcPOpMaxNOxUsPlaus_GMAP

Injection Qty (mm^3/rev) / Engine Speed (rpm)	600	1000	1100	1200	1300	1350	1400	1450	1500	1600	1650	2000	2200	2400	2600	3000
60	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	(
80	0	0	0	0	0	0	1	1	0	0	0	0	0	0	0	(
100	0	0	0	0	0	0	1	1	0	0	0	0	0	0	0	(
120	0	0	0	1	1	1	1	1	0	0	0	0	0	0	0	(
140	0	0	0	1	1	1	1	1	0	0	0	0	0	0	0	(
160	0	0	0	0	0	0	1	1	0	0	0	0	0	0	0	(
180	0	0	0	0	0	0	1	1	0	0	0	0	0	0	0	(
200	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	(
220	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	(
240	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	(

72 P11CC

SCRChk_idcPOpMinNOxUsPlaus_GMAP

Injection Qty (mm^3/rev) / Engine Speed (rpm)	600	1000	1100	1200	1300	1350	1400	1450	1500	1600	1650	2000	2200	2400	2600	3000
60	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
80	0	0	0	0	0	0	1	1	0	0	0	0	0	0	0	0
100	0	0	0	0	0	0	1	1	0	0	0	0	0	0	0	0
120	0	0	0	1	1	1	1	1	0	0	0	0	0	0	0	0
140	0	0	0	1	1	1	1	1	0	0	0	0	0	0	0	0
160	0	0	0	0	0	0	1	1	0	0	0	0	0	0	0	0
180	0	0	0	0	0	0	1	1	0	0	0	0	0	0	0	0
200	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
220	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
240	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

Table no. Fault Codes

Label (Internal Manufacturer Reference)

73 P20EE, P2BAD SCRChk_mEstNH3LdMax_CUR

SCR Catalyst Temp (°C)	224.96	249.96	259.96	269.96	279.96	289.96	299.96	324.96
Est. Reductant Load (g)	1.85	1.7	1.5	1.4	1.3	1.2	1	0.3

75 P20EE, P2BAD SCRChk_mEstNH3LdMin_CUR

SCR Catalyst Temp (°C)	224.96	249.96	259.96	269.96	279.96	289.96	299.96	324.96
Est. Reductant Load (g)	1.69	1.5	1.3	1.1	0.85	0.68	0.5	0.1

77 P20EE, P2BAD SCRChk_mNH3LdDvtMax_CUR

SCR Catalyst Temp (°C)	199.96	248.96	274.96	299.96	324.96	349.96	399.96	439.96
Est. Reductant Load Diff. (g)	0.2	0.2	0.2	0.18	0.15	0.15	0.08	0.05

79 P11CC

SCRChk_rNOxDiffThresBasMinUs_GMAP

Injection Qty (mm^3/rev) / Engine Speed (rpm)	1100	1200	1300	1350	1400	1450	1500	1600	1650	2000
60	-0.69995117	-0.7	-0.7	-0.7	-0.7	-0.7	-0.7	-0.7	-0.7	-0.7
80	-0.69995117	-0.7	-0.7	-0.7	-0.47	-0.47	-0.47	-0.7	-0.7	-0.7
100	-0.32995605	-0.33	-0.4	-0.4399	-0.47	-0.47	-0.47	-0.7	-0.7	-0.7
120	-0.32995605	-0.33	-0.4	-0.4399	-0.47	-0.47	-0.47	-0.7	-0.7	-0.7
140	-0.32995605	-0.33	-0.39	-0.42	-0.4399	-0.4399	-0.4399	-0.7	-0.7	-0.7
160	-0.32995605	-0.33	-0.39	-0.42	-0.4	-0.4	-0.4	-0.7	-0.7	-0.7
180	-0.69995117	-0.7	-0.7	-0.7	-0.37	-0.37	-0.37	-0.7	-0.7	-0.7
200	-0.69995117	-0.7	-0.7	-0.7	-0.37	-0.37	-0.37	-0.7	-0.7	-0.7
220	-0.69995117	-0.7	-0.7	-0.7	-0.7	-0.7	-0.7	-0.7	-0.7	-0.7
240	-0.69995117	-0.7	-0.7	-0.7	-0.7	-0.7	-0.7	-0.7	-0.7	-0.7

80 P11CB, P11CC

SCRChk_stExhTempRlsUsPlaus_CUR

SCR Upstream Temp (°C)	-0.04	88.96
(-)	0	1

81 P11CB, P11CC

SCRChk_stInjCharNOxUsPlaus_CA

	0	1	2	3	4	5	6	7
Injection Pattern (-)	24	56	58	26	0	0	0	0

Table no. Fault Codes

Label (Internal Manufacturer Reference)

82 P20EE, P2BAD

SCRChk_stPOpSelEta1_MAP

Filetered Exh Mass Flow (g/s) / SCR Upstream Temp (°C)	219.96	239.96	244.96	249.96	254.96	259.96	264.96	269.96	274.96	279.96	284.96	289.96	294.96	299.96	314.96	329.96
61.11	0	0	0	1	1	1	1	1	1	1	1	0	0	0	0	0
69.44	0	0	0	1	1	1	1	1	1	1	1	0	0	0	0	0
77.78	0	0	0	1	1	1	1	1	1	1	1	0	0	0	0	0
86.11	0	0	0	1	1	1	1	1	1	1	1	0	0	0	0	0
94.44	0	0	0	1	1	1	1	1	1	1	1	0	0	0	0	C
102.78	0	0	0	1	1	1	1	1	1	1	1	0	0	0	0	0
111.11	0	0	0	1	1	1	1	1	1	1	1	0	0	0	0	C
119.44	0	0	0	1	1	1	1	1	1	1	1	0	0	0	0	0
127.78	0	0	0	1	1	1	1	1	1	1	1	0	0	0	0	0
136.11	0	0	0	1	1	1	1	1	1	1	1	0	0	0	0	C
144.44	0	0	0	1	1	1	1	1	1	1	1	0	0	0	0	C
152.78	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	C
161.11	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	C
169.44	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
177.78	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
186.11	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

84 P20EE, P2BAD

SCRChk_tDeltaTempSCRMax_CUR

Filtered SCR Temp (°C)	-50.04	249.96	289.96	294.96	304.96	399.96	499.96	999.96
Delta SCR Temp (°C)	29.96	39.96	39.96	59.96	59.96	29.96	29.96	29.96

85 P20EE, P2BAD

SCRChk_tiAddDisbl_MAP

Nox Peak Duration (s) / Nox Mass Flow (g/s)	0.05	0.1	0.15	0.2	0.25	0.3	0.35	0.4
	0 0	0	0	0	0.1	0.2	0.3	0.4
	0.3	0.3	0.3	0.3	0.5	1	1.5	2
	2 0.5	0.5	0.5	0.5	1	2	3	4
	1 1	1	1	1	2	4	6	8
	3 1.5	1.5	1.5	1.5	3	6	9	12
1	2.5	2.5	2.5	2.5	5	10	15	20
2	5 5	5	5	5	10	20	30	40
6) 5	5	5	15	30	60	90	120

86 P20BA

SCRPOD_tiUTnkTExpi_CUR

Reductant Tank Temp (°C)	-25.04	-20.04	-17.54	-15.94	-15.84	14.86	14.96	32.96
Tank Heater Activation Time (sec)	1000	1000	1200	1200	32767	32767	32767	32767

87 Engine Running

StSys_nStrtCutOut_MAP

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

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Table no. Fault Codes

Label (Internal Manufacturer Reference)

88 P2598, P2599 TrbCh_tiDiaEnblDly_CUR

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

89 P12B3, P12B4, P12B5, P12B6, P12B7, P12B8, P12B9, ZFC_stGearRls_CA P12BA, P12BB, P12BC, P12BD, P12BE, P12BF, P12C0, P12C1, P12C2

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

90 P12B3, P12B4, P12B5, P12B6, P12B7, P12B8, P12B9, ZFC_tiCldCham_CUR P12BA, P12BB, P12BC, P12BD, P12BE, P12BF, P12C0, P12C1, P12C2

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

Label (Internal Manufacturer Reference)

S3-12OBDG09-LGH_Specific - Calibration Tables

1 P111D

Air_tDiffMaxHiTAFS_CUR

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

2 P111D

Air_tDiffMaxLoTAFS_CUR

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

Label (Internal Manufacturer Reference)

Calibration Parameter Definition - Calibration Tables

Status and State Calibration Tables

1 Status of NOx signal of upstream NOx sensor DewDet_wThresLSU0_MAP

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

2 Status of NOx signal of downstream NOx sensor

DewDet_wThresLSU1_MAP

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

3 Status thermal regeneration active

PFltLd_dmSotSimRgnBas_CUR

DPF Soot Mass (g)	0	10	20	30	40	50	55	60	65	70	75	80
Mass Flow (g/s)	0.02	0.03	0.07	0.10	0.14	0.18	0.20	0.22	0.24	0.25	0.27	0.29

4 Status thermal regeneration active

PFltLd_facO2SimRgn_MAP

Exhaust Mass Flow (g/s) / Lambda (-)	1	1.2	1.35	1.5	2	2.5	3	25
0.00	0	0.62	0.98	1.26	1.91	2.31	2.58	3.78
2.78	0	0.65	1.02	1.32	2.00	2.42	2.70	3.96
5.56	0	0.65	1.02	1.32	2.00	2.42	2.70	3.96
8.33	0	0.65	1.02	1.32	2.00	2.42	2.70	3.96
11.11	0	0.69	1.07	1.39	2.10	2.54	2.83	4.00
13.89	0	0.69	1.07	1.39	2.10	2.54	2.83	4.00
25.00	0	0.69	1.07	1.39	2.10	2.54	2.83	4.00
36.11	0	0.73	1.14	1.48	2.24	2.71	3.02	4.00

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Table no. Fault Codes

Label (Internal Manufacturer Reference)

5 Status thermal regeneration active PFltLd_facTempSimRgn_CUR

Particulate Filter Surface Temp (°C)	49.96	199.96	299.96	499.96	524.96	549.96	574.96	599.96	624.96	649.96	674.96	699.96
Temperature Factor (-)	0	0	0	0.02	0.06	0.11	0.21	0.35	0.63	1.09	1.82	2.97

6 Rail Control - PCV Closed Loop Control Only Rail_dvolMeUnCtlUpLim_CUR

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

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

Engine Speed (rpm)	900	901	1200	1400	1600	1800	2000	4800
Injection Qty (mm ³ /rev)	400	60	60	60	12	12	12	12

8 Status of the SCR adaptation plausibility check active SCRAd_mNH3MinTrg_MAP

SCR Modeled Efficieny (-)/ SCR Temp (°C)	249.96	299.96	349.96	399.96	449.96	499.96
0	0	0	0	0.04	0.04	0.04
0.2	0	0	0	0.04	0.04	0.04
0.4	0	0	0	0.04	0.04	0.04
0.6	0	0	0	0.04	0.04	0.04
0.8	0	0	0	0.04	0.04	0.04
1	0	0	0	0.04	0.04	0.04

9 Overdosing detected

SCRAd_mNOxOvrMetPh3_CUR

SCR Avg. Temp (°C)	254.96	299.96	349.96	424.96
Nox Mass (g)	-0.6	-0.65	-0.8	-0.8

10 Status of the SCR adaptation plausibility check active SCRAd_stSpdLd_MAP

Engine Speed (rpm) / Injection Qty. (mm^3/rev)	0	80	100	120	160	200	240	280	320	360	400	480
600	0	0	0	1	1	1	1	1	1	1	1	1
800	0	0	0	1	1	1	1	1	1	1	1	1
900	1	1	1	1	1	1	1	1	1	1	1	1
1200	1	1	1	1	1	1	1	1	1	1	1	1
1400	1	1	1	1	1	1	1	1	1	1	1	1
1600	1	1	1	1	1	1	1	1	1	1	1	1
1800	1	1	1	1	1	1	1	1	1	1	1	1
2000	1	1	1	1	1	1	1	1	1	1	1	1
2200	1	1	1	1	1	1	1	1	1	1	1	1
2400	1	1	1	1	1	1	1	1	1	1	1	1
2800	1	1	1	1	1	1	1	1	1	1	1	1
3100	1	1	1	1	1	1	1	1	1	1	1	1

Table no. Fault Codes

Label (Internal Manufacturer Reference)

11 Request for pre controlled dosing

SCRFFC_stN	QntCurrH	li_MAP	

Engine Speed (rpm) / Injection Qty. (mm^3/rev)	0	40	60	80	120	160	200	240	280	320	400	480
600	0	0	0	0	0	0	100	100	100	100	100	100
1000	0	0	0	0	0	0	100	100	100	100	100	100
1200	0	0	0	0	0	0	100	100	100	100	100	100
1400	0	0	0	0	0	0	100	100	100	100	100	100
1600	0	0	0	0	0	0	0	100	100	100	100	100
1800	0	0	0	0	0	0	0	100	100	100	100	100
2000	0	0	0	0	0	0	0	100	100	100	100	100
2200	100	100	100	100	100	100	100	100	100	100	100	100
2400	100	100	100	100	100	100	100	100	100	100	100	100
2600	100	100	100	100	100	100	100	100	100	100	100	100
3000	100	100	100	100	100	100	100	100	100	100	100	100
3600	100	100	100	100	100	100	100	100	100	100	100	100

12 Request for pre controlled dosing

SCRFFC_stNQntCurrMid_MAP

Engine Speed (rpm) / Injection Qty. (mm^3/rev)	0	40	60	80	120	160	200	240	280	320	400	480
600	0	0	0	0	0	0	100	100	100	100	100	100
1000	0	0	0	0	0	0	100	100	100	100	100	100
1200	0	0	0	0	0	0	100	100	100	100	100	100
1400	0	0	0	0	0	0	100	100	100	100	100	100
1600	0	0	0	0	0	0	0	100	100	100	100	100
1800	0	0	0	0	0	0	0	100	100	100	100	100
2000	0	0	0	0	0	0	0	100	100	100	100	100
2200	100	100	100	100	100	100	100	100	100	100	100	100
2400	100	100	100	100	100	100	100	100	100	100	100	100
2600	100	100	100	100	100	100	100	100	100	100	100	100
3000	100	100	100	100	100	100	100	100	100	100	100	100
3600	100	100	100	100	100	100	100	100	100	100	100	100

13 Request for pre controlled dosing

SCRFFC_stNQntCurrSeaLvl_MAP

Engine Speed (rpm) / Injection Qty. (mm^3/rev)	0	40	60	80	120	160	200	240	280	320	400	480
600	0	0	0	0	0	0	100	100	100	100	100	100
1000	0	0	0	0	0	0	100	100	100	100	100	100
1200	0	0	0	0	0	0	100	100	100	100	100	100
1400	0	0	0	0	0	0	100	100	100	100	100	100
1600	0	0	0	0	0	0	0	100	100	100	100	100
1800	0	0	0	0	0	0	0	100	100	100	100	100
2000	0	0	0	0	0	0	0	100	100	100	100	100
2200	100	100	100	100	100	100	100	100	100	100	100	100
2400	100	100	100	100	100	100	100	100	100	100	100	100
2600	100	100	100	100	100	100	100	100	100	100	100	100
3000	100	100	100	100	100	100	100	100	100	100	100	100
3600	100	100	100	100	100	100	100	100	100	100	100	100

Look-Up Tables

Table no. Fault Codes

Label (Internal Manufacturer Reference)

14 Engine Running

StSys	nStrtCutOut	MAP

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

15 State of Reductant injection valve Component Protection UDC_tUDosVIvCoPrActv_MAP

Vehicle Speed (mph) / SCR Upstream Temp (°C)	99.96	199.96	299.96	399.96	499.96	599.96
0	104.96	104.96	104.96	104.96	103.96	100.96
12.5	114.96	114.96	114.96	113.96	107.96	102.96
31.25	114.96	114.96	114.96	114.96	111.96	104.96
37.5	114.96	114.96	114.96	114.96	114.96	111.96
62.5	114.96	114.96	114.96	114.96	114.96	111.96
93.75	114.96	114.96	114.96	114.96	114.96	111.96

16 Release of tank heater circuit

UHC_tiC1Dfrst_CUR

Reductant Tank Temp. (°C)	-35.04	-25.04	-18.04	-9.04	-8.04	-5.04	9.96	19.96
Reductant Heater Time (sec)	14400	5400	3300	2700	600	300	5	0

17 Release of tank heater circuit

UHC_tiC1On_CUR

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

18 Release of tank heater circuit

UHC_tiDfrstC2_CUR

Reductant Tank Temp. (°C)	-35.04	-25.04	-18.04	-9.04	-8.04	-5.04	-0.14	-0.04
Reductant Heater Time (sec)	3276.7	3276.7	3276.7	2700	600	300	200	0

19 Release of tank heater circuit

UHC_tiDfrstC3_CUR

Reductant Tank Temp. (°C)	-35.04	-25.04	-18.04	-9.04	-8.04	-5.04	-0.14	-0.04
Reductant Heater Time (sec)	3276.7	3276.7	3276.7	2700	600	300	200	0

20 Release of tank heater circuit

UHC_tiOnC2_CUR

Reductant Tank Temp. (°C)	-30.04	-18.04	-15.04	-11.04	-7.04	-0.04	4.96	5.06
Reductant Heater Time (sec)	3276.7	3276.7	3276.7	3276.7	600	300	10	0

21 Release of tank heater circuit

UHC_tiOnC3_CUR

Reductant Tank Temp. (°C)	-30.04	-18.04	-15.04	-11.04	-7.04	-0.04	4.96	5.06
Reductant Heater Time (sec)	3276.7	3276.7	3276.7	3276.7	600	300	10	0

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This document is intended to meet the requirements documented in section 1968.2 of Title 13, California Code of Regulations entitled Modifications to Malfunction and Diagnosis System Requirements for 2004 and Subsequent Model-Year Passenger Cars, Light-Duty Trucks, and Medium-Duty Vehicles and Engines (OBD II), paragraphs (i)(2.2) for a table detailing supplemental calibration parameter data for OBD II Group 12OBDG09.

Inhibit Matrix for Diagnostic System Manager

Revised 1/21/2011 SW Step V040 - 99%

Active DTC				Inhibited DTCs					
P0016 - Crankshaft to Camshaft Correlation	P0191 - Fuel Rail Pressure Sensor Performance	P0315 - Crankshaft Position System Variation Not Learned							-
P0045 - Turbocharger Boost Control Circuit	P0234 - Turbocharger Engine Overboost	P0299 - Turbocharger Engine Underboost	P0401 - Exhaust Gas Recirculation Flow Insufficient	P0402 - Exhaust Gas Recirculation Flow Excessive]				
P0047 - Turbocharger Boost Control Circuit Low Voltage	P0234 - Turbocharger Engine Overboost	P0299 - Turbocharger Engine	P0401 - Exhaust Gas Recirculation	P0402 - Exhaust Gas Recirculation	1				
P0048 - Turbocharger Boost Control Circuit High Voltage	P0234 - Turbocharger Engine	P0299 - Turbocharger Engine	P0401 - Exhaust Gas Recirculation	P0402 - Exhaust Gas Recirculation	1				
P006E - Turbocharger Boost High	P0234 - Turbocharger Engine	P0299 - Turbocharger Engine	P0401 - Exhaust Gas Recirculation	P0402 - Exhaust Gas Recirculation					
P006F - Turbocharger Boost High Control Circuit High Voltage	P0234 - Turbocharger Engine Overboost	P0299 - Turbocharger Engine Underboost	P0401 - Exhaust Gas Recirculation Flow Insufficient	P0402 - Exhaust Gas Recirculation Flow Excessive	P2510 - ECM Power Relay Circuit Performance				
P007C - CAC Temperature	P0234 - Turbocharger Engine	P0299 - Turbocharger Engine	P0401 - Exhaust Gas Recirculation	P0402 - Exhaust Gas Recirculation	P2080 - Exhaust Temperature	P2084 - Exhaust Temperature	P242B - Exhaust Temperature Sensor 3 Performance	P246F - Exhaust Temperature]
P007D - CAC Temperature	P0234 - Turbocharger Engine	P0299 - Turbocharger Engine	P0401 - Exhaust Gas Recirculation	P0402 - Exhaust Gas Recirculation	P2080 - Exhaust Temperature	P2084 - Exhaust Temperature	P242B - Exhaust Temperature	P246F - Exhaust Temperature	
P008F - Engine Coolant Temperature (ECT)-Fuel Temperature Not Plausible	P0101 - Mass Air Flow Sensor Performance	Underboost	Plow insufficient	Flow Excessive	Sensor i Penormance	Sensor 2 Penormance	Sensor 3 Penormance	Sensor 4 Penormance	1
P0097 - Intake Air Temperature Sensor 2 Circuit Low	P2080 - Exhaust Temperature Sensor 1 Performance	P2084 - Exhaust Temperature Sensor 2 Performance	P242B - Exhaust Temperature Sensor 3 Performance	P246F - Exhaust Temperature Sensor 4 Performance	1				
P0098 - Intake Air Temperature	P2080 - Exhaust Temperature	P2084 - Exhaust Temperature	P242B - Exhaust Temperature	P246F - Exhaust Temperature	1				
P00CA - Fuel Pressure Regulator 1 High Control Circuit High Voltage	P2510 - ECM Power Relay Circuit Performance	Sensor 2 Performance	Sensor 3 Performance	Sensor 4 Performance					
P0101 - Mass Air Flow Sensor	P0401 - Exhaust Gas Recirculation Flow Insufficient	P0402 - Exhaust Gas Recirculation Flow Excessive	P11CB - NOx Sensor Performance - Signal High Bank 1 Sensor 1	P11CC - NOx Sensor Performance - Signal Low Bank 1 Sensor 1	P2002 - Diesel Particulate Filter (DPF) Low Efficiency	P2080 - Exhaust Temperature Sensor 1 Performance	P2084 - Exhaust Temperature Sensor 2 Performance	P242B - Exhaust Temperature Sensor 3 Performance	P2453 - Diesel Particulate Filter Differential Pressure Sensor Performance
Performance	P2459 - Diesel Particulate Filter Regeneration Frequency	P246F - Exhaust Temperature Sensor 4 Performance	P249D - Closed Loop Reductant Injection Control At Limit - Flow Too Low	P249E - Closed Loop Reductant Injection Control At Limit - Flow Too High					
P0102 - Mass Air Flow Sensor Circuit Low	P0101 - Mass Air Flow Sensor Performance	P0234 - Turbocharger Engine Overboost	P0299 - Turbocharger Engine Underboost	P0401 - Exhaust Gas Recirculation Flow Insufficient	P0402 - Exhaust Gas Recirculation Flow Excessive	P2080 - Exhaust Temperature Sensor 1 Performance	P2084 - Exhaust Temperature Sensor 2 Performance	P242B - Exhaust Temperature Sensor 3 Performance	P246F - Exhaust Temperature Sensor 4 Performance
P0103 - Mass Air Flow Sensor Circuit High	P0101 - Mass Air Flow Sensor Performance	P0234 - Turbocharger Engine Overboost	P0299 - Turbocharger Engine Underboost	P0401 - Exhaust Gas Recirculation Flow Insufficient	P0402 - Exhaust Gas Recirculation Flow Excessive	P2080 - Exhaust Temperature Sensor 1 Performance	P2084 - Exhaust Temperature Sensor 2 Performance	P242B - Exhaust Temperature Sensor 3 Performance	P246F - Exhaust Temperature Sensor 4 Performance
P0106 - Manifold Absolute Pressure Sensor Performance	P0101 - Mass Air Flow Sensor Performance	P0234 - Turbocharger Engine Overboost	P0299 - Turbocharger Engine Underboost	P0401 - Exhaust Gas Recirculation Flow Insufficient	P0402 - Exhaust Gas Recirculation Flow Excessive		• • • • • • • • •	• • • • • • • • • •	• • • • • • • • •
P0107 - Manifold Absolute Pressure (MAP) Sensor Circuit	P0101 - Mass Air Flow Sensor Performance	P0106 - Manifold Absolute Pressure Sensor Performance	P0234 - Turbocharger Engine Overboost	P0299 - Turbocharger Engine Underboost	P0401 - Exhaust Gas Recirculation Flow Insufficient	P0402 - Exhaust Gas Recirculation Flow Excessive	P2080 - Exhaust Temperature Sensor 1 Performance	P2084 - Exhaust Temperature Sensor 2 Performance	P2263 - Turbo Boost System Performance
Low Voltage	P242B - Exhaust Temperature Sensor 3 Performance	P246F - Exhaust Temperature Sensor 4 Performance							
P0108 - Manifold Absolute Pressure (MAP) Sensor Circuit	P0101 - Mass Air Flow Sensor Performance	P0106 - Manifold Absolute Pressure Sensor Performance	P0234 - Turbocharger Engine Overboost	P0299 - Turbocharger Engine Underboost	P0401 - Exhaust Gas Recirculation Flow Insufficient	P0402 - Exhaust Gas Recirculation Flow Excessive	P2080 - Exhaust Temperature Sensor 1 Performance	P2084 - Exhaust Temperature Sensor 2 Performance	P2263 - Turbo Boost System Performance
High Voltage	P242B - Exhaust Temperature Sensor 3 Performance	P246F - Exhaust Temperature Sensor 4 Performance							
P0112 - Intake Air Temperature Sensor 1 Circuit Low	P0101 - Mass Air Flow Sensor Performance	P0401 - Exhaust Gas Recirculation Flow Insufficient	P0402 - Exhaust Gas Recirculation Flow Excessive	P040F - Exhaust Gas Recirculation (EGR) Temperature Sensor 1-2 Correlation	P2080 - Exhaust Temperature Sensor 1 Performance	P2084 - Exhaust Temperature Sensor 2 Performance	P20E2 - Exhaust Gas Temperature (EGT) Sensors 1-2 not plausible	P242B - Exhaust Temperature Sensor 3 Performance	P246F - Exhaust Temperature Sensor 4 Performance
P0113 - Intake Air Temperature Sensor 1 Circuit High	P0101 - Mass Air Flow Sensor Performance	P0401 - Exhaust Gas Recirculation Flow Insufficient	P0402 - Exhaust Gas Recirculation Flow Excessive	P040F - Exhaust Gas Recirculation (EGR) Temperature Sensor 1-2 Correlation	P2080 - Exhaust Temperature Sensor 1 Performance	P2084 - Exhaust Temperature Sensor 2 Performance	P20E2 - Exhaust Gas Temperature (EGT) Sensors 1-2 not plausible	P242B - Exhaust Temperature Sensor 3 Performance	P246F - Exhaust Temperature Sensor 4 Performance
	P0106 - Manifold Absolute Pressure Sensor Performance	P0191 - Fuel Rail Pressure Sensor Performance	P0234 - Turbocharger Engine Overboost	P0263 - Cly 1 Balance System	P0266 - Cly 2 Balance System	P0269 - Cly 3 Balance System	P0272 - Cly 4 Balance System	P0275 - Cly 5 Balance System	P0278 - Cly 6 Balance System
P0117 - Engine Coolant	P0281 - Cly 7 Balance System	P0284 - Cly 8 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	P0305 - Cylinder 5 Misfire Detect
Temperature Sensor Circuit Low	P0306 - Cylinder 6 Misfire Detected	P0307 - Cylinder 7 Misfire Detected	P0308 - Cylinder 8 Misfire Detected	P0401 - Exhaust Gas Recirculation Flow Insufficient	P0402 - Exhaust Gas Recirculation Flow Excessive	P0506 - Idle Speed Low	P0507 - Idle Speed High	P2080 - Exhaust Temperature Sensor 1 Performance	P2084 - Exhaust Temperature Sensor 2 Performance
	P242B - Exhaust Temperature Sensor 3 Performance	P246F - Exhaust Temperature Sensor 4 Performance							
	P0106 - Manifold Absolute Pressure	P0191 - Fuel Rail Pressure Sensor Performance	P0234 - Turbocharger Engine	P0263 - Cly 1 Balance System	P0266 - Cly 2 Balance System	P0269 - Cly 3 Balance System	P0272 - Cly 4 Balance System	P0275 - Cly 5 Balance System	P0278 - Cly 6 Balance System
P0118 - Engine Coolant	P0281 - Cly 7 Balance System	P0284 - Cly 8 Balance System	P0299 - Turbocharger Engine Underboost	P0300 - Engine Misfire Detected	P0301 - Cylinder 1 Misfire Detected		L	L	J
Temperature Sensor Circuit High	P0302 - Cylinder 2 Misfire Detected	P0303 - Cylinder 3 Misfire Detected	P0304 - Cylinder 4 Misfire Detected	P0305 - Cylinder 5 Misfire Detected	P0306 - Cylinder 6 Misfire Detected	P0307 - Cylinder 7 Misfire Detected	P0308 - Cylinder 8 Misfire Detected	P0401 - Exhaust Gas Recirculation Flow Insufficient	P0402 - Exhaust Gas Recirculation Flow Excessive
	P0506 - Idle Speed Low	P0507 - Idle Speed High	P2080 - Exhaust Temperature Sensor 1 Performance	P2084 - Exhaust Temperature Sensor 2 Performance	P242B - Exhaust Temperature Sensor 3 Performance	P246F - Exhaust Temperature Sensor 4 Performance			1
P0128 - Engine Coolant Temperature Below Thermostat Regulating Temperature	P0101 - Mass Air Flow Sensor Performance		Sensor Frenomiance	Genaul 2 r enormance	Sensor 9 r enormance	Genaor 4 renormance	1		
P0192 - Fuel Rail Pressure	P0191 - Fuel Rail Pressure Sensor	1							
P0193 - Fuel Rail Pressure	P0191 - Fuel Rail Pressure Sensor	1							
P0234 - Turbocharger Engine	Performance P11CB - NOx Sensor Performance -	P11CC - NOx Sensor Performance -							
Overboost	Signal High Bank 1 Sensor 1	Signal Low Bank 1 Sensor 1							

Inhibit Tables

Active DTC				Inhibited DTCs					
P0299 - Turbocharger Engine	P11CB - NOx Sensor Performance -	P11CC - NOx Sensor Performance -							•
Underboost	Signal High Bank 1 Sensor 1	Signal Low Bank 1 Sensor 1		1	P122D Dissel Intake Air Flow	1	1		
P02E0 - Intake Air Flow Valve Control Circuit	P0234 - Turbocharger Engine Overboost	P0299 - Turbocharger Engine Underboost	P0401 - Exhaust Gas Recirculation Flow Insufficient	P0402 - Exhaust Gas Recirculation Flow Excessive	Position Sensor Exceeded Learning Limit	P2510 - ECM Power Relay Circuit Performance			
P02E7 - Diesel Intake Air Flow Position Sensor Circuit Range Performance	P0401 - Exhaust Gas Recirculation Flow Insufficient	P0402 - Exhaust Gas Recirculation Flow Excessive							
P02E8 - Diesel Intake Air Flow Position Sensor Circuit Low	P0234 - Turbocharger Engine Overboost	P0299 - Turbocharger Engine Underboost	P0401 - Exhaust Gas Recirculation Flow Insufficient	P0402 - Exhaust Gas Recirculation Flow Excessive	P122D - Diesel Intake Air Flow Position Sensor Exceeded Learning Limit	P2080 - Exhaust Temperature Sensor 1 Performance	P2084 - Exhaust Temperature Sensor 2 Performance	P242B - Exhaust Temperature Sensor 3 Performance	P246F - Exhaust Temperature Sensor 4 Performance
P02E9 - Diesel Intake Air Flow Position Sensor Circuit High	P0234 - Turbocharger Engine Overboost	P0299 - Turbocharger Engine Underboost	P0401 - Exhaust Gas Recirculation Flow Insufficient	P0402 - Exhaust Gas Recirculation Flow Excessive	P122D - Diesel Intake Air Flow Position Sensor Exceeded Learning	P2080 - Exhaust Temperature Sensor 1 Performance	P2084 - Exhaust Temperature Sensor 2 Performance	P242B - Exhaust Temperature Sensor 3 Performance	P246F - Exhaust Temperature Sensor 4 Performance
P02EB - Intake Air Flow Valve Control Motor Current Performance	P0234 - Turbocharger Engine Overboost	P0299 - Turbocharger Engine Underboost	P0401 - Exhaust Gas Recirculation Flow Insufficient	P0402 - Exhaust Gas Recirculation Flow Excessive	P122D - Diesel Intake Air Flow Position Sensor Exceeded Learning				•
P0335 - Crankshaft Position	P0102 - Mass Air Flow Sensor Circui	t P0103 - Mass Air Flow Sensor Circuit	P0191 - Fuel Rail Pressure Sensor	P0315 - Crankshaft Position System	P0506 - Idle Speed Low	P0507 - Idle Speed High	1		
Sensor Circuit P0336 - Crankshaft Position	Low P0102 - Mass Air Flow Sensor Circui	High tl P0103 - Mass Air Flow Sensor Circuit	Performance P0191 - Fuel Rail Pressure Sensor	Variation Not Learned P0315 - Crankshaft Position System					
Sensor Performance	Low	High	Performance	Variation Not Learned	P0506 - Idle Speed Low	P0507 - Idle Speed High			
P0340 - Camshaft Position Sensor Circuit	P0191 - Fuel Rail Pressure Sensor Performance	P0315 - Crankshaft Position System Variation Not Learned							
P0341 - Camshaft Position Sensor	P0191 - Fuel Rail Pressure Sensor	P0315 - Crankshaft Position System							
Performance P0400 - Exhaust Gas	Performance	Variation Not Learned	P249D - Closed Loop Reductant	P249F - Closed Loop Reductant	1				
Recirculation (EGR) Flow Incorrect	P11CB - NOx Sensor Performance - Signal High Bank 1 Sensor 1	 P11CC - NOx Sensor Performance - Signal Low Bank 1 Sensor 1 	Injection Control At Limit - Flow Too Low	Injection Control At Limit - Flow Too High		I	1	D240D Classed Lass Badustant	D2405 Classed Lass Deductort
P0401 - Exhaust Gas Recirculation Flow Insufficient	P11CB - NOx Sensor Performance - Signal High Bank 1 Sensor 1	P11CC - NOx Sensor Performance - Signal Low Bank 1 Sensor 1	P2080 - Exhaust Temperature Sensor 1 Performance	P2084 - Exhaust Temperature Sensor 2 Performance	P242B - Exhaust Temperature Sensor 3 Performance	P2459 - Diesel Particulate Filter Regeneration Frequency	P246F - Exhaust Temperature Sensor 4 Performance	Injection Control At Limit - Flow Too Low	Injection Control At Limit - Flow Too High
P0402 - Exhaust Gas Recirculation Flow Excessive	P11CB - NOx Sensor Performance - Signal High Bank 1 Sensor 1	P11CC - NOx Sensor Performance - Signal Low Bank 1 Sensor 1	P2080 - Exhaust Temperature Sensor 1 Performance	P2084 - Exhaust Temperature Sensor 2 Performance	P242B - Exhaust Temperature Sensor 3 Performance	P2459 - Diesel Particulate Filter Regeneration Frequency	P246F - Exhaust Temperature Sensor 4 Performance	P249D - Closed Loop Reductant Injection Control At Limit - Flow Too Low	P249E - Closed Loop Reductant Injection Control At Limit - Flow Too High
P0403 - Exhaust Gas Recirculation (EGR) Motor Control	P0101 - Mass Air Flow Sensor Performance	P0234 - Turbocharger Engine Overboost	P0299 - Turbocharger Engine Underboost	P0401 - Exhaust Gas Recirculation Flow Insufficient	P0402 - Exhaust Gas Recirculation Flow Excessive	P049D - EGR Control Position Not Learned	P2080 - Exhaust Temperature Sensor 1 Performance	P2084 - Exhaust Temperature Sensor 2 Performance	P242B - Exhaust Temperature Sensor 3 Performance
Circuit	P246F - Exhaust Temperature Sensor 4 Performance	P2510 - ECM Power Relay Circuit Performance						1	
Recirculation Position Sensor Circuit Low	P0401 - Exhaust Gas Recirculation Flow Insufficient	P0402 - Exhaust Gas Recirculation Flow Excessive	P049D - EGR Control Position Not Learned	P2080 - Exhaust Temperature Sensor 1 Performance	P2084 - Exhaust Temperature Sensor 2 Performance	P242B - Exhaust Temperature Sensor 3 Performance	P246F - Exhaust Temperature Sensor 4 Performance		
P0406 - Exhaust Gas Recirculation Position Sensor Circuit High	P0401 - Exhaust Gas Recirculation Flow Insufficient	P0402 - Exhaust Gas Recirculation Flow Excessive	P049D - EGR Control Position Not Learned	P2080 - Exhaust Temperature Sensor 1 Performance	P2084 - Exhaust Temperature Sensor 2 Performance	P242B - Exhaust Temperature Sensor 3 Performance	P246F - Exhaust Temperature Sensor 4 Performance		
P040C - Exhaust Gas Recirculation (EGR) Temperature Sensor 2 Circuit Low Voltage	P040F - Exhaust Gas Recirculation (EGR) Temperature Sensor 1-2 Correlation								
P040D - Exhaust Gas Recirculation (EGR) Temperature Sensor 2 Circuit High Voltage	P040F - Exhaust Gas Recirculation (EGR) Temperature Sensor 1-2 Correlation								
P041C - Exhaust Gas Recirculation (EGR) Temperature Sensor 1 Circuit Low Voltage	P040F - Exhaust Gas Recirculation (EGR) Temperature Sensor 1-2 Correlation								
P041D - Exhaust Gas Recirculation (EGR) Temperature Sensor 1 Circuit High Voltage	P040F - Exhaust Gas Recirculation (EGR) Temperature Sensor 1-2 Correlation								
P0420 - NMHC Catalyst Efficiency Below Threshold Bank 1	P249D - Closed Loop Reductant Injection Control At Limit - Flow Too Low	P249E - Closed Loop Reductant Injection Control At Limit - Flow Too High						_	
P046C - Exhaust Gas Recirculation(EGR) Position Sensor Performance	P0101 - Mass Air Flow Sensor Performance	P0234 - Turbocharger Engine Overboost	P0299 - Turbocharger Engine Underboost	P2080 - Exhaust Temperature Sensor 1 Performance	P2084 - Exhaust Temperature Sensor 2 Performance	P242B - Exhaust Temperature Sensor 3 Performance	P246F - Exhaust Temperature Sensor 4 Performance		
P0545 - Exhaust Gas Temperature (EGT) Sensor 1 Circuit Low Voltage	P2080 - Exhaust Temperature Sensor 1 Performance	P2084 - Exhaust Temperature Sensor 2 Performance	P20E2 - Exhaust Gas Temperature (EGT) Sensors 1-2 not plausible	P2428 - Exhaust Gas High Temperature					
P0546 - Exhaust Gas Temperature (EGT) Sensor 1 Circuit High Voltage	P2080 - Exhaust Temperature Sensor 1 Performance	P2084 - Exhaust Temperature Sensor 2 Performance	P20E2 - Exhaust Gas Temperature (EGT) Sensors 1-2 not plausible	P2428 - Exhaust Gas High Temperature					
P0575 - Cruise Control Input Circuit	P0567 - Cruise Control Resume Switch Circuit	P0568 - Cruise Control Set Switch Circuit							
P057C - Brake Pedal Position	P057D - Brake Pedal Position								
Sensor Circuit High Voltage P057D - Brake Pedal Position	Sensor Circuit Low Voltage P057C - Brake Pedal Position	4							
Sensor Circuit Low Voltage	Sensor Circuit High Voltage				-				
P0606 - Control Module Internal Performance	P2146 - Injector Positive Voltage Control Circuit Group 1	P2149 - Injector Positive Voltage Control Circuit Group 2	P2152 - Injector Positive Voltage Control Circuit Group 3	P2155 - Injector Positive Voltage Control Circuit Group 4					
P064C - Glow Plug Control Module Performance	P11DB - NOx Sensor Current Performance Bank 1 Sensor 1	P2209 - N0x Heater Performance Bank 1 Sensor 1	Control Circuit Circuit Circuit	Sonadi Groat Groap 1	1				
P0651 - 5 Volt Reference 2 Circuit	P2127 - Accelerator Pedal Position Sensor 2 Circuit Low	P2128 - Accelerator Pedal Position (APP) Sensor 2 Circuit High Voltage							
P0697 - 5 Volt Reference 3 Circuit	P2122 - Accelerator Pedal Position Sensor 1 Circuit Low	P2123 - Accelerator Pedal Position Sensor 1 Circuit High]						
P0851 - Park/Neutral Position (PNP) Switch Circuit Low Voltage	P0852 - Park/Neutral Position (PNP) Switch Circuit High Voltage	-							
P0852 - Park/Neutral Position (PNP) Switch Circuit High Voltage	P0851 - Park/Neutral Position (PNP) Switch Circuit Low Voltage	<u>'</u>							

Active DTC				Inhibited DTCs		
P1044 - Reductant Pump High Control Circuit High Voltage	P2510 - ECM Power Relay Circuit Performance		-			
P1046 - Reductant Purge Valve High Control Circuit High Voltage	P2510 - ECM Power Relay Circuit Performance					
P1048 - Reductant Injector High Control Circuit Low Voltage	P202E - Reductant Injector Performance		_			
P1049 - Reductant Injector High Control Circuit High Voltage	P202E - Reductant Injector Performance	P2510 - ECM Power Relay Circuit Performance				
P10CE - Exhaust Aftertreatment Fuel Injector High Control Circuit High Voltage	P2510 - ECM Power Relay Circuit Performance					
P111C - Charge Air Cooler Temperature-Intake Air Temperature (IAT) Sensor 2 Not Plausible	P0101 - Mass Air Flow Sensor Performance	P2080 - Exhaust Temperature Sensor 1 Performance	P2084 - Exhaust Temperature Sensor 2 Performance	P242B - Exhaust Temperature Sensor 3 Performance	P246F - Exhaust Temperature Sensor 4 Performance	
P112A - Intake Air Temperature (IAT) Sensor 1 - Fuel Temperature Sensor 1 Not Plausible	P0101 - Mass Air Flow Sensor Performance	P2080 - Exhaust Temperature Sensor 1 Performance	P2084 - Exhaust Temperature Sensor 2 Performance	P242B - Exhaust Temperature Sensor 3 Performance	P246F - Exhaust Temperature Sensor 4 Performance	
P113A - Exhaust Gas Temperature Sensors 3-4 Not Plausible	P242B - Exhaust Temperature Sensor 3 Performance	P246F - Exhaust Temperature Sensor 4 Performance				
P11DB - NOx Sensor Current Performance Bank 1 Sensor 1	P249D - Closed Loop Reductant Injection Control At Limit - Flow Too Low	P249E - Closed Loop Reductant Injection Control At Limit - Flow Too High				
P11DC - NOx Sensor Current Performance Bank 1 Sensor 2	P249D - Closed Loop Reductant Injection Control At Limit - Flow Too Low	P249E - Closed Loop Reductant Injection Control At Limit - Flow Too High				
P1224 - Injector 1 Control Circuit Shorted	P0201 - Injector 1 Control Circuit	P0606 - Control Module Internal Performance	P2146 - Injector Positive Voltage Control Circuit Group 1			
P1227 - Injector 2 Control Circuit Shorted	P0202 - Injector 2 Control Circuit	P0606 - Control Module Internal Performance	P2152 - Injector Positive Voltage Control Circuit Group 3			
P122A - Injector 3 Control Circuit Shorted	P0203 - Injector 3 Control Circuit	P0606 - Control Module Internal Performance	P2155 - Injector Positive Voltage Control Circuit Group 4		I	
Position Sensor Exceeded Learning Limit	P0234 - Turbocharger Engine Overboost	P0299 - Turbocharger Engine Underboost	P0401 - Exhaust Gas Recirculation Flow Insufficient	P0402 - Exhaust Gas Recirculation Flow Excessive		
P1233 - Injector 4 Control Circuit Shorted	P0204 - Injector 4 Control Circuit	P0606 - Control Module Internal Performance	Control Circuit Group 1			
P1236 - Injector 5 Control Circuit Shorted	P0205 - Injector 5 Control Circuit	P0606 - Control Module Internal Performance	P2152 - Injector Positive Voltage Control Circuit Group 3			
P1239 - Injector 8 Control Circuit Shorted	P0206 - Injector 6 Control Circuit	P0606 - Control Module Internal Performance	Control Circuit Group 2			
P1242 - Injector 7 Control Circuit Shorted	P0207 - Injector 7 Control Circuit	P0606 - Control Module Internal Performance	Control Circuit Group 2			
P1247 - Injector 8 Control Circuit Shorted	P0208 - Injector 8 Control Circuit	Poblo - Control Module Internal Performance	Control Circuit Group 4			
2 High Control Circuit High Voltage	P2510 - ECM Power Relay Circuit Performance					
P140B - Exhaust Gas Recirculation Slow Response- Increasing Flow	P11CB - NOx Sensor Performance - Signal High Bank 1 Sensor 1	P11CC - NOx Sensor Performance - Signal Low Bank 1 Sensor 1	P249D - Closed Loop Reductant Injection Control At Limit - Flow Too Low	P249E - Closed Loop Reductant Injection Control At Limit - Flow Too High		
P140C - Exhaust Gas Recirculation Slow Response- Decreasing Flow	P11CB - NOx Sensor Performance - Signal High Bank 1 Sensor 1	P11CC - NOx Sensor Performance - Signal Low Bank 1 Sensor 1	P249D - Closed Loop Reductant Injection Control At Limit - Flow Too Low	P249E - Closed Loop Reductant Injection Control At Limit - Flow Too High		
P140F - Exhaust Gas Recirculation (EGR) Motor Current Performance	P0101 - Mass Air Flow Sensor Performance	P0234 - Turbocharger Engine Overboost	P0299 - Turbocharger Engine Underboost	P0401 - Exhaust Gas Recirculation Flow Insufficient	P0402 - Exhaust Gas Recirculation Flow Excessive	P049D - EGR Control Position Not Learned
P1414 - Exhaust Gas Recirculation (EGR) Cooler Bypass Valve Current Performance	P0401 - Exhaust Gas Recirculation Flow Insufficient	P0402 - Exhaust Gas Recirculation Flow Excessive	P140A - EGR Cooler BY Pass Position Sensor Exceded Learning Limit			
P163C - Glow Plug Control Module Primary Circuit	P11DB - NOx Sensor Current Performance Bank 1 Sensor 1	P2209 - N0x Heater Performance Bank 1 Sensor 1				
P16A0 - Throttle Sensor Communication Circuit Low Voltage	P0401 - Exhaust Gas Recirculation Flow Insufficient	P0402 - Exhaust Gas Recirculation Flow Excessive	P122D - Diesel Intake Air Flow Position Sensor Exceeded Learning Limit			
P16A1 - Throttle Sensor Communication Circuit High Voltage	P0401 - Exhaust Gas Recirculation Flow Insufficient	P0402 - Exhaust Gas Recirculation Flow Excessive	P122D - Diesel Intake Air Flow Position Sensor Exceeded Learning Limit			
P16A2 - Throttle Sensor Communication Circuit Performance	P0401 - Exhaust Gas Recirculation Flow Insufficient	P0402 - Exhaust Gas Recirculation Flow Excessive	P122D - Diesel Intake Air Flow Position Sensor Exceeded Learning Limit			
P2002 - Diesel Particulate Filter (DPF) Low Efficiency	P2459 - Diesel Particulate Filter Regeneration Frequency			-		_
P2032 - Exhaust Gas Temperature (EGT) Sensor 2 Circuit Low Voltage	P2080 - Exhaust Temperature Sensor 1 Performance	P2084 - Exhaust Temperature Sensor 2 Performance	P20E2 - Exhaust Gas Temperature (EGT) Sensors 1-2 not plausible	P2428 - Exhaust Gas High Temperature	P242B - Exhaust Temperature Sensor 3 Performance	
P2033 - Exhaust Gas Temperature (EGT) Sensor 2 Circuit High Voltage	P2080 - Exhaust Temperature Sensor 1 Performance	P2084 - Exhaust Temperature Sensor 2 Performance	P20E2 - Exhaust Gas Temperature (EGT) Sensors 1-2 not plausible	P2428 - Exhaust Gas High Temperature	P242B - Exhaust Temperature Sensor 3 Performance	
P2047 - Reductant Injector Control Circuit	P202E - Reductant Injector Performance					
P2048 - Reductant Injector Control Circuit Low Voltage	P202E - Reductant Injector Performance					
P2049 - Reductant Injector Control Circuit High Voltage	P202E - Reductant Injector Performance	P2510 - ECM Power Relay Circuit Performance				
P204B - Reductant Pump Pressure Sensor Performance	P204F - Reductant System Performance Bank 1 (cannot build pump pressure)	P20E8 - Reductant Pressure Too Low	P20E9 - Reductant Pressure Too High			
P204C - Reductant Pump Pressure Sensor Circuit Low	P204B - Reductant Pump Pressure Sensor Performance	P20A1 - Reductant Purge Valve Performance		-		
P204D - Reductant Pump Pressure Sensor Circuit High	P204B - Reductant Pump Pressure Sensor Performance	P20A1 - Reductant Purge Valve				

Inhibit Tables

Active DTC				Inhibited DTCs				
P205C - Reductant Tank Temperature Sensor Circuit Low	P20BA - Reductant Heater 1 Performance							
P205D - Reductant Tank Temperature Sensor Circuit High	P205B - Reductant Tank Temperature Sensor Performance	P20BA - Reductant Heater 1 Performance						
P208A - Reductant Pump Control Circuit	P204F - Reductant System Performance Bank 1 (cannot build pump pressure)	P20A1 - Reductant Purge Valve Performance	P20E8 - Reductant Pressure Too Low	P20E9 - Reductant Pressure Too High				
P208D - Reductant Pump Control Circuit High Voltage	P204F - Reductant System Performance Bank 1 (cannot build pump pressure)	P20A1 - Reductant Purge Valve Performance	P20E8 - Reductant Pressure Too Low	P20E9 - Reductant Pressure Too High	P2510 - ECM Power Relay Circuit Performance			
P20A0 - Reductant Purge Valve Control Circuit	P204F - Reductant System Performance Bank 1 (cannot build pump pressure)	P20A1 - Reductant Purge Valve Performance	P20E8 - Reductant Pressure Too Low	P20E9 - Reductant Pressure Too High				
P20A2 - Reductant Purge Valve Control Circuit Low Voltage	P204F - Reductant System Performance Bank 1 (cannot build pump pressure)	P20A1 - Reductant Purge Valve Performance	P20E8 - Reductant Pressure Too Low	P20E9 - Reductant Pressure Too High				
P20A3 - Reductant Purge Valve Control Circuit High Voltage	P204F - Reductant System Performance Bank 1 (cannot build pump pressure)	P20A1 - Reductant Purge Valve Performance	P20E8 - Reductant Pressure Too Low	P20E9 - Reductant Pressure Too High	P2510 - ECM Power Relay Circuit Performance			
P20CB - Exhaust Aftertreatment Fuel Injector Control Circuit	P2510 - ECM Power Relay Circuit Performance							
P20CE - Exhaust Aftertreatment Fuel Injector Control Circuit High Voltage	P2510 - ECM Power Relay Circuit Performance							
P20E2 - Exhaust Gas Temperature (EGT) Sensors 1-2 not plausible	P0101 - Mass Air Flow Sensor Performance	P2080 - Exhaust Temperature Sensor 1 Performance	P2084 - Exhaust Temperature Sensor 2 Performance	P242B - Exhaust Temperature Sensor 3 Performance	P246F - Exhaust Temperature Sensor 4 Performance			
P2122 - Accelerator Pedal Position Sensor 1 Circuit Low	P2138 - Accelerator Pedal Position (APP) Sensor 1-2 Correlation							
P2123 - Accelerator Pedal Position Sensor 1 Circuit High	P2138 - Accelerator Pedal Position (APP) Sensor 1-2 Correlation							
P2127 - Accelerator Pedal Position Sensor 2 Circuit Low	P2138 - Accelerator Pedal Position (APP) Sensor 1-2 Correlation							
P2128 - Accelerator Pedal Position (APP) Sensor 2 Circuit High Voltage	P2138 - Accelerator Pedal Position (APP) Sensor 1-2 Correlation							
P2146 - Injector Positive Voltage Control Circuit Group 1	P0606 - Control Module Internal Performance							
P2149 - Injector Positive Voltage Control Circuit Group 2	P0606 - Control Module Internal Performance							
P2152 - Injector Positive Voltage Control Circuit Group 3	P0606 - Control Module Internal Performance							
P2155 - Injector Positive Voltage Control Circuit Group 4	P0606 - Control Module Internal Performance	P2146 - Injector Positive Voltage Control Circuit Group 1	P2149 - Injector Positive Voltage Control Circuit Group 2	P2152 - Injector Positive Voltage Control Circuit Group 3				
P2200 - N0x Sensor Circuit Bank 1 Sensor 1	P11DB - NOx Sensor Current Performance Bank 1 Sensor 1	P2209 - N0x Heater Performance Bank 1 Sensor 1	P249D - Closed Loop Reductant Injection Control At Limit - Flow Too Low	P249E - Closed Loop Reductant Injection Control At Limit - Flow Too High				
P2202 - N0x Sensor Circuit Low Bank 1 Sensor 1	P249D - Closed Loop Reductant Injection Control At Limit - Flow Too Low	P249E - Closed Loop Reductant Injection Control At Limit - Flow Too High						
P2203 - N0x Sensor Circuit High 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						
P2205 - N0x Heater Control Circuit Bank 1 Sensor 1	P11DB - NOx Sensor Current Performance Bank 1 Sensor 1	P2209 - N0x Heater Performance Bank 1 Sensor 1	P249D - Closed Loop Reductant Injection Control At Limit - Flow Too Low	P249E - Closed Loop Reductant Injection Control At Limit - Flow Too High				
P2209 - N0x Heater Performance Bank 1 Sensor 1	P249D - Closed Loop Reductant Injection Control At Limit - Flow Too Low	P249E - Closed Loop Reductant Injection Control At Limit - Flow Too High		· · · · ·				
P220A - N0x Sensor Supply Voltage Out Of Range Bank 1 Sensor 1	P11DB - NOx Sensor Current Performance Bank 1 Sensor 1	P2209 - N0x Heater Performance Bank 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	P0106 - Manifold Absolute Pressure Sensor Performance	P0234 - Turbocharger Engine Overboost	P0299 - Turbocharger Engine Underboost	P0401 - Exhaust Gas Recirculation Flow Insufficient	P0402 - Exhaust Gas Recirculation Flow Excessive	P11CB - NOx Sensor Performance - Signal High Bank 1 Sensor 1	P11CC - NOx Sensor Performance - Signal Low Bank 1 Sensor 1	P2002 - Diesel Particulate Filter (DPF) Low Efficiency
Sensor Circuit Low	P2084 - Exhaust Temperature Sensor 2 Performance	P242B - Exhaust Temperature Sensor 3 Performance	P246F - Exhaust Temperature Sensor 4 Performance					
P2229 - Barometric Pressure	P0106 - Manifold Absolute Pressure Sensor Performance	P0234 - Turbocharger Engine Overboost	P0299 - Turbocharger Engine Underboost	P0401 - Exhaust Gas Recirculation Flow Insufficient	P0402 - Exhaust Gas Recirculation Flow Excessive	P11CB - NOx Sensor Performance - Signal High Bank 1 Sensor 1	P11CC - NOx Sensor Performance - Signal Low Bank 1 Sensor 1	P2002 - Diesel Particulate Filter (DPF) Low Efficiency
Sensor Circuit High	P2084 - Exhaust Temperature Sensor 2 Performance	P242B - Exhaust Temperature Sensor 3 Performance	P2459 - Diesel Particulate Filter Regeneration Frequency	P246F - Exhaust Temperature Sensor 4 Performance			<u>`</u>	
P2263 - Turbo Boost System Performance	P0101 - Mass Air Flow Sensor Performance	P0106 - Manifold Absolute Pressure Sensor Performance	P0234 - Turbocharger Engine Overboost	P0299 - Turbocharger Engine Underboost	P0401 - Exhaust Gas Recirculation Flow Insufficient	P0402 - Exhaust Gas Recirculation Flow Excessive		
P229E - NOx Sensor Circuit Bank 1 Sensor 2	P11AF - HO2S Performance - Signal High During Moderate Load Bank 1 Sensor 2	P11B2 - HO2S Performance - Signal Low During Moderate Load Bank 1 Sensor 2	P249D - Closed Loop Reductant Injection Control At Limit - Flow Too Low	P249E - Closed Loop Reductant Injection Control At Limit - Flow Too High				
P229F - NOx Sensor Performance Bank 1 Sensor 2	P249D - Closed Loop Reductant Injection Control At Limit - Flow Too Low	P249E - Closed Loop Reductant Injection Control At Limit - Flow Too High		a				
P22A3 - NOx Heater Control Circuit Bank 1 Sensor 2	P11AF - HO2S Performance - Signal High During Moderate Load Bank 1 Sensor 2	P11B2 - HO2S Performance - Signal Low During Moderate Load Bank 1 Sensor 2	P249D - Closed Loop Reductant Injection Control At Limit - Flow Too Low	P249E - Closed Loop Reductant Injection Control At Limit - Flow Too High				
P22A7 - NOx Heater Performance Bank 1 Sensor 2	P249D - Closed Loop Reductant Injection Control At Limit - Flow Too Low	P249E - Closed Loop Reductant Injection Control At Limit - Flow Too High						
P2413 - Exhaust Gas Recirculation (EGR) System Performance	P11CB - NOx Sensor Performance - Signal High Bank 1 Sensor 1	P11CC - NOx Sensor Performance - Signal Low Bank 1 Sensor 1	P249D - Closed Loop Reductant Injection Control At Limit - Flow Too Low	P249E - Closed Loop Reductant Injection Control At Limit - Flow Too High				

P2080 - Exhaust Temperature Sensor 1 Performance

P2080 - Exhaust Temperature Sensor 1 Performance

Active DTC				Inhibited DTCs					
P242C - Exhaust Gas Temperature (EGT) Sensor 3 Circuit Low Voltage	P2428 - Exhaust Gas High Temperature	P242B - Exhaust Temperature Sensor 3 Performance	P246F - Exhaust Temperature Sensor 4 Performance						
P242D - Exhaust Gas Temperature (EGT) Sensor 3 Circuit High Voltage	P2428 - Exhaust Gas High Temperature	P242B - Exhaust Temperature Sensor 3 Performance	P246F - Exhaust Temperature Sensor 4 Performance						
P2453 - Diesel Particulate Filter Differential Pressure Sensor Performance	P0234 - Turbocharger Engine Overboost	P0299 - Turbocharger Engine Underboost	P0401 - Exhaust Gas Recirculation Flow Insufficient	P0402 - Exhaust Gas Recirculation Flow Excessive	P2002 - Diesel Particulate Filter (DPF) Low Efficiency	P2459 - Diesel Particulate Filter Regeneration Frequency			
P2454 - Diesel Particulate Filter Differential Pressure Sensor Circuit Low Voltage	P2002 - Diesel Particulate Filter (DPF) Low Efficiency	P2453 - Diesel Particulate Filter Differential Pressure Sensor Performance	P2455 - Diesel Particulate Filter Differential Pressure Sensor Circuit High Voltage	P2459 - Diesel Particulate Filter Regeneration Frequency					
P2455 - Diesel Particulate Filter Differential Pressure Sensor Circuit High Voltage	P2002 - Diesel Particulate Filter (DPF) Low Efficiency	P2453 - Diesel Particulate Filter Differential Pressure Sensor Performance	P2454 - Diesel Particulate Filter Differential Pressure Sensor Circuit Low Voltage	P2459 - Diesel Particulate Filter Regeneration Frequency					
P245A - Exhaust Gas Recirculation (EGR) Cooler Bypass Valve Control Circuit	P0401 - Exhaust Gas Recirculation Flow Insufficient	P0402 - Exhaust Gas Recirculation Flow Excessive	P140A - EGR Cooler BY Pass Position Sensor Exceded Learning Limit	P2080 - Exhaust Temperature Sensor 1 Performance	P2084 - Exhaust Temperature Sensor 2 Performance	P242B - Exhaust Temperature Sensor 3 Performance	P246F - Exhaust Temperature Sensor 4 Performance	P2510 - ECM Power Relay Circuit Performance	
P2463 - Diesel Particulate Filter - Soot Accumulation	(DPF) Low Efficiency								
P2470 - Exhaust Gas Temperature (EGT) Sensor 4 Circuit Low Voltage	P2428 - Exhaust Gas High Temperature	P246F - Exhaust Temperature Sensor 4 Performance							
Temperature (EGT) Sensor 4 Circuit High Voltage	P2428 - Exhaust Gas High Temperature	P246F - Exhaust Temperature Sensor 4 Performance							
Position Sensor Performance	Flow Insufficient	Flow Excessive							
P2494 - EGR Cooler BY Pass Position Sensor Circuit Low	P0234 - Turbocharger Engine Overboost	P0299 - Turbocharger Engine Underboost	P0401 - Exhaust Gas Recirculation Flow Insufficient	P0402 - Exhaust Gas Recirculation Flow Excessive	Position Sensor Exceded Learning Limit	P2080 - Exhaust Temperature Sensor 1 Performance	P2084 - Exhaust Temperature Sensor 2 Performance	P242B - Exhaust Temperature Sensor 3 Performance	P246F - Exhaust Temperature Sensor 4 Performance
P2495 - EGR Cooler BY Pass Position Sensor Circuit High	P0234 - Turbocharger Engine Overboost	P0299 - Turbocharger Engine Underboost	P0401 - Exhaust Gas Recirculation Flow Insufficient	P0402 - Exhaust Gas Recirculation Flow Excessive	P140A - EGR Cooler BY Pass Position Sensor Exceded Learning Limit	P2080 - Exhaust Temperature Sensor 1 Performance	P2084 - Exhaust Temperature Sensor 2 Performance	P242B - Exhaust Temperature Sensor 3 Performance	P246F - Exhaust Temperature Sensor 4 Performance
P2564 - Turbocharger Boost Control Position Sensor Circuit Low	P0234 - Turbocharger Engine Overboost	P0299 - Turbocharger Engine Underboost	P0401 - Exhaust Gas Recirculation Flow Insufficient	P0402 - Exhaust Gas Recirculation Flow Excessive					
P2565 - Turbocharger Boost Control Position Sensor Circuit High	P0234 - Turbocharger Engine Overboost	P0299 - Turbocharger Engine Underboost	P0401 - Exhaust Gas Recirculation Flow Insufficient	P0402 - Exhaust Gas Recirculation Flow Excessive					
P2598 - Turbocharger Boost Control Position Sensor "A" Circuit Range/Performance - Stuck Low	P0101 - Mass Air Flow Sensor Performance								
P2599 - Turbocharger Boost Control Position Sensor "A" Circuit Range/Performance - Stuck High	P0101 - Mass Air Flow Sensor Performance								
U0073 - CAN A BUS OFF	P0851 - Park/Neutral Position (PNP) Switch Circuit Low Voltage	P0852 - Park/Neutral Position (PNP) Switch Circuit High Voltage							
U0101 - Lost Communications With Transmission Control System	P0851 - Park/Neutral Position (PNP) Switch Circuit Low Voltage	P0852 - Park/Neutral Position (PNP) Switch Circuit High Voltage							
U0106 - Lost Communication With Glow Plug Control Module	P11DB - NOx Sensor Current Performance Bank 1 Sensor 1	P249D - Closed Loop Reductant Injection Control At Limit - Flow Too Low	P249E - Closed Loop Reductant Injection Control At Limit - Flow Too High						
U029D - N0x 1 loss of comm	P249D - Closed Loop Reductant Injection Control At Limit - Flow Too Low	P249E - Closed Loop Reductant Injection Control At Limit - Flow Too High							
U029E - N0x 2 loss of comm	P11DB - NOx Sensor Current Performance Bank 1 Sensor 1	P249D - Closed Loop Reductant Injection Control At Limit - Flow Too Low	P249E - Closed Loop Reductant Injection Control At Limit - Flow Too High						

This document is intended to meet the requirements documented in section 1968.2 of Title 13, California Code of Regulations entitled Modifications to Matlinuction and Diagnosis System Requirements for 2004 and Subsequent Moder-Year Passenger Cars. Light-DuT Trucks, and Medium-Duty Vehicles and Engines (OBD II), paragraphs (t)(22) for a table detailing supplemental calibration parameter data for OBD II Group 12OEDCG9. Disable Matrix for Diagnostic System Manager

Additional Basic Enable Co

DIC			Additional Dasie 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)					
P003A - Turbocharger Boost Control Position Not Learned	Engine not in afterrun mode (defined as engine speed greater than 0 rpm)	Engine speed greater than 600 to 850 rpm	engine is not in standby state (standby state occurs after ECM initialization or following after-run)	battery voltage is above 11 V for at least 3s	Engine is running which means the engine speed is greater than 600 to 850 rpm	engine is not in ready state (which is active when the ignition is on or following a stall o the engine)	e N		
P0045 - Turbocharger Boost Contre 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 Contr 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 Contr Circuit High Voltage	Engine not in afterrun mode (defined as engine speed greater than 0 rpm)	engine is not in standby state (standby state occurs after ECM initialization or following after-run)	battery voltage is above 11 V for at least 3s	Engine is running which means the engine speed is greater than 600 to 850 rpm					
P006E - Turbocharger Boost High Control Circuit Low Voltage	Engine not in afterrun mode (defined as engine speed greater than 0 rpm)	engine is not in standby state (standby state occurs after ECM initialization or following after-run)	battery voltage is above 11 V for at least 3s	Engine is running which means the engine speed is greater than 600 to 850 rpm					
P006F - Turbocharger Boost High Control Circuit High Voltage	engine is not in standby state (standby state occurs after ECM initialization or following after-run)							_	
P007C - CAC Temperature Senso Circuit Low Voltage	Engine not in afterrun mode (defined as engine speed greater than 0 rpm)	Engine speed greater than 600 to 850 rpm	engine is not in standby state (standby state occurs after ECM initialization or following after-run)	battery voltage is above 11 V for at least 3s	Engine Run Time greater than 10 seconds (engine speed greater than 600 to 850 rpm to indicate the engine is running)	B Engine is running which means the engine speed is greater than 600 to 850 rpm	engine is not in ready state (which is active when the ignition is on or following a stall of the engine)	3	
P007D - CAC Temperature Senso Circuit High Voltage	Engine not in afterrun mode (defined as engine speed greater than 0 rpm)	Engine speed greater than 600 to 850 rpm	engine is not in standby state (standby state occurs after ECM initialization or following after-run)	battery voltage is above 11 V for at least 3s	Engine Run Time greater than 10 seconds (engine speed greater than 600 to 850 rpm to indicate the engine is running)	Engine is running which means the engine speed is greater than 600 to 850 rpm	engine is not in ready state (which is active when the ignition is on or following a stall of the engine)		
P0087 - Fuel Rail Pressure Too Lo	w 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 o 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 o the engine)						
P008F - Engine Coolant Temperature (ECT)-Fuel Temperature Not Plausible	Engine not in afterrun mode (defined as engine speed greater than 0 rpm)	Engine speed greater than 600 to 850 rpm	engine is not in standby state (standby state 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 on the engine)	e 01			
P0090 - Fuel Pressure Regulator 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 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 Control Circuit High	Engine not in afterrun mode (defined as engine speed greater than 0 rpm)	engine is not in standby state (standby state occurs after ECM initialization or following after-run)	battery voltage is above 11 V for at least 3s	Engine is running which means the engine speed is greater than 600 to 850 rpm					
P0097 - Intake Air Temperature Sensor 2 Circuit Low	Engine not in afterrun mode (defined as engine speed greater than 0 rpm)	Engine speed greater than 600 to 850 rpm	engine is not in standby state (standby state occurs after ECM initialization or following after-run)	battery voltage is above 11 V for at least 3s	Engine Run Time greater than 10 seconds (engine speed greater than 600 to 850 rpn to indicate the engine is running)	Engine is running which means the engine speed is greater than 600 to 850 rpm	engine is not in ready state (which is active when the ignition is on or following a stall of the engine)	e N	
P0098 - Intake Air Temperature Sensor 2 Circuit High	Engine not in afterrun mode (defined as engine speed greater than 0 rpm)	Engine speed greater than 600 to 850 rpm	engine is not in standby state (standby state occurs after ECM initialization or following after-run)	battery voltage is above 11 V for at least 3s	Engine Run Time greater than 10 seconds (engine speed greater than 600 to 850 rpm to indicate the engine is running)	Engine is running which means the engine speed is greater than 600 to 850 rpm	engine is not in ready state (which is active when the ignition is on or following a stall of the engine)	2 X	
		engine is not in standby state (standby	hatteny voltage is shown 11 V, for at least	Engine is running which means the engine					
P00C9 - Fuel Pressure Regulator High Control Circuit Low Voltage	Engine not in afterrun mode (defined as engine speed greater than 0 rpm)	state occurs after ECM initialization or following after-run)	38	speed is greater than 600 to 850 rpm					
P00C9 - Fuel Pressure Regulator High Control Circuit Low Voltage P00CA - Fuel Pressure Regulator High Control Circuit High Voltage	Engine not in afterrum mode (defined as engine speed greater than 0 rpm) engine is not in standby state (standby state occurs after ECM initialization or following after-rum)	state occurs after ECM initialization or following after-run)	38	speed is greater than 600 to 850 rpm					
P00C9 - Fuel Pressure Regulator High Control Circuit Low Voltage P00CA - Fuel Pressure Regulator High Control Circuit High Voltage P0101 - Mass Air Flow 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 not in afterrun mode (defined as engine speed greater than 0 rpm)	state occurs after ECM initialization or following after-run) Engine speed greater than 600 to 850 rpm	engine is not in standby state (standby state occurs after ECM initialization or following after-run)	speed is greater than 600 to 850 rpm	ambient pressure is above 74.8kPa	battery voltage is above 11 V for at least 3s	Engine Run Time greater than 10 seconds (engine speed greater than 600 to 850 rpm to indicate the engine is running)	Engine is running which means the engine speed is greater than 600 to 850 rpm	engine is not in ready state (which is active when the ignition is on or following a stall o the engine)
P0020 - Fiyel Pressure Regulator High Control Circuit Low Voltage P002A - Fiyel Pressure Regulator High Control Circuit High Voltage P0101 - Mass Air Flow Sensor Performance P0102 - Mass Air Flow Sensor Circuit Low	Engine not in afterrum mode (defined as engine segal greater than 0 rpm) engine is not in standby state (standby state occurs after FCM initialization or following after-run) Engine not in afterrum mode (defined as engine speed greater than 0 rpm) Engine not in afterrum mode (defined as	state occurs after ECM initialization or following after-run) Engine speed greater than 600 to 850 rpm Engine speed greater than 600 to 850 rpm	engine is not in standby state (standby state occurs after ECM Initialization or following after-run) engine is not in standby state (standby state occurs after ECM Initialization or following after-run)	ambient air temperature is above -7 deg C battery voltage is above 11 V for at least 3s	ambient pressure is above 74.8kPa Engine Run Time greater than 10 second (engine speed greater than 500 to 650 ru to Indicate the engine is running)	battery voltage is above 11 V for at least 3s Engine is running which means the engin speed is greater than 600 to 850 rpm	Engine Run Time greater than 10 seconds (engine speed greater than 60 to 850 pm to indicate the engine is nurning) engine is not in ready state (which is active when the ignition is on or following a stat of the engine)	Engline is numing which means the engline speed is greater than 600 to 850 rpm	engine is not in ready state (which is active when the ignition is on or following a stall or the engine)
P0029 - Fuel Pressue Regulator High Control Crouit Law Voltage P002A - Fuel Pressure Regulator High Control Circuit High Voltage P0101 - Mass Air Flow Sensor Oricuit Low P0102 - Mass Air Flow Sensor Circuit Low	Engine not in afterrum mode (defined as engine several greater than or trym) engine is not in standby state (standby state occurs the FCM initiatization or <u>Colorving after runn</u>) Engine not in afterrum mode (defined as engine speed greater than 0 rpm) Engine not in afterrum mode (defined as engine speed greater than 0 rpm) Engine not in afterrum mode (defined as	state cours after ECM initiatzation or following after (xn) Engine speed greater than 600 to 850 rpm Engine speed greater than 600 to 850 rpm Engine speed greater than 600 to 850 rpm	single is not in standby state (standby indices) and the CRA initialization or following after run) engine is not in standby state (standby state occurs) after run) initial occurs after CRA initiazion or following after-run)	ambient ar temperature is above 7 deg C battery voltage is above 11 V for at least 38 battery voltage is above 11 V for at least 39	ambient pressure is above 74 88-Pa Engine Run Ting greater han 10 second (eight spikel, and spikel) Is indicate the engine is numeric) Engine Run Ting greater than 10 second (engine speed greater than 00 to 360 pm to indicate the engine is numeric)	battery voltage is above 11 V for at least 3s Engine is running which means the engine speed is greater hand 00 b 650 mm and 00 b Engine is running which means the engine speed is greater than 600 b 650 rpm	Engine Run Time greater than 10 seconds (engine speed greater than 600 to 850 rpm to indicate the engine is running) engine is not in ready state (which is active when the ignition is on or following a stati of the engine is not in ready state (which is active when the ignition is on or following a stati of the engine is not in eady state (which is active when the ignition is on or following a stati of the engine).	Engine is running which means the engine speed is greater than 600 to 850 rpm	engine is not in ready state (which is active when the lightion is on or following a stati o the engine)
P0023 - Fuel Pressue Regulator High Control Creat Law Voltage P002A - Fuel Pressure Regulator High Control Creat High Voltage P0101 - Mass Air Flow Sensor Circuit Low P0102 - Mass Air Flow Sensor Circuit High P0103 - Mass Air Flow Sensor Circuit High P0106 - Manifold Absolute Pressu Sensor Performance	Engine not in afterum mode (defined as engine speaker than 0 speaker than 0 speaker state access the FCAH initialization or Extension after FCAH initialization or Extension afterum mode (defined as engine spead greater than 0 spm) Engine not in afterum mode (defined as engine spead greater than 0 spm) Engine not in afterum mode (defined as engine spead greater than 0 spm)	state cours after ECM initialization or following after (nn) Engine speed greater than 600 to 850 rpm Engine speed greater than 600 to 850 rpm Engine speed greater than 600 to 850 rpm engine is not in standay lattle (standay) state (cours after ECM initialization or following after (nn)	entrie y rouge view of the denoted as a series of the seri	ambient air temperature is above -7 deg C ambient air temperature is above -7 deg C battery voltage is above 11 V for at least battery voltage is above 11 V for at least 3s Engine is nunning which means the engine speed a gradest mar 000 to 850 pm	ambient pressure is above 74.8XPa Engine Run Time greater than 10 accords (engine speed greater than 600 accords b) indicate the angine is running) Engine Run Time greater than 100 to 500 b) for that the angine is running) greater than 600 to 500 b) for dicate the engine is running (greater that angine) state (indicate state when the (pation is on or following a stati the orgine)	battery voltage is above 11 V for at least 36 Engine is running which means the engine speed a greater hana 600 b 650 mm Engine is running which means the engin speed is greater than 600 b 650 pm	Engine Run Time greater than 10 seconds (engine speed greater than 600 to 850 rpm to indicate the engine is running) engine is not in navly state (which is active when the ignition is on or following a state or the engine) is not in navly state (which is active when the ignition is on ar following a state or the engine)	Engine is running which means the engine speed is greater than 600 to 850 rpm	engine is not in ready state (which is active when the galiton is on or following a stall o the engine)
P0020 - Fuel Pressure Regulator High Control Coval Lew Voltage P002A - Fuel Pressure Regulator High Control Creat High Voltage P0101 - Meas Air Flow Sensor P0102 - Mass Air Flow Sensor P0102 - Mass Air Flow Sensor P0102 - Mass Air Flow Sensor P0103 - Mass Air Flow Sensor P0105 - Manitold Absolute Pressu P0107 - Meind Absolute Pressu P0107 - Meind Absolute Vertex	Engine not in afterrum mode (defined as engine sevel of prester than 0 rpm) engine is not in standby state (standby state occors after ECM initialization or <u>tolowing after vani</u> Engine not in afterrum mode (defined as engine speed greater than 0 rpm) Engine not in afterrum mode (defined as engine speed greater than 0 rpm) Engine not in afterrum mode (defined as engine speed greater than 0 rpm) Engine not in afterrum mode (defined as engine speed greater than 0 rpm)	state occurs after ECM initiatzation or following after (un) Engine speed greater than 600 to 850 rpm Engine speed greater than 600 to 850 rpm Engine speed greater than 600 to 850 rpm engine is not in standby state (submby state occurs after (Submby after (submby table occurs after (submby table occurs) after (submby table occurs) after (submby Engine speed greater than 600 to 850 rpm	angine is not in standby state (standby state occurs after ECM Initiatization or following after-rain) engine is not in standby state (standby state occurs after ECM Initiatization or following after-rain) engine is not in standby state (standby state occurs after ECM Initiatization or following after-rain) battery voltage is above 11 V for at least 3 engine is not in standby state (standby state occurs after ECM Initiatization or following after-rain)	ambient ar temperature is above -7 deg C ambient ar temperature is above -7 deg C battery voltage is above 11 V for at least 3 battery voltage is above 11 V for at least 3 Engine is unively athich means to Bos ryon append is greater than 0001 to Bos ryon battery voltage is above 11 V for at least 3 battery voltage is above 11 V for at least 3	ambient pressure is above 74.88/Pa Engine Run Time greater than 10 second regime speed greater than 600 to 550 pm to indicate the engine is numeral Engine Run Time gener than 10 second (engine speed greater than 10 second tengine is numeral) indicate the engine is numeral the engine. The engine Run Time generat than 10 second (engine speed greater than 10 second	battery voltage is above 11 V for at least 36 Engine is running which means the engine speed is greater finan 600 to 850 rpm Engine 18 running which means the engine speed is greater than 600 to 850 rpm Engine is running which means the engine speed is greater than 600 to 850 rpm	Engine Run Time greater than 10 seconds (engine speed greater than 600 to 850 pm to indicate the engine is running) engine is not in ready state (which is active when the ignition is on or following a stati of the engine) state engine) when the ignition is on or following a stati of the engine is not in ready state (which is active when the ignition is on or following a stati of the engine)	Engine is running which means the engine speed is greater than 600 to 850 rpm	engine is not in ready state (which is active when the gradion is on or following a stall o the engine)
P0023 - Fuel Pressure Regulator High Control Crouit Law Voltage P002A - Fuel Pressure Regulator High Control Crouit High Voltage P0101 - Mass Air Flow Sensor Performance P0102 - Mass Air Flow Sensor P0102 - Mass Air Flow Sensor P0103 - Mass Air Flow Sensor P0106 - Manital Abolute Pressus P0107 - Manital Abolute Pressus P0107 - Manital Abolute Pressus P0108 - Manital Abolute Pressus P0109 - Sensor Circuit High Voltage P0109 - Sensor Circuit High Voltage	Engine not in afterrum mode (defined as engine segue) faither than 0 rpm) engine is not in standby state (standby state occurs after ECM initialization or <u>tolowing afterrum</u>) Engine not in afterrum mode (defined as engine speed greater than 0 rpm) Engine not in afterrum mode (defined as engine speed greater than 0 rpm) Engine not in afterrum mode (defined as engine speed greater than 0 tpm) Engine not in afterrum mode (defined as engine speed greater than 0 tpm) Engine not in afterrum mode (defined as engine speed greater than 0 tpm) Engine not in afterrum mode (defined as engine speed greater than 0 tpm) Engine not in afterrum mode (defined as	state cours after ECM (milatzation or following after (nn) Engine speed greater than 600 to 850 rpm Engine speed greater than 600 to 850 rpm Engine speed greater than 600 to 850 rpm engine in off in standby state (standby state cours after ECM (milatzation or following after (nn) Engine speed greater than 800 to 850 rpm Engine speed greater than 800 to 850 rpm	engine is not in standby state (standby state occurs after ECM initiatization or following after-cini) state occurs after ECM initiatization or following after-cini) engine is not instandby state (standby state occurs after ECM initiatization or following after-cini) and the occurs after ECM initiatization following after-cini) battery voltage is above 11 V for at least 3 engine is not in standby state (standby state occurs after ECM initiatization or following after-cini) engine is not in standby state (standby state occurs after ECM initiatization or following after-cini)	ambient ar temperature is above -7 deg C ambient ar temperature is above -7 deg C battery voltage is above 11 V for al least 35 Engine is running witch means the engine speed if gradet all mol 00 to 850 mm battery voltage is above 11 V for al least 36 battery voltage is above 11 V for al least 39	ambient pressure is above 74.8XPa Engine Run Time greater than 10 accords (engine speed greater than 600 to 550 pm b) indicate the angine is running) regime Run Time greater than 10 accords (engine speed greater than 600 to 550 pm b) indicate the engine is nunning) engine is not in exclusive than 600 to 550 pm b) indicate the engine is nunning). Engine Run Time greater than 10 accords (engine speed greater than 600 to 550 pm b) indicate the engine is nunning) is b) indicate the engine is nunning).	battery voltage is above 11 V for at least 36 Engine is running which means the engine speed is greater and both 505 bits speed is greater than 600 bits 500 million Engine is running which means the engine speed is greater than 600 bits 500 million speed is greater than 600 bits 500 million Engine is running which means the engine speed is greater than 600 bits 500 million Engine is running which means the engine speed is greater than 600 bits 500 million Engine is running which means the engine speed is greater than 600 bits 500 million	Engine Run Time greater than 10 seconds (engine speed greater than 600 to 850 rpm to indicate the engine is running) ergine is not in endy state (which is active when the ignition is on or following a stati or the engine) engine is not in ready state (which is active when the ignition is on or following a stati or the engine) engine is not in ready state (which is active when the ignition is on or following a stati or the engine) engine is not in ready state (which is active when the ignition is on or following a stati or the engine) engine is not in ready state (which is active when the ignition is on or following a stati or the engine)	Engine is running which means the engine speed is greater than 600 to 800 rpm	engine is not in ready state (which is active when the gration is on or following a stall o the engine)
P0020-Field Pressure Regulator High Carolic Creat Law Voltage P002A - Fuel Pressure Regulator High Carolic Creat High Voltage P0102 - Mass Air Flow Sensor P0102 - Mass Air Flow Sensor P0103 - Mass Air Flow Sensor P0104 - Manifold Abolute Pressure P0105 - Manifold Abolute Pressure P0106 - Manifold Abolute Pressure P0107 - Manifold Abolute Pressure P0108 - Manifold Abolute Pressure P0109 - Sensor Circuit Low P0109 - Sensor Circuit High Voltage P0112 - Intel Air Temperature Sensor 1 Circuit Low	Engine not in afterum mode (defined as engine segue segue) and the open of the open of engine is not in standby state (standby state occurs the FCM initiatization or <u>Colorving after uno</u>) Engine not in afterum mode (defined as engine speed greater than 0 rpm) Engine not in afterum mode (defined as engine speed greater than 0 rpm) Engine not in afterum mode (defined as engine speed greater than 0 tpm) Engine not in afterum mode (defined as engine speed greater than 0 tpm) Engine not in afterum mode (defined as engine speed greater than 0 tpm) Engine not in afterum mode (defined as engine speed greater than 0 tpm) Engine not in afterum mode (defined as engine speed greater than 0 tpm) Engine not in afterum mode (defined as	state occurs after ECM initiatization or following after (vn) Engine speed greater than 600 to 850 rpm Engine speed greater than 600 to 850 rpm Engine speed greater than 600 to 850 rpm engine in of in standby state (standby after (vn) Engine speed greater than 600 to 850 rpm Engine speed greater than 600 to 850 rpm Engine speed greater than 600 to 850 rpm Engine speed greater than 600 to 850 rpm	engine is not in standby state (standby state occurs after ECM initiatization or following after-run) engine is not in standby state (standby state occurs after ECM initiatization or following after-run) engine is not in standby state (standby state occurs after ECM initiatization or following after-run) battery voltage is above 11 V for at least a state occurs after ECM initiatization following after-run following after-run following after-run engine is not in standby state (standby state occurs after ECM initiatization or following after-run) engine is not instandby state (standby state occurs after ECM initiatization or following after-run) engine is not instandby state (standby state occurs after ECM initiatization or following after-run)	ambient air temperature is above. 7 deg C battery voltage is above 11 V for at least 35 battery voltage is above 11 V for at least 36 battery voltage is above 11 V for at least 36	ambient pressure is above 74.88-Pa Engine Run Time gester than 10 second regime peed grader than 600 to 550 pp bindicate the engine is running; Engine Run Time gester than 10 second regime speed grader than 600 to 500 pp bindicate the engine is running). Engine Run Time gester than 10 second regime so not in ready state (which is activ- which he signific a conditioning as all conditioned the engine is running). Engine Run Time gester than 10 second regime speed grader than 600 to 500 pp bindicate the engine is running). Engine Run Time gester than 10 second (engine speed grader than 600 to 500 pp bindicate the engine is running). Engine Run Time gester than 10 second (engine speed grader than 600 to 550 pp bindicate the engine is running).	battery voltage is above 11 V for at least 3s Erigine is running which means the engine speed is greater than 600 to 650 pm Erigine is running which means the engin speed is greater than 600 to 650 pm Erigine is running which means the engin speed is greater than 600 to 650 pm Erigine is running which means the engin speed is greater than 600 to 650 pm Erigine is running which means the engin speed is greater than 600 to 650 pm	Engine Run Time greater than 10 seconds (engine speed greater than 60 to 850 rpm to indicate the engine is running) engine is not in ready state (which is active when the ignition is on or following a stati or the engine) engine is not in ready state (which is active when the ignition is on or following a stati or the engine) engine is not in ready state (which is active when the ignition is on or following a stati or the engine) engine is not in ready state (which is active when the ignition is on or following a stati or the engine) engine is not in ready state (which is active when the ignition is on or following a stati or the engine) engine is not in ready state (which is active when the ignition is on or following a stati or the engine)	Engine is running which means the engine speed is greater than 600 to 850 rpm	engne is not in ready state (which is active when the lynition is or or following a stati o me engrue)
P002.9 - Fuel Pressure Regulator High Control Creat Lew Voltage P002.4 - Fuel Pressure Regulator High Control Creat High Voltage P0101 - Mass Air Flow Sensor P0102 - Mass Air Flow Sensor P0102 - Mass Air Flow Sensor P0102 - Mass Air Flow Sensor P0103 - Mass Air Flow Sensor P0104 - Manfold Absolute Pressur P0105 - Manfold Absolute Pressur P0106 - Manfold Absolute Pressur P0107 - Mass Air Temperature P0108 - Manfold Absolute Pressur P0109 - Manfold Absolute Pressur P01019 - Manfold Absolute Pressur <t< th=""><th>Engine not in afterum mode (defined as engine sevel after than 0 rpm) engine is not in standby state (standby state occurs after ECM initialization or (blowing after uno) Engine not in afterum mode (defined as engine speed greater than 0 rpm) Engine not in afterum mode (defined as engine speed greater than 0 rpm) Engine not in afterum mode (defined as engine speed greater than 0 rpm) Engine not in afterum mode (defined as engine speed greater than 0 rpm) Engine not in afterum mode (defined as engine speed greater than 0 rpm) Engine not in afterum mode (defined as engine speed greater than 0 rpm) Engine not in afterum mode (defined as engine speed greater than 0 rpm) Engine not in afterum mode (defined as engine speed greater than 0 rpm) Engine not in afterum mode (defined as engine speed greater than 0 rpm) Engine not in afterum mode (defined as engine speed greater than 0 rpm)</th><th>state cours after ECM (militazation or following after ena). 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Engine speed greater than 600 to 850 rpm Engine speed greater than 600 to 850 rpm</th><th>engine is not in standby state (standby state occurs after ECM initiatization or following after-cini) engine is not in standby state (standby state occurs after ECM initiatization or following after-cini) engine is not in standby state (standby state occurs after ECM initiatization or following after-cini) battery voltage a davort 1 V for at least 3- engine is not in standby state (standby state occurs after ECM initiatization or following after-cini) engine is not in standby state (standby state occurs after ECM initiatization or following after-cini) engine is not in standby state (standby state occurs after ECM initiatization or following after-cini) engine is not in standby state (standby state occurs after ECM initiatization or following after-cini)</th><th>ambient air temperature is above -7 deg C antheint air temperature is above -7 deg C battery voltage is above 11 V for at least 35 battery voltage is above 11 V for at least 35 battery voltage is above 11 V for at least 36 battery voltage is above 11 V for at least 36</th><th>ambient pressure is above 74.85Pa Engine Run Time greater than 10 accord (engine speed greater than 600 b 350 rp b) indicate the angine is unning) Engine Run Time greater than 10 accord (engine speed greater than 600 b 350 rp b) indicate the angine is unning) engine is not in accord that that the the angine is and inage static within a static the angine is and inage static within a static the angine is not inage static within a static the angine is not inage static than 500 b 350 rp b) indicate the angine is noning) Engine Run Time greater than 10 accord (engine speed greater than 50 accord) (engine speed greater than 50 accord)</th><th>battery voltage is above 11 V for at least 38 Engine in norring which means the engine speed is greater than 600 to 850 rpm Engine is running which means the engin speed is greater than 600 to 850 rpm Engine is running which means the engin speed is greater than 600 to 850 rpm Engine is running which means the engin speed is greater than 600 to 850 rpm Engine is running which means the engin speed is greater than 600 to 850 rpm Engine is running which means the engin speed is greater than 600 to 850 rpm Engine is running which means the engin speed is greater than 600 to 850 rpm Engine is running which means the engin speed is greater than 600 to 850 rpm Engine is greater than 600 to 850 rpm Engine is greater than 600 to 850 rpm</th><th>Engine Run Time greater than 10 seconds (engine speed greater than 600 to 850 rpm to indicate the engine is running) engine is not in eady state (which is active when the ignition is on or following a state) of the engine) when the ignition is on or following a state of the engine) engine is not in ready state (which is active when the ignition is on or following a state) means the engine is on the engine ingline is not in ready state (which is active when the ignition is on or following a state) means the engine is on the engine engine is not in ready state (which is active when the ignition is on or following a state) the engine is not in ready state (which is active when the ignition is on or following a state) the engine is not in ready state (which is active when the ignition is on or following a state) the engine is not in ready state (which is active when the ignition is on or following a state) the engine is not in ready state (which is active when the ignition is on or following a state) the engine is not in ready state (which is active when the ignition is on or following a state)</th><th>Engline is running which means the engine speed is greater than 600 to 850 rpm</th><th>engine is not in ready state (which is active when the gallion is on or following a stall o the engine)</th></t<>	Engine not in afterum mode (defined as engine sevel after than 0 rpm) engine is not in standby state (standby state occurs after ECM initialization or (blowing after uno) Engine not in afterum mode (defined as engine speed greater than 0 rpm) Engine not in afterum mode (defined as engine speed greater than 0 rpm) Engine not in afterum mode (defined as engine speed greater than 0 rpm) Engine not in afterum mode (defined as engine speed greater than 0 rpm) Engine not in afterum mode (defined as engine speed greater than 0 rpm) Engine not in afterum mode (defined as engine speed greater than 0 rpm) Engine not in afterum mode (defined as engine speed greater than 0 rpm) Engine not in afterum mode (defined as engine speed greater than 0 rpm) Engine not in afterum mode (defined as engine speed greater than 0 rpm) Engine not in afterum mode (defined as engine speed greater than 0 rpm)	state cours after ECM (militazation or following after ena). 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P0020 - Fuel Pressure Regulator High Control Crouit Lew Voltage P002A - Fuel Pressure Regulator High Control Crouit Lew Voltage P0101 - Mass Air Flav Sensor P0102 - Mass Air Flav Sensor P0102 - Mass Air Flav Sensor P0103 - Mass Air Flav Sensor P0105 - Manifold Absolute Pressur P0107 - Menifold Absolute Pressur P0108 - Manifold Absolute Pressur P0119 - Intake Air Temperature Sensor 1 Circuit Lingh P0117 - Engine Collent P0117 - Tengine Collent P0117 - Tengine Collent	Engine not in afterrum mode (defined as engine sevel after than 0 prim) engine is not in standby state (standby state occurs that FCM initialization or <u>following after run</u>) Engine not in afterrum mode (defined as engine speed greater than 0 prim) Engine not in afterrum mode (defined as engine speed greater than 0 prim) Engine not in afterrum mode (defined as engine speed greater than 0 prim) Engine not in afterrum mode (defined as engine speed greater than 0 prim) Engine not in afterrum mode (defined as engine speed 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(which is active when the ignition is on or following a stati of the engine) engine is not in ready state (which is active when the ignition is on or following a stati of the engine)	Engine is running which means the engine speed is greater than 600 to 850 rpm	engne is not in ready state (which is active when the gradion is on or following a stall o the engrice)
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850 rpm State (cours) after ECM (militazion or following after-can) Engine speed greater than 600 to 850 rpm Engine speed greater than 600 to 850 rpm	engine is not in standby state (standby state occurs after ECM initiatization or following after-cm) engine is not in standby state (standby state occurs after ECM initiatization or following after-cm) engine is not in standby state (standby state occurs after ECM initiatization or following after-cm) battery voltage is above 11 V for al least as occurs after ECM initiatization state occurs after ECM initiatization following after-cm) battery voltage is above 11 V for al least as occurs after ECM initiatization following after-cm) engine is not in standby state (standby state occurs after ECM initiatization following after-cm) engine is not in standby state (standby state occurs after ECM initiatization or following after-cm) engine is not in standby state (standby state occurs after ECM initiatization or following after-cm) engine is not 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P0020 - Fuel Pressue Regulator High Control Croat Low Voltage P0020-A - Fuel Pressure Regulator High Control Croat Low Voltage P0101 - Mass Air Flow Sensor Derformance P0102 - Mass Air Flow Sensor Circuit High P0103 - Mass Air Flow Sensor Circuit Low P0103 - Mass Air Flow Sensor Circuit Low P0105 - Manifold Absolute Pressus (MAP) Sensor Circuit Low Voltage P0107 - Manifold Absolute Pressus (MAP) Sensor Circuit Low Voltage P0108 - Manifold Absolute Pressus (MAP) Sensor Circuit Low Voltage P0117 - Indiak Air Temperature Sensor 1 Circuit High P0117 - Engine Coolant Temperature Sensor Circuit High P0118 - Engine Coolant Temperature Below Thermoniat Regulating Temperature Sensor 1 Circuit High P0117 - Hogine Coolant Temperature Below Thermoniat Regulating Temperature Sensor 1 Circuit High P0118 - HO2S Bark 1 Sensor 2 circuit High P0118 - HO2S Bark 1 Sensor 2 circuit High P0128 - Fuel Temperature Sensor Circuit High P0128 - Fuel Temperature Sensor Circuit High	Engine not in afterum mode 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510			Additional Duble Enable Conditions							
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								
P0234 - Turbocharger Engine Overboost	Engine not in afterrun mode (defined as engine speed greater than 0 rpm)	Engine speed greater than 600 to 850 rpm	engine is not in standby state (standby state occurs after ECM initialization or following after-run)	ambient air temperature is above -7 deg C	ambient pressure is above 74.8kPa	battery voltage is above 11 V for at least 3s	Engine Run Time greater than 10 seconds (engine speed greater than 600 to 850 rpm to indicate the engine is running)	Engine is running which means the engine speed is greater than 600 to 850 rpm	engine is not in ready state (which is active when the ignition is on or following a stall o the engine)	e 1
P0263 - Cly 1 Balance System P0266 - Cly 2 Balance System P0269 - Cly 3 Balance System	Power Take-Off (PTO) is not engaged Power Take-Off (PTO) is not engaged Power Take-Off (PTO) is not engaged	4								-
P026A - CAC Effecientcy Below Threshold	Engine not in afterrun mode (defined as engine speed greater than 0 rpm)	Engine speed greater than 600 to 850 rpm	engine is not in standby state (standby state occurs after ECM initialization or following after-run)	ambient air temperature is above -7 deg C	ambient pressure is above 74.8kPa	battery voltage is above 11 V for at least 3s	Engine Run Time greater than 10 seconds (engine speed greater than 600 to 850 rpm to indicate the engine is running)	Engine is running which means the engine speed is greater than 600 to 850 rpm	engine is not in ready state (which is active when the ignition is on or following a stall o the engine)	e M
P0272 - Cly 4 Balance System P0275 - Cly 5 Balance System P0278 - Cly 6 Balance System P0281 - Cly 7 Balance System P0284 - Cly 8 Balance System	Power Take-Off (PTO) is not engaged Power Take-Off (PTO) is not engaged									-
P0299 - Turbocharger Engine Underboost	Engine not in afterrun mode (defined as engine speed greater than 0 rpm)	Engine speed greater than 600 to 850 rpm	engine is not in standby state (standby state occurs after ECM initialization or following after-run)	ambient air temperature is above -7 deg C	ambient pressure is above 74.8kPa	battery voltage is above 11 V for at least 3s	Engine Run Time greater than 10 seconds (engine speed greater than 600 to 850 rpm to indicate the engine is running)	Engine is running which means the engine speed is greater than 600 to 850 rpm	engine is not in ready state (which is active when the ignition is on or following a stall o the engine)	2
P02E0 - Intake Air Flow 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					1		1	_
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 speed greater than 600 to 850 rpm	engine is not in standby state (standby state occurs after ECM initialization or following after-run)	battery voltage is above 11 V for at least 3s	Engine Run Time greater than 10 seconds (engine speed greater than 600 to 850 rpm to indicate the engine is running)	Engine is running which means the engine speed is greater than 600 to 850 rpm	engine is not in ready state (which is active when the ignition is on or following a stall o the engine)	e		
P02E8 - Diesel Intake Air Flow Position Sensor Circuit Low	Engine not in afterrun mode (defined as engine speed greater than 0 rpm)	Engine speed greater than 600 to 850 rpm	engine is not in standby state (standby state occurs after ECM initialization or following after-run)	battery voltage is above 11 V for at least 3s	Engine Run Time greater than 10 seconds (engine speed greater than 600 to 850 rpm to indicate the engine is running)	Engine is running which means the engine speed is greater than 600 to 850 rpm	engine is not in ready state (which is active when the ignition is on or following a stall o the engine)	e		
P02E9 - Diesel Intake Air Flow Position Sensor Circuit High	Engine not in afterrun mode (defined as engine speed greater than 0 rpm)	Engine speed greater than 600 to 850 rpm	engine is not in standby state (standby state occurs after ECM initialization or following after-run)	battery voltage is above 11 V for at least 3s	Engine Run Time greater than 10 seconds (engine speed greater than 600 to 850 rpm to indicate the engine is running)	Engine is running which means the engine speed is greater than 600 to 850 rpm	engine is not in ready state (which is active when the ignition is on or following a stall o the engine)	e		
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 o the engine)	3								
P0301 - Cylinder 1 Misfire Detected	engine is not in ready state (which is active when the ignition is on or following a stall o 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 o the engine)	2								
P0303 - Cylinder 3 Misfire Detected	engine is not in ready state (which is active when the ignition is on or following a stall o 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 o the engine)									
P0305 - Cylinder 5 Misfire Detected	engine is not in ready state (which is active when the ignition is on or following a stall o the engine)									
P0306 - Cylinder 6 Misfire Detected	engine is not in ready state (which is active when the ignition is on or following a stall or the engine)	2								
P0307 - Cylinder 7 Misfire Detected	when the ignition is on or following a stall o the engine)									
P0308 - Cylinder 8 Misfire Detected	when the ignition is on or following a stall o the engine)		1		-					
P0335 - Crankshaft Position Sensor Circuit	Engine not in afterrun mode (defined as engine speed greater than 0 rpm)	state occurs after ECM initialization or following after-run)	Engine is running which means the engine speed is greater than 600 to 850 rpm	when the ignition is on or following a stall o the engine)	e D					
20336 - 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	e engine is not in ready state (which is activi when the ignition is on or following a stall o the engine)	e Di					
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	a engine is not in ready state (which is active when the ignition is on or following a stall o the engine)	e Di					
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	e engine is not in ready state (which is activi when the ignition is on or following a stall o the engine)	e					
P0381 - Wait to Start Lamp Control Circuit	Engine not in afterrun mode (defined as engine speed greater than 0 rpm)	engine is not in standby state (standby state occurs after ECM initialization or following after-run)	battery voltage is above 11 V for at least 3s	Engine is running which means the engine speed is greater than 600 to 850 rpm	e					
P0400 - Exhaust Gas Recirculation (EGR) Flow Incorrect	Engine not in afterrun mode (defined as engine speed greater than 0 rpm)	Engine speed greater than 600 to 850 rpm	engine is not in standby state (standby state occurs after ECM initialization or following after-run)	ambient air temperature is above -7 deg C	ambient pressure is above 74.8kPa	battery voltage is above 11 V for at least 3s	Engine Run Time greater than 10 seconds (engine speed greater than 600 to 850 rpm to indicate the engine is running)	Engine is running which means the engine speed is greater than 600 to 850 rpm	engine is not in ready state (which is active when the ignition is on or following a stall o the engine)	e
P0401 - Exhaust Gas Recirculation Flow Insufficient	Engine not in afterrun mode (defined as engine speed greater than 0 rpm)	Engine speed greater than 600 to 850 rpm	engine is not in standby state (standby state occurs after ECM initialization or following after-run)	ambient air temperature is above -7 deg C	ambient pressure is above 74.8kPa	battery voltage is above 11 V for at least 3s	Engine Run Time greater than 10 seconds (engine speed greater than 600 to 850 rpn to indicate the engine is running)	s System is not in active regeneration mode	Engine is running which means the engine speed is greater than 600 to 850 rpm	engine is not in ready star when the ignition is on or the engine
P0402 - Exhaust Gas Recirculation Flow Excessive	Engine not in afterrun mode (defined as engine speed greater than 0 rpm)	Engine speed greater than 600 to 850 rpm	engine is not in standby state (standby state occurs after ECM initialization or following after-run)	ambient air temperature is above -7 deg C	ambient pressure is above 74.8kPa	battery voltage is above 11 V for at least 3s	Engine Run Time greater than 10 seconds (engine speed greater than 600 to 850 rpm to indicate the engine is running)	s N 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 sta when the ignition is on or the engine
P0403 - Exhaust Gas Recirculation (EGR) Motor Control Circuit	engine is not in standby state (standby state occurs after ECM initialization or following after-run)	battery voltage is above 11 V for at least 3s						_		
P0405 - Exhaust Gas Recirculation Position Sensor Circuit Low	Engine not in afterrun mode (defined as engine speed greater than 0 rpm)	Engine speed greater than 600 to 850 rpm	engine is not in standby state (standby state occurs after ECM initialization or following after-run)	battery voltage is above 11 V for at least 3s	Engine Run Time greater than 10 seconds (engine speed greater than 600 to 850 rpm to indicate the engine is running)	Engine is running which means the engine speed is greater than 600 to 850 rpm	engine is not in ready state (which is active when the ignition is on or following a stall o the engine)	e 2		
P0406 - Exhaust Gas Recirculation Position Sensor Circuit High	Engine not in afterrun mode (defined as engine speed greater than 0 rpm)	Engine speed greater than 600 to 850 rpm	engine is not in standby state (standby state occurs after ECM initialization or following after-run)	battery voltage is above 11 V for at least 3s	Engine Run Time greater than 10 seconds (engine speed greater than 600 to 850 rpm to indicate the engine is running)	Engine is running which means the engine speed is greater than 600 to 850 rpm	engine is not in ready state (which is active when the ignition is on or following a stall o the engine)	e 2		
P040C - Exhaust Gas Recirculation (EGR) Temperature Sensor 2 Circuit Low Voltage	Engine not in afterrun mode (defined as engine speed greater than 0 rpm)	Engine speed greater than 600 to 850 rpm	engine is not in standby state (standby state occurs after ECM initialization or following after-run)	battery voltage is above 11 V for at least 3s	Engine Run Time greater than 10 seconds (engine speed greater than 600 to 850 rpm to indicate the engine is running)	Engine is running which means the engine speed is greater than 600 to 850 rpm	engine is not in ready state (which is active when the ignition is on or following a stall o the engine)	e 2		
P040D - Exhaust Gas Recirculation (EGR) Temperature Sensor 2 Circuit High Voltage	Engine not in afterrun mode (defined as engine speed greater than 0 rpm)	Engine speed greater than 600 to 850 rpm	engine is not in standby state (standby state occurs after ECM initialization or following after-run)	battery voltage is above 11 V for at least 3s	Engine Run Time greater than 10 seconds (engine speed greater than 600 to 850 rpm to indicate the engine is running)	Engine is running which means the engine speed is greater than 600 to 850 rpm	engine is not in ready state (which is active when the ignition is on or following a stall o the engine)	e X		
P040F - Exhaust Gas Recirculation (EGR) Temperature Sensor 1-2	Engine not in afterrun mode (defined as engine speed greater than 0 rpm)	Engine speed greater than 600 to 850 rpm	engine is not in standby state (standby state occurs after ECM initialization or	Engine is running which means the engine speed is greater than 600 to 850 rpm	e engine is not in ready state (which is active when the ignition is on or following a stall o					

DTC			Additional Basic Enable Conditions					-
P041C - Exhaust Gas Recirculation (EGR) Temperature Sensor 1 Circuit Low Voltage	Engine not in afterrun mode (defined as engine speed greater than 0 rpm)	Engine speed greater than 600 to 850 rpm	engine is not in standby state (standby state occurs after ECM initialization or following after-run)	battery voltage is above 11 V for at least 3s	Engine Run Time greater than 10 seconds (engine speed greater than 600 to 850 rpm to indicate the engine is running)	Engine is running which means the engine speed is greater than 600 to 850 rpm	engine is not in ready state (which is active when the ignition is on or following a stall o the engine)	
P041D - Exhaust Gas Recirculation (EGR) Temperature Sensor 1 Circuit High Voltage	Engine not in afterrun mode (defined as engine speed greater than 0 rpm)	Engine speed greater than 600 to 850 rpm	engine is not in standby state (standby state occurs after ECM initialization or following after-run)	battery voltage is above 11 V for at least 3s	Engine Run Time greater than 10 seconds (engine speed greater than 600 to 850 rpm to indicate the engine is running)	Engine is running which means the engine speed is greater than 600 to 850 rpm	engine is not in ready state (which is active when the ignition is on or following a stall o the engine)	
P0420 - NMHC Catalyst Efficiency Below Threshold Bank 1	Engine not in afterrun mode (defined as engine speed greater than 0 rpm)	Engine speed greater than 600 to 850 rpm	engine is not in standby state (standby state occurs after ECM initialization or following after-run)	ambient air temperature is above -7 deg C	ambient pressure is above 74.8kPa	Engine Run Time greater than 10 seconds (engine speed greater than 600 to 850 rpn to indicate the engine is running)	Engine is running which means the engine speed is greater than 600 to 850 rpm	engine is not in ready state (which is active when the ignition is on or following a stall o the engine)
P0461 - Fuel Level Sensor Performance	Engine not in afterrun mode (defined as engine speed greater than 0 rpm)	Engine speed greater than 600 to 850 rpm	engine is not in standby state (standby state occurs after ECM initialization or following after-run)	battery voltage is above 11 V for at least 3s	Engine Run Time greater than 10 seconds (engine speed greater than 600 to 850 rpm to indicate the engine is running)	Engine is running which means the engine speed is greater than 600 to 850 rpm	engine is not in ready state (which is active when the ignition is on or following a stall o the engine)	
P0462 - Fuel Level Sensor Circuit Low	Engine not in afterrun mode (defined as engine speed greater than 0 rpm)	Engine speed greater than 600 to 850 rpm	engine is not in standby state (standby state occurs after ECM initialization or following after-run)	battery voltage is above 11 V for at least 3s	Engine Run Time greater than 10 seconds (engine speed greater than 600 to 850 rpm to indicate the engine is running)	Engine is running which means the engine speed is greater than 600 to 850 rpm	engine is not in ready state (which is active when the ignition is on or following a stall o the engine)	
P0463 - Fuel Level Sensor Circuit High	Engine not in afterrun mode (defined as engine speed greater than 0 rpm)	Engine speed greater than 600 to 850 rpm	engine is not in standby state (standby state occurs after ECM initialization or following after-run)	battery voltage is above 11 V for at least 3s	Engine Run Time greater than 10 seconds (engine speed greater than 600 to 850 rpm to indicate the engine is running)	Engine is running which means the engine speed is greater than 600 to 850 rpm	engine is not in ready state (which is active when the ignition is on or following a stall o the engine)	
P046C - Exhaust Gas Recirculation(EGR) Position Sensor	Engine not in afterrun mode (defined as	Engine speed greater than 600 to 850 rpm	engine is not in standby state (standby state occurs after ECM initialization or	battery voltage is above 11 V for at least	Engine is running which means the engine	engine is not in ready state (which is active when the ignition is on or following a stall of		-
Performance P0480 - Cooling Fan Speed Output Circuit	Engine not in afterrun mode (defined as engine speed greater than 0 rpm)	engine is not in standby state (standby state occurs after ECM initialization or following after-run)	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	apeed in greater that one to oper print	the engine)]	
P0483 - Cooling Fan System Performance	Engine not in afterrun mode (defined as engine speed greater than 0 rpm)	Engine speed greater than 600 to 850 rpm	engine is not in standby state (standby state occurs after ECM initialization or following after-run)	Manufacturer Enable Counter is zero (value of 0 means ECM is locked and out of assembly plant mode)	ambient pressure is above 74.8kPa	Engine Run Time greater than 10 seconds (engine speed greater than 600 to 850 rpm to indicate the engine is running)	Engine is running which means the engine speed is greater than 600 to 850 rpm	engine is not in ready state (which is active when the ignition is on or following a stall o the engine)
P0489 - Exhaust Gas Recirculation (EGR) Motor Control Circuit 1 Low Voltage	engine is not in standby state (standby state occurs after ECM initialization or following after-run)	battery voltage is above 11 V for at least 3s						
(EGR) Motor Control Circuit 1 High	state occurs after ECM initialization or	battery voltage is above 11 V for at least 3s						
P0495 - Cooling Fan Speed High	Engine not in afterrun mode (defined as engine speed greater than 0 rpm)	Engine speed greater than 600 to 850 rpm	engine is not in standby state (standby state occurs after ECM initialization or following after-run)	Manufacturer Enable Counter is zero (value of 0 means ECM is locked and out of assembly plant mode)	Engine Run Time greater than 10 seconds (engine speed greater than 600 to 850 rpm to indicate the engine is running)	Engine is running which means the engine speed is greater than 600 to 850 rpm	engine is not in ready state (which is active when the ignition is on or following a stall o the engine)	
P049D - EGR Control Position Not Learned	engine is not in standby state (standby state occurs after ECM initialization or following after-run)	battery voltage is above 11 V for at least 3s				I		1
P0506 - Idle Speed Low	Engine Run Time greater than 10 seconds (engine speed greater than 600 to 850 rpm to indicate the engine is running)	engine is not in ready state (which is active when the ignition is on or following a stall of the engine)						
P0507 - Idle Speed High	Engine Run Time greater than 10 seconds (engine speed greater than 600 to 850 rpm to indicate the engine is running)	engine is not in ready state (which is active when the ignition is on or following a stall of the engine)						_
P0526 - Cooling Fan Speed Sensor Circuit	Engine not in afterrun mode (defined as engine speed greater than 0 rpm)	Engine speed greater than 600 to 850 rpm	engine is not in standby state (standby state occurs after ECM initialization or following after-run)	battery voltage is above 11 V for at least 3s	Engine Run Time greater than 10 seconds (engine speed greater than 600 to 850 rpm to indicate the engine is running)	Engine is running which means the engine speed is greater than 600 to 850 rpm	engine is not in ready state (which is active when the ignition is on or following a stall o the engine)	
P0545 - Exhaust Gas Temperature (EGT) Sensor 1 Circuit Low Voltage	Engine not in afterrun mode (defined as engine speed greater than 0 rpm)	Engine speed greater than 600 to 850 rpm	engine is not in standby state (standby state occurs after ECM initialization or	battery voltage is above 11 V for at least 3s	Engine is running which means the engine speed is greater than 600 to 850 rpm			
P0546 - Exhaust Gas Temperature (EGT) Sensor 1 Circuit High Voltage	Engine not in afterrun mode (defined as engine speed greater than 0 rpm)	Engine speed greater than 600 to 850 rpm	engine is not in standby state (standby state occurs after ECM initialization or following after-run)	battery voltage is above 11 V for at least 3s	Engine is running which means the engine speed is greater than 600 to 850 rpm			
P0567 - Cruise Control Resume Switch Circuit	Engine not in afterrun mode (defined as engine speed greater than 0 rpm)	Engine speed greater than 600 to 850 rpm	engine is not in standby state (standby state occurs after ECM initialization or following after-run)	Manufacturer Enable Counter is zero (value of 0 means ECM is locked and out of assembly plant mode)	battery voltage is above 11 V for at least 3s	Engine Run Time greater than 10 seconds (engine speed greater than 600 to 850 rpm to indicate the engine is running)	Engine is running which means the engine speed is greater than 600 to 850 rpm	engine is not in ready state (which is active when the ignition is on or following a stall o the engine)
P0568 - Cruise Control Set Switch Circuit	Engine not in afterrun mode (defined as engine speed greater than 0 rpm)	Engine speed greater than 600 to 850 rpm	engine is not in standby state (standby state occurs after ECM initialization or following after-run)	Manufacturer Enable Counter is zero (value of 0 means ECM is locked and out of assembly plant mode)	battery voltage is above 11 V for at least 3s	Engine Run Time greater than 10 seconds (engine speed greater than 600 to 850 rpm to indicate the engine is running)	Engine is running which means the engine speed is greater than 600 to 850 rpm	engine is not in ready state (which is active when the ignition is on or following a stall o the engine)
P0575 - Cruise Control Input Circuit	Engine not in afterrun mode (defined as engine speed greater than 0 rpm)	Engine speed greater than 600 to 850 rpm	engine is not in standby state (standby state occurs after ECM initialization or following after-run)	Manufacturer Enable Counter is zero (value of 0 means ECM is locked and out of assembly plant mode)	battery voltage is above 11 V for at least 3s	Engine is running which means the engine speed is greater than 600 to 850 rpm	engine is not in ready state (which is active when the ignition is on or following a stall o the engine)	
P0606 - Control Module Internal Performance	Engine not in afterrun mode (defined as engine speed greater than 0 rpm)	Engine speed greater than 600 to 850 rpm	engine is not in standby state (standby state occurs after ECM initialization or following after-run)	Engine Run Time greater than 10 seconds (engine speed greater than 600 to 850 rpm to indicate the engine is running)	Engine is running which means the engine speed is greater than 600 to 850 rpm	engine is not in ready state (which is active when the ignition is on or following a stall on the engine)		
P062F - Control Module Long Term Memory Performance	state occurs after ECM initialization or							
P0640 - Intake Air (IA) Heater Switch/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						
P0641 - 5 Volt Reference 1 Circuit	engine is not in standby state (standby state occurs after ECM initialization or following after run)	battery voltage is above 11 V for at least 3s						
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						
P0650 - Malfunction Indicator Lamp Control Circuit	Engine not in afterrun mode (defined as engine speed greater than 0 rpm)	engine is not in standby state (standby state occurs after ECM initialization or following offer pup)	battery voltage is above 11 V for at least 3s	Engine is running which means the engine speed is greater than 600 to 850 rpm				
P0651 - 5 Volt Reference 2 Circuit	engine is not in standby state (standby state occurs after ECM initialization or following after-run)	battery voltage is above 11 V for at least 3s		I	1			
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	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) engine is not in standby state (standby	battery voltage is above 11 V for at least 38						
P0674 - Glow Plug 4 Control Circuit	state occurs after ECM initialization or following after-run)	battery voltage is above 11 V for at least 3s						
P0675 - Glow Plug 5 Control Circuit	engine is not in standby state (standby state occurs after ECM initialization or following after-run)	battery voltage is above 11 V for at least 3s						
P0676 - Glow Plug 6 Control Circuit	engine is not in standby state (standby state occurs after ECM initialization or following after-run)	battery voltage is above 11 V for at least 3s						
P0677 - Glow Plug 7 Control Circuit	engine is not in standby state (standby state occurs after ECM initialization or following after-run)	battery voltage is above 11 V for at least 3s						
P0678 - Glow Plug 8 Control Circuit	engine is not in standby state (standby state occurs after ECM initialization or following after ann)	battery voltage is above 11 V for at least 3s						
P0697 - 5 Volt Reference 3 Circuit	engine is not in standby state (standby state occurs after ECM initialization or following after-run)	battery voltage is above 11 V for at least 3s						

Karana Caran	P06A3 - 5 Volt Reference 4 Circuit	engine is not in standby state (standby state occurs after ECM initialization or following after-run)	battery voltage is above 11 V for at least 3s									
Marca Marca Marca Marca Marca Marca Marca Marca Marca Marca 	P06D2 - 5 Volt Reference 5 Circuit	engine is not in standby state (standby state occurs after ECM initialization or following after-run)	battery voltage is above 11 V for at least 3s									
Marrian Marrian Marrian Marrian Marrian Marrian Marrian Marrian Marrian Marrian Marrian Marrian Marrian 	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)		-								
Mathematical Stratematical Stratematical Stratematical Stratematical Stratematical Stratematical Stratematical Stratematical Stratematical Stratematical Stratematical Stratematical 	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)										
Mathematical	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)										
InteractionSource and source	P0856 - Traction Control Torque Request Signal Message Counter Incorrect	Engine not in afterrun mode (defined as engine speed greater than 0 rpm)	engine is not in standby state (standby state occurs after ECM initialization or following after-run)	Engine Run Time greater than 10 seconds (engine speed greater than 600 to 850 rpm to indicate the engine is running)								
Interface Stature Stature Stature Stature 1 Stature Stature <t< th=""><th>P1043 - Reductant Pump High Control Circuit Low Voltage</th><th>Engine not in afterrun mode (defined as engine speed greater than 0 rpm)</th><th>Engine speed greater than 600 to 850 rpm</th><th>engine is not in standby state (standby state occurs after ECM initialization or following after-run)</th><th>Engine Run Time greater than 10 seconds (engine speed greater than 600 to 850 rpm to indicate the engine is running)</th><th>Engine is running which means the engine speed is greater than 600 to 850 rpm</th><th>engine is not in ready state (which is active when the ignition is on or following a stall o the engine)</th><th></th><th></th><th></th><th></th><th></th></t<>	P1043 - Reductant Pump High Control Circuit Low Voltage	Engine not in afterrun mode (defined as engine speed greater than 0 rpm)	Engine speed greater than 600 to 850 rpm	engine is not in standby state (standby state occurs after ECM initialization or following after-run)	Engine Run Time greater than 10 seconds (engine speed greater than 600 to 850 rpm to indicate the engine is running)	Engine is running which means the engine speed is greater than 600 to 850 rpm	engine is not in ready state (which is active when the ignition is on or following a stall o the engine)					
InteractionSolut	P1044 - Reductant Pump High Control Circuit High Voltage	Engine speed greater than 600 to 850 rpm	engine is not in standby state (standby state occurs after ECM initialization or following after-run)	Engine Run Time greater than 10 seconds (engine speed greater than 600 to 850 rpm to indicate the engine is running)	Engine is running which means the engine speed is greater than 600 to 850 rpm	engine is not in ready state (which is active when the ignition is on or following a stall of the engine)						
Image: Section of Sectin of Sectin of Sectin of Section of Section of Section of Section	P1048 - Reductant Injector High Control Circuit Low Voltage	Engine not in afterrun mode (defined as engine speed greater than 0 rpm)	Engine speed greater than 600 to 850 rpm	engine is not in standby state (standby state occurs after ECM initialization or following after-run)	battery voltage is above 11 V for at least 3s	Engine Run Time greater than 10 seconds (engine speed greater than 600 to 850 rpm to indicate the engine is running)	Engine is running which means the engine speed is greater than 600 to 850 rpm	engine is not in ready state (which is active when the ignition is on or following a stall of the engine)				
Mathematical	P1049 - Reductant Injector High Control Circuit High Voltage	Engine not in afterrun mode (defined as engine speed greater than 0 rpm)	Engine speed greater than 600 to 850 rpm	engine is not in standby state (standby state occurs after ECM initialization or following after-run)	battery voltage is above 11 V for at least 3s	Engine Run Time greater than 10 seconds (engine speed greater than 600 to 850 rpm to indicate the engine is running)	Engine is running which means the engine speed is greater than 600 to 850 rpm	engine is not in ready state (which is active when the ignition is on or following a stall of the engine)				
Name Name Name Name Name Name	P10CC - Exhaust Aftertreatment Fuel Injector Control Circuit Shorted	Engine not in afterrun mode (defined as engine speed greater than 0 rpm)	engine is not in standby state (standby state occurs after ECM initialization or following after-run)	battery voltage is above 11 V for at least 3s	Engine is running which means the engine speed is greater than 600 to 850 rpm							
Mathematical	Fuel Injector High Control Circuit Low Voltage	Engine not in afterrun mode (defined as engine speed greater than 0 rpm)	engine is not in standby state (standby state occurs after ECM initialization or following after-run)	battery voltage is above 11 V for at least 3s	Engine is running which means the engine speed is greater than 600 to 850 rpm							
Name Procession	P10CE - Exhaust Aftertreatment Fuel Injector High Control Circuit High Voltage P111C - Charge Air Conter	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		1					
Million Markanesse Markanesse Markanesse Markanesse Million Salasse Markanesse Markanese Mar	Temperature-Intake Air Temperature (IAT) Sensor 2 Not Plausible	Engine not in afterrun mode (defined as engine speed greater than 0 rpm)	Engine speed greater than 600 to 850 rpm	engine is not in standby state (standby state occurs after ECM initialization or following after-run)	Engine is running which means the engine speed is greater than 600 to 850 rpm	engine is not in ready state (which is active when the ignition is on or following a stall of the engine)						
Name Name Name Name Name Name Name Sector Sector<	P111D - Intake Air Temperature (IAT) Sensor 1 - Fuel Temperature Sensor 2 Not Plausible	Engine not in afterrun mode (defined as engine speed greater than 0 rpm)	Engine speed greater than 600 to 850 rpm	engine is not in standby state (standby state occurs after ECM initialization or following after-run)	Engine is running which means the engine speed is greater than 600 to 850 rpm	engine is not in ready state (which is active when the ignition is on or following a stall of the engine)						
Image: state sta	P113A - Exhaust Gas Temperature Sensors 3-4 Not Plausible	Engine not in afterrun mode (defined as engine speed greater than 0 rpm)	Engine speed greater than 600 to 850 rpm	engine is not in standby state (standby state occurs after ECM initialization or following after-run)	Engine is running which means the engine speed is greater than 600 to 850 rpm	engine is not in ready state (which is active when the ignition is on or following a stall of the engine)						
Max Subscription Subscri	P11AF - HO2S Performance - Signal High During Moderate Load Bank 1 Sensor 2	Engine not in afterrun mode (defined as engine speed greater than 0 rpm)	Engine speed greater than 600 to 850 rpm	engine is not in standby state (standby state occurs after ECM initialization or following after-run)	Manufacturer Enable Counter is zero (value of 0 means ECM is locked and out of assembly plant mode)	battery voltage is above 11 V for at least 3s	Engine Run Time greater than 10 seconds (engine speed greater than 600 to 850 rpm to indicate the engine is running)	Engine is running which means the engine speed is greater than 600 to 850 rpm	engine is not in ready state (which is active when the ignition is on or following a stall of the engine)			
Image: Similar biological biologic	P11B2 - HO2S Performance - Signal Low During Moderate Load Bank 1 Sensor 2	Engine not in afterrun mode (defined as engine speed greater than 0 rpm)	Engine speed greater than 600 to 850 rpm	engine is not in standby state (standby state occurs after ECM initialization or following after-run)	Manufacturer Enable Counter is zero (value of 0 means ECM is locked and out of assembly plant mode)	battery voltage is above 11 V for at least 3s	Engine Run Time greater than 10 seconds (engine speed greater than 600 to 850 rpm to indicate the engine is running)	Engine is running which means the engine speed is greater than 600 to 850 rpm	engine is not in ready state (which is active when the ignition is on or following a stall or the engine)			
Induction and mathematication andimensional andimensional and mathematicat	P11B5 - HO2S Current Performance Bank 1 Sensor 2	Engine not in afterrun mode (defined as engine speed greater than 0 rpm)	Engine speed greater than 600 to 850 rpm	engine is not in standby state (standby state occurs after ECM initialization or following after-run)	Manufacturer Enable Counter is zero (value of 0 means ECM is locked and out of assembly plant mode)	battery voltage is above 11 V for at least 3s	Engine Run Time greater than 10 seconds (engine speed greater than 600 to 850 rpm to indicate the engine is running)	Engine is running which means the engine speed is greater than 600 to 850 rpm	engine is not in ready state (which is active when the ignition is on or following a stall o the engine)			
Initial Additional Series And additional Series And additional Series And additional Series And additional Series Addition Se	P11CB - NOx Sensor Performance - Signal High Bank 1 Sensor 1	Engine not in afterrun mode (defined as engine speed greater than 0 rpm)	Engine speed greater than 600 to 850 rpm	engine is not in standby state (standby state occurs after ECM initialization or following after-run)	Manufacturer Enable Counter is zero (value of 0 means ECM is locked and out of assembly plant mode)	ambient air temperature is above -7 deg C	ambient pressure is above 74.8kPa	battery voltage is above 11 V for at least 3s	Engine Run Time greater than 10 seconds (engine speed greater than 600 to 850 rpm to indicate the engine is running)	System is not in active regeneration mode	Engine is running which means the engine speed is greater than 600 to 850 rpm	engine is not in ready state (which is active when the ignition is on or following a stall of the engine)
Intermediation Intermediatintermediatintermediation Intermediatio	P11CC - NOx Sensor Performance - Signal Low Bank 1 Sensor 1	Engine not in afterrun mode (defined as engine speed greater than 0 rpm)	Engine speed greater than 600 to 850 rpm	engine is not in standby state (standby state occurs after ECM initialization or following after-run)	Manufacturer Enable Counter is zero (value of 0 means ECM is locked and out of assembly plant mode)	ambient air temperature is above -7 deg C	ambient pressure is above 74.8kPa	battery voltage is above 11 V for at least 3s	Engine Run Time greater than 10 seconds (engine speed greater than 600 to 850 rpm to indicate the engine is running)	System is not in active regeneration mode	Engine is running which means the engine speed is greater than 600 to 850 rpm	engine is not in ready state (which is active when the ignition is on or following a stall of the engine)
Interaction Inte	P11DB - NOx Sensor Current Performance Bank 1 Sensor 1	Engine not in afterrun mode (defined as engine speed greater than 0 rpm)	Engine speed greater than 600 to 850 rpm	engine is not in standby state (standby state occurs after ECM initialization or following after-run)	Manufacturer Enable Counter is zero (value of 0 means ECM is locked and out of assembly plant mode)	battery voltage is above 11 V for at least 3s	Engine Run Time greater than 10 seconds (engine speed greater than 600 to 850 rpm to indicate the engine is running)	System is not in active regeneration mode	Engine is running which means the engine speed is greater than 600 to 850 rpm	engine is not in ready state (which is active when the ignition is on or following a stall of the engine)		
Pictor Weight	P11DC - NOx Sensor Current Performance Bank 1 Sensor 2	Engine not in afterrun mode (defined as engine speed greater than 0 rpm)	Engine speed greater than 600 to 850 rpm	engine is not in standby state (standby state occurs after ECM initialization or following after-run)	Manufacturer Enable Counter is zero (value of 0 means ECM is locked and out of assembly plant mode)	battery voltage is above 11 V for at least 3s	Engine Run Time greater than 10 seconds (engine speed greater than 600 to 850 rpm to indicate the engine is running)	System is not in active regeneration mode	Engine is running which means the engine speed is greater than 600 to 850 rpm	engine is not in ready state (which is active when the ignition is on or following a stall of the engine)		
Phase Handbork Mine Partial Handbork Mine Select Handbork Mine Select Handbork Mine H122: Handbork Handbork Mine Select Handbork Mine Select Handbork Mine H122: Handbork Handbork Mine Select Handbork Mine Select Handbork Mine H122: Handbork Handbork Mine Select Handbork Mine Select Handbork Mine H122: Handbork Handbork Mine Select Handbork Mine Select Handbork Mine H122: Handbork Mine Select Handbork Mine Select Handbork Mine H123: Handbork Mine Select Handbork Mine Select Handbork Mine H123: Handbork Mine Select Handbork Mine Select Handbork Mine H123: Handbork Mine Select Handbork Mine Select Handbork Mine H123: Handbork Mine Select Handbork Mine Select Handbork Mine H123: Handbork Mine Select Handbork Mine Select Handbork Mine H123: Handbork Mine Select Handbork Mine Select Handbork Mine H123: Handbork Mine Select Handbork Mine Select Handbork Mine H123: Handbork Mine Select Handbork Mine Select Handbork Mine H124: Handbork Mine Select Handbork Mine Select Handbork Mine H124: Handbork Mine Select Handbork Mine Select Handbork Mine H124: Handbork Mine Select Handbork Mine Select Handbork Mine	P122C - Intake Air Flow Valve Control Circuit Shorted	state occurs after ECM initialization or following after-run)	battery voltage is above 11 V for at least 3s									
IP 280-0000Open and the stand with with with with with with with with	P122D - Diesel Intake Air Flow Position Sensor Exceeded Learning Limit	engine is not in standby state (standby state occurs after ECM initialization or following after-run)	battery voltage is above 11 V for at least 3s									
PD20- Grand Cond Cond Cond Cond Boolega Advanced To Use Cond Boolega Advanc	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									
N1206- Folder ConstructionOrigine for an in advance (advance advance	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									
Pit2B0- Reflectional Registrational registrational Registrational registrational Registrational registrational Registrational Reflectional Registrational Reflectional Registrational Reflectional Registrational Reflectional Registrational Reflectional Registrational Reflectional Registrational Reflectional Registrational Registrational Reflectional Registrational Reflectional Registrational Reflectional Registrational Registrational Reflectional Registrational Registrational Reflectional Registrational Registrational Reflectional Registrational Registrational Registrational Registrational Reflectional Registrational Registrational Registrational Reflectional Reflectional Registrational Reflectional Reflectiona	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							
PPEder Upfel kand i mange statute (which is a sub mer operator)P1280- Opinder 1 mer opinuomahent ar i merperatori is above 7.4 ge Cmahente pressure is above 7.4 ge Cmahente pressure is above 7.4 ge CP1280- Opinder 2 mercorisonmahent ar i merperatori is above 7.4 ge Cmahente pressure is above 7.4 ge Cmahente pressure is above 7.4 ge CP1280- Opinder 2 mercorisonmahent ar i merperatori is above 7.4 ge Cmahente pressure is above 7.4 ge Cmahente pressure is above 7.4 ge CP1280- Opinder 2 mercorisonmahent ar imerperatori is above 7.4 ge Cmahente pressure is above 7.4 ge Cmahente pressure is above 7.4 ge CP1280- Opinder 2 mercorisonmahent ar imerperatori is above 7.4 ge Cmahente pressure is above 7.4 ge Cmahente pressure is above 7.4 ge CP1280- Opinder 2 mercorisonmahent ar imerperatori is above 7.4 ge Cmahente pressure is above 7.4 ge Cmahente pressure is above 7.4 ge CP1280- Opinder 2 mercorisonmahent ar imerperatori is above 7.4 ge Cmahente pressure is above 7.4 ge Cmahente pressure is above 7.4 ge CP1280- Opinder 2 mercorisonmahent ar imerperatori is above 7.4 ge Cmahenter pressure is above 7.4 ge Cmercorison and and the mercorison and and the mercorison and and the mercorison and and the mercorison and the mercoriso	P125B - Fuel Pressure Regulator 2 High Control Circuit High Voltage	engine is not in standby state (standby state occurs after ECM initialization or following after-run)										
P1283- Outdood 11 getedoor 10m Retardoodander at	P128E - Fuel Rail Pressure Performance	engine is not in ready state (which is active when the ignition is on or following a stall o the engine)	e D									
P12B2-Optimized 1 presentative is above 7-40e Candeent pressure is above 7-40e C	P12B3 - 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)								
P1285 - Opinder 2 speedon Timm andbert at temperature is above -7-deg C andbert pressure is above 74.84P engine in out ready state (which is active meranic) at all on the heightion is on of bolowing at all on the heightion is	P12B4 - 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)								
P12Be - Opinder 2 lipedion Timing ambient air temperature is above -7.4 eg C ambient pressure is above 7.4 8/A engine in out ready state (wich is active on following a state) P12Br - Opinder 3 lipedion Timing ambient air temperature is above -7.4 eg C ambient pressure is above 7.4 8/A engine in out ready state (wich is active on following a state) P12Br - Opinder 3 lipedion Timing ambient air temperature is above -7.4 eg C ambient pressure is above 7.4 8/A engine in out ready state (wich is active on following a state) P12Br - Opinder 4 lipedion Timing ambient air temperature is above -7.4 eg C ambient air temperature is above -7.4 eg C ambient air temperature is above -7.4 eg C engine in out ready state (wich is active on following a state) P12Br - Opinder 4 lipedion Timing ambient air temperature is above -7.4 eg C ambient air t	P12B5 - 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)								
P12B - Opinder 3 specielon Thimp Retarded ambient at temperature is above -7.4 BBC ambient pressure is above -7.4 BBC ambient pressure is above -7.4 BBC ambient pressure is above -7.4 BBC P12B - Opinder 3 specielon Thimp Retarded ambient at temperature is above -7.4 BBC ambient pressure is above -7.4 BBC ambient pressure is above -7.4 BBC ambient pressure is above -7.4 BBC P12B - Opinder 4 specielon Thimp Retarded ambient at temperature is above -7.4 BBC ambient pressure is above -7.4 BBC ambient pressure is above -7.4 BBC ambient pressure is above -7.4 BBC P12B - Opinder 4 specielon Thimp Retarded ambient at temperature is above -7.4 BBC ambient pressure is above -7.4 BBC ambient pressure is above -7.4 BBC ambient pressure is above -7.4 BBC	P12B6 - 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)								
P12Be-Oylinder 3 lingestion Timing Advanced ambient ar temperature is above -7.4 eg C ambient pressure is above 7.4 BAPa endprine to at interady sate (ruchos is active endprine) a control of the outperature field addate P12Be-Oylinder 4 lingestion Timing Retarded ambient ar temperature is above -7.4 eg C ambient pressure is above 7.4 BAPa endprine to at interady sate (ruchos is active when the lingetion is non following a satil on the toward is non following a satil on following a	P12B7 - 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)								
P12BA - Oyinder 4 liyection Timing Retarded ambient air temperature is above -7 deg C ambient pressure is above -7 deg C ambient pressure is above -7 deg C ambient pressure is above -7 deg C P12BA - Oyinder 4 liyection Timing Advanced ambient air temperature is above -7 deg C ambient pressure is above -7 deg C ambient pressure is above -7 deg C ambient pressure is above -7 deg C	P12B8 - 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 accion)								
P12BA - Oyimder 4 Injection Timing Advanced ambient ar temperature is above -7 deg C ambient pressure is above 74 d8xP (mun is active method in the legition or following a stall of the engine)	P12B9 - 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)								
	P12BA - Cylinder 4 Injection Timing Advanced	ambient air temperature is above -7 deg C	ambient pressure is above 74.8kPa	when the ignition is on or following a stall of the engine)								

P12BB - Cylinder 5 Injection Timing Retarded	ambient air temperature is above -7 deg C	ambient pressure is above 74.8kPa	engine is not in ready state (which is active when the ignition is on or following a stall of the engine)							
P12BC - Cylinder 5 Injection Timing Advanced	ambient air temperature is above -7 deg C	ambient pressure is above 74.8kPa	engine is not in ready state (which is active when the ignition is on or following a stall of the engine)							
P12BD - Cylinder 6 Injection Timing Retarded	ambient air temperature is above -7 deg C	ambient pressure is above 74.8kPa	engine is not in ready state (which is active when the ignition is on or following a stall of the engine)							
P12BE - Cylinder 6 Injection Timing Advanced	ambient air temperature is above -7 deg C	ambient pressure is above 74.8kPa	engine is not in ready state (which is active when the ignition is on or following a stall of the engine)							
P12BF - Cylinder 7 Injection Timing Retarded	ambient air temperature is above -7 deg C	ambient pressure is above 74.8kPa	engine is not in ready state (which is active when the ignition is on or following a stall of the engine)							
P12C0 - Cylinder 7 Injection Timing Advanced	ambient air temperature is above -7 deg C	ambient pressure is above 74.8kPa	engine is not in ready state (which is active when the ignition is on or following a stall of the engine)							
P12C1 - Cylinder 8 Injection Timing Retarded	ambient air temperature is above -7 deg C	ambient pressure is above 74.8kPa	engine is not in ready state (which is active when the ignition is on or following a stall of the engine)							
P12C2 - Cylinder 8 Injection Timing Advanced	ambient air temperature is above -7 deg C	ambient pressure is above 74.8kPa	engine is not in ready state (which is active when the ignition is on or following a stall of the engine)							
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								
Position Sensor Exceded Learning Limit	state occurs after ECM initialization or following after-run)	battery voltage is above 11 V for at least 3s			I		1	I	1	
P140B - Exhaust Gas Recirculation Slow Response-Increasing Flow	Engine not in afterrun mode (defined as engine speed greater than 0 rpm)	Engine speed greater than 600 to 850 rpm	engine is not in standby state (standby state occurs after ECM initialization or following after-run)	ambient air temperature is above -7 deg C	ambient pressure is above 74.8kPa	battery voltage is above 11 V for at least 3s	Engine Run Time greater than 10 seconds (engine speed greater than 600 to 850 rpm to indicate the engine is running)	System is not in active regeneration mode	Engine is running which means the engine speed is greater than 600 to 850 rpm	engine is not in ready state (which is active when the ignition is on or following a stall o the engine)
P140C - Exhaust Gas Recirculation Slow Response-Decreasing Flow	Engine not in afterrun mode (defined as engine speed greater than 0 rpm)	Engine speed greater than 600 to 850 rpm	engine is not in standby state (standby state occurs after ECM initialization or following after-run)	ambient air temperature is above -7 deg C	ambient pressure is above 74.8kPa	battery voltage is above 11 V for at least 3s	Engine Run Time greater than 10 seconds (engine speed greater than 600 to 850 rpm to indicate the engine is running)	System is not in active regeneration mode	Engine is running which means the engine speed is greater than 600 to 850 rpm	engine is not in ready state (which is active when the ignition is on or following a stall of the engine)
P140D - Exhaust Gas Recirculation (EGR) Motor Control Circuit 2 Low Voltage	engine is not in standby state (standby state occurs after ECM initialization or following after-run)	battery voltage is above 11 V for at least 3s								
P140E - Exhaust Gas Recirculation (EGR) Motor Control Circuit 2 High Voltage	engine is not in standby state (standby state occurs after ECM initialization or following after-run)	battery voltage is above 11 V for at least 3s								
P140F - Exhaust Gas Recirculation (EGR) Motor Current Performance	engine is not in standby state (standby state occurs after ECM initialization or following after-run)	battery voltage is above 11 V for at least 38								
P1411 - Exhaust Gas Recirculation (EGR) Cooler Bypass 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								
P1412 - Exhaust Gas Recirculation (EGR) Cooler Bypass 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								
P1413 - Exhaust Gas Recirculation (EGR) Cooler Bypass 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								
P1414 - Exhaust Gas Recirculation (EGR) Cooler Bypass Valve Current	engine is not in standby state (standby state occurs after ECM initialization or	battery voltage is above 11 V for at least								
Performance	following after-run)	55					_			
Performance P144B - Closed Loop Diesel Particulate Filter (DPF) Regeneration Control At Limit - Stage 1 Temperature Too Low	Engine not in afterrun mode (defined as engine speed greater than 0 rpm)	Engine speed greater than 600 to 850 rpm	engine is not in standby state (standby state occurs after ECM initialization or following after-run)	Engine Run Time greater than 10 seconds (engine speed greater than 600 to 850 rpm to indicate the engine is running)	Engine is running which means the engine speed is greater than 600 to 850 rpm	engine is not in ready state (which is active when the ignition is on or following a stall o the engine)				
Performance P144B - Closed Loop Diesel Particulate Filter (DPF) Regeneration Control At Limit - Stage 1 Temperature Too Low P144C - Closed Loop Diesel Particulate Filter (DPF) Regeneration Control At Limit - Stage 1 Temperature Too High	torowing after-run) Engine not in afterrun mode (defined as engine speed greater than 0 rpm) Engine not in afterrun mode (defined as engine speed greater than 0 rpm)	Engine speed greater than 600 to 850 rpm Engine speed greater than 600 to 850 rpm	engine is not in standby state (standby state occurs after ECM initialization or following after-run) engine is not in standby state (standby state occurs after ECM initialization or following after-run)	Engine Run Time greater than 10 seconds (engine speed greater than 600 to 850 rpm to indicate the engine is running) Engine Run Time greater than 60 to 850 rpm to indicate the engine is running)	Engine is running which means the engine speed is greater than 600 to 850 rpm Engine is running which means the engine speed is greater than 600 to 850 rpm	engine is not in ready state (which is active when the ignition is on or following a stall or the engine) engine is not in ready state (which is active when the ignition is on or following a stall or the engine)				
Performance P1448 - Closed Loop Diesel Particulate Filter (DPF) Regeneration Control At Limit - Stage 1 Temperature Too Low P144C - Closed Loop Diesel Particulate Filter (DPF) Regeneration Control At Limit - Stage 1 Temperature Too High P150C - TOM Engine Speed Request Signal Message Counter Incorrect	totowing after-fun) Engine not in afterrum mode (defined as engine speed greater than 0 rpm) Engine not in afterrum mode (defined as engine speed greater than 0 rpm) engine is not in standby state (standby state occurs after EGM initialization or following after-rum)	Engine speed greater than 600 to 850 rpm	engine is not in standby state (standby state occurs after ECM initialization or following after-run) engine is not in standby state (standby state occurs after ECM initialization or following after-run)	Engine Run Time greater than 10 seconds (engine speed greater than 600 to 850 rpm to indicate the engine is running) Engine Run Time greater than 10 seconds (engine speed greater than 600 to 850 rpm to indicate the engine is running)	Engine is running which means the engine speed is greater than 600 to 850 rpm Engine is running which means the engine speed is greater than 600 to 850 rpm	engine is not in ready state (which is active when the ignition is on or following a stall or the engine) engine is not in ready state (which is active when the ignition is on or following a stall or the engine)				
Performance PridaB-Cospet Loop Deset Particulate Filer (DPF) Regeneration Control AL Limit- Stage 1 Temperature Too Low PridaC-Cospet Loop Deset PridaC-Cost AL Limit Regeneration Control AL Limit PridaC-Cost AL Limit PridaC-Tot Regner Speed Request Signal Message Counter Incorrect Prisof - Boy Control Module Engine Speed Request Signal Message Counter Incorrect	totoxing after-fun) Engine not in after-un mode (defined as engine speed greater than 0 rpm) Engine not in after-un mode (defined as engine speed greater than 0 rpm) engine is not in andhry state couns state occurs after EOA Initialization or following after-run) Engine not in after-un mode (defined as engine speed greater than 0 rpm)	Engine speed greater than 600 to 850 rpm Engine speed greater than 600 to 850 rpm engine is not in standby state (standby state occurs after ECM initialization or following after Curl)	engine is not in standby state (standby state occurs after CCM initialization or following after-run) engine is not in standby state (standby state occurs after ECM initialization or following after-run) battery voltage is above 11 V for at least 3a	Engine Run Time greater than 10 accords (engine speed greater than 600 to 650 pm to indicate the engine is uniting) Engine Run Time greater than 10 scords (engine speed greater than 600 to 650 pm to indicate the engine is running)	Engine is running which means the engine speed is greater than 600 to 850 pm Engine is running which means the engine speed is greater than 600 to 850 pm	engine is not in ready state (which is active when the ignition is on or following a stat a the engine) engine is not in ready state (which is active when the ignition is on or following a stat the engine)				
Performance P144B - Closed Loop Diesel Particulate Filer (DPF) Regeneration Control Al Limit- Stage 1 Temperature Too Low P144C - Closed Loop Diesel P144C - Closed Loop Diesel P144C - Closed Loop Diesel Regeneration Control Al Limit- Stage 1 Temperature Too High P150C - TCM Engine Speed Request Signal Message Counter Incorrect P1501 - Body Control Module E-Message Counter Incorrect P1502 - Engine Calibration Information Not Programed In The Control Module	totowing after-un) Engine not in after-un mode (defined as engine speed greater than 0 rpm) Engine not in after-un mode (defined as engine is not in standty state (standty) state occurs after ECM initiatisation or following after-un) Engine not in after-un mode (defined as engine speed greater than 0 rpm) Mandfecturer Entante Counter is zero (value of 0 means ECM is locked and out of assembly plant mode)	Engine speed greater than 600 to 850 rpm Engine speed greater than 600 to 850 rpm engine is not in standby plate islandby state occurs site: ECM installation or following after sun battery voltage is above 11 V for at least 3s	engine is not in standby state (standby state cours after ECM initialization or following after-cnn) engine is not in standby state (standby state occurs after ECM initialization or following after-cnn) battery voltage is above 11 V for at least 3s	Engler Run Time greater than 10 exconds (regime waved greater than 000 to 500 pm to indicate the engler is running) Engine Run. The greater than 10 excosis (regime speed greater than 000 to 500 pm to indicate the engine is running)	Engine is running which means the engine speed is greater than 600 to 8550 mm Engine is running which means the engine speed is greater than 600 to 850 rpm	engine is not in ready date (which is active when the sphilon is on or following a start the engine) engine is not in ready state (which is active when the sphilon is on or following a start the engine)				
Performance Pri48 - Crose Loop Diesel Particulate Filer (DPF) Regeneration Control AL Limit- Stage 11 Temperature Too Loov Particulate Filer (DPF) Performance Filer (DPF) Regeneration Control AL Limit- Stage 11 Temperature Too High Pri50C - TCM Engine Speed Request Signal Messare Counter Indomation Net Programmed in The Control Module Dr160C - Clow Plag Control Module Information Net Programmed in The Control Module	totowing after-fun) Engine not in afterrum mode (defined as engine speed greater than 0 rpm) Engine is not in afterrum mode (defined as engine speed greater than 0 rpm) engine is not in alterrum mode (defined as engine speed greater than 0 rpm) State focus after EOM Initialization of Engine not in afterrum mode (defined as engine speed greater than 0 rpm) Manufacturer Enable Courtier is zero (rolay of 0 method (defined as engine is not in androy state (standby state cours after EOM Initialization or fociologia after-rum)	Engine speed greater than 600 to 850 rpm Engine speed greater than 600 to 850 rpm engine is not in standby state (standby state occurs after ECM initiatization or fotowing after-run) battery voltage is above 11 V for at least 3s battery voltage is above 11 V for at least 3s	engine is not in standby state (standby state occurs after ECA initialization or following after-run) engine is not in standby state (standby state occurs after ECA initialization or following after-run) battery voltage is above 11 V for at least 3a	Englee Run Time gester than 10 accords (engine speed gradet than 600 to 500 rgn to indicate the greater than 10 accords (engine speed greater than 10 accords (engine speed greater than 600 to 600 rgn to indicate the engine is running)	Engine is running which means the engine speed is greater than 600 to 550 rpm Engine is running which means the engine speed is greater than 600 to 350 rpm	engine is not in mady state (which is a sci- when the ignition is on or following a stati or engine) are engine) engine is not in ready state (which is active when the ignition is on or following a stati the engine)				
Performance Pri448 - Closed Loop Diesel Pri448 - Closed Loop Diesel Pri448 - Closed Loop Diesel Diesel Particulate Filter (DPF) Regeneration Control Al Limit- Sible of Temperature To High Pri501 - Filter (DPF) Regeneration Control Al Limit- Sible of Temperature To High Pri501 - Body Control Module Pris01 - Body Control Module Pri501 - Body Control Module Pri502 -	totoxing after-fun) Engine not in afterrum mode (defined as engine speed greater than 0 trpm) Engine not in afterrum mode (defined as engine speed greater than 0 trpm) engine is not in thandby state (standby state occurs after ECM initialization or following after-rum) Marufacturer Enable Counter is zero (ruba) of 0 means ECM is locked and out of assembly plant mode) engine is not in adhoty state (standby state occurs after ECM initialization or engine is not in adhoty state (standby state occurs after ECM initialization engine is not in standby state (standby state occurs after ECM initialization or following after-rum)	Engine speed greater than 600 to 850 rpm Engine speed greater than 600 to 850 rpm engine is not in standby state (standby state occurs after ECM initialization or following after vun) battery voltage is above 11 V for at least 3s battery voltage is above 11 V for at least 3s	engine is not in standby state (standby state occurs after CCM initialization or following after (un) engine is not in standby state (standby state occurs after CCM initialization or following after-run) battery voltage is above 11 V for at least 38	Engine Ron Time gester than 10 seconds (engine need gratet than 000 to 550 pm to indicat the require is numing). Engine Ron Time gratest than 10 to 650 pm to indicate the set to 70 to 650 pm to indicate the engine is running)	Engine is running which means the engine speed is greater than 600 to 850 rpm Engine is running which means the engine speed is greater than 600 to 850 rpm	engine is not in ready state (which is active when the gration is on or following a stati or engine) engine is not in ready state (which is active when the ignition is on or following a stati or or following a stati me engine)				
Performance Performance PH48E - Close Loop Diesel Ph48E - Close Loop Diesel Ph48E - Close Loop Diesel Ph44E - Close Loop Diesel Ph44E - Close Loop Diesel Ph46E - Close Loop Diesel Ph40E - Close Loop Diese Loop Diese Loop Diese Loop Diese Loop Diese Diese Loop Diese L	totoxing atter-un) Engine not in afterium mode (defined as engine speed greater than 0 rpm) Engine not in afterium mode (defined as engine speed greater than 0 rpm) engine is not in standby state (standby state occurs after ECM initialization or following after-un) Manufacturer Enable Counter is zero (value of 0 means Equivalence) and out of engine in out in afterium mode (defined as engine speed greater than 0 rpm) Manufacturer Enable Counter is zero (value) engine is not in afterium mode) assembly platin troob) state occurs after ECM initialization or following after-un) engine is not in admoty state (dandby state occurs after ECM initialization or following after-un) engine is not in admoty state (dandby state occurs after ECM initialization or engine is not in admoty state (dandby state occurs after ECM initialization or engine is not in admoty state (dandby state occurs after ECM initialization or engine is not in admoty state (dandby state occurs after ECM initialization or engine is not in admoty state (dandby state occurs after ECM initialization or engine is not in admoty state (dandby state occurs after ECM initialization or engine is not in admoty state occurs after ECM initialization or engine is not in admoty state occurs after ECM initialization or engine is not in admoty state occurs after ECM initialization or engine is not in admoty state occurs after ECM initialization or engine is not in admoty state occurs after ECM initialization or engine is not in admoty state occurs after ECM initialization or engine is not in admoty state occurs after ECM initialization or engine is not in admoty state occurs after ECM initialization or engine is not in admoty state occurs after ECM initialization or engine is not in admoty state occurs after ECM initialization or engine is not in admoty state occurs after ECM initialization or engine is not in admoty state occurs after ECM initialization or engine is not in admoty state occurs after ECM initialization or engine is not in admoty state occurs after engin	Engine speed greater than 600 to 850 rpm Engine speed greater than 600 to 850 rpm engine a end greater than 600 to 850 rpm and the foreign state ECM initialization of table to charge after 400 battery voltage is above 11 V for at least 3 battery voltage is above 11 V for at least 3 engres is not instandy state (chardby state occurs after ECM initialization or following after 400	engine is not in standby state (standby state occurs after ECM initialization or following after-run) engine is not in abandby state (standby state occurs after ECM initialization or following after-run) battery voltage is above 11 V for at least 35	Engine Run Time greater than 10 seconds (engine need greater than 000 to 560 pm to indicate the engine is running). Engine Run Time greater than 10 to accords (engine need greater than 000 to 500 pm to indicate the engine is running)	Engine is running which means the engine speed is greater than 600 to 550 pm Engine is running which means the engine speed is greater than 600 to 550 pm	engine is not in ready state (which is active when the ignition is on or following a state the engine) regime is not in ready state (which is active when the ignition is on or following a state the engine)				
Performance Pridel-Crosel Loop Diesel Pridel-Crosel Pridel-Crosel Loop Diesel Pridel-Crosel Price (DPF) Resperators Control AL Limit- Stage 1 Temperature Too High Pridel-Crosel Price (DPF) Resperation Control AL Limit- Stage 1 Temperature Too High Pridel-Crosel Respect Respect Signal Message Counter Incorrect Pridel-Crosel Respect Respect Signal	totoxing affar-fun) Engine not in afterrum mode (defined as engine speed greater than 0 rpm) Engine not in afterrum mode (defined as engine speed greater than 0 rpm) engine is not in andhry state clandby state occurs after ECM initialization or following after-rum) Manufacturer Enable Counterli s zero (value) of 0 means ECM is locked and out of engine is not in atendry state (standby state occurs after ECM initiazation or following after-rum) engine is not in standby state (standby engine is not in standby state (standby state occurs after ECM initiazation or following after-rum) engine is not in standby state (standby state occurs after ECM initiazation or following after-rum)	Engine speed greater than 600 to 850 rpm Engine speed greater than 600 to 850 rpm engine is not in standby state (standby state occurs after ECM inflatization or following after-run) battery voltage is above 11 V for at least 35 battery voltage is above 11 V for at least 38 engine is not it suddy state (standby state occurs after ECM inflatization or following after run) battery voltage is above 11 V for at least 38	engine is not in standby state (standby state occurs after ECM initialization or following after-run) engine is not in standby state (standby state occurs after ECM initialization or following after-run) battery voltage is above 11 V for at least 38	Engine Run Time greater than 10 seconds (engine need greater than 000 to 560 pm to indicate the engine is numming) Engine Run Time greater than 10 due solar (engine need greater than 000 to 580 pm to indicate the engine is running)	Engine is running which means the engine speed is greater than 600 to 850 rpm Engine is running which means the engine speed is greater than 600 to 850 rpm	engine is not in mady state (which is activ- when the ignition is on or following a stati of the engine) engine is not in eady state (which is activ- when the ignition is on or following a stati of the engine) the engine)				
Performance Performance PridaB-Crosed Loop Diesel PridaB-Crosed Loop Diesel PridaB-Crosed Loop Diesel Prida-Crosed Control AL Limit- Stage 11 Temperature To a logn Particulate Filer (DPF) Regeneration Control AL Limit- Stage 11 Temperature To a High PrisoD-Crose Priorite PrisoD-Crosed PrisoD-Crose PrisoD-Crosed PrisoD-Cros	totowing after-fun) Engine not in afterrum mode (defined as engine speed greater than 0 rpm) Engine not in afterrum mode (defined as engine is not in afterrum mode (defined as engine is not in tabarby state is clambity engine is not in tabarby state is clambity engine is not in afterrum mode (defined as engine speed greater than 0 rpm) Manufacturer Enable Countrel is zero (rolaw) of 0 means ECM is tocked and out of assembly plant mode) engine is not in standby state (standby state occurs after ECM initialization or following after-rum) Engine not in standby state (standby state occurs after ECM initialization or following after-rum) engine is not in standby state (standby state occurs after ECM initialization or following after-rum) engine is not in standby state (standby state occurs after ECM initialization or following after-rum) engine is not in standby state (standby state occurs after ECM initialization or following after-rum) engine is not in standby state (standby state occurs after ECM initialization or following after-rum) engine is not in standby state (standby state occurs after ECM initialization or following after-rum)	Engine speed greater than 600 to 850 rpm Engine speed greater than 600 to 850 rpm engine is not in standby state (standby state occurs after ECM initialization or following after vun) battery voltage is above 11 V for at least 36 battery voltage is above 11 V for at least 39 battery voltage is above 11 V for at least 39 batter vun 400 rpm FCM initialization or following after vun) battery voltage is above 11 V for at least 39 battery voltage is above 11 V for at least 39	engine is not in standby state (standby state occurs after ECM initialization or following after cun) engine is not in standby state (standby state occurs after ECM initialization or following after cun) battery voltage is above 11 V for at least 3s	Englee Ren Time gester than 10 accords (engine speed gealer than 900 to 550 pm to indicate the angle is numing) Englee Run Time gester than 10 seconds (engine speed geater than 600 to 550 pm to indicate the engine is numing) to indicate the engine is numing)	Engine is running which means the engine speed is greater than 600 to 550 rpm.	engine is not in mady state knihol is activ when the ignition is on or following a stati or engine) engine is not in ready state (which is active when the ignition is on or following a stati the engine)				
Performance Performance Pri448 - Closed Loop Diesel Pri548 - Televenter So High RequestSgrah Message Counter Incorrect Pri59 - Body Control Module Pri50 - Engine California Pri50 - Engine California Pri50 - Closed Prigo Control Module Pri50 - Closed Prigo Control Module Pri52 - Clow Plug Control Pri53 - Thatka Ark (A) Heater Over Primerative Pri540 - Thatka Sensor Communication Crouit Low Voltage	totoxing affer-fun) Engine not in afterium mode (defined as engine speed greater than 0 rpm) Engine not in afterium mode (defined as engine speed greater than 0 rpm) engine is not in standby state (standby state occurs after ECM initialization or totoxing after-rum) Manufacturer Enable Counter is zero (value) dr 0 means ECM initialization or following after-rum) state occurs after ECM initialization or following after-rum) state occurs after ECM initialization or following after-rum) engine is not in standby state (standby state occurs after ECM initialization or following after-rum) engine is not in standby state (standby state occurs after ECM initialization or following after-rum) engine is not in standby state (standby state occurs after ECM initialization or following after-rum) engine is not in standby state (standby state occurs after ECM initialization or following after-rum) engine is not in standby state (standby state occurs after ECM initialization or following after-rum) engine is not in standby state (standby state occurs after ECM initialization or following after-rum) Engine not in after-rum mode (defined as engine speed greater than 0 rpm)	Engine speed greater than 600 to 850 rpm Engine speed greater than 600 to 850 rpm engine apeed greater than 600 to 850 rpm and the constraint of the second	engine is not in standby state (standby state occurs after ECM initialization or following after-run) engine is not in atandby state (standby state occurs after ECM initialization or following after-run) battery voltage is above 11 V for at least 3s battery voltage is above 11 V for at least 3s	Engine Run Time greater than 10 seconds (engine peed greater than 00 to 500 pm to indicate the engine is running). Engine Run Time greater than 10 to 500 pm to indicate the engine is nunning) to indicate the engine is nunning) battery voltage is above 11 V for at teast 38	Engine is running which means the engine speed is greater than 600 to 550 pm Engine is running which means the engine speed is greater than 600 to 550 pm engine from the speed of the spee	engine is not in marky state terticit is active when the ignition is on or following a state the engine) engine is not in marky state terticit is active when the ignition is no following a state the engine) the engine is not following a state of the engine is provide the engine is not following a state of the engine is not following a state of the engine is not following a state of the engine is not following a state of the engine is not following a state of the engine is not provide the engine	engine is not in nesdy state (which is active when the lightion is on or following a stat o			
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Performance Performance Pi448 - Coset Loop Diesel Particulate Filer (DPF) Regeneration Control Al Limit- Signal C - Closed Loop Diesel Particulate Filer (DPF) Regeneration Control AL Limit- Signal T - Emperimente To High Picol Limit - Signal C - Closed Loop Diesel Particulate Filer (DPF) Regeneration Control AL Limit- Signal T - Emperimente To High Picol C - Explane Californian Picol C - Clow Pig Control Module Picol C - Clow Picol C - C	totoxing atter-un) Engine not in afterrum mode (defined as engine speed greater than 0 rpm) Engine not in afterrum mode (defined as engine speed greater than 0 rpm) engine is not in standby state (standby state occurs after ECM initialization or following after-un) Manufacturer Enable Counter is zero (roku) of 0 means ECM is locked and out of assembly plent mode) engine is not in standby state (standby state occurs after ECM initialization or following after-un) engine is not in standby state (standby state occurs after ECM initialization or following 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Performance Performance Performance PridaB - Create Loop Diesel Particulate Filer (DPF) Regeneration Control Al Limi- Sible C - Crossel Loop Diesel Particulate Filer (DPF) Regeneration Control AL Limi- Sible 1 - Temperature To High Prisoc - TOA Engine Speece Prisol - Body Control Module Engine Speece Request Signal Message Counter Incomed Control Module Prisol - Body Control Module Prisol - Collow Plug Control Module Prisol - Control Module Prisol - Control Module Prisol - Throttle Sensor Communication Circuit High Voltage P16A0 - Throttle Sensor Communication Circuit High Voltage P16A1 - Throttle Sensor Communication Circuit High Voltage P16A2 - Throttle Sensor Communication Circuit High Voltage P16A2 - Throttle Sensor Communication Circuit High Voltage P16A2 - Throttle Sensor Communication Circuit Levy Voltage P16A2 - Throttle Sensor Communication Circuit High Voltage P16A2 - Throttle Sensor Communication Circuit Levy Voltage P16A2 - Throttle Sensor Co	totoxing atter-un) Engine not in after-un mode (defined as engine speed greater than 0 rpm) Engine not in after-un mode (defined as engine speed greater than 0 rpm) engine is not in after-un mode (defined as engine speed greater than 0 rpm) Manufacturer Enable State (standby state occurs after ECM initiazation or following after-un) Manufacturer Enable Counter is zero (value) of assembly plant mode) engine is not in standby state (standby state occurs after ECM initiazation or following after-un) engine is not in standby state (standby state occurs after ECM initiazation or following after-un) engine is not in adarby state (standby state occurs after ECM initiazation or following after-un) engine is not in adarby state (standby state occurs after ECM initiazation or following after-un) Engine not in after-un mode (defined as engine speed greater than 0 rpm) Engine not in after-un mode (defined as engine speed greater than 0 rpm) Engine not in after-un mode (defined as engine speed greater than 0 rpm) Engine not in after-un mode (defined as engine speed greater than 0 rpm) Engine not in after-un mode (defined as engine speed greater than 0 rpm) Engine not in after-un mode (defined as engine speed greater than 0 rpm) Engine not in after-un mode (defined as engine speed greater than 0 rpm) Engine not in after-un mode (defined as engine speed greater than 0 rpm) Engine not in after-un mode (defined as engine speed greater than 0 rpm) Engine not in after-un mode (defined as engine speed greater than 0 rpm) Engine not in after-un mode (defined as engine speed greater than 0 rpm) Engine not in after-un mode (defined as engine speed greater than 0 rpm) Engine not in after-un mode (defined as engine speed greater than 0 rpm)	Engine speed greater than 600 to 850 rpm Engine speed greater than 600 to 850 rpm engine is not in standby state (standby state occurs after ECM Initialization or following after-unit battery voltage is above 11 V for at least 3 battery voltage is above 11 V for at least 3 Engine speed greater than 600 to 850 rpm Engine speed greater than 60 to 850 rpm	engine is not in standby state (standby state occurs after CCM initialization or following after-run) engine is not in standby state (standby state occurs after CCM initialization or following after-run) battery voltage is above 11 V for at least 3s battery voltage is above 11 V for at least 3s battery voltage is above 11 V for at least 3s engine is not in standby state (standby state occurs after CCM initialization or following after-run) engine is not in standby state (standby state occurs after CCM initialization or following after-run) engine is not in standby state (standby state occurs after CCM initialization or following after-run) engine is not in standby state (standby state occurs after CCM initialization or following after-run) Engine speed greater than 600 to 850 rpm engine is not in standby state (standby state occurs after CCM initialization or following after-run)	Engine Run Time greater than 10 seconds (regine need gradet than 00 to 50 pm to indicate the regine is numing). 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Performance Performance Performance Private-Costo Loop Diesel Private-Costo AL Limit- Structure Filer (DPF) Regeneration Control AL Limit- Stage 1 Temporature Too High Particulate Filer (DPF) Regeneration Control AL Limit- Stage 1 Temporature Too High Performance Private Privat	totoxing after-fun) Engine not in afterrum mode (defined as engine speed greater than 0 rpm) Engine not in afterrum mode (defined as engine is poet greater than 0 rpm) engine is not in standby state (standby state occurs after EGM initialization or following after-fun) Manufacturer Enable Counter is zero (roku) dr 0 means EGM is locked and out of assembly platt mode) engine is not in standby state (standby state occurs after EGM initialization or following after-fun) engine is not in standby state (standby state occurs after EGM initialization or following after-fun) engine is not in standby state (standby state occurs after EGM initialization or following after-fun) engine is not in standby state (standby state occurs after EGM initialization or following after-fun) engine is not in standby state (standby state occurs after EGM initialization or following after-fun) Engine not in afterrum mode (defined as engine speed greater than 0 rpm) Engine not in afterrum mode (defined as engine speed greater than 0 rpm) Engine not in afterrum mode (defined as engine speed greater than 0 rpm) Engine not in afterrum mode (defined as engine speed greater than 0 rpm) Engine not in afterrum mode (defined as engine speed greater than 0 rpm) Engine not in afterrum mode (defined as engine speed greater than 0 rpm) Engine not in afterrum mode (defined as engine speed greater than 0 rpm) Engine not in afterrum mode (defined as engine speed greater than 0 rpm) Engine not in afterrum mode (defined as engine speed greater than 0 rpm) Engine not in afterrum mode (defined as engine speed greater than 0 rpm) Engine not in afterrum mode (defined as engine speed greater than 0 rpm)	Engine speed greater than 600 to 850 rpm Engine speed greater than 600 to 850 rpm engine is not in standby state (standby state occurs after ECM initialization of following after with battery voltage is above 11 V for at least 3 battery voltage is above 11 V for at least 3 Engine speed greater than 600 to 850 rpm Engine speed greater than 600 to 850 rpm	engine is not in standby state (standby state occurs after CEAI initialization or following after run) engine is not in standby state (standby state occurs after CEAI initiazion or following after run) battery voltage is above 11 V for at least 3 a battery voltage is above 11 V for at least 3 a battery voltage is above 11 V for at least 3 a engine is not in standby state (standby state occurs after CEAI initiazization or following after run) engine is not in standby state (standby state occurs after CEAI initiazization or following after run) engine is not in standby state (standby state occurs after CEAI initiazization or following after run) engine is not in standby state (standby state occurs after CEAI initiazization or following after-run) engine is not in standby state (standby state occurs after CEAI initiazization or following after-run) engine is not in standby state (standby state occurs after CEAI initiazization or following after-run) engine is not in standby state (standby state occurs after CEAI initiazization or following after-run) engine is not in standby state (standby state occurs after CEAI initiazization or following after-run) engine is not in standby state (standby state occurs after CEAI initiazization or following after-run)	Engine Run Time greater than 10 seconds (regine speed greater than 00 to 500 pm to indicate the regine is running). Engine Run Time greater (han 10 seconds regine speed greater than 00 to 500 pm to indicate the engine is nunning) to indicate the engine is nunning) building is above 11 V for at least 35 battery voltage is above 11 V for at least 36 ambient air temperature is above -7 deg C engine is not in standby state (astimuty 10 km/s) and 10 km 10 km 20 k	Engine is running which means the engine speed a greater than 600 to 850 rpm Engine is running which means the engine speed is greater than 600 to 850 rpm Engine Run Time greater than 600 to 850 rpm December 2000 to 850 rpm Engine Is running which means the engine speed is greater than 600 to 850 rpm	engine is not in ready state terhich is active when the ignition is on or following a static engine is not in ready state (which is active when the ignition is on or bound a static term of the ignition is on or bound a static memory of the ignition is on or bound a static memory of the ignition is on or bound a static memory of the ignition is on or bound a static memory of the ignition is on or bound a static memory of the ignition is on or bound a static speed is greater than 600 to 500 rpm Engine is running which means the engine speed is greater than 600 to 500 rpm Engine is running which means the engine speed is greater than 600 to 500 rpm Engine set running which means the engine bound at the memory of the second (engine speed greater than 600 to 500 rpm bound and the engine is running) rp bound at the engine is running)	engine is not in ready state (which is active when the ignificant is an of following a statil the engine) engine is not in ready state (which is active when the ignificant is on or following a statil the engine). Engine is not in ready state (which is active when the ignificant is on or following a statil the engine). Engine is running valid means the engine speed is greater than 600 to 350 pm Engine is unning which means the engine speed is greater than 600 to 350 pm	engine is not in ready state (which is active when the sprition is or or following as stati or engine is not in mady state (which is active when the sprition is or following a stati o the engine)		

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DTC			Additional Basic Enable Conditions						
P203C - Reductant Level Sensor 1 Circuit Low	Engine not in afterrun mode (defined as engine speed greater than 0 rpm)	Engine speed greater than 600 to 850 rpm	engine is not in standby state (standby state occurs after ECM initialization or following after-run)	battery voltage is above 11 V for at least 3s	Engine Run Time greater than 10 seconds (engine speed greater than 600 to 850 rpm to indicate the engine is running)	Engine is running which means the engin speed is greater than 600 to 850 rpm	e engine is not in ready state (which is active when the ignition is on or following a stall o the engine)		
P203D - Reductant Level Sensor 1 Circuit High	Engine not in afterrun mode (defined as engine speed greater than 0 rpm)	Engine speed greater than 600 to 850 rpm	engine is not in standby state (standby state occurs after ECM initialization or following after-run)	battery voltage is above 11 V for at least 3s	Engine Run Time greater than 10 seconds (engine speed greater than 600 to 850 rpm to indicate the engine is running)	Engine is running which means the engin speed is greater than 600 to 850 rpm	e engine is not in ready state (which is active when the ignition is on or following a stall o the engine)		
P2047 - Reductant Injector Control Circuit	Engine not in afterrun mode (defined as engine speed greater than 0 rpm)	Engine speed greater than 600 to 850 rpm	engine is not in standby state (standby state occurs after ECM initialization or following after-run)	battery voltage is above 11 V for at least 3s	Engine Run Time greater than 10 seconds (engine speed greater than 600 to 850 rpm to indicate the engine is running)	Engine is running which means the engin speed is greater than 600 to 850 rpm	e engine is not in ready state (which is active when the ignition is on or following a stall o the engine)		
P2048 - Reductant Injector Control Circuit Low Voltage	Engine not in afterrun mode (defined as engine speed greater than 0 rpm)	Engine speed greater than 600 to 850 rpm	engine is not in standby state (standby state occurs after ECM initialization or following after-run)	battery voltage is above 11 V for at least 3s	Engine Run Time greater than 10 seconds (engine speed greater than 600 to 850 rpm to indicate the engine is running)	Engine is running which means the engin speed is greater than 600 to 850 rpm	e when the ignition is on or following a stall o the engine)		
P2049 - Reductant Injector Control Circuit High Voltage	Engine not in afterrun mode (defined as engine speed greater than 0 rpm)	Engine speed greater than 600 to 850 rpm	engine is not in standby state (standby state occurs after ECM initialization or following after-run)	battery voltage is above 11 V for at least 3s	Engine Run Time greater than 10 seconds (engine speed greater than 600 to 850 rpm to indicate the engine is running)	Engine is running which means the engin speed is greater than 600 to 850 rpm	e engine is not in ready state (which is active when the ignition is on or following a stall o the engine)		
P204B - Reductant Pump Pressure Sensor Performance	engine is not in standby state (standby state occurs after ECM initialization or following after run)							1	
P204C - Reductant Pump Pressure Sensor Circuit Low	Engine not in afterrun mode (defined as engine speed greater than 0 rpm)	Engine speed greater than 600 to 850 rpm	engine is not in standby state (standby state occurs after ECM initialization or following after-run)	battery voltage is above 11 V for at least 3s	Engine Run Time greater than 10 seconds (engine speed greater than 600 to 850 rpm to indicate the engine is running)	Engine is running which means the engin speed is greater than 600 to 850 rpm	e engine is not in ready state (which is active when the ignition is on or following a stall o 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)							4	
P204F - Reductant System Performance Bank 1 (cannot build pump pressure)	SCR Reductant Level not in restriction or empty level state (see reductant level warning definition)	Engine not in afterrun mode (defined as engine speed greater than 0 rpm)	Engine speed greater than 600 to 850 rpm	engine is not in standby state (standby state occurs after ECM initialization or following after-run)	battery voltage is above 11 V for at least 3s	Engine Run Time greater than 10 seconds (engine speed greater than 600 to 850 rpm to indicate the engine is running)	Engine is running which means the engine speed is greater than 600 to 850 rpm	engine is not in ready state (which is active when the ignition is on or following a stall o the engine)	
P205B - Reductant Tank Temperature Sensor Performance	Engine not in afterrun mode (defined as engine speed greater than 0 rpm)	Engine speed greater than 600 to 850 rpm	engine is not in standby state (standby state occurs after ECM initialization or following after-run)	Manufacturer Enable Counter is zero (value of 0 means ECM is locked and out of assembly plant mode)	battery voltage is above 11 V for at least 3s	Engine is running which means the engin speed is greater than 600 to 850 rpm	e engine is not in ready state (which is active when the ignition is on or following a stall o the engine)		1
P205C - Reductant Tank Temperature Sensor Circuit Low	Engine not in afterrun mode (defined as engine speed greater than 0 rpm)	Engine speed greater than 600 to 850 rpm	engine is not in standby state (standby state occurs after ECM initialization or following after-run)	battery voltage is above 11 V for at least 3s	Engine Run Time greater than 10 seconds (engine speed greater than 600 to 850 rpm to indicate the engine is running)	Engine is running which means the engin speed is greater than 600 to 850 rpm	e engine is not in ready state (which is active when the ignition is on or following a stall o the engine)		
P205D - Reductant Tank Temperature Sensor Circuit High	Engine not in afterrun mode (defined as engine speed greater than 0 rpm)	Engine speed greater than 600 to 850 rpm	engine is not in standby state (standby state occurs after ECM initialization or following after-run)	battery voltage is above 11 V for at least 3s	Engine Run Time greater than 10 seconds (engine speed greater than 600 to 850 rpm to indicate the engine is running)	Engine is running which means the engin speed is greater than 600 to 850 rpm	e engine is not in ready state (which is active when the ignition is on or following a stall o the engine)		
P207F - Nox Sensor Bank 1 Sensor 2 Performance	SCR Reductant Level not in restriction or empty level state (see reductant level warning definition)	Engine not in afterrun mode (defined as engine speed greater than 0 rpm)	Engine speed greater than 600 to 850 rpm	engine is not in standby state (standby state occurs after ECM initialization or following after-run)	Manufacturer Enable Counter is zero (valu of 0 means ECM is locked and out of assembly plant mode)	a battery voltage is above 11 V for at least 3s	Engine Run Time greater than 10 seconds (engine speed greater than 600 to 850 rpm to indicate the engine is running)	Engine is running which means the engine speed is greater than 600 to 850 rpm	engine is not in ready state (which is active when the ignition is on or following a stall o the engine)
P2080 - Exhaust Temperature Sensor 1 Performance	Engine speed greater than 600 to 850 rpm	Manufacturer Enable Counter is zero (value of 0 means ECM is locked and out of assembly plant mode)	Engine Run Time greater than 10 seconds (engine speed greater than 600 to 850 rpm to indicate the engine is running)	Engine is running which means the engine speed is greater than 600 to 850 rpm	engine is not in ready state (which is active when the ignition is on or following a stall o the engine)	e d			
P2084 - Exhaust Temperature Sensor 2 Performance	Engine speed greater than 600 to 850 rpm	Manufacturer Enable Counter is zero (value of 0 means ECM is locked and out of assembly plant mode)	Engine Run Time greater than 10 seconds (engine speed greater than 600 to 850 rpm to indicate the engine is running)	⁸ Engine is running which means the engine speed is greater than 600 to 850 rpm	engine is not in ready state (which is active when the ignition is on or following a stall o the engine)				
P208A - Reductant Pump Control Circuit	Engine not in afterrun mode (defined as engine speed greater than 0 rpm)	Engine speed greater than 600 to 850 rpm	engine is not in standby state (standby state occurs after ECM initialization or following after-run)	battery voltage is above 11 V for at least 3s	Engine Run Time greater than 10 seconds (engine speed greater than 600 to 850 rpm to indicate the engine is running)	Engine is running which means the engin speed is greater than 600 to 850 rpm	engine is not in ready state (which is active when the ignition is on or following a stall o the engine)		
P208B - Reductant Pump Performance	engine is not in standby state (standby state occurs after ECM initialization or following after-run)	Manufacturer Enable Counter is zero (value of 0 means ECM is locked and out of assembly plant mode)	a battery voltage is above 11 V for at least 3s	Status of the Reductant Tank is not Frozen which means ambient air temperature is >= -7°C and the reductatn tank temperature is >= -7°C				•	
P208D - Reductant Pump Control Circuit High Voltage	Engine not in afterrun mode (defined as engine speed greater than 0 rpm)	Engine speed greater than 600 to 850 rpm	engine is not in standby state (standby state occurs after ECM initialization or following after-run)	Engine Run Time greater than 10 seconds (engine speed greater than 600 to 850 rpm to indicate the engine is running)	Engine is running which means the engine speed is greater than 600 to 850 rpm	engine is not in ready state (which is activ when the ignition is on or following a stall the engine)	e		
P20A0 - Reductant Purge Valve Control Circuit	Engine not in afterrun mode (defined as engine speed greater than 0 rpm)	Engine speed greater than 600 to 850 rpm	engine is not in standby state (standby state occurs after ECM initialization or following after-run)	Engine Run Time greater than 10 seconds (engine speed greater than 600 to 850 rpm to indicate the engine is running)	Engine is running which means the engine speed is greater than 600 to 850 rpm	engine is not in ready state (which is active when the ignition is on or following a stall the engine)	e D		
P20A1 - Reductant Purge Valve Performance	engine is not in standby state (standby state occurs after ECM initialization or following after-run)	battery voltage is above 11 V for at least 3s					-		
P20A2 - Reductant Purge Valve Control Circuit Low Voltage	Engine not in afterrun mode (defined as engine speed greater than 0 rpm)	Engine speed greater than 600 to 850 rpm	engine is not in standby state (standby state occurs after ECM initialization or following after-run)	Engine Run Time greater than 10 seconds (engine speed greater than 600 to 850 rpm to indicate the engine is running)	Engine is running which means the engine speed is greater than 600 to 850 rpm	engine is not in ready state (which is activ when the ignition is on or following a stall the engine)	e		
P20A3 - Reductant Purge Valve Control Circuit High Voltage	Engine not in afterrun mode (defined as engine speed greater than 0 rpm)	Engine speed greater than 600 to 850 rpm	engine is not in standby state (standby state occurs after ECM initialization or following after-run)	Engine is running which means the engine speed is greater than 600 to 850 rpm	engine is not in ready state (which is active when the ignition is on or following a stall o the engine)	2	-		
P20B9 - Reductant Heater 1 Control Circuit	engine is not in standby state (standby state occurs after ECM initialization or followion after on)	battery voltage is above 11 V for at least 3s				-			
P20BA - Reductant Heater 1 Performance	SCR Reductant Level not in restriction or empty level state (see reductant level warning definition)	Engine not in afterrun mode (defined as engine speed greater than 0 rpm)	engine is not in standby state (standby state occurs after ECM initialization or following after-run)	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	e		
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 fellowice ofter nue)	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			_				
P20CB - Exhaust Aftertreatment Fuel Injector Control Circuit	Engine not in afterrun mode (defined as engine speed greater than 0 rpm)	engine is not in standby state (standby state occurs after ECM initialization or following after-run)	battery voltage is above 11 V for at least 3s	Engine is running which means the engine speed is greater than 600 to 850 rpm		_			
P20CC - Exhaust Aftertreatment Fuel Injector Performance	Engine not in afterrun mode (defined as engine speed greater than 0 rpm)	Engine speed greater than 600 to 850 rpm	engine is not in standby state (standby state occurs after ECM initialization or following after-run)	Engine is running which means the engine speed is greater than 600 to 850 rpm	engine is not in ready state (which is active when the ignition is on or following a stall o the engine)				
P20CD - Exhaust Aftertreatment Fuel Injector Control Circuit Low Voltage	Engine not in afterrun mode (defined as engine speed greater than 0 rpm)	engine is not in standby state (standby state occurs after ECM initialization or following after-nin)	battery voltage is above 11 V for at least 3s	Engine is running which means the engine speed is greater than 600 to 850 rpm		-			
P20CE - Exhaust Aftertreatment Fuel Injector Control Circuit High Voltage	Engine not in afterrun mode (defined as engine speed greater than 0 rpm)	engine is not in standby state (standby state occurs after ECM initialization or following after ann)	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	1				

DTC			Additional Basic Enable Conditions							
P20E2 - Exhaust Gas Temperature (EGT) Sensors 1-2 not plausible	Engine not in afterrun mode (defined as engine speed greater than 0 mm)	Engine speed greater than 600 to 850 rpm	engine is not in standby state (standby state occurs after ECM initialization or	Engine is running which means the engine speed is greater than 600 to 850 mm	engine is not in ready state (which is active when the ignition is on or following a stall of	e				
P2DEE - SCR Nox Catalyst Efficiency Below Threshold Bank 1	SCR Reductant Level not in restriction or empty level state (see reductant level warning definition)	Engine not in afterrun mode (defined as engine speed greater than 0 rpm)	following after-run) Engine speed greater than 600 to 850 rpm	engine is not in standby state (standby state occurs after ECM initialization or following after-run)	the engine) Manufacturer Enable Counter is zero (valu of 0 means ECM is locked and out of assembly plant mode)	e battery voltage is above 11 V for at least 3s	Status of the Reductant Tank is not Frozen which means ambient air temperature is >= -7*C and the reductant tank temperature is >= -7*C	Engine Run Time greater than 10 seconds (engine speed greater than 600 to 850 rpm to indicate the engine is running)	Engine is running which means the engine speed is greater than 600 to 850 rpm	engine is not in ready state (which is active when the ignition is on or following a stall of the engine)
P21AA - Reductant Level Sensor 2 Circuit Low	Engine not in afterrun mode (defined as engine speed greater than 0 rpm)	Engine speed greater than 600 to 850 rpm	engine is not in standby state (standby state occurs after ECM initialization or following after-run)	battery voltage is above 11 V for at least 3s	Engine Run Time greater than 10 seconds (engine speed greater than 600 to 850 rpn to indicate the engine is running)	Brgine is running which means the engine speed is greater than 600 to 850 rpm	e engine is not in ready state (which is active when the ignition is on or following a stall of the engine)		L	<u> </u>
P21AB - Reductant Level Sensor 2 Circuit High	Engine not in afterrun mode (defined as engine speed greater than 0 rpm)	Engine speed greater than 600 to 850 rpm	engine is not in standby state (standby state occurs after ECM initialization or following after-run)	battery voltage is above 11 V for at least 3s	Engine Run Time greater than 10 seconds (engine speed greater than 600 to 850 rpm to indicate the engine is running)	Engine is running which means the engine speed is greater than 600 to 850 rpm	e engine is not in ready state (which is active when the ignition is on or following a stall of the engine)			
P21AF - Reductant Level Sensor 3 Circuit Low	Engine not in afterrun mode (defined as engine speed greater than 0 rpm)	Engine speed greater than 600 to 850 rpm	engine is not in standby state (standby state occurs after ECM initialization or following after-run)	battery voltage is above 11 V for at least 3s	Engine Run Time greater than 10 seconds (engine speed greater than 600 to 850 rpm to indicate the engine is running)	Engine is running which means the engine speed is greater than 600 to 850 rpm	e engine is not in ready state (which is active when the ignition is on or following a stall of the engine)			
P21B0 - Reductant Level Sensor 3 Circuit High	Engine not in afterrun mode (defined as engine speed greater than 0 rpm)	Engine speed greater than 600 to 850 rpm	engine is not in standby state (standby state occurs after ECM initialization or following after-run)	battery voltage is above 11 V for at least 3s	Engine Run Time greater than 10 seconds (engine speed greater than 600 to 850 rpm to indicate the engine is running)	Engine is running which means the engine speed is greater than 600 to 850 rpm	e engine is not in ready state (which is active when the ignition is on or following a stall of the engine)		_	
P2200 - N0x Sensor Circuit Bank 1 Sensor 1	Engine not in afterrun mode (defined as engine speed greater than 0 rpm)	Engine speed greater than 600 to 850 rpm	engine is not in standby state (standby state occurs after ECM initialization or following after-run)	Manufacturer Enable Counter is zero (value of 0 means ECM is locked and out of assembly plant mode)	e battery voltage is above 11 V for at least 3s	Engine Run Time greater than 10 seconds (engine speed greater than 600 to 850 rpn to indicate the engine is running)	Brgine is running which means the engine speed is greater than 600 to 850 rpm	engine is not in ready state (which is active when the ignition is on or following a stall or the engine)		
P2201 - N0x Sensor Performance Bank 1 Sensor 1	Engine not in afterrun mode (defined as engine speed greater than 0 rpm)	Engine speed greater than 600 to 850 rpm	engine is not in standby state (standby state occurs after ECM initialization or following after-run)	Manufacturer Enable Counter is zero (value of 0 means ECM is locked and out of assembly plant mode)	e battery voltage is above 11 V for at least 3s	Engine Run Time greater than 10 seconds (engine speed greater than 600 to 850 rpm to indicate the engine is running)	s System is not in active regeneration mode	Engine is running which means the engine speed is greater than 600 to 850 rpm	engine is not in ready state (which is active when the ignition is on or following a stall o the engine)	
P2202 - N0x Sensor Circuit Low Bank 1 Sensor 1	Engine not in afterrun mode (defined as engine speed greater than 0 rpm)	Engine speed greater than 600 to 850 rpm	engine is not in standby state (standby state occurs after ECM initialization or following after-run)	Manufacturer Enable Counter is zero (value of 0 means ECM is locked and out of assembly plant mode)	e battery voltage is above 11 V for at least 3s	Engine Run Time greater than 10 seconds (engine speed greater than 600 to 850 rpm to indicate the engine is running)	a Engine is running which means the engine speed is greater than 600 to 850 rpm	engine is not in ready state (which is active when the ignition is on or following a stall o the engine)		
P2203 - N0x Sensor Circuit High Bank 1 Sensor 1	Engine not in afterrun mode (defined as engine speed greater than 0 rpm)	Engine speed greater than 600 to 850 rpm	engine is not in standby state (standby state occurs after ECM initialization or following after-run)	Manufacturer Enable Counter is zero (value of 0 means ECM is locked and out of assembly plant mode)	e battery voltage is above 11 V for at least 3s	Engine Run Time greater than 10 seconds (engine speed greater than 600 to 850 rpm to indicate the engine is running)	a Engine is running which means the engine speed is greater than 600 to 850 rpm	engine is not in ready state (which is active when the ignition is on or following a stall o the engine)		
P2205 - N0x Heater Control Circuit Bank 1 Sensor 1	Engine not in afterrun mode (defined as engine speed greater than 0 rpm)	Engine speed greater than 600 to 850 rpm	engine is not in standby state (standby state occurs after ECM initialization or following after-run)	Manufacturer Enable Counter is zero (value of 0 means ECM is locked and out of assembly plant mode)	e battery voltage is above 11 V for at least 3s	Engine Run Time greater than 10 seconds (engine speed greater than 600 to 850 rpm to indicate the engine is running)	B Engine is running which means the engine speed is greater than 600 to 850 rpm	engine is not in ready state (which is active when the ignition is on or following a stall o the engine)		
P2209 - N0x Heater Performance Bank 1 Sensor 1	Engine not in afterrun mode (defined as engine speed greater than 0 rpm)	Engine speed greater than 600 to 850 rpm	engine is not in standby state (standby state occurs after ECM initialization or following after-run)	Manufacturer Enable Counter is zero (value of 0 means ECM is locked and out of assembly plant mode)	e battery voltage is above 11 V for at least 3s	Engine Run Time greater than 10 seconds (engine speed greater than 600 to 850 rpm to indicate the engine is running)	a Engine is running which means the engine speed is greater than 600 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	battery voltage is above 11 V for at least 3s								
P2228 - Barometric Pressure Sensor Circuit Low	following after-run) Engine not in afterrun mode (defined as engine speed greater than 0 rpm)	Engine speed greater than 600 to 850 rpm	engine is not in standby state (standby state occurs after ECM initialization or following after-run)	battery voltage is above 11 V for at least 3s	Engine Run Time greater than 10 seconds (engine speed greater than 600 to 850 rpm to indicate the engine is running)	Engine is running which means the engine speed is greater than 600 to 850 rpm	e engine is not in ready state (which is active when the ignition is on or following a stall of the engine)			
P2229 - Barometric Pressure Sensor Circuit High	Engine not in afterrun mode (defined as engine speed greater than 0 rpm)	Engine speed greater than 600 to 850 rpm	engine is not in standby state (standby state occurs after ECM initialization or following after-run)	battery voltage is above 11 V for at least 3s	Engine Run Time greater than 10 seconds (engine speed greater than 600 to 850 rpn to indicate the engine is running)	Engine is running which means the engine speed is greater than 600 to 850 rpm	engine is not in ready state (which is active when the ignition is on or following a stall of the engine)			
P2263 - Turbo Boost System Performance	Engine not in afterrun mode (defined as engine speed greater than 0 rpm)	Engine speed greater than 600 to 850 rpm	engine is not in standby state (standby state occurs after ECM initialization or following after-run)	battery voltage is above 11 V for at least 3s	Engine Run Time greater than 10 seconds (engine speed greater than 600 to 850 rpm to indicate the engine is running)	Engine is running which means the engine speed is greater than 600 to 850 rpm	e when the ignition is on or following a stall of the engine)			
P2295 - Fuel Pressure Regulator 2 Control Circuit Low Voltage	Engine not in afterrun mode (defined as engine speed greater than 0 rom)	engine is not in standby state (standby state occurs after ECM initialization or	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	2					
P2296 - Fuel Pressure Regulator 2	Engine not in afterrun mode (defined as	engine is not in standby state (standby state occurs after ECM initialization or	battery voltage is above 11 V for at least	Engine is running which means the engine	2					
Control Circuit High Voltage	engine speed greater than 0 rpm)	following after-run)	38 engine is not in standby state (standby	speed is greater than 600 to 850 rpm Manufacturer Enable Counter is zero (value	e batten ueltens is about 11 V for at least	Engine Run Time greater than 10 seconds	Engine is supplies which means the opping	engine is not in ready state (which is active	1	
Sensor 2	engine speed greater than 0 rpm)	Engine speed greater than 600 to 850 rpm	state occurs after ECM initialization or following after-run)	of 0 means ECM is locked and out of assembly plant mode)	3s	(engine speed greater than 600 to 850 rpm to indicate the engine is running)	speed is greater than 600 to 850 rpm	when the ignition is on or following a stall or the engine)		
P229F - NOx Sensor Performance Bank 1 Sensor 2	Engine not in afterrun mode (defined as engine speed greater than 0 rpm)	Engine speed greater than 600 to 850 rpm	engine is not in standby state (standby state occurs after ECM initialization or following after-run)	Manufacturer Enable Counter is zero (value of 0 means ECM is locked and out of assembly plant mode)	e ambient air temperature is above -7 deg C	ambient pressure is above 74.8kPa	battery voltage is above 11 V for at least 3s	Engine Run Time greater than 10 seconds (engine speed greater than 600 to 850 rpm to indicate the engine is running)	Engine is running which means the engine speed is greater than 600 to 850 rpm	engine is not in ready state (which is active when the ignition is on or following a stall o the engine)
P22A0 - NOx Sensor Circuit Low Bank 1 Sensor 2	Engine not in afterrun mode (defined as engine speed greater than 0 rpm)	Engine speed greater than 600 to 850 rpm	engine is not in standby state (standby state occurs after ECM initialization or following after-run)	Manufacturer Enable Counter is zero (value of 0 means ECM is locked and out of assembly plant mode)	e battery voltage is above 11 V for at least 3s	Engine Run Time greater than 10 seconds (engine speed greater than 600 to 850 rpm to indicate the engine is running)	a Engine is running which means the engine speed is greater than 600 to 850 rpm	engine is not in ready state (which is active when the ignition is on or following a stall or the engine)		
P22A1 - NOx Sensor Circuit High Bank 1 Sensor 2	Engine not in afterrun mode (defined as engine speed greater than 0 rpm)	Engine speed greater than 600 to 850 rpm	engine is not in standby state (standby state occurs after ECM initialization or following after-run)	Manufacturer Enable Counter is zero (value of 0 means ECM is locked and out of assembly plant mode)	e battery voltage is above 11 V for at least 3s	Engine Run Time greater than 10 seconds (engine speed greater than 600 to 850 rpm to indicate the engine is running)	a Engine is running which means the engine speed is greater than 600 to 850 rpm	engine is not in ready state (which is active when the ignition is on or following a stall o the engine)		
P22A3 - NOx Heater Control Circuit Bank 1 Sensor 2	Engine not in afterrun mode (defined as engine speed greater than 0 rpm)	Engine speed greater than 600 to 850 rpm	engine is not in standby state (standby state occurs after ECM initialization or following after-run)	Manufacturer Enable Counter is zero (value of 0 means ECM is locked and out of assembly plant mode)	e battery voltage is above 11 V for at least 3s	Engine Run Time greater than 10 seconds (engine speed greater than 600 to 850 rpm to indicate the engine is running)	Engine is running which means the engine speed is greater than 600 to 850 rpm	engine is not in ready state (which is active when the ignition is on or following a stall or the engine)		
P22A7 - NOx Heater Performance Bank 1 Sensor 2	Engine not in afterrun mode (defined as engine speed greater than 0 rpm)	Engine speed greater than 600 to 850 rpm	engine is not in standby state (standby state occurs after ECM initialization or following after-run)	Manufacturer Enable Counter is zero (value of 0 means ECM is locked and out of assembly plant mode)	e battery voltage is above 11 V for at least 3s	Engine Run Time greater than 10 seconds (engine speed greater than 600 to 850 rpn to indicate the engine is running)	Engine is running which means the engine speed is greater than 600 to 850 rpm	engine is not in ready state (which is active when the ignition is on or following a stall or the engine)		,ī
P2413 - Exhaust Gas Recirculation (EGR) System Performance	Engine not in afterrun mode (defined as engine speed greater than 0 rpm)	Engine speed greater than 600 to 850 rpm	engine is not in standby state (standby state occurs after ECM initialization or following after-run)	ambient air temperature is above -7 deg C	ambient pressure is above 74.8kPa	battery voltage is above 11 V for at least 3s	Engine Run Time greater than 10 seconds (engine speed greater than 600 to 850 rpm to indicate the engine is running)	System is not in active regeneration mode	Engine is running which means the engine speed is greater than 600 to 850 rpm	engine is not in ready state (which is active when the ignition is on or following a stall o the engine)
P242B - Exhaust Temperature Sensor 3 Performance	Engine speed greater than 600 to 850 rpm	Manufacturer Enable Counter is zero (value of 0 means ECM is locked and out of assembly plant mode)	Engine Run Time greater than 10 seconds (engine speed greater than 600 to 850 rpm to indicate the engine is running)	Engine is running which means the engine speed is greater than 600 to 850 rpm	engine is not in ready state (which is active when the ignition is on or following a stall o the engine)					
P242C - Exhaust Gas Temperature (EGT) Sensor 3 Circuit Low Voltage	Engine not in afterrun mode (defined as engine speed greater than 0 rpm)	Engine speed greater than 600 to 850 rpm	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	e				
P242D - Exhaust Gas Temperature (EGT) Sensor 3 Circuit High Voltage	Engine not in afterrun mode (defined as engine speed greater than 0 rpm)	Engine speed greater than 600 to 850 rpm	engine is not in standby state (standby state occurs after ECM initialization or following after-run)	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	e				
P2453 - Diesel Particulate Filter Differential Pressure Sensor Performance	Engine not in afterrun mode (defined as engine speed greater than 0 rpm)	Engine speed greater than 600 to 850 rpm	engine is not in standby state (standby state occurs after ECM initialization or following after-run)	Manufacturer Enable Counter is zero (value of 0 means ECM is locked and out of assembly plant mode)	e battery voltage is above 11 V for at least 3s	Engine Run Time greater than 10 seconds (engine speed greater than 600 to 850 rpm to indicate the engine is running)	Brigine is running which means the engine speed is greater than 600 to 850 rpm	engine is not in ready state (which is active when the ignition is on or following a stall o the engine)		
P2454 - Diesel Particulate Filter Differential Pressure Sensor Circuit Low Voltage	Engine not in afterrun mode (defined as engine speed greater than 0 rpm)	Engine speed greater than 600 to 850 rpm	engine is not in standby state (standby state occurs after ECM initialization or following after-run)	battery voltage is above 11 V for at least 3s	Engine Run Time greater than 10 seconds (engine speed greater than 600 to 850 rpm to indicate the engine is running)	a Engine is running which means the engine speed is greater than 600 to 850 rpm	e engine is not in ready state (which is active when the ignition is on or following a stall of the engine)			
P2455 - Diesel Particulate Filter Differential Pressure Sensor Circuit High Voltage	Engine not in afterrun mode (defined as engine speed greater than 0 rpm)	Engine speed greater than 600 to 850 rpm	engine is not in standby state (standby state occurs after ECM initialization or following after-run)	battery voltage is above 11 V for at least 3s	Engine Run Time greater than 10 seconds (engine speed greater than 600 to 850 rpn to indicate the engine is running)	Engine is running which means the engine speed is greater than 600 to 850 rpm	e engine is not in ready state (which is active when the ignition is on or following a stall of the engine)			
P2457 - Exhaust Gas (EGR) Cooler Performance	Engine not in afterrun mode (defined as engine speed greater than 0 rpm)	Engine speed greater than 600 to 850 rpm	engine is not in standby state (standby state occurs after ECM initialization or following after-run)	ambient air temperature is above -7 deg C	ambient pressure is above 74.8kPa	battery voltage is above 11 V for at least 3s	Engine Run Time greater than 10 seconds (engine speed greater than 600 to 850 rpm to indicate the engine is running)	Engine is running which means the engine speed is greater than 600 to 850 rpm	engine is not in ready state (which is active when the ignition is on or following a stall o the engine)	
P2459 - Diesel Particulate Filter Regeneration Frequency	ambient air temperature is above -7 deg C	ambient pressure is above 74.8kPa								

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P245A - Exhaust Gas Recirculatio (EGR) Cooler Bypass Valve Contr Circuit	n engine is 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	n engine is not in standby state (standby state occurs after ECM initialization or following after cur)	battery voltage is above 11 V for at least 3s								
P245D - Exhaust Gas Recirculatio (EGR) Cooler Bypass Valve Contr Circuit 1 Hinh Voltage	n engine is not in standby state (standby state occurs after ECM initialization or followion aftercrun)	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 speed greater than 600 to 850 rpm	engine is not in standby state (standby state occurs after ECM initialization or following after-run)	Engine Run Time greater than 10 seconds (engine speed greater than 600 to 850 rpm to indicate the engine is running)	s n Engine is running which means the engine speed is greater than 600 to 850 rpm	engine is not in ready state (which is active when the ignition is on or following a stall o the engine)				
P246F - Exhaust Temperature Sensor 4 Performance	Engine speed greater than 600 to 850 rpm	Manufacturer Enable Counter is zero (value of 0 means ECM is locked and out of assembly plant mode)	Engine Run Time greater than 10 seconds (engine speed greater than 600 to 850 rpm to indicate the engine is running)	Engine is running which means the engine speed is greater than 600 to 850 rpm	e engine is not in ready state (which is active when the ignition is on or following a stall o the engine)	e d	1			
P2470 - Exhaust Gas Temperatur (EGT) Sensor 4 Circuit Low Voltag	e Engine not in afterrun mode (defined as engine speed greater than 0 rpm)	Engine speed greater than 600 to 850 rpm	engine is not in standby state (standby state occurs after ECM initialization or following after-run)	battery voltage is above 11 V for at least 3s	Engine is running which means the engine speed is greater than 600 to 850 rpm	•				
P2471 - Exhaust Gas Temperatur (EGT) Sensor 4 Circuit High Volta	Engine not in afterrun mode (defined as engine speed greater than 0 rpm)	Engine speed greater than 600 to 850 rpm	engine is not in standby state (standby state occurs after ECM initialization or following after-run)	battery voltage is above 11 V for at least 3s	Engine is running which means the engine speed is greater than 600 to 850 rpm					
P2493 - EGR Cooler BY Pass Position Sensor Performance	Engine not in afterrun mode (defined as engine speed greater than 0 rpm)	Engine speed greater than 600 to 850 rpm	engine is not in standby state (standby state occurs after ECM initialization or following after-run)	battery voltage is above 11 V for at least 3s	Engine Run Time greater than 10 seconds (engine speed greater than 600 to 850 rpm to indicate the engine is running)	Engine is running which means the engine speed is greater than 600 to 850 rpm	engine is not in ready state (which is active when the ignition is on or following a stall of the engine)			
P2494 - EGR Cooler BY Pass Position Sensor Circuit Low	Engine not in afterrun mode (defined as engine speed greater than 0 rpm)	Engine speed greater than 600 to 850 rpm	engine is not in standby state (standby state occurs after ECM initialization or following after-run)	battery voltage is above 11 V for at least 3s	Engine Run Time greater than 10 seconds (engine speed greater than 600 to 850 rpm to indicate the engine is running)	Engine is running which means the engine speed is greater than 600 to 850 rpm	engine is not in ready state (which is active when the ignition is on or following a stall of the engine)			
P2495 - EGR Cooler BY Pass Position Sensor Circuit High	Engine not in afterrun mode (defined as engine speed greater than 0 rpm)	Engine speed greater than 600 to 850 rpm	engine is not in standby state (standby state occurs after ECM initialization or following after-run)	battery voltage is above 11 V for at least 3s	Engine Run Time greater than 10 seconds (engine speed greater than 600 to 850 rpm to indicate the engine is running)	Engine is running which means the engine speed is greater than 600 to 850 rpm	engine is not in ready state (which is active when the ignition is on or following a stall of the engine)			
P249D - Closed Loop Reductant Injection Control At Limit - Flow To Low	SCR Reductant Level not in restriction or empty level state (see reductant level warning definition)	Engine not in afterrun mode (defined as engine speed greater than 0 rpm)	Engine speed greater than 600 to 850 rpm	engine is not in standby state (standby state occurs after ECM initialization or following after-run)	Manufacturer Enable Counter is zero (valu of 0 means ECM is locked and out of assembly plant mode)	a battery voltage is above 11 V for at least 3s	Status of the Reductant Tank is not Frozen which means ambient air temperature is >= -7*C and the reductatn tank temperature is >= -7*C	Engine Run Time greater than 10 seconds (engine speed greater than 600 to 850 rpm to indicate the engine is running)	Engine is running which means the engine speed is greater than 600 to 850 rpm	engine is not in ready state (which is active when the ignition is on or following a stall of the engine)
P249E - Closed Loop Reductant Injection Control At Limit - Flow To High	SCR Reductant Level not in restriction or empty level state (see reductant level warning definition)	Engine not in afterrun mode (defined as engine speed greater than 0 rpm)	Engine speed greater than 600 to 850 rpm	engine is not in standby state (standby state occurs after ECM initialization or following after-run)	Manufacturer Enable Counter is zero (valu of 0 means ECM is locked and out of assembly plant mode)	battery voltage is above 11 V for at least 3s	Status of the Reductant Tank is not Frozen which means ambient air temperature is >= -7*C and the reductant tank temperature is >= -7*C	Engine Run Time greater than 10 seconds (engine speed greater than 600 to 850 rpm to indicate the engine is running)	Engine is running which means the engine speed is greater than 600 to 850 rpm	engine is not in ready state (which is active when the ignition is on or following a stall o the engine)
P24A0 - Closed Loop Particulate Filter Regeneration Control At Lim Temperature Too Low	t. Engine not in afterrun mode (defined as engine speed greater than 0 rpm)	Engine speed greater than 600 to 850 rpm	engine is not in standby state (standby state occurs after ECM initialization or following after-run)	Engine Run Time greater than 10 seconds (engine speed greater than 600 to 850 rpm to indicate the engine is running)	Engine is running which means the engine speed is greater than 600 to 850 rpm	engine is not in ready state (which is active when the ignition is on or following a stall o the engine)				
P24A1 - Closed Loop Particulate Filter Regeneration Control At Lim Temperature Too High	t. Engine not in afterrun mode (defined as engine speed greater than 0 rpm)	Engine speed greater than 600 to 850 rpm	engine is not in standby state (standby state occurs after ECM initialization or following after-run)	Engine Run Time greater than 10 seconds (engine speed greater than 600 to 850 rpm to indicate the engine is running)	s n Engine is running which means the engine speed is greater than 600 to 850 rpm	engine is not in ready state (which is active when the ignition is on or following a stall o the engine)				
P2510 - ECM Power Relay Circuit Performance	battery voltage is above 11 V for at least 3s					·				
P2564 - Turbocharger Boost Contre Position Sensor Circuit Low	Engine not in afterrun mode (defined as engine speed greater than 0 rpm)	Engine speed greater than 600 to 850 rpm	engine is not in standby state (standby state occurs after ECM initialization or following after-run)	battery voltage is above 11 V for at least 3s	Engine Run Time greater than 10 seconds (engine speed greater than 600 to 850 rpm to indicate the engine is running)	Engine is running which means the engine speed is greater than 600 to 850 rpm	engine is not in ready state (which is active when the ignition is on or following a stall of the engine)			
P2565 - Turbocharger Boost Contr Position Sensor Circuit High	Engine not in afterrun mode (defined as engine speed greater than 0 rpm)	Engine speed greater than 600 to 850 rpm	engine is not in standby state (standby state occurs after ECM initialization or following after-run)	battery voltage is above 11 V for at least 3s	Engine Run Time greater than 10 seconds (engine speed greater than 600 to 850 rpm to indicate the engine is running)	Engine is running which means the engine speed is greater than 600 to 850 rpm	engine is not in ready state (which is active when the ignition is on or following a stall of the engine)			
P2598 - Turbocharger Boost Contre Position Sensor "A" Circuit Range/Performance - Stuck Low	Engine not in afterrun mode (defined as engine speed greater than 0 rpm)	Engine speed greater than 600 to 850 rpm	engine is not in standby state (standby state occurs after ECM initialization or following after-run)	battery voltage is above 11 V for at least 3s	Engine is running which means the engine speed is greater than 600 to 850 rpm	engine is not in ready state (which is active when the ignition is on or following a stall o the engine)				
P2599 - Turbocharger Boost Contri Position Sensor "A" Circuit Range/Performance - Stuck High	Engine not in afterrun mode (defined as engine speed greater than 0 rpm)	Engine speed greater than 600 to 850 rpm	engine is not in standby state (standby state occurs after ECM initialization or following after-run)	battery voltage is above 11 V for at least 3s	Engine is running which means the engine speed is greater than 600 to 850 rpm	engine is not in ready state (which is active when the ignition is on or following a stall o the engine)				
P2610 - Control Module Ignition O Timer Performance	ff engine is not in standby state (standby state occurs after ECM initialization or following after-nun)	battery voltage is above 11 V for at least 3s					-			
P268A - Fuel Injector Calibration Not Programmed ECM	Manufacturer Enable Counter is zero (valu of 0 means ECM is locked and out of	e								
P268C - Cylinder 1 Injector Data	Annufacturer Enable Counter is zero (valu of 0 means ECM is locked and out of	e								
P268D - Cylinder 2 Injector Data	assembly plant mode) Manufacturer Enable Counter is zero (valu	ie								
Incorrect	Annufacturer Enable Counter is zero (valu	4								
Incorrect	of 0 means ECM is locked and out of assembly plant mode)	-								
P268F - Cylinder 4 Injector Data Incorrect	of 0 means ECM is locked and out of assembly plant mode)	-								
P2690 - Cylinder 5 Injector Data Incorrect	of 0 means ECM is locked and out of assembly plant mode)	e								
P2691 - Cylinder 6 Injector Data Incorrect	Manufacturer Enable Counter is zero (valu of 0 means ECM is locked and out of assembly plant mode)	e								
P2692 - Cylinder 7 Injector Data Incorrect	Manufacturer Enable Counter is zero (valu of 0 means ECM is locked and out of assembly right mode)	e								
P2693 - Cylinder 8 Injector Data Incorrect	Manufacturer Enable Counter is zero (valu of 0 means ECM is locked and out of assembly niant mode)	e								
P2771 - 4wd Low Switch Circuit	Engine not in afterrun mode (defined as engine speed greater than 0 rpm)	Engine speed greater than 600 to 850 rpm	engine is not in standby state (standby state occurs after ECM initialization or following after-run)	battery voltage is above 11 V for at least 3s	Engine Run Time greater than 10 seconds (engine speed greater than 600 to 850 rpm to indicate the engine is running)	Engine is running which means the engine speed is greater than 600 to 850 rpm	engine is not in ready state (which is active when the ignition is on or following a stall of the engine)			
U0073 - CAN A BUS OFF	Engine not in afterrun mode (defined as engine speed greater than 0 rpm)	engine is not in standby state (standby state occurs after ECM initialization or following after-nin)	battery voltage is above 11 V for at least 3s							
U0074 - CAN B BUS OFF	Engine not in afterrun mode (defined as engine speed greater than 0 rpm)	engine is not in standby state (standby state occurs after ECM initialization or following after-run)	battery voltage is above 11 V for at least 3s							
U0101 - Lost Communications Wit Transmission Control System	h 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	battery voltage is above 11 V for at least 3s							
U0106 - Lost Communication With Glow Plug Control Module	Engine not in afterrun mode (defined as engine speed greater than 0 row)	engine is not in standby state (standby state occurs after ECM initialization or	battery voltage is above 11 V for at least							
UD10E - Lost Communications Wil Reductant Control Module	h Engine not in afterrun mode (defined as engine speed greater than 0 rpm)	following after-run) Engine speed greater than 600 to 850 rpm	engine is not in standby state (standby state occurs after ECM initialization or following after-run)	battery voltage is above 11 V for at least 3s	Engine Run Time greater than 10 seconds (engine speed greater than 600 to 850 rpm to indicate the engine is running)	Engine is running which means the engine speed is greater than 600 to 850 rpm	engine is not in ready state (which is active when the ignition is on or following a stall of the engine)			
U029D - N0x 1 loss of comm	Engine not in afterrun mode (defined as engine speed greater than 0 mm)	Engine speed greater than 600 to 850 rpm	battery voltage is above 11 V for at least 3s	Engine is running which means the engine speed is greater than 600 to 850 mm	e					
U029E - N0x 2 loss of comm	Engine not in afterrun mode (defined as engine speed greater than 0 rpm)	Engine speed greater than 600 to 850 rpm	battery voltage is above 11 V for at least 3s	Engine is running which means the engine speed is greater than 600 to 850 rpm	e					

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