Component / System	Fault Code	Monitor Strategy Description	Primary Malfunction Criteria		Threshold Logic and Valu	ie	Secondary Parameters		Enable Conditions		Time Required	MIL Illum.
Crankshaft to Camshaft Correlation	P0016	Detects a shift of the camshaft angle by monitoring the average offset angle.	average value of camshaft offset	<	-20.00	degrees	ignition on and basic enable conditions met:	=	TRUE see sheet enable tables	-	fail conditions exists for more than 4 events test performed continuously 0.01 s rate	В
Turbocharger Boost Control Position Not Learned	P003A	Detects in range vane position errors during a vane sweep initiated to learn minimum and maximum vane position values.	Path 1: mean offset learned value at fully open	<	5.54	%	injection quantity	>=	0.00	mm^3/r ev	fail conditions exists for 0.01 s monitor runs once per trip with 0.01 s	В
	valve position or	valve position or mean offset learned value at fully open	>	36.94	%	injection quantity	<=	100	mm^3/r ev	rate whenever enable conditions		
			valve position				accelerator pedal position	<=	0.10	%	are met	
							and Engine Speed and	>=	500.00	rpm		
							Engine Speed and	<=	760.00	rpm		
							Vehicle speed and	>=	0.00	mph		
							Vehicle speed and	<=	3.11	mph		
							Battery voltage and	>=	10.00	V		
							Engine Coolant Temperature and	>=	71.96	°C		
							Engine Coolant Temperature and	<=	99.96	°C		
						Barometric pressure and	>=	65.00	kPa			
						Barometric pressure and	<=	110.00	kPa			
						time since start and	>	10.08	sec			
						Regeneration Active and Adaptation is finished for this driving cycle	=	FALSE FALSE	-			
							and valve open	=	TRUE	-		

Component /	Fault	Monitor Strategy	Primary Malfunction	Threshold	Secondary		Enable		Time	MIL
System	Code	Description	Criteria	Logic and Value	Parameters	1	Conditions		Required	Illum.
					and turbocharger offset adaptation timer and	>=	0.60	sec		
					NO Pending or Confirmed DTCs:	=	see sheet inhibit tables	-		
					and basic enable conditions met:	=	see sheet enable tables	-		
								_		
			Path 2:		injection quantity	>=	0.00	mm^3/r		
			time taken to learn the mean offset learned value at fully open valve position	> 30.00 se	c and			ev		
					injection quantity	<=	100	mm^3/r ev		
					and accelerator pedal position and	<=	0.10	%		
					Engine Speed and	>=	500.00	rpm		
					Engine Speed and	<=	760.00	rpm		
					Vehicle speed and	>=	0.00	mph		
					Vehicle speed and	<=	3.11	mph		
					Battery voltage and	>=	10.00	V		
					Engine Coolant Temperature and	>=	71.96	°C		
					Engine Coolant Temperature and	<=	99.96	°C		
					Barometric pressure and	>=	65.00	kPa		
					Barometric pressure and	<=	110.00	kPa		
					time since start	>	10.08	sec		
					Regeneration Active and	=	FALSE FALSE	-		
					Adaptation is finished for this driving cycle and	=		-		
					valve open and	=	TRUE	-		
					turbocharger offset adaptation timer and	>=	0.60	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	Illun
			Path 3:				injection quantity	>=	0.00	mm^3/r ev		
			mean offset learned value at fully closed	<	68.01	%	and			ev		
			valve position									
			or				injection quantity	<=	100	mm^3/r		
			mean offset learned value at fully closed	>	95.61	%	and			ev		
			valve position									
							accelerator pedal position and	<=	0.10	%		
							Engine Speed	>=	500.00	rpm		
							and					
							Engine Speed	<=	760.00	rpm		
							and Vehicle speed	>=	0.00	mph		
							and					
							Vehicle speed and	<=	3.11	mph		
							Battery voltage	>=	10.00	V		
							and					
							Engine Coolant Temperature	>=	71.96	°C		
							and Engine Coolant Temperature	<=	99.96	°C		
							and					
							Barometric pressure and	>=	65.00	kPa		
							Barometric pressure	<=	110.00	kPa		
							and					
							time since start	>	10.08	sec		
							and Regeneration Active	=	FALSE	_		
							and					
							Adaptation is finished for this driving	=	FALSE	-		
							cycle and					
							valve closed	=	TRUE	-		
							and		0.00			
							turbocharger offset adaptation timer and	>=	0.60	sec		
							mean offset learned value at fully open	>=	5.54	%		
							valve position					
							and mean offset learned value at fully open	<=	36.94	%		
							valve position	`-	00.01	/0		
							and					
							NO Pending or Confirmed DTCs:	=	see sheet inhibit tables	-		
							and		tabics			
							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.
			Path 4:		injection quantity	>=	0.00	mm^3/r ev		
			time taken to learn the mean offset learned value at fully closed valve position	> 30.00 sec	and			ev		
			position		injection quantity	<=	100	mm^3/r ev		
					and accelerator pedal position	<=	0.10	%		
					and Engine Speed and	>=	500.00	rpm		
					Engine Speed and	<=	760.00	rpm		
					Vehicle speed and Vehicle speed	>=	0.00 3.11	mph mph		
					and Battery voltage	>=	10.00	V		
					and Engine Coolant Temperature	>=	71.96	°C		
					and Engine Coolant Temperature and	<=	99.96	°C		
					Barometric pressure and	>=	65.00	kPa		
					Barometric pressure and time since start	<=	110.00 10.08	kPa		
					and Regeneration Active	> =	FALSE	sec -		
					and Adaptation is finished for this driving	=	FALSE	-		
					cycle and valve closed	=	TRUE	_		
					and turbocharger offset adaptation timer	>=	0.60	sec		
					and mean offset learned value at fully open valve position	>=	5.54	%		
					and mean offset learned value at fully open valve position	<=	36.94	%		
					and NO Pending or Confirmed DTCs:	=	see sheet inhibit tables	-		
					and basic enable conditions met:	=	see sheet enable tables	-		

Component / System	Fault Code	Monitor Strategy Description	Primary Malfunction Criteria	Threshold Logic and Value	Secondary Parameters		Enable Conditions		Time Required	MIL Illum.
Turbocharger Boost Control Circuit	P0045	Diagnoses the Turbo Charger Boost Circuit low side driver circuit for circuit faults.	Voltage low during driver off state (indicates open circuit)	= Open Circuit: ≥ - 200 K Ω impedance between ECU pin and load	for time and starter is active cranking	> =	3.00 FALSE	v sec	fail conditions exists for 3 s monitor runs with 0.01 s rate whenever enable conditions are met	В
	state of the driver	The ECM detects that the commanded state of the driver and the actual state of the control circuit do not match.		battery voltage for time and starter is active cranking	> =	11.00 3.00 FALSE	V sec	fail conditions exists for 1 s monitor runs with 0.01 s rate whenever enable conditions are met		
Turbocharger Boost Control Circuit Low Voltage	P0047	Diagnoses the Turbo Charger Boost Circuit low side driver circuit for circuit faults.	Voltage low during driver off state (indicates short-to-ground)	= Short to ground: - ≤ 0.5 Ω impedance between signal and controller ground	battery voltage for time and starter is active cranking	> =	11.00 3.00 FALSE	V sec	fail conditions exists for 3 s monitor runs with 0.01 s rate whenever enable conditions are met	В
Turbocharger Boost Control Circuit High Voltage	P0048	Diagnoses the Turbo Charger Boost Circuit low side driver circuit for circuit faults.	Voltage high during driver on state (indicates short to power)	= Short to power: - ≤ 0.5 Ω impedance between signal and controller power	battery voltage	>	11.00	V	fail conditions exists for 1 s monitor runs with 0.01 s rate whenever	В

Component / System	Fault Code	Monitor Strategy Description	Primary Malfunction Criteria		Threshold Logic and Value	_	Secondary Parameters		Enable Conditions		Time Required	MIL Illum.
							for time and starter is active cranking	> =	3.00 FALSE	sec -	enable conditions are met	
Turbocharger Boost High Control Circuit Low Voltage	P006E	Diagnoses the Turbo Charger Boost Circuit high side driver circuit for circuit faults.	Voltage low during driver on state (indicates short to ground)	=	Short to ground: ≤ 0.5 Ω impedance between signal and controller ground		ignition on and basic enable conditions met:	=	TRUE see sheet enable tables		fail conditions exists for 1.5 s monitor runs with 0.1 s rate whenever enable conditions are met	В
Turbocharger Boost High Control Circuit High Voltage	P006F	Diagnoses the Turbo Charger Boost Circuit high side driver circuit for circuit faults.	Voltage high during driver off state (indicates short to power)	=	Short to power: ≤ 0.5 Ω impedance between signal and controller power		battery voltage for time and starter is active cranking	> =	11.00 3.00 FALSE	v sec	fail conditions exists for 0.1 s monitor runs with 0.1 s rate whenever enable conditions are met	В
CAC Temperature Sensor Circuit Low Voltage	P007C	Detects a CAC temperature sensor circuit short to ground.	CAC downstream temperature sensor voltage same as downstream CAC temperature	>	0.11	v °C	ignition on and basic enable conditions met: and NO Pending or Confirmed DTCs:	= =	TRUE see sheet enable tables see sheet inhibit tables		fail conditions exists for 5 s test performed continuously 0.1 s rate	A

Component / System	Fault Code	Monitor Strategy Description	Primary Malfunction Criteria		Threshold Logic and Value		Secondary Parameters		Enable Conditions		Time Required	MIL Illum.
CAC Temperature Sensor Circuit High Voltage	P007D	Detects a CAC temperature sensor circuit short to high voltage or a sensor open circuit	CAC downstream temperature sensor voltage same as downstream CAC temperature	>	4.93 -53	°C	ignition on and basic enable conditions met: and NO Pending or Confirmed DTCs:	= =	TRUE see sheet enable tables see sheet inhibit tables	-	fail conditions exists for 5 s test performed continuously 0.1 s rate	A
Fuel Rail Pressure [FRP] Too Low	P0087	Measured rail pressure is checked against desired rail pressure to detect low rail pressure conditions.	rail pressure deviation from set point calculated out of difference between desired and actual value (see Look-Up-Table #68)	>	11000 to 80000	kPa	state machine rail pressure control equal to metering unit control mode and basic enable conditions met: and metering unit actuator test active and NO Pending or Confirmed DTCs:	=	see sheet enable tables FALSE see sheet inhibit tables	-	fail conditions exists for 8 s monitor runs with 0.02 s rate whenever enable conditions are met	В
			rail pressure deviation from set point calculated out of difference between desired and actual value (see Look-Up-Table #71)	>	11000 to 80000	kPa	state machine rail pressure control equal to pressure control valve or state machine rail pressure control equal coupled pressure control (rail pressure is controlled by metering unit and pressure control valve)) and basic enable conditions met: and metering unit actuator test active and NO Pending or Confirmed DTCs:	= = = =	TRUE TRUE see sheet enable tables FALSE see sheet inhibit tables		fail conditions exists for 8 s monitor runs with 0.02 s rate whenever enable conditions are met	
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 set point calculated out of difference between desired and actual value (see Look-Up- Table #69)	<	-80000 to - 10000	kPa	current injection quantity	>	8.00	mm^3/r ev	fail conditions exists for 8 s monitor runs	В

Component / System	Fault Code	Monitor Strategy Description	Primary Malfunction Criteria		Threshold Logic and Value		Secondary Parameters		Enable Conditions		Time Required	MIL Illum.
							and state machine rail pressure control equal to metering unit control mode and basic enable conditions met: and metering unit actuator test active and NO Pending or Confirmed DTCs:	= = =	TRUE see sheet enable tables FALSE see sheet inhibit tables	-	with 0.02 s rate whenever enable conditions are met	
			rail pressure deviation from set point calculated out of difference between desired and actual value	<	-10000.00	kPa	state machine rail pressure control equal to pressure control valve or state machine rail pressure control equal coupled pressure control (rail pressure is controlled by metering unit and pressure control valve)) and basic enable conditions met: and NO Pending or Confirmed DTCs:	= = =	TRUE TRUE see sheet enable tables see sheet inhibit tables	-	fail conditions exists for 8 s monitor runs with 0.02 s rate whenever enable conditions are met	
Engine Coolant Temperature (ECT)-Fuel Temperature Not Plausible	P008F	Detects a biased ECT or fuel temperature by comparing start-up temperatures between the two sensors.	Path 1: (a) - (b) (see Look-Up-Table #15) where ((a) captured engine coolant temperature at start and (b) captured fuel temperature at start) or Path 2: (a) - (b) (see Look-Up-Table #15) with	> = =	100 to 999 measured parameter measured parameter 100 to 999	°C -	and ambient temperature and engine speed (see Look-Up-Table #91) for time and engine post drive/ afterun and diagnostic performed in current dc and	>= >= > = = = = = = = = = = = = = = = =	28800.00 -60.04 600 to 850 0.00 FALSE FALSE	°C rpm sec	fail conditions exists for 0.2 s monitor runs once per trip with 0.2 s rate whenever enable conditions are met	В

Component / System	Fault Code	Monitor Strategy Description	Primary Malfunction Criteria	Threshold Logic and Value		Secondary Parameters		Enable Conditions		Time Required	MIL Illum.
			(a) captured engine coolant temperature at start and (b) captured fuel temperature at start	parameter		basic enable conditions met: and NO Pending or Confirmed DTCs:	=	see sheet enable tables see sheet inhibit tables	-		
	where (a) captured engine coolant temperature at start and (b) captured fuel temperature at and (constant) (dostatus of block heater (see paramedefinition) The status of block heater (see paramedefinition)	(a) - (b) (see Look-Up-Table #16) where (a) captured engine coolant temperature at start and (b) captured fuel temperature at start and (c) status of block heater (see parameter	> 20 to 999 = measured parameter = measured parameter = FALSE	°C - -							
Fuel Pressure Regulator 1 Control Circuit/Open	P0090			= Open Circuit:≥ 200 K Ω impedance between ECU pin and load		for time and starter is active cranking for time and starter is active cranking for time and basic enable conditions met:	> = > =	3.00 FALSE 3.00 see sheet enable tables	v sec - sec -	fail conditions exists for 1 s monitor runs with 0.01 s rate whenever enable conditions are met	А
			The ECM detects that the commanded state of the driver and the actual state of the control circuit do not match.			for time and starter is active cranking for time and starter active cranking for time and basic enable conditions met:	> = > =	3.00 FALSE 3.00 see sheet enable tables	v sec	fail conditions exists for 1 s monitor runs with 0.01 s rate whenever enable conditions are met	

Component / System	Fault Code	Monitor Strategy Description	Primary Malfunction Criteria		Threshold Logic and Value		Secondary Parameters		Enable Conditions		Time Required	MIL Illum.
Fuel Pressure Regulator 1 Control Circuit Low	P0091	Diagnoses the Fuel Pressure Regulator 1 low side driver circuit for circuit faults.	Voltage low during driver off state (indicates short-to-ground)	=	Short to ground: ≤ 0.5 Ω impedance between signal and controller ground	-	battery voltage for time and starter is active cranking for time and basic enable conditions met:	> = > =	3.00 FALSE 3.00 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 1 Control Circuit High	P0092	Diagnoses the Fuel Pressure Regulator 1 low side driver circuit for circuit faults.	Voltage high during driver on state (indicates short to power)	=	Short to power: ≤ 0.5 Ω impedance between signal and controller power		for time and starter is active cranking for time and basic enable conditions met:	> = > =	3.00 FALSE 3.00 see sheet enable tables	v sec	fail conditions exists for 1 s monitor runs with 0.01 s rate whenever enable conditions are met	A
Intake Air Temperature (IAT) Sensor 2 Circuit Low Voltage	P0097	Detects low voltage readings on the MAF IAT circuit, indicating an OOR low condition on the MAF IAT circuit (IAT #2)	MAF intake air temperature sensor voltage same as intake air temperature	>	0.08	°C	ignition on and basic enable conditions met:	=	TRUE see sheet enable tables		fail conditions exists for 5 s test performed continuously with 0.1 s rate	А

Component / System	Fault Code	Monitor Strategy Description	Primary Malfunction Criteria		Threshold Logic and Value		Secondary Parameters		Enable Conditions		Time Required	MIL Illum.
Intake Air Temperature (IAT) Sensor 2 Circuit High Voltage	P0098	Detects high voltage readings on the MAF IAT circuit, indicating an OOR high condition on the MAF IAT circuit (IAT#2)	MAF intake air temperature sensor voltage same as intake air temperature	>	4.93 -52	v °C	ignition on and and basic enable conditions met:	=	TRUE see sheet enable tables	-	fail conditions exists for 5 s test performed continuously with 0.1 s rate	A
Fuel Pressure Regulator 1 High Control Circuit Low Voltage	P00C9	Diagnoses the Fuel Pressure Regulator 1 high side driver circuit for circuit faults.	Voltage low during driver on state (indicates short to ground)	=	Short to ground: ≤ 0.5 Ω impedance between signal and controller ground		basic enable conditions met:	=	see sheet enable tables		fail conditions exists for 0.5s monitor runs with 0.01 s rate whenever enable conditions are met	Α
Fuel Rail Pressure Regulator 1 High Control Circuit High Voltage	POOCA	Diagnoses the Fuel Pressure Regulator 1 high side driver circuit for circuit faults.	Voltage high during driver off state (indicates short to power)	=	Short to power: ≤ 0.5 Ω impedance between signal and controller power		battery voltage for time and starter is active cranking for time and engine post drive/ afterun for time and basic enable conditions met:	> = > = > = =	3.00 FALSE 3.00 TRUE 2.00 see sheet enable tables	sec - sec - sec -	fail conditions exists for 0.1 s monitor runs with 0.1 s rate whenever enable conditions are met	A
Intake Air Temperature Sensor 3 Circuit Low Voltage	P00EA	Detects low voltage readings on the intake air temperature sensor 3 circuit, indicating an OOR low condition.	intake air temperature sensor 3 voltage	<	0.03	V	ignition on	=	TRUE		fail conditions exists for 5 s test performed	В

Component / System	Fault Code	Monitor Strategy Description	Primary Malfunction Criteria		Threshold Logic and Value		Secondary Parameters		Enable Conditions		Time Required	MIL Illum.
			same as temperature of intake air temperature sensor 3	^	250	°C	and basic enable conditions met: and NO Pending or Confirmed DTCs:	=	see sheet enable tables see sheet inhibit tables	-	continuously 0.1 s rate	
Intake Air Temperature Sensor 3 Circuit High Voltage	POOEB	Detects high voltage readings on the intake air temperature sensor 3 circuit, indicating an OOR high condition.	intake air temperature sensor 3 voltage same as temperature of intake air temperature sensor 3	>	4.93 -53	v °C	ignition on and basic enable conditions met: and NO Pending or Confirmed DTCs:	=	TRUE see sheet enable tables see sheet inhibit tables	-	fail conditions exists for 5 s test performed continuously 0.1 s rate	В
Humidity Sensor Circuit Low	P00F4	Detects a low duty cycle signal from the humidity sensor, indicating an OOR low condition on the humidity sensor circuit	Humidity Sensor Duty Cycle same as relative humidity	>	5.00	%	Engine Running (please see the definition) and following conditions for time: battery voltage battery voltage and basic enable conditions met: and no pending or confirmed DTCs	> > < =	1.00 11.00 655.34 see sheet enable tables see sheet inhibit tables	sec V V	fail conditions exists for 0.1 s test performed continuously with 0.1 s rate	В
		The internal ECM PWM circuit driver detects either a duty cycle which has not been received or the maximum period has been exceeded, indicating short low condition on the humidity sensor circuit.	Internal ECM PWM circuit low voltage and ECM PWM circuit maximum period detected or Internal ECM PWM period not received	= = =	TRUE TRUE TRUE		Engine Running (please see the definition) and following conditions for time: battery voltage battery voltage	> > <	1.00 11.00 655.34	sec V	fail conditions exists for 0.1 s test performed continuously with 0.1 s rate	

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

Component / System	Fault Code	Monitor Strategy Description	Primary Malfunction Criteria		Threshold Logic and Value		Secondary Parameters		Enable Conditions		Time Required	MIL Illum.
Humidity Sensor Circuit Intermittent / Erratic	P00F6	The humidity signal performance monitor monitors the humidity signal delta in a defined time interval. The sum of these signal delta's over a number of time intervals is compared to a threshold.	Cumulative Humidity Sensor signal delta accumulated over a defined time interval	>=	50.00	% counts	Engine Running (please see the definition)	=	TRUE	-	fail conditions exists for 4 out of 5 windows (x out of y), test is performed continuously with 0.1 s	В
	I I	same as accumulated over time	>	0.13	sec	basic enable conditions met: and no pending or confirmed DTCs	=	see sheet enable tables see sheet inhibit tables	-	rate		
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	>	74.80	kPa	fail conditions exists for 10 s monitor runs	В
	r	measured air mass flow signal with (a) engine load dependent MAP for	< =	(a) - (b) 0.8	-	and engine coolant temperature	>=	69.96	°C	with 0.01 s rate whenever enable		
			calculating lower threshold 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	conditions are met	
			or measured air mass flow signal with	>	(c) + (b)	-	and					
			(c) Engine load dependent MAP for calculating higher threshold and with (b) air temperature dependent correction factor curve (see Look-Up-Table #1)	=	1.2 0 to 0.05	-	gradient of the charge-air temperature and gradient of the charge-air temperature	>= <=	-2.00 2.00	°C / sec		
)				and (Engine Running (see parameter definition) for time since start	= >	TRUE 90.00	- sec		
) and control value of the throttle valve and	>=	-400.00	%		
							control value of the throttle valve and (<=	5.00	%		

Component / System	Fault Code	Monitor Strategy Description	Primary Malfunction Criteria	Lo	Threshold ogic and Value		Secondary Parameters		Enable Conditions		Time Required	MIL Illum.
- System	0000	Dodonphon	Ontona		gio una varac		setpoint valve position of exhaust-gas recirculation	>=	-400.00	%	required	mam
							and setpoint valve position of exhaust-gas recirculation for	<=	2.00	%		
							time) and	>	3.00	sec		
							(and			***		
							injection quantity	<=	300.00	mm^3/r ev		
							and air pressure in the induction volume	<=	280.00	kPa		
							and engine speed	>=	-16384.00	rpm		
							and engine speed	<=	3100.00	rpm		
							and intake air temperature	>=	-7.04	°C		
							and intake air temperature	<=	51.96	°C		
							basic enable conditions met: and	=	see sheet enable tables	-		
							NO Pending or Confirmed DTCs:	=	see sheet inhibit tables	-		
Mass Air Flow	P0102		signal period of air mass flow sensor	>	881.00	us	ignition on	=	TRUE	-	fail	A
(MAF) Sensor Circuit High Voltage		readings on the MAF circuit, indicating an OOR low condition on the MAF circuit	(MAF)								conditions exists for 3 s monitor runs	
			same as air mass flow	<	3.9	kg/h	and basic enable conditions met:	=	see sheet enable tables	-	0.01 s rate whenever enable conditions	
							and NO Pending or Confirmed DTCs:	=	see sheet inhibit tables	-	are met	
												_

Component /	Fault	Monitor Strategy	Primary Malfunction		Threshold		Secondary		Enable		Time	MIL
Mass Air Flow (MAF) Sensor Circuit Low Voltage	P0103	Description Detects high frequency readings on the MAF circuit, indicating an OOR high condition on the MAF circuit	Criteria PWM period too long or signal period of air mass flow sensor (MAF) same as air mass flow	< >	TRUE 50.00 2043	us kg/h	ignition on and basic enable conditions met: and NO Pending or Confirmed DTCs:	=	TRUE see sheet enable tables see sheet inhibit tables	-	fail conditions exists for 3 s monitor runs 0.01 s rate whenever enable conditions are met	A A
Manifold Absolute Pressure (MAP) Sensor Performance	P0106	Detects a skewed MAP or BARO sensor by comparing MAP readings to the BARO sensor	Path 1: (a) - (b) or Path 2: (a) - (b) where (a) MAP sensor measured pressure and (b) BARO sensor measured pressure	< > = =	-15.00 15.00 measured parameter measured parameter	kPa kPa -	measured coolant engine downstream temperature and current injection quantity and actuator position of throttle valve and turbo charger (VNT) wiping is active and (engine speed and engine speed) and vehicle speed and	> < <= = >= <= <	1308.00 327.67 FALSE 0.00 100.00	°C mm^3/r ev % - rpm rpm mph	fail conditions exists for 5 s monitor runs with 0.01 s rate whenever enable conditions are met	В
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: (sensor voltage of manifold absolute pressure same as manifold absolute pressure	< <	0.91	V	basic enable conditions met: and NO Pending or Confirmed DTCs: engine synchronization completed and basic enable conditions met:	= =	see sheet enable tables see sheet inhibit tables TRUE see sheet enable tables	-	fail conditions exists for 5 s test performed continuously 0.01 s rate	Α

Component / System	Fault Code	Monitor Strategy Description	Primary Malfunction Criteria	ı	Threshold Logic and Valu	e	Secondary Parameters	Enable Conditions		Time Required	MIL Illum.
			and actuator position of throttle valve) or Path 2:	<=	20.00	%					
			(sensor voltage of manifold absolute pressure same as	<	0.38	V					
			manifold absolute pressure	<	-0.3	kPa					
			actuator position of throttle valve	>	20.00	%					
Manifold Absolute Pressure (MAP) Sensor Circuit High Voltage	P0108	Detects high voltage readings on the MAP circuit, indicating an OOR high condition on the MAP circuit	sensor voltage of manifold absolute pressure same as manifold absolute pressure	>	4.75 371.3	V kPa	engine synchronization completed and basic enable conditions met:	= TRUE = see sheet enable tables		fail conditions exists for 5 s test performed continuously 0.01 s rate	A
Intake Air Temperature Sensor 1 Circuit Low	P0112	Detects a low PWM period from the humidity temperature sensor, indicating an OOR low condition on the humidity temperature sensor circuit	Humidity Temperature sensor period same as humidity temperature	>	0.00260	sec °C	Engine Running (please see the definition) and following conditions for time: battery voltage battery voltage and basic enable conditions met: and no pending or confirmed DTCs	= TRUE > 1.00 > 11.00 < 655.34 = see sheet enable tables = see sheet inhibit tables	sec V V	fail conditions exists for 0.1 s test performed continuously with 0.1 s rate	В

Component / System	Fault Code	Monitor Strategy Description	Primary Malfunction Criteria		Threshold Logic and Value		Secondary Parameters		Enable Conditions		Time Required	MIL Illum.
		The internal ECM PWM circuit driver detects either a duty cycle which has not been received or the maximum period has been exceeded, indicating short low condition on the humidity sensor circuit.	Internal ECM PWM circuit low voltage	=	TRUE	-	Engine Running (please see the definition) and	=	TRUE	-	fail conditions exists for 0.1 s test performed continuously with 0.1 s	
			ECM PWM circuit maximum period detected	=	TRUE	-	following conditions for time:	>	1.00	sec	rate	ı
			or Internal ECM PWM period not received	=	TRUE	-	battery voltage battery voltage	> <	11.00 655.34	V V		İ
							and basic enable conditions met:	=	see sheet enable tables	-		I
							and no pending or confirmed DTCs	=	see sheet inhibit tables	-		l
Intake Air Temperature Sensor 1 Circuit High	P0113	Detects a high PWM period from the humidity temperature sensor, indicating an OOR high condition on the humidity temperature sensor circuit	Humidity Temperature sensor period	>	0.10	sec	Engine Running (please see the definition)	=	TRUE	-	fail conditions exists for 0.1 s test performed	В
			same as humidity temperature	<	-65.00	°C	and following conditions for time: battery voltage battery voltage and basic enable conditions met:	> > <	1.00 11.00 655.34 see sheet enable	sec V V	continuously with 0.1 s rate	ı
							and no pending or confirmed DTCs	=	tables see sheet inhibit tables	-		ı
		The internal ECM PWM circuit driver detects either a duty cycle which has not been received or the maximum period has been exceeded, indicating short high condition on the humidity sensor circuit.		=	TRUE	-	Engine Running (please see the definition)	=	TRUE	-	fail conditions exists for 0.1 s test performed continuously with 0.1 s	
			and ECM PWM circuit maximum period detected or	=	TRUE	-	and following conditions for time: battery voltage	>	1.00 11.00	sec V	rate	ı

Component / System	Fault Code	Monitor Strategy Description	Primary Malfunction Criteria	L	Threshold Logic and Value		Secondary Parameters		Enable Conditions		Time Required	MIL Illum.
		Internal ECM PWM period not received	=	TRUE	-	battery voltage and basic enable conditions met: and no pending or confirmed DTCs	=	655.34 see sheet enable tables see sheet inhibit tables	V -			
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	>	0.51	v °C	ignition on and basic enable conditions met:	=	TRUE see sheet enable tables		fail conditions exists for 15 s test performed continuously 0.2 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 engine coolant temperature	>	4.90 -53	v °C	ignition on and basic enable conditions met:	=	TRUE see sheet enable tables	-	fail conditions exists for 60 s test performed continuously 0.2 s rate	A
Engine Coolant Temperature (ECT) Below Thermostat Regulating Temperature	P0128	Detects a stuck open thermostat by comparing actual engine coolant heat up profile to an expected modeled heat up profile. The targets are dependent on start up conditions (high and low regions) Low Region Engine Temperature at start < 31 degC AND ambient air temperature <= 10 degC.	modeled coolant temperature (model derived from injection quantity, coolant temperature at start, and ambient temperature) and measured engine coolant temperature	>= <	59.96 49.96	°C	and time since start and measured engine coolant temperature and	= < >=	1440.00 -40.04	sec °C	fail conditions exists for 0.2 s monitor runs once per trip with 0.2 s rate whenever enable conditions are met	В

Component / System	Fault Code	Monitor Strategy Description	Primary Malfunction Criteria	1.6	Threshold ogic and Value		Secondary Parameters		Enable Conditions		Time Required	MIL Illum.
System	Code	Description	Criteria	L	ogić and value		captured value of coolant temperature during start	<=	30.96	°C	Required	mun.
							and (
							ambient temperature and	>	-7.04	°C		
							ambient temperature) and	<	59.96	°C		
							ambient temperature (used for low region determination)	<=	9.96	°C		
							engine idle time ratio which is defined by	<	0.50	%		
							idle time divided by time since start					
) where idle time is incremented when:					
							(accelerator pedal value and	<=	10.01	%		
							vehicle speed and	<=	9.94	mph		
							engine speed)	<=	750.00	rpm		
							and diagnostic performed in current dc and	=	FALSE	-		
							basic enable conditions met:	=	see sheet enable tables	-		
							and NO Pending or Confirmed DTCs:	=	see sheet inhibit tables	-		
		Detects a stuck open	modeled coolant temperature	>=	81.96	°C	engine pre drive	=	FALSE			
		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)	and measured engine coolant temperature	<	70.96	°C	and time since start	<	1440.00	sec		
							and measured engine coolant temperature	>=	-40.04	°C		

Component /	Fault	Monitor Strategy	Primary Malfunction	Threshold	Secondary	Enable		Time	MIL
System	Code	Description	Criteria	Logic and Value	Parameters	Conditions		Required	Illum.
		High region Engine Temperature at start < 52 degC AND ambient air temperature > 10 degC			and captured value of coolant temperature during start and	<= 51.96	°C		
					(ambient temperature and	> -7.04	°C		
					ambient temperature)	< 59.96	°C		
					and ambient temperature (used for high region determination) and	> 9.96	°C		
					engine idle time ratio which is defined by (< 0.50	%		
					idle time divided by time since start				
					where idle time is incremented when:				
					accelerator pedal value and	<= 10.01 <= 9.94	%		
					vehicle speed and engine speed	<= 9.94 <= 750.00	mph rpm		
) and				
					diagnostic performed in current dc and basic enable conditions met:	= FALSE = see sheet enable	-		
					and	tables			
					NO Pending or Confirmed DTCs:	= see sheet inhibit tables	-		
HO2S Bank 1 Sensor 1 Circuit Low	P0131	Detects an out of range low fault of the upstream Nox sensor lambda signal	Upstream Nox sensor lambda signal received via CAN	< -150.00 co	Valid upstream NOx signal from CAN is received (no Nox sensor communication failures)	= TRUE	-	fault exists for more than 10 sec;	В
		- So. Idinada digilal		1100 Lambda =	- Engine Running (see parameter definition)	= TRUE		monitor runs at 0.1 s	
				~27 %O2)	for time (required for the NOx sensor to give valid response) and	> 20.00	sec	when enable conditions are met	
					basic enable conditions met:	= see sheet enable tables	-		

Component / System	Fault Code	Monitor Strategy Description	Primary Malfunction Criteria		Threshold Logic and Value)	Secondary Parameters		Enable Conditions		Time Required	MIL Illum.
HO2S Bank 1 Sensor 1 Circuit High	P0132	Detects an out of range high fault of the upstream Nox sensor lambda signal	Upstream Nox sensor lambda signal received via CAN	>	1550.00 (1550 counts = 0.65 Lambda = - 0.1178 %O2)	counts	Valid upstream NOx signal from CAN is received (no Nox sensor communication failures) Engine Running (see parameter definition) for time (required for the NOx sensor to give valid response) and basic enable conditions met:	= = >	TRUE TRUE 20.00 see sheet enable tables	- sec	fault exists for more than 3 sec; monitor runs at 0.1 s when enable conditions are met	В
HO2S Bank1 Sensor2 Circuit Low	P0137	Detects an out of range low fault of the downstream Nox sensor lambda signal	Downstream Nox sensor lambda signal received via CAN	<	-150.00 (-150 counts = 1100 Lambda = ~27 %O2)	counts	Valid downstream NOx signal from CAN is received (no Nox sensor communication failures) Engine Running (see parameter definition) for time (required for the NOx sensor to give valid response) and basic enable conditions met:	= = >	TRUE TRUE 20.00 see sheet enable tables	- sec	fault exists for more than 3 sec; monitor runs at 0.1 s when enable conditions are met	В
HO2S Bank1 Sensor2 Circuit High	P0138	Detects an out of range high fault of the downstream Nox sensor lambda signal	Downstream Nox sensor lambda signal received via CAN	>	1550.00 (1550 counts = 0.65 Lambda = - 0.1178 %O2)	counts	Valid downstream NOx signal from CAN is received (no Nox sensor communication failures) Engine Running (see parameter definition) for time (required for the NOx sensor to give valid response) and basic enable conditions met:	= = >	TRUE TRUE 20.00 see sheet enable tables	- sec	fault exists for more than 3 sec; monitor runs at 0.1 s when enable conditions are met	В
O2 Sensor Slow Response - Rich to Lean Bank 1 Sensor 1	P014C	NOx sensor monitoring; transition time is too high to achieve an expected amount of oxygen	Measured O2 concentration at NOx sensor for transition time	< >=	Calculated O2 concentration at NOx sensor 2.00	- sec	### Basic enable conditions ###				fault exists for more than 0.1 sec; monitor runs at 0.1 s	В

Color Colo	Component / System	Fault Code	Monitor Strategy Description	Primary Malfunction Criteria	Threshold Logic and Value	Secondary Parameters		Enable Conditions		Time Required	MIL Illum.
and Battery collane Battery collane and Arriver vollane Arriver vollane Arriver vollane Arriver vollane Arriver vollane and Arriver vollane and Overen Concentration Starsal and Active Communication with NOx Bassor and Active Communication with NOx Bassor DOC Upstrama Temporature arriver vollane and active vollane and active vollane arriver vollan	System	Code	Description	Griteria	Logic and value						mum.
Battery voltage and extra African and and Ambiet Air Pressure and extra African and and and and and and and and and a							<	4000.00	rpm		
and Ambient Air Pressure Ambient Air Pressure Ambient Air Temperature Ambient								11.00	\/		
Ambient Air Pressure							>	11.00	V	are met	
Ambient Air Temperature Ambien							\	74.80	kPa		
and Ambient Air Temperature Arribent Air Temperature Active and Ambient Air Temperature Active Ac											
Ambient Air Temperature							\=	100.00	ĸга		
Ambient Air Temperature and Te							\	-7.04	°C		
and Regeneration Active and Regeneration Signal and Regeneration Active active active active active at tables and Regeneration Active and Regeneration											
Regeneration Active and Oxygen Concentration Signal and Oxygen Concentration Signal and Oxygen Concentration Signal and NO Pending or Corfirmed DTCs: and Active Communication with NOX sersor and DoC Upstream Temperature by tables and Active Communication with NOX sersor and DoC Upstream Temperature conditions during what for calibrated time to exclude dynamic effects' attitic calculated O2 signal (based on injection quantity, air mass and fluel density) and experiment of the property of t							\-	124.30	C		
and Oxygen Concentration Signal and Signal Sign							_	FAI SE	_		
Oxygen Concentration Signal and NO Pending or Confirmed DTCs: and NO Pending or Confirmed DTCs: and Active Communication with NOx Sensor and DOC Upstream Temperature Sensor and Sensor and Sensor and Sensor and Sensor and Sensor and Sensor and Sensor and Sensor and Sensor and Sensor and Sensor and Engine speed Sensor and Engine speed Sensor and Engine speed Sensor and Se							_	TALOL			
and NO Pending or Confirmed DTCs: NO Pending or Confirmed DTCs: and Active Communication with NOx Sensor DCC Upstream Temperature DCC Upstream T							_	active	_		
NO Pending or Confirmed DTCs: and Active Communication with NOx Sensor and DOC Upstream Temperature = -0.04 °C = 1299.96 °C ### Additional enable conditions during wall for calibrated time to exclude dynamic effects' ### calculated Q2 signal (based on injection quantity, air mass and fuel density) and Fuel Injection Quantity are ### Additional enable conditions during calculated Q2 signal (based on injection quantity > 120.00 mm²3/r ev and Engine speed Tor time ### Additional enable conditions during calculate Q2 threshold dependent on injection quantity, air mass and fuel density for evaluation of transition time* #### Fuel Injection Quantity with a) Measured and stored Fuel injection Quantity < (a) + (b) - with a) Measured and stored Fuel injection Quantity > 18.00 mm²3/r from stored fuel quantity at start of diagnosis							_	dolivo			
and Active Communication with NOx Sensor and DOC Upstream Temperature DOC Upstream Temperature Collibrated Imme to exclude dynamic effects' ### calculated OZ signal (based on injection quantity, air mass and fuel density) and Fuel Injection Quantity ### Additional enable conditions during variance injection quantity and Fuel Injection Quantity #### Additional enable conditions during calculate OZ signal (based on injection quantity) #### Additional enable conditions during calculate OZ threshold dependent on injection quantity, air mass and fuel density for evaluation of transition time* ###################################							=		-		
Active Communication with NOx Sersor and DOC Upstream Temperature DOC Upstream Temperature						and		100100			
Sensor and DOC Upstream Temperature DOC Upstream Temperature ### Additional enable conditions during "wait for calibrated time to exclude dynamic effects" ### calculated O2 signal (based on injection quantity, air mass and fuel density) and Fuel Injection Quantity and Engine speed for time ### Additional enable conditions during "calculated O2 signal (based on injection quantity > 120.00 mm^3/r ev and Engine speed for time ### Additional enable conditions during "calculate O2 threshold dependent on injection quantity, air mass and fuel density for evaluation of transition time" ### Fuel Injection Quantity with a) Measured and stored Fuel Injection Quantity at start of diagnosis b) Decline of Injection Quantity From stored fuel quantity at start of diagnosis and Fuel Injection Quantity > (a) - (b)							=	TRUF	_		
DOC Upstream Temperature						Sensor					
DCC Upstream Temperature ### Additional enable conditions during "wait for calibrated time to exclude dynamic effects" ### calculated O2 signal (based on injection quantity, air mass and fuel density) and Fuel Injection Quantity and Engine speed Engine speed For time ### Additional enable conditions during "calculate O2 threshold dependent on injection quantity, air mass and fuel density for evaluation of transition time" ### Fuel Injection Quantity with a) Measured and store Fuel Injection Quantity at start of diagnosis b) Decline of Injection Quantity from stored fuel quantity at start of diagnosis and Fuel Injection Quantity Four stored fuel quantity and Fuel Injection Quantity Form stored fuel quantity Form form fuel fuel fuel fuel fuel fuel fuel fuel							\-	-0.04	°C		
### Additional enable conditions during Vaint for calibrated time to exclude dynamic effects* ### calculated O2 signal (based on injection quantity, air mass and fuel density) and Fuel Injection Quantity and Engine speed > 600.00 rpm or line for time > 1.80 sec ### Additional enable conditions during calculate O2 threshold dependent on injection quantity, air mass and fuel density for evaluation of transition time* #### Fuel Injection Quantity < (a) + (b) - with a) Measured and stored Fuel Injection Quantity at start of diagnosis D) Decline of Injection Quantity from stored fuel quantity at start of diagnosis and Fuel Injection Quantity > (a) - (b)											
"wait for calibrated time to exclude dynamic effects" ### calculated O2 signal (based on injection quantity, air mass and fuel density) and Fuel Injection Quantity and Engine speed for time ### Additional enable conditions during "calculate O2 threshold dependent on injection quantity, air mass and fuel density for evaluation of transition time" ### Fuel Injection Quantity (a) + (b) - with a) Measured and stored Fuel Injection Quantity at start of diagnosis and Fuel Injection Quantity at start of diagnosis and Fuel Injection Quantity + (a) - (b) - (b) - (b) - (b) - (c) -						DOO opstream remperature	_	1233.30	O		
calculated Q2 signal (based on injection quantity, air mass and fuel density) and Fuel Injection Quantity Fuel Injection Quantity						"wait for calibrated time to exclude					
density) and Fuel Injection Quantity and Engine speed for time ### Additional enable conditions during 'calculate O2 threshold dependent on injection quantity, air mass and fuel density for evaluation of transition time' ### Fuel Injection Quantity with a) Measured and stored Fuel Injection Quantity at start of diagnosis b) Decline of Injection Quantity from stored fuel quantity from stored fuel quantity at start of diagnosis and Fuel Injection Quantity > 120.00 mm/3/r ev (a) + (b) - ### = measured parameter parameter = measured parameter > b) Decline of Injection Quantity from stored fuel quantity at start of diagnosis and Fuel Injection Quantity > (a) - (b)						calculated O2 signal (based on	<	0.12	-		
Fuel Injection Quantity and Engine speed for time ### Additional enable conditions during "calculate O2 threshold dependent on injection quantity, air mass and fuel density for evaluation of transition time" ### Fuel Injection Quantity with a) Measured and stored Fuel Injection Quantity at start of diagnosis b) Decline of Injection Quantity from stored fuel quantity at start of diagnosis and Fuel Injection Quantity **Tend Injection Quantity Fuel Injecti						density)					
and Engine speed for time ### Additional enable conditions during "calculate O2 threshold dependent on injection quantity, air mass and fuel density for evaluation of transition time" ### Fuel Injection Quantity with a) Measured and stored Fuel Injection Quantity at start of diagnosis b) Decline of Injection Quantity from stored fuel quantity at start of diagnosis and Fuel Injection Quantity s = 18.00 mm^3/r ev ### Possible Time							>	120.00	mm^3/r		
and Engine speed for time ### Additional enable conditions during "calculate O2 threshold dependent on injection quantity, air mass and fuel density for evaluation of transition time" ### Fuel Injection Quantity with a) Measured and stored Fuel Injection Quantity at start of diagnosis b) Decline of Injection Quantity from stored fuel quantity at start of diagnosis and Fuel Injection Quantity > 600.00 rpm > 1.80 = measured - parameter parameter = 18.00 mm^3/r ev 18.00 mm^3/r 20 mm/3/r 20 mm/3/r 30 mm/3/r 31 mm/3/r 41 mm/3/r 42 mm/3/r 43 mm/3/r 44 mm/3/r 54 mm/3/r 55 mm/3/r 56 mm/3/r 57 mm/3/r 58 mm/3/r 59 mm/3/r 60 mm/3						. doi injocation quantity		120.00			
Engine speed for time ### Additional enable conditions during "calculate O2 threshold dependent on injection quantity, air mass and fuel density for evaluation of transition time" #### Fuel Injection Quantity with a) Measured and stored Fuel Injection Quantity at start of diagnosis b) Decline of Injection Quantity from stored fuel quantity at start of diagnosis and Fuel Injection Quantity > 600.00 rpm > 1.80 sec (a) + (b) - ### ### ### Fuel Injection Quantity = measured - parameter parameter ev diagnosis ev ev fuel Injection Quantity ev fuel Injection Quantity ev (a) - (b)						and			•		
### Additional enable conditions during "calculate O2 threshold dependent on injection quantity, air mass and fuel density for evaluation of transition time" ### Fuel Injection Quantity with a) Measured and stored Fuel Injection Quantity at start of diagnosis b) Decline of Injection Quantity from stored fuel quantity at start of diagnosis and Fuel Injection Quantity > 1.80 sec > (a) + (b) - measured - parameter parameter diagnosis ev diagnosis and Fuel Injection Quantity > (a) - (b)							>	600.00	rpm		
"calculate O2 threshold dependent on injection quantity, air mass and fuel density for evaluation of transition time" ### Fuel Injection Quantity with a) Measured and stored Fuel Injection Quantity at start of diagnosis b) Decline of Injection Quantity from stored fuel quantity at start of diagnosis and Fuel Injection Quantity > (a) - (b)											
"calculate O2 threshold dependent on injection quantity, air mass and fuel density for evaluation of transition time" ### Fuel Injection Quantity with a) Measured and stored Fuel Injection Quantity at start of diagnosis b) Decline of Injection Quantity from stored fuel quantity at start of diagnosis and Fuel Injection Quantity > (a) - (b)											
injection quantity, air mass and fuel density for evaluation of transition time* ### Fuel Injection Quantity with a) Measured and stored Fuel Injection Quantity at start of diagnosis b) Decline of Injection Quantity from stored fuel quantity at start of diagnosis and Fuel Injection Quantity >= measured - parameter parameter 18.00 mm^3/r ev (a) - (b)						### Additional enable conditions during					
density for evaluation of transition time" ### Fuel Injection Quantity with a) Measured and stored Fuel Injection Quantity at start of diagnosis b) Decline of Injection Quantity from stored fuel quantity at start of diagnosis and Fuel Injection Quantity > (a) + (b) - measured - parameter parameter ev diagnosis and Fuel Injection Quantity > (a) - (b)						"calculate O2 threshold dependent on					
Fuel Injection Quantity with a) Measured and stored Fuel = measured - Injection Quantity at start of diagnosis b) Decline of Injection Quantity from stored fuel quantity at start of diagnosis and Fuel Injection Quantity > (a) - (b)						injection quantity, air mass and fuel					
Fuel Injection Quantity with a) Measured and stored Fuel Injection Quantity at start of diagnosis b) Decline of Injection Quantity from stored fuel quantity at start of diagnosis and Fuel Injection Quantity > (a) + (b) parameter parameter + 18.00 mm^3/r ev ev											
with a) Measured and stored Fuel Injection Quantity at start of diagnosis b) Decline of Injection Quantity from stored fuel quantity at start of diagnosis and Fuel Injection Quantity > (a) - (b)						###					
with a) Measured and stored Fuel Injection Quantity at start of diagnosis b) Decline of Injection Quantity from stored fuel quantity at start of diagnosis and Fuel Injection Quantity > (a) - (b)						Fuel Injection Quantity	<	(a) + (b)	-		
Injection Quantity at start of diagnosis b) Decline of Injection Quantity from stored fuel quantity at start of diagnosis and Fuel Injection Quantity Parameter Parameter								,			
diagnosis b) Decline of Injection Quantity from stored fuel quantity at start of diagnosis and Fuel Injection Quantity >= 18.00 mm^3/r ev (a) - (b)							=		-		
from stored fuel quantity at start of diagnosis and Fuel Injection Quantity > (a) - (b)						diagnosis	>=	·	mm^3/r		
Fuel Injection Quantity > (a) - (b)						from stored fuel quantity at start of diagnosis		10.00			
								(a) (b)			
							>	(a) - (b)			

Component /	Fault	Monitor Strategy	Primary Malfunction	Threshold	Secondary		Enable		Time	MIL
System	Code	Description	Criteria	Logic and Value	Parameters		Conditions		Required	Illum.
					A) Measured and stored Fuel Injection Quantity at start of	=	measured parameter	-		
					diagnosis b) Decline of Injection Quantity	>=	18.00	mm^3/r		
					from stored fuel quantity at start of diagnosis and			ev		
					Engine speed	>	600.00	rpm		
					### Additional enable conditions during "wait for calibrated time dependent on exhaust gas mass flow to concern					
					exhaust gas transfer time" ###					
					Fuel Injection Quantity with	<=	(a) - (b)	-		
					a) Measured and stored Fuel Injection Quantity at start of diagnosis	=	measured parameter	-		
					b) Decline of Injection Quantity from stored fuel quantity at start of diagnosis	>=	18.00	mm^3/r ev		
					and Fuel Injection Quantity with	<	(a) + (b)			
					a) Measured and stored Fuel Injection Quantity at start of diagnosis	=	measured parameter	-		
					b) Decline of Injection Quantity from stored fuel quantity at start of diagnosis	>=	18.00	mm^3/r ev		
					for exhaust gas transfer time	>	0.5	sec		
					### Additional enable conditions during "measure transition time needed to achieve calibrated oxygen threshold" ###					
					actual valve position of exhaust-gas recirculation and	>=	0.00	%		
					actual valve position of exhaust-gas recirculation	<=	80.00	%		
					and Fuel Injection Quantity	<	16.00	mm^3/r ev		
					### Additional enable conditions during "validate measurement of transition time by excluding dynamic effects" ###					
					Deviation from maximum O2 concentration during overrun and	<	0.06	-		

Component / System	Fault Code	Monitor Strategy Description	Primary Malfunction Criteria	Threshold Logic and Value	Secondary Parameters		Enable Conditions		Time Required	MIL Illum.
System.		2001, p.10.1		Logic and value	Fuel Injection Quantity with a) Measured Minimum Fuel Injection Quantity b) Maximum fluctuation of Injection Quantity ### Additional enable conditions during "set fault" or "clear fault" process ###	<	(a) + (b)	- mm^3/r ev		
					Deviation from maximum O2 concentration during overrun and	<	0.06	-		
					Fuel Injection Quantity with a) Measured Minimum Fuel Injection Quantity b) Maximum fluctuation of Injection Quantity	< = =<	(a) + (b) measured parameter 16.00	- mm^3/r ev		
Fuel Trim System	P0171	Monitors the fuel mass	Fuel mass observer emission correction		e Status of the Observer function's lambda-	=	TRUE	-	fail	В
Lean		observer correction quantity. Detects if the correction quantity exceeds the feedback limit.	quantity (see Look-Up-Table #47)	46.42 v	signal				conditions exists for 12 s monitor runs with 0.02 s rate	
					lambda signal from NOx sensor ready (see parameter definition)	=	TRUE	-	whenever enable conditions	
					fuel system is in fuel cut off (see parameter definition) Particulate Filter Regeneration Mode	=	FALSE FALSE	-	are met	
					((component of combusted fuel in the engine	>=	1	-		
					or calculated EGR rate	>=	0	-		
					for time)) and	>	1.00	sec		
					Controller status of the observer means (=	TRUE	-		
					Load dependent release state (see look up table #) (see Look-Up- Table #48) and	=	0 to 1	-		
					Component Protection release state (see look up table #) (see Look-Up-Table #43)	>	0 to 1	-		

Component /	Fault	Monitor Strategy	Primary Malfunction	Threshold	Secondary	Enable	Tim	
System	Code	Description	Criteria	Logic and Value	Parameters	Conditions	Requi	ed Illum.
					engine coolant temperature engine coolant temperature Normal Injection Mode Barometric pressure Ambient temperature NO Pending or Confirmed DTCs: basic enable conditions met:	<= 199.96 >= 64.96 = TRUE >= 74.80 >= -7.04 = see sheet inhibit tables = see sheet enable tables	°C °C kPa °C -	
Fuel Trim System Rich	P0172	Monitors the fuel mass observer correction quantity. Detects if the correction quantity exceeds the feedback limit.	Fuel mass observer emission correction quantity (see Look-Up-Table #46)	>= 46.42 to 164.6 mm^3/ru v	Status of the Observer function's lambda- signal	= TRUE	- fai conditi exists fo s monitor with 0.0	ons or 12 runs o2 s
					(lambda signal from NOx sensor ready	= TRUE	whene	ver e
					(see parameter definition) fuel system is in fuel cut off (see	= FALSE	conditi - are m	
					parameter definition) Particulate Filter Regeneration Mode	= FALSE	-	
					((component of combusted fuel in the engine or calculated EGR rate)	>= 1	-	
					for time)) and Controller status of the observer means	> 1.00 = TRUE	sec -	
					(Load dependent release state (see look up table #) (see Look-Up- Table #48) and	= 0 to 1	-	
					Component Protection release state (see look up table #) (see Look-Up- Table #43)	> 0 to 1	-	
					engine coolant temperature engine coolant temperature Normal Injection Mode Barometric pressure Ambient temperature NO Pending or Confirmed DTCs:	<= 199.96 >= 64.96 = TRUE >= 74.80 >= -7.04 = see sheet inhibit tables	°C °C kPa °C -	

Component / System	Fault Code	Monitor Strategy Description	Primary Malfunction Criteria	L	Threshold ogic and Value		Secondary Parameters		Enable Conditions		Time Required	MIL Illum.
							basic enable conditions met:	=	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	<	0.60	V	ignition on	=	TRUE	-	fail conditions exists for 5 s test performed continuously	В
			or same as fuel temperature	>	149.96	°C	and basic enable conditions met:	=	see sheet enable tables	-	0.2 s rate	
Fuel Temperature Sensor 1 Circuit High	P0183	Detects high voltage readings in the fuel pump temperature sensor 1 circuit, indicating an OOR high condition on the fuel pump temperature sensor 1 circuit	voltage of fuel temperature sensor 1 same as fuel temperature	>	4.71 - 50	v °C	ignition on and basic enable conditions met:	=	TRUE see sheet enable tables		fail conditions exists for 5 s test performed continuously 0.2 ms rate	В
Fuel Temperature Sensor 2 Circuit Low	P0187	Detects low voltage condition of the fuel temperature sensor circuit, indicating an OOR low condition	fuel temperature sensor voltage same as fuel temperature	>	150	V °C	ignition on and basic enable conditions met:	=	TRUE see sheet enable tables		fail conditions exists for 5 s test performed continuously 0.2 s rate	В

Component /	Fault	Monitor Strategy	Primary Malfunction		Threshold		Secondary		Enable		Time	MIL
System	Code	Description	Criteria	1	ogic and Valυ 4.75	v V	Parameters ignition on		Conditions TRUE		Required fail	Illum. B
Fuel Temperature Sensor 2 Circuit High	P0188	Detects high voltage condition of the fuel temperature sensor circuit, indicating an OOR high condition	fuel temperature sensor voltage same as fuel temperature	<	-50	°C	and basic enable conditions met:	=	see sheet enable tables	-	conditions exists for 5 s test performed continuously 0.2 s rate	Б
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	A
	or fuel pressure regulator 2 adaptation factor	<=	0.75	factor	and adaptation for fuel pressure regulator 2 active means (counter for successful adaptation	=	TRUE 0	-	rate whenever enable conditions are met			
						or counter for successful adaptation or counter for the successful calculation of the adaptation and	>	9.00	counts			
							engine speed and	>	400.00	rpm		
							engine speed) and vehicle speed and	<=	1.86	rpm mph		
							(state machine rail pressure control equal to pressure control valve	=	TRUE	-		
							or state machine rail pressure control equal coupled pressure control (rail pressure is controlled by metering unit and pressure control valve)) and	=	TRUE	-		
							basic enable conditions met:	=	see sheet enable tables	-		

Component /	Fault	Monitor Strategy	Primary Malfunction		Threshold		Secondary		Enable		Time	MIL
System	Code	Description	Criteria	Lo	ogic and Value		Parameters		Conditions		Required	Illum.
		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 or rail pressure sensor voltage)	٧٨	0.35 0.65	V V	and fuel temperature and engine has already run in this driving cycle and rail pressure is reduced means rail pressure and fuel pressure regulator 2 current and time since engine off and number of fault measurements during engine postdrive/ afterun and basic enable conditions met: and NO Pending or Confirmed DTCs:		-0.04 TRUE TRUE 0.00 1.70 30.08 10.00 see sheet enable tables see sheet inhibit tables	°C - kPa Amps sec counts	ail conditions exists for more than 0.30 s monitor runs once per driving cycle with 0.01 s rate whenever enable conditions are met	
Fuel Rail Pressure [FRP] Sensor Circuit Low	P0192	Detects low voltage readings on the FRP circuit, indicating an OOR low condition on the FRP circuit	rail pressure sensor voltage same as rail pressure	<	0.19	V kPa	ignition on and basic enable conditions met: and NO Pending or Confirmed DTCs:	=	TRUE see sheet enable tables see sheet inhibit tables		fail conditions exists for 0.14 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.
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	V kPa	ignition on and basic enable conditions met: and NO Pending or Confirmed DTCs:	= =	TRUE see sheet enable tables see sheet inhibit tables	-	fail conditions exists for 0.2 s monitor runs with 0.01 s rate whenever enable conditions are met	A
Cylinder 1 Injection Timing Retarded	P01CB	Monitors the correction values for the energizing time of each cylinder. A correction value for the energizing time is learned for each cylinder at a calibrated rail pressure operating point. Detects a fault when the corrected energizing time exceeds the allowed limit.	corrected energizing time for the rail pressure calibration points and cylinder 1 (with (a) maximum injection energizing time and with (b) offset of the maximum filtered energizing time)) for rail pressure point	> = = =	(a) - (b) 384.4 12 70000.00	us us kPa	environmental temperature and (fuel temperature and fuel temperature) and engine temperature and battery voltage and combustion chamber is not cold off means time since last combustion (see Look- Up-Table #94) and intake manifold pressure and intake manifold pressure and coelerator pedal position and Fuel system status and (engine speed and	> = <= > < < = > < < = > > < < = > > < < = > > < < < = > > < < < > > < < > > < < > > = > > < < < <	-7.04 0.06 79.96 49.96 10.00 5 to 30 75.00 150.00 0.05 Fuel cut off (b) - (a)	°C °C °C V sec kPa kPa -	fail conditions exists for more than 0.01 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 Valu	e	Secondary Parameters		Enable Conditions		Time Required	MIL Illum.
							engine speed	<	(a) + (c)	-		
							with (a) value of engine speed	=	30.00	rpm		
							and with					
							(b) gear specific minimum engine speed	=	950	rpm		
							and with					
							(c) gear specific maximum engine speed	=	1850	rpm		
)					
							and current gear (see Look-Up-Table #93)	=	0 to 1	_		
							and					
							vehicle speed and	>	0	mph		
							rail pressure deviation from setpoint	<	5000.00	kPa		
							calculated out of difference between desired and actual value					
							and					
							rail pressure is stable for at least and	>	0.10	sec		
							no gear change is occurred	=	TRUE	-		
							and 4 wheel mode	=	FALSE	_		
							and					
							basic enable conditions met:	=	see sheet enable tables	-		
							and					
							NO Pending or Confirmed DTCs:	=	see sheet inhibit tables	-		
Cylinder 2 Injection Timing	P01CD	Monitors the correction values for the energizing	(environmental temperature	>	-7.04	°C	fail conditions	В
Retarded		time of each cylinder. A									exists for	
		correction value for the									more than	
		energizing time is learned for each cylinder at a									0.01 s monitor runs	
		calibrated rail pressure									with 0.01 s	
		operating point. Detects a fault when the	corrected energizing time for the rail	>	(a) - (b)	_	and				rate whenever	
		corrected energizing time	pressure calibration points and cylinder 1		(-) (-)						enable	
		exceeds the allowed limit.	((conditions are met	
			with				fuel temperature	>=	0.06	°C	are met	
			(a) maximum injection energizing time and with	=	384.4	us	and fuel temperature	<=	79.96	°C		
			(b) offset of the maximum filtered	=	12	us)	~-	70.00	0		
			energizing time				and					
			Ś									
			for rail pressure point	=	70000.00	kPa	engine temperature and	>	49.96	°C		
1	ĺ	1	Tan procedic point	_	, 0000.00	NI C	battery voltage	>	10.00	V		

Component /	Fault	Monitor Strategy	Primary Malfunction	Threshold	Secondary		Enable		Time	MIL
System	Code	Description	Criteria	Logic and Value	Parameters		Conditions		Required	Illum.
					and combustion chamber is not cold off means time since last combustion (see Look-		5 to 30			l
					Up-Table #94) and	>=		sec		İ
					intake manifold pressure and	>	75.00	kPa		i
					intake manifold pressure and	<	150.00	kPa		ı
					accelerator pedal position and	<	0.05	%		i
					Fuel system status and	=	Fuel cut off	-		ı
					engine speed and	>	(b) - (a)	-		ı
					engine speed with	<	(a) + (c)	-		ı
					(a) value of engine speed and with	=	30.00	rpm		i
					(b) gear specific minimum engine speed	=	950	rpm		ı
					and with (c) gear specific maximum engine speed	=	1850	rpm		İ
) and					ı
					current gear (see Look-Up-Table #93) and	=	0 to 1	-		ı
					vehicle speed and	>	0	mph		ı
					rail pressure deviation from setpoint calculated out of difference between desired and actual value and	<	5000.00	kPa		ı
					rail pressure is stable for at least and	>	0.10	sec		ı
					no gear change is occurred and	=	TRUE	-		ı
					4 wheel mode and	=	FALSE	-		ı
					basic enable conditions met:	=	see sheet enable tables	-		ı
					NO Pending or Confirmed DTCs:	=	see sheet inhibit tables	-		ı

Component / System	Fault Code	Monitor Strategy Description	Primary Malfunction Criteria		Threshold Logic and Value		Secondary Parameters		Enable Conditions		Time Required	MIL Illum
Cylinder 7 Injection Timing Retarded	P01D7	Monitors the correction values for the energizing time of each cylinder. A correction value for the	(environmental temperature	>	-7.04	°C	fail conditions exists for more than	В
		energizing time is learned for each cylinder at a calibrated rail pressure operating point.									0.01 s monitor runs with 0.01 s rate	
		Detects a fault when the corrected energizing time exceeds the allowed limit.	corrected energizing time for the rail pressure calibration points and cylinder 1	>	(a) - (b)	-	and				whenever enable conditions are met	
			with (a) maximum injection energizing time	=	384.4	us	fuel temperature and	>=	0.06	°C	4.001	
	and with (b) offset of the maximum filtered energizing time)	=	12	us	fuel temperature)	<=	79.96	°C				
)				and					
	for rail pressure point	=	70000.00	kPa	engine temperature and	>	49.96	°C				
					battery voltage	>	10.00	V				
							and combustion chamber is not cold off means					
							time since last combustion (see Look- Up-Table #94)	>=	5 to 30	sec		
							and intake manifold pressure and	>	75.00	kPa		
							intake manifold pressure and	<	150.00	kPa		
							accelerator pedal position and	<	0.05	%		
							Fuel system status and	=	Fuel cut off	-		
							engine speed	>	(b) - (a)	-		
							engine speed with	<	(a) + (c)	-		
							(a) value of engine speed and with	=	30.00	rpm		
					(b) gear specific minimum engine speed	=	950	rpm				
					and with (c) gear specific maximum engine speed	=	1850	rpm				
) and current gear (see Look-Up-Table #93)	=	0 to 1	-				
						and vehicle speed and	>	0	mph			

Component /	Fault	Monitor Strategy	Primary Malfunction		Threshold		Secondary		Enable		Time	MIL
System	Code	Description	Criteria		Logic and Valu	е	Parameters		Conditions		Required	Illum.
							rail pressure deviation from setpoint calculated out of difference between desired and actual value	<	5000.00	kPa		
							and rail pressure is stable for at least	>	0.10	sec		
							and no gear change is occurred and	=	TRUE	-		
							4 wheel mode and	=	FALSE	-		
							basic enable conditions met:	=	see sheet enable tables	-		
							and NO Pending or Confirmed DTCs:	=	see sheet inhibit tables	-		
Cylinder 8	P01D9	Monitors the correction	(environmental temperature	>	-7.04	°C	fail	В
njection Timing Retarded		values for the energizing time of each cylinder. A correction value for the energizing time is learned									conditions exists for more than 0.01 s	
		for each cylinder at a calibrated rail pressure operating point.									monitor runs with 0.01 s rate	
		Detects a fault when the corrected energizing time exceeds the allowed limit.	corrected energizing time for the rail pressure calibration points and cylinder 1	>	(a) - (b)	-	and				whenever enable conditions	
			with		004.4		(fuel temperature	>=	0.06	°C	are met	
			(a) maximum injection energizing time and with (b) offset of the maximum filtered	=	384.4 12	us	and fuel temperature	<=	79.96	°C		
			energizing time		12	uo	and					
) for				engine temperature	>	49.96	°C		
			rail pressure point	=	70000.00	kPa	and battery voltage	>	10.00	V		
							and combustion chamber is not cold off means					
							time since last combustion (see Look- Up-Table #94)	>=	5 to 30	sec		
							intake manifold pressure and	>	75.00	kPa		
							intake manifold pressure and	<	150.00	kPa		
							accelerator pedal position and	<	0.05	%		
							Fuel system status and	=	Fuel cut off	-		

Component / System	Fault Code	Monitor Strategy Description	Primary Malfunction Criteria	L	Threshold ogic and Value		Secondary Parameters		Enable Conditions		Time Required	MIL Illum.
							(engine speed and	>	(b) - (a)	-		
							engine speed with	<	(a) + (c)	-		
							(a) value of engine speed and with	=	30.00	rpm		
							(b) gear specific minimum engine speed	=	950	rpm		
							and with (c) gear specific maximum engine speed	=	1850	rpm		
) and current gear (see Look-Up-Table #93) and	=	0 to 1	-		
							vehicle speed and	>	0	mph		
							rail pressure deviation from setpoint calculated out of difference between desired and actual value	<	5000.00	kPa		
							and rail pressure is stable for at least and	>	0.10	sec		
							no gear change is occurred and	=	TRUE	-		
							4 wheel mode and	=	FALSE	-		
							basic enable conditions met:	=	see sheet enable tables	-		
							and NO Pending or Confirmed DTCs:	=	see sheet inhibit tables	-		
Cylinder 4	P01D1	Manitore the correction					anvironmental temperature		-7.04	°C	fail	В
Unjection Timing Retarded	POIDI	Monitors the correction values for the energizing time of each cylinder. A correction value for the energizing time is learned for each cylinder at a calibrated rail pressure operating point. Detects a fault when the corrected energizing time exceeds the allowed limit.	corrected energizing time for the rail pressure calibration points and cylinder 1 (with	>	(a) - (b)	-	and (fuel temperature	>=	-7.04	°C	conditions exists for more than 0.01 s monitor runs with 0.01 s rate whenever enable conditions are met	В
			(a) maximum injection energizing time and with	=	384.4	us	and fuel temperature	<=	79.96	°C		
			(b) offset of the maximum filtered energizing time	=	12	us	and					

Component / System	Fault Code	Monitor Strategy Description	Primary Malfunction Criteria	Threshold Logic and Value	Secondary Parameters		Enable Conditions		Time Required	MIL Illum.
Cycloni	Oodo	Decemption	for	Logic and value	engine temperature	>	49.96	°C	rtoquirou	mami
			rail pressure point	= 70000.00 kPa	and					
					battery voltage	>	10.00	V		
					and					
					combustion chamber is not cold off					
					means		F 4 - 00			
					time since last combustion (see Look- Up-Table #94)	>=	5 to 30	sec		
					and					
					intake manifold pressure	>	75.00	kPa		
					and intake manifold pressure	<	150.00	kPa		
					and		150.00	KFa		
					accelerator pedal position	<	0.05	%		
					and		F			
					Fuel system status and	=	Fuel cut off	-		
					(
					engine speed	>	(b) - (a)	-		
					and engine speed	<	(a) + (c)	_		
					with		(a) + (c)	-		
					(a) value of engine speed	=	30.00	rpm		
					and with		050			
					(b) gear specific minimum engine speed	=	950	rpm		
					and with					
					(c) gear specific maximum engine speed	=	1850	rpm		
					,					
					and					
					current gear (see Look-Up-Table #93)	=	0 to 1	-		
					and		0			
					vehicle speed and	>	U	mph		
					rail pressure deviation from setpoint	<	5000.00	kPa		
					calculated out of difference between					
					desired and actual value and					
					rail pressure is stable for at least	>	0.10	sec		
					and					
J					no gear change is occurred and	=	TRUE	-		
					4 wheel mode	=	FALSE	_		
					and					
					basic enable conditions met:	=	see sheet enable	-		
J					and		tables			
					NO Pending or Confirmed DTCs:	=	see sheet inhibit	-		
							tables			

Component /	Fault	Monitor Strategy	Primary Malfunction		Threshold		Secondary		Enable		Time	MIL
System	Code	Description	Criteria		Logic and Value	е	Parameters		Conditions	00	Required	Illum.
Cylinder 5 Injection Timing Retarded	P01D3	Monitors the correction values for the energizing time of each cylinder. A correction value for the					environmental temperature	>	-7.04	°C	fail conditions exists for more than	В
		energizing time is learned for each cylinder at a calibrated rail pressure operating point.									0.01 s monitor runs with 0.01 s rate	
		Detects a fault when the corrected energizing time exceeds the allowed limit.	corrected energizing time for the rail pressure calibration points and cylinder 1	>	(a) - (b)	-	and				whenever enable conditions are met	
			with (a) maximum injection energizing time	=	384.4	us	fuel temperature and	>=	0.06	°C	are met	
			and with	=	304.4	us	fuel temperature	<=	79.96	°C		
			(b) offset of the maximum filtered energizing time	=	12	us)	,	7 0.00	· ·		
)				and					
			for rail pressure point	=	70000.00	kPa	engine temperature and	>	49.96	°C		
							battery voltage	>	10.00	V		
							and combustion chamber is not cold off means					
							time since last combustion (see Look- Up-Table #94) and	>=	5 to 30	sec		
							intake manifold pressure and	>	75.00	kPa		
							intake manifold pressure and	<	150.00	kPa		
							accelerator pedal position and	<	0.05	%		
							Fuel system status and (=	Fuel cut off	-		
							engine speed and	>	(b) - (a)	-		
							engine speed with	<	(a) + (c)	-		
							(a) value of engine speed and with	=	30.00	rpm		
						(b) gear specific minimum engine speed	=	950	rpm			
						and with (c) gear specific maximum engine speed	=	1850	rpm			
) and						
							current gear (see Look-Up-Table #93) and	=	0 to 1	-		
						vehicle speed and	>	0	mph			

Component /	Fault	Monitor Strategy	Primary Malfunction		Threshold		Secondary		Enable		Time	MIL
System	Code	Description	Criteria		Logic and Valu	е	Parameters		Conditions		Required	Illum.
							rail pressure deviation from setpoint calculated out of difference between desired and actual value	<	5000.00	kPa		
							and rail pressure is stable for at least and	>	0.10	sec		
							no gear change is occurred and	=	TRUE	-		
							4 wheel mode and	=	FALSE	-		
							basic enable conditions met:	=	see sheet enable tables	-		
							and NO Pending or Confirmed DTCs:	=	see sheet inhibit tables	-		
Cylinder 6	P01D5	Monitors the correction	(environmental temperature	>	-7.04	°C	fail	В
njection Timing Retarded		values for the energizing time of each cylinder. A correction value for the energizing time is learned									conditions exists for more than 0.01 s	
		for each cylinder at a calibrated rail pressure operating point.			(-) (1-)						monitor runs with 0.01 s rate	
		Detects a fault when the corrected energizing time exceeds the allowed limit.	corrected energizing time for the rail pressure calibration points and cylinder 1	>	(a) - (b)	-	and				whenever enable conditions	
			with (a) maximum injection energizing time	=	384.4	us	fuel temperature and	>=	0.06	°C	are met	
			and with (b) offset of the maximum filtered	=	12	us	fuel temperature	<=	79.96	°C		
			energizing time)				and					
			for				engine temperature	>	49.96	°C		
			rail pressure point	=	70000.00	kPa	and battery voltage	>	10.00	V		
							and combustion chamber is not cold off means					
							time since last combustion (see Look- Up-Table #94)	>=	5 to 30	sec		
							intake manifold pressure and	>	75.00	kPa		
							intake manifold pressure and	<	150.00	kPa		
							accelerator pedal position and	<	0.05	%		
							Fuel system status and	=	Fuel cut off	-		

Component / System	Fault Code	Monitor Strategy Description	Primary Malfunction Criteria		Threshold gic and Value		Secondary Parameters		Enable Conditions		Time Required	MIL Illum.
- Cystem	Joue	Description	Ontena	LO	gio ana value		(engine speed	>	(b) - (a)	-	Roquileu	mani.
							and engine speed	<	(a) + (c)	-		
							with (a) value of engine speed	=	30.00	rpm		
							and with (b) gear specific minimum engine speed	=	950	rpm		
							and with (c) gear specific maximum engine speed	=	1850	rpm		
							and current gear (see Look-Up-Table #93) and vehicle speed	=	0 to 1	-		
							and rail pressure deviation from setpoint calculated out of difference between desired and actual value	>	5000.00	mph kPa		
							and rail pressure is stable for at least and	>	0.10	sec		
							no gear change is occurred and	=	TRUE	-		
							4 wheel mode and	=	FALSE	-		
							basic enable conditions met:	=	see sheet enable tables	-		
							and NO Pending or Confirmed DTCs:	=	see sheet inhibit tables	-		
Culinday 2	DO4.CE	Maritanatha annatian							7.04	90	fail	
Cylinder 3 Injection Timing Retarded	P01CF	Monitors the correction values for the energizing time of each cylinder. A correction value for the energizing time is learned for each cylinder at a calibrated rail pressure operating point. Detects a fault when the corrected energizing time exceeds the allowed limit.	corrected energizing time for the rail pressure calibration points and cylinder 1	>	(a) - (b)	-	environmental temperature and	>	-7.04	°C	fail conditions exists for more than 0.01 s monitor runs with 0.01 s rate whenever enable conditions are met	В
			with (a) maximum injection energizing time	=	384.4	us	fuel temperature and	>=	0.06	°C	aro mot	
			and with (b) offset of the maximum filtered energizing time	=	12	us	fuel temperature)	<=	79.96	°C		
)				and					

Component / System	Fault Code	Monitor Strategy Description	Primary Malfunction Criteria	Threshold Logic and Value	Secondary Parameters		Enable Conditions		Time Required	MIL Illum.
Cycloni	Oodo	Decemption	for	Logic and value	engine temperature	>	49.96	°C	rtoquirou	mami
			rail pressure point	= 70000.00 kPa	and					
					battery voltage	>	10.00	V		
					and					
					combustion chamber is not cold off					
					means		F 4 - 00			
					time since last combustion (see Look- Up-Table #94)	>=	5 to 30	sec		
					and					
					intake manifold pressure	>	75.00	kPa		
					and intake manifold pressure	<	150.00	kPa		
					and		150.00	KFa		
					accelerator pedal position	<	0.05	%		
					and		F			
					Fuel system status and	=	Fuel cut off	-		
					(
					engine speed	>	(b) - (a)	-		
					and engine speed	<	(a) + (c)	_		
					with		(a) + (c)	-		
					(a) value of engine speed	=	30.00	rpm		
					and with		050			
					(b) gear specific minimum engine speed	=	950	rpm		
					and with					
					(c) gear specific maximum engine speed	=	1850	rpm		
					,					
					and					
					current gear (see Look-Up-Table #93)	=	0 to 1	-		
					and		0			
					vehicle speed and	>	U	mph		
					rail pressure deviation from setpoint	<	5000.00	kPa		
					calculated out of difference between					
					desired and actual value and					
					rail pressure is stable for at least	>	0.10	sec		
					and					
J					no gear change is occurred and	=	TRUE	-		
					4 wheel mode	=	FALSE	_		
					and					
					basic enable conditions met:	=	see sheet enable	-		
J					and		tables			
					NO Pending or Confirmed DTCs:	=	see sheet inhibit	-		
							tables			

Component / System	Fault Code	Monitor Strategy Description	Primary Malfunction Criteria		Threshold Logic and Value		Secondary Parameters		Enable Conditions		Time Required	MIL Illum.
Cylinder 1 Injection Timing Advanced	P01CC	Monitors the correction values for the energizing time of each cylinder. A correction value for the energizing time is learned for each cylinder at a calibrated rail pressure operating point. Detects a fault when the	corrected energizing time for the rail	<	(a) + (b)	_	environmental temperature	>	-7.04	°C	fail conditions exists for more than 0.01 s monitor runs with 0.01 s rate whenever	В
		corrected energizing time falls below the allowed limit.	pressure calibration points and cylinder 1				(enable conditions are met	
			with (a) minimum injection energizing time	=	107.2	us	fuel temperature and	>=	0.06	°C		
	and with (b) offset of the minimum filtered energizing time)	(b) offset of the minimum filtered	=	60	us	fuel temperature)	<=	79.96	°C			
)				and					
			for rail pressure point	=	70000.00	kPa	engine temperature and	>	49.96 10.00	°C		
						battery voltage and combustion chamber is not cold off means	>	10.00	V			
							time since last combustion (see Look- Up-Table #94) and	>=	5 to 30	sec		
							intake manifold pressure and	>	75.00	kPa		
							intake manifold pressure and	<	150.00	kPa		
							accelerator pedal position and	<	0.05	%		
							Fuel system status and (=	Fuel cut off	-		
							engine speed and	>	(b) - (a)	-		
							engine speed with	<	(a) + (c)	-		
						(a) value of engine speed and with	=	30.00	rpm			
						(b) gear specific minimum engine speed	=	950	rpm			
						and with (c) gear specific maximum engine speed)	=	1850	rpm			
							and current gear (see Look-Up-Table #93) and	=	0 to 1	-		
							vehicle speed	>	0	mph		

Component / System	Fault Code	Monitor Strategy Description	Primary Malfunction Criteria		Threshold Logic and Value	•	Secondary Parameters		Enable Conditions		Time Required	MIL Illum.
System	Code	Description	Criteria		Logic and valu	<u>e</u>	and rail pressure deviation from setpoint calculated out of difference between desired and actual value	<	5000.00	kPa	Requirea	illum.
							and rail pressure is stable for at least and	>	0.10	sec		
							no gear change is occurred and	=	TRUE	-		
							4 wheel mode and basic enable conditions met:	=	FALSE see sheet enable tables	-		
							and NO Pending or Confirmed DTCs:	=	see sheet inhibit tables	-		
					_	-			_	-		
Cylinder 2 Injection Timing Advanced	P01CE	Monitors the correction values for the energizing time of each cylinder. A correction value for the energizing time is learned for each cylinder at a calibrated rail pressure operating point. Detects a fault when the corrected energizing time falls below the allowed limit.	corrected energizing time for the rail pressure calibration points and cylinder 1	<	(a) + (b)	-	environmental temperature and	>	-7.04	°C	fail conditions exists for more than 0.01 s monitor runs with 0.01 s rate whenever enable conditions are met	В
			with (a) minimum injection energizing time	=	107.2	us	fuel temperature and	>=	0.06	°C		
			and with (b) offset of the minimum filtered energizing time	=	60	us	fuel temperature)	<=	79.96	°C		
)) for				and engine temperature	>	49.96	°C		
			rail pressure point	=	70000.00	kPa	and battery voltage	>	10.00	V		
							and combustion chamber is not cold off means time since last combustion (see Look- Up-Table #94)	>=	5 to 30	sec		
							and intake manifold pressure and	>	75.00	kPa		
							intake manifold pressure and	<	150.00	kPa		
							accelerator pedal position and	<	0.05	%		

Component / System	Fault Code	Monitor Strategy Description	Primary Malfunction Criteria	Lo	Threshold ogic and Value		Secondary Parameters		Enable Conditions		Time Required	MIL Illum.
- Cystom	-5500	2000			g. 2 a a . a . a . a		Fuel system status and	=	Fuel cut off	-	Joquilou	
							(engine speed and	>	(b) - (a)	-		
							engine speed with	<	(a) + (c)	-		
							(a) value of engine speed and with	=	30.00	rpm		
							(b) gear specific minimum engine speed and with	=	950	rpm		
							(c) gear specific maximum engine speed	=	1850	rpm		
) and current gear (see Look-Up-Table #93)	=	0 to 1	-		
							and vehicle speed and	>	0	mph		
							rail pressure deviation from setpoint calculated out of difference between desired and actual value	<	5000.00	kPa		
							and rail pressure is stable for at least and	>	0.10	sec		
							no gear change is occurred and	=	TRUE	-		
							4 wheel mode and	=	FALSE	-		
							basic enable conditions met:	=	see sheet enable tables	-		
							and NO Pending or Confirmed DTCs:	=	see sheet inhibit tables	-		
					_				_			_
Cylinder 7 Injection Timing Advanced	P01D8	Monitors the correction values for the energizing time of each cylinder. A correction value for the energizing time is learned for each cylinder at a calibrated rail pressure					environmental temperature	>	-7.04	°C	fail conditions exists for more than 0.01 s monitor runs with 0.01 s	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 1	<	(a) + (b)	-	and				rate whenever enable conditions are met	
			with (a) minimum injection energizing time	=	107.2	us	fuel temperature and	>=	0.06	°C		
			and with				fuel temperature	<=	79.96	°C		

Component /	Fault	Monitor Strategy	Primary Malfunction		Threshold		Secondary		Enable		Time	MIL
System	Code	Description	Criteria		Logic and Value		Parameters		Conditions		Required	Illum.
			(b) offset of the minimum filtered	=	60	us)					
			energizing time				and					
)				and					
			for				engine temperature	>	49.96	°C		
			rail pressure point	=	70000.00	kPa	and		40.00	.,		
							battery voltage	>	10.00	V		
							and					
							combustion chamber is not cold off					
							means time since last combustion (see Look-	>=	5 to 30	sec		
							Up-Table #94)	/=	5 10 50	Sec		
							and					
							intake manifold pressure	>	75.00	kPa		
							and intake manifold pressure	<	150.00	kPa		
							and	`	130.00	IXI G		
							accelerator pedal position	<	0.05	%		
							and		Fuel out off			
							Fuel system status and	=	Fuel cut off	-		
							(
							engine speed	>	(b) - (a)	-		
							and engine speed	<	(a) + (c)	_		
							with	`	(a) 1 (c)			
							(a) value of engine speed	=	30.00	rpm		
							and with		050	rn m		
							(b) gear specific minimum engine speed	=	950	rpm		
							and with					
							(c) gear specific maximum engine speed	=	1850	rpm		
							,					
							and					
							current gear (see Look-Up-Table #93)	=	0 to 1	-		
							and		0			
							vehicle speed and	>	Ü	mph		
							rail pressure deviation from setpoint	<	5000.00	kPa		
							calculated out of difference between					
							desired and actual value and					
							rail pressure is stable for at least	>	0.10	sec		
							and					
							no gear change is occurred	=	TRUE	-		
							and 4 wheel mode	_	FALSE	_		
							and					
							basic enable conditions met:	=	see sheet enable	-		
							and		tables			
							and NO Pending or Confirmed DTCs:	=	see sheet inhibit	_		
							1		tables			

Component / System	Fault Code	Monitor Strategy Description	Primary Malfunction Criteria		Threshold Logic and Value)	Secondary Parameters		Enable Conditions		Time Required	MIL Illum.
Cylinder 8	P01DA	Monitors the correction	(environmental temperature	>	-7.04	°C	fail	В
jection Timing dvanced		values for the energizing time of each cylinder. A correction value for the energizing time is learned for each cylinder at a calibrated rail pressure operating point. Detects a fault when the corrected energizing time falls below the allowed limit.	corrected energizing time for the rail pressure calibration points and cylinder 1	<	(a) + (b)	-	and				conditions exists for more than 0.01 s monitor runs with 0.01 s rate whenever enable conditions are met	
			(with	=	107.2	us	(fuel temperature and	>=	0.06	°C		
	(a) minimum injection energizing time and with (b) offset of the minimum filtered energizing time)) for rail pressure point	=	60	us	fuel temperature)	<=	79.96	°C				
					and	1	40.00					
		=	70000.00	kPa	engine temperature and battery voltage	>	49.96 10.00	°C				
						and combustion chamber is not cold off means time since last combustion (see Look- Up-Table #94)	>=	5 to 30	sec			
							and intake manifold pressure	>	75.00	kPa		
							and intake manifold pressure and	<	150.00	kPa		
							accelerator pedal position and	<	0.05	%		
							Fuel system status and	=	Fuel cut off	-		
						(engine speed and	>	(b) - (a)	-			
					engine speed with	<	(a) + (c)	-				
					(a) value of engine speed and with	=	30.00	rpm				
					(b) gear specific minimum engine speed and with (c) gear specific maximum engine speed	=	950 1850	rpm				
) and						

Component / System	Fault Code	Monitor Strategy Description	Primary Malfunction Criteria	Lo	Threshold ogic and Valu	e	Secondary Parameters		Enable Conditions		Time Required	MIL Illum.
- ,	2340				J. J. J. J. W. T. WILL		current gear (see Look-Up-Table #93)	=	0 to 1	-		
							and vehicle speed	>	0	mph		
							and rail pressure deviation from setpoint calculated out of difference between desired and actual value	<	5000.00	kPa		
							and rail pressure is stable for at least and	>	0.10	sec		
							no gear change is occurred and	=	TRUE	-		
							4 wheel mode and	=	FALSE	-		
							basic enable conditions met:	=	see sheet enable tables	-		
							and NO Pending or Confirmed DTCs:	=	see sheet inhibit tables	-		
Cylinder 4 Injection Timing Advanced	P01D2	Monitors the correction values for the energizing time of each cylinder. A correction value for the energizing time is learned for each cylinder at a calibrated rail pressure operating point. Detects a fault when the corrected energizing time falls below the allowed limit.	corrected energizing time for the rail pressure calibration points and cylinder 1	<	(a) + (b)	-	environmental temperature and	>	-7.04	°C	fail conditions exists for more than 0.01 s monitor runs with 0.01 s rate whenever enable conditions are met	В
			with (a) minimum injection energizing time	=	107.2	us	fuel temperature and	>=	0.06	°C		
			and with (b) offset of the minimum filtered	=	60	us	fuel temperature)	<=	79.96	°C		
			energizing time)				and					
			for rail pressure point	=	70000.00	kPa	engine temperature and	>	49.96	°C		
							battery voltage	>	10.00	V		
							and combustion chamber is not cold off means time since last combustion (see Look- Up-Table #94)	>=	5 to 30	sec		
							and intake manifold pressure	>	75.00	kPa		
							and intake manifold pressure	<	150.00	kPa		

Fault	Monitor Strategy	Primary Malfunction	Threshold	Secondary		Enable		Time	MIL
Code	Description	Criteria	Logic and Value			Conditions		Required	Illum.
				accelerator pedal position	<	0.05	%		
				Fuel system status and	=	Fuel cut off	-		
				(engine speed and	>	(b) - (a)	-		
				engine speed with	<	(a) + (c)	-		
				(a) value of engine speed and with	=	30.00	rpm		
					=	950	rpm		
				and with (c) gear specific maximum engine speed	=	1850	rpm		
) and current gear (see Look-Up-Table #93)	=	0 to 1	-		
				vehicle speed	>	0	mph		
				rail pressure deviation from setpoint calculated out of difference between desired and actual value	<	5000.00	kPa		
				rail pressure is stable for at least	>	0.10	sec		
				no gear change is occurred	=	TRUE	-		
				4 wheel mode	=	FALSE	-		
				basic enable conditions met:	=	see sheet enable tables	-		
				and NO Pending or Confirmed DTCs:	=	see sheet inhibit tables	-		
Do.(D.)						7.04			
P01D4	Monitors the correction values for the energizing time of each cylinder. A correction value for the energizing time is learned for each cylinder at a calibrated rail pressure operating point. Detects a fault when the corrected energizing time falls below the allowed limit.	corrected energizing time for the rail pressure calibration points and cylinder 1	< (a) + (b) -	environmental temperature and	^	-7.04	°C	fail conditions exists for more than 0.01 s monitor runs with 0.01 s rate whenever enable conditions are met	В
	P01D4	P01D4 Monitors the correction values for the energizing time of each cylinder. A correction value for the energizing time is learned for each cylinder at a calibrated rail pressure operating point. Detects a fault when the corrected energizing time falls below the allowed limit.	P01D4 Monitors the correction values for the energizing time of each cylinder. A correction value for the energizing time of each cylinder at a calibrated rail pressure operating point. Detects a fault when the corrected energizing time or corrected energizing time for the rail pressure calibration points and cylinder 1	P01D4 Monitors the correction values for the energizing time of each cylinder. A correction value for the energizing time of each cylinder at a calibrated rail pressure operating point. Detects a fault when the corrected energizing time if alls below the allowed limit. P01D4	Code Description Criteria Logic and Value Parameters and and Every leave the system status and (engine speed and with (b) gear specific maximum engine speed and vehicle speed and vehicle speed and rull pressure deviation from setpoint calculated out of difference between desired and actual value and and vehicle speed and	Code Description Criteria Logic and Value Parameters and accelerator podal position and Fuel system status = (engine speed and value of engine speed and val	Code Description Criteria Logic and Value Parameters Conditions and accelerator pedal position and Puls system status and accelerator pedal position and Puls system status and accelerator pedal position and Puls system status and accelerator pedal position and Puls system status and accelerator pedal position and accelerator pedal position and accelerator pedal position and and accelerator pedal position and accelerator and and accelerator and and accelerator and accelerator and and accelerator and accelerator and accelerator and accelerator and accelerator and accelerator and accelerator and accelerator and accelerator and accelerator and accelerator and accelerator and accelerator and accelerator and accelerator and accelerator and accelerator and accelerat	Code Description Criteria Logic and Value Parameters Conditions and accelerator pedal position and Foul system sature pedal position and Foul system sature pedal position and Foul system sature pedal position and per pedal position and per pedal	Code Description Criteria Logic and Value end accelerator podal position Conditions Required

Component /	Fault	Monitor Strategy	Primary Malfunction		Threshold		Secondary		Enable		Time	MIL
System	Code	Description	Criteria		Logic and Value		Parameters		Conditions		Required	Illum.
			(a) minimum injection energizing time and with (b) offset of the minimum filtered	=	107.2 60	us	and fuel temperature)	<=	79.96	°C		
			energizing time				and					
			for rail pressure point	=	70000.00	kPa	engine temperature and	>	49.96	°C		
							battery voltage	>	10.00	V		
							and combustion chamber is not cold off means time since last combustion (see Look- Up-Table #94) and	>=	5 to 30	sec		
							intake manifold pressure and	>	75.00	kPa		
							intake manifold pressure and accelerator pedal position	<	150.00 0.05	kPa %		
							and Fuel system status and	=	Fuel cut off	-		
							(engine speed and	>	(b) - (a)	-		
							engine speed with	<	(a) + (c)	-		
							(a) value of engine speed and with	=	30.00	rpm		
							(b) gear specific minimum engine speed	=	950	rpm		
							and with (c) gear specific maximum engine speed	=	1850	rpm		
) and current gear (see Look-Up-Table #93)	=	0 to 1	-		
							and vehicle speed	>	0	mph		
							and rail pressure deviation from setpoint calculated out of difference between desired and actual value	<	5000.00	kPa		
							and rail pressure is stable for at least and	>	0.10	sec		
							no gear change is occurred and	=	TRUE	-		
							4 wheel mode and	=	FALSE	-		
							basic enable conditions met: and	=	see sheet enable tables	-		

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	-		
	Double								7.01			
Cylinder 6 Injection Timing Advanced	P01D6	Monitors the correction values for the energizing time of each cylinder. A correction value for the energizing time is learned for each cylinder at a calibrated rail pressure operating point. Detects a fault when the corrected energizing time falls below the allowed limit.	corrected energizing time for the rail pressure calibration points and cylinder 1	<	(a) + (b)	-	environmental temperature and	^	-7.04	°C	fail conditions exists for more than 0.01 s monitor runs with 0.01 s rate whenever enable conditions are met	В
			(with (a) minimum injection energizing time	=	107.2	us	(fuel temperature and	>=	0.06	°C		
			and with (b) offset of the minimum filtered	=	60	us	fuel temperature)	<=	79.96	°C		
			energizing time)				and					
			for rail pressure point	_	70000.00	kPa	engine temperature and	>	49.96	°C		
			Tall prossure point	_	70000.00	Nια	battery voltage	>	10.00	V		
							and combustion chamber is not cold off means time since last combustion (see Look- Up-Table #94)	>=	5 to 30	sec		
							and intake manifold pressure and	>	75.00	kPa		
							intake manifold pressure and	<	150.00	kPa		
							accelerator pedal position and	<	0.05	%		
							Fuel system status and	=	Fuel cut off	-		
							(engine speed and	>	(b) - (a)	-		
							engine speed with	<	(a) + (c)	-		
							(a) value of engine speed and with	=	30.00	rpm		
							(b) gear specific minimum engine speed	=	950	rpm		
							and with (c) gear specific maximum engine speed	=	1850	rpm		

Component / System	Fault Code	Monitor Strategy Description	Primary Malfunction Criteria		Threshold Logic and Value	e	Secondary Parameters		Enable Conditions		Time Required	MIL Illum.
							and current gear (see Look-Up-Table #93) and vehicle speed and rail pressure deviation from setpoint calculated out of difference between desired and actual value and rail pressure is stable for at least and no gear change is occurred and 4 wheel mode and basic enable conditions met: and NO Pending or Confirmed DTCs:	= > < > = = =	0 to 1 0 5000.00 0.10 TRUE FALSE see sheet enable tables see sheet inhibit tables	mph kPa sec		
Cylinder 3 Injection Timing Advanced	P01D0	Monitors the correction values for the energizing time of each cylinder. A correction value for the energizing time is learned for each cylinder at a calibrated rail pressure operating point. Detects a fault when the corrected energizing time falls below the allowed limit.	corrected energizing time for the rail pressure calibration points and cylinder 1 (with (a) minimum injection energizing time and with	<	(a) + (b)	- us	environmental temperature and (fuel temperature and fuel temperature	>= <=	-7.04 0.06 79.96	°C °C	fail conditions exists for more than 0.01 s monitor runs with 0.01 s rate whenever enable conditions are met	В
			(b) offset of the minimum filtered energizing time)) for rail pressure point	=	70000.00	us kPa	and engine temperature and battery voltage and combustion chamber is not cold off means time since last combustion (see Look- Up-Table #94) and intake manifold pressure	> >	49.96 10.00 5 to 30 75.00	°C V sec kPa		

Component /	Fault	Monitor Strategy	Primary Malfunction		Threshold		Secondary		Enable		Time	MIL
System	Code	Description	Criteria	Le	ogic and Valu	ie	Parameters		Conditions		Required	Illum.
					- g		and					
							intake manifold pressure and	<	150.00	kPa		
							accelerator pedal position and	<	0.05	%		
							Fuel system status and	=	Fuel cut off	-		
							(engine speed and	>	(b) - (a)	-		
							engine speed with	<	(a) + (c)	-		
							(a) value of engine speed and with	=	30.00	rpm		
							(b) gear specific minimum engine speed	=	950	rpm		
							and with (c) gear specific maximum engine speed	=	1850	rpm		
							and		0.45.4			
							current gear (see Look-Up-Table #93) and	=	0 to 1	-		
							vehicle speed and	>	0	mph		
							rail pressure deviation from setpoint calculated out of difference between desired and actual value	<	5000.00	kPa		
							and rail pressure is stable for at least and	>	0.10	sec		
							no gear change is occurred and	=	TRUE	-		
							4 wheel mode and	=	FALSE	-		
							basic enable conditions met:	=	see sheet enable tables	-		
							and NO Pending or Confirmed DTCs:	=	see sheet inhibit tables	-		
									tables			
Coolant Temperature Dropped Below Diagnostic Monitoring Temperature	P01F0	Detects a stuck open thermostat by monitoring for a decrease of the engine coolant temperature below the OBD monitoring threshold during normal	engine coolant temperature	<	70.96	°C	engine pre drive	=	FALSE	-	fail conditions exists for 0.2 s monitor runs with 0.2 s	В
		operating conditions	for fault counter	>=	400.00	_	and				rate whenever enable	
			which is equivalent to fault time	>=	80.00	sec	ambient temperature and	>=	-7.04	°C	conditions are met	
							engine coolant temperature	>=	70.96	°C		

Component / System	Fault Code	Monitor Strategy Description	Primary Malfunction Criteria	Threshold Logic and Value	Secondary Parameters	Enable Conditions		Time Required	MIL Illum.
					at least once in driving cycle and instantaneous fuel consumption (low-pass filtered) and basic enable conditions met: and NO Pending or Confirmed DTCs:	>= 9.00 = see sheet enable tables = see sheet inhibit tables	l/h - -		
Injector 1 Control Circuit	P0201	Diagnoses the Fuel Injector Cylinder #1 low side driver circuit for circuit faults.	Voltage low during driver off state (indicates open circuit)	= Open Circuit:≥ - 200 K Ω impedance between ECU pin and load	Engine Running (see parameter definition)	= TRUE	-	fail conditions exists for more than 0.04 s monitor runs with 0.01 s rate whenever enable conditions are met	A
Injector 2 Control Circuit	P0202	Diagnoses the Fuel Injector Cylinder #2 low side driver circuit for circuit faults.	Voltage low during driver off state (indicates open circuit)	= Open Circuit:≥ - 200 K Ω impedance between ECU pin and load	Engine Running (see parameter definition)	= TRUE		fail conditions exists for more than 0.04 s monitor runs with 0.01 s rate whenever enable conditions are met	А
Injector 3 Control Circuit	P0203	Diagnoses the Fuel Injector Cylinder #3 low side driver circuit for circuit faults.	Voltage low during driver off state (indicates open circuit)	= Open Circuit:≥ - 200 K Ω impedance between ECU pin and load	Engine Running (see parameter definition)	= TRUE	-	fail conditions exists for more than 0.04 s monitor runs	A

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

Component / System	Fault Code	Monitor Strategy Description	Primary Malfunction Criteria	Threshold Logic and Value	Secondary Parameters	Enable Conditions	Time Required enable	MIL Illum.
							conditions are met	
Injector 7 Control Circuit	P0207	Diagnoses the Fuel Injector Cylinder #7 low side driver circuit for circuit faults.	Voltage low during driver off state (indicates open circuit)	= Open Circuit:≥ - 200 K Ω impedance between ECU pin and load	Engine Running (see parameter definition)	= TRUE -	fail conditions exists for more than 0.04 s monitor runs with 0.01 s rate whenever enable conditions are met	А
Injector 8 Control Circuit	P0208	Diagnoses the Fuel Injector Cylinder #8 low side driver circuit for circuit faults.	Voltage low during driver off state (indicates open circuit)	= Open Circuit:≥ - 200 K Ω impedance between ECU pin and load	Engine Running (see parameter definition)	= TRUE -	fail conditions exists for more than 0.04 s monitor runs with 0.01 s rate whenever enable conditions are met	А
Turbocharger Overboost	P0234	Detects an permanent negative control deviation of the boost pressure	control deviation of the boost pressure calculated out of difference between desired and actual value	< a*b*c kPa			fail conditions exists for 10 s monitor runs with 0.02 s rate whenever enable conditions are met	В

Component /	Fault	Monitor Strategy	Primary Malfunction		Threshold		Secondary		Enable		Time	MIL
System	Code	Description	Criteria		Logic and Value	е	Parameters		Conditions		Required	Illum.
			with (a) control deviation threshold (see Look-Up-Table #62)	=	-40 to -12.5	kPa	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	-		
			(b) environmental pressure correction factor (see Look-Up-Table #60)	=	0.65 to 1	factor	and					
			(c) correction factor	=	1.00	factor	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 injection quantity is stable means	=	TRUE	-		
							increase of injection quantity	<	6.00	(mm^3/ stroke)/		
							and			S		
							engine speed is stable means	=	TRUE	-		
							increase of engine speed	<	25.00	rpm/s		
							injection Quantity	>=	112.00	mm^3/r ev		
							injection Quantity	<=	1310.68	mm^3/r ev		
							and		4000.00			
							engine Speed engine Speed and	>= <=	1600.00 3000.00	rpm rpm		
							working range of boost pressure is in closed-loop means	=	TRUE	-		
							engine speed and	>	550.00	rpm		
							injection quantity	>	80.00	mm^3/r ev		
							NO Pending or Confirmed DTCs:	=	see sheet inhibit tables	-		
							for time and	>	1.00	sec		

Component / System	Fault Code	Monitor Strategy Description	Primary Malfunction Criteria	L	Threshold ogic and Val	ue	Secondary Parameters		Enable Conditions		Time Required	MIL Illum.
							basic enable conditions met:	=	see sheet enable tables	-		
Cylinder 1 Balance System	P0263	Detects if the injector is leaking by Looking at 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 30 s monitor runs with 0.01 s	В
		(1.20)	or fuel balance correction quantity	>	(c) * (b)	-	and current injection quantity	>	52.00	mm^3/r ev	rate whenever enable	
			with (a) lower limitation (see Look-Up-	=	-68 to 0	mm^3/re	current injection quantity engine coolant temperature	< >=	380.00 39.96	mm^3/r ev °C	conditions are met	
			Table #38) and with (b) factor for correction quantity and with (c) upper limitation (see Look-Up- Table #39)	=	0.95 0 to 68	v factor mm^3/re v	ambient pressure engine speed engine speed vehicle speed and basic enable conditions met: and NO Pending or Confirmed DTCs:	>= > < <= = =	0.00 590.00 3000.00 186.45 see sheet enable tables see sheet inhibit tables	kPa rpm rpm mph		
Cylinder 2 Balance System	P0266	Detects if the injector is leaking by Looking at 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 30 s monitor runs with 0.01 s	В
			or fuel balance correction quantity with	>	(c) * (b)	-	and current injection quantity current injection quantity	>	52.00 380.00	mm^3/r ev mm^3/r	rate whenever enable	
			(a) lower limitation (see Look-Up- Table #38)	=	-68 to 0	mm^3/re	engine coolant temperature	>=	39.96	ev °C	conditions are met	
			and with (b) factor for correction quantity and with (c) upper limitation (see Look-Up- Table #39)	=	0.95 0 to 68	factor mm^3/re v	ambient pressure engine speed engine speed vehicle speed and basic enable conditions met:	>= > < <=	0.00 590.00 3000.00 186.45	kPa rpm rpm mph		
							and		tables			

Component / System	Fault Code	Monitor Strategy Description	Primary Malfunction Criteria	L	Threshold ogic and Value	ıe	Secondary Parameters		Enable Conditions		Time Required	MIL Illum.
							NO Pending or Confirmed DTCs:	=	see sheet inhibit tables	-		
Cylinder 3 Balance System	P0269	Detects if the injector is leaking by Looking at 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 30 s monitor runs with 0.01 s	В
			or fuel balance correction quantity with	>	(c) * (b)	-	current injection quantity	> <	52.00 380.00	mm^3/r ev mm^3/r	rate whenever enable conditions	
			(a) lower limitation (see Look-Up- Table #38)	=	-68 to 0	mm^3/re v	engine coolant temperature ambient pressure	>=	39.96 0.00	ev °C kPa	are met	
			and with (b) factor for correction quantity and with (c) upper limitation (see Look-Up-	=	0.95 0 to 68	factor mm^3/re	engine speed engine speed vehicle speed	>= > < <=	590.00 3000.00 186.45	rpm rpm mph		
			Table #39)			V	basic enable conditions met:	=	see sheet enable tables	-		
							NO Pending or Confirmed DTCs:	=	see sheet inhibit tables	-		
Cylinder 4 Balance System	P0272	Detects if the injector is leaking by Looking at 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 30 s monitor runs with 0.01 s	В
			fuel balance correction quantity	>	(c) * (b)	-	and current injection quantity	>	52.00	mm^3/r ev	rate whenever enable	
			with (a) lower limitation (see Look-Up- Table #38)	=	-68 to 0	mm^3/re	current injection quantity engine coolant temperature	>=	380.00 39.96	ev °C	conditions are met	
			and with (b) factor for correction quantity and with (c) upper limitation (see Look-Up-	=	0.95 0 to 68	factor mm^3/re	ambient pressure engine speed engine speed vehicle speed and	>= > < <=	0.00 590.00 3000.00 186.45	kPa rpm rpm mph		
			Table #39)			V	basic enable conditions met:	=	see sheet enable tables	-		

Component / System	Fault Code	Monitor Strategy Description	Primary Malfunction Criteria	L	Threshold ogic and Value	ie	Secondary Parameters		Enable Conditions		Time Required	MIL Illum.
		·					NO Pending or Confirmed DTCs:	=	see sheet inhibit tables	-		
Cylinder 5 Balance System	P0275	Detects if the injector is leaking by Looking at 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 30 s monitor runs with 0.01 s rate	В
			fuel balance correction quantity with	>	(c) * (b)	-	current injection quantity	>	52.00 380.00	mm^3/r ev mm^3/r	whenever enable conditions	
			(a) lower limitation (see Look-Up- Table #38)	=	-68 to 0	mm^3/re v	engine coolant temperature ambient pressure	>=	39.96	ev °C kPa	are met	
			and with (b) factor for correction quantity and with (c) upper limitation (see Look-Up-	=	0.95 0 to 68	factor mm^3/re	engine speed engine speed vehicle speed	> < <=	590.00 3000.00 186.45	rpm rpm mph		
			Table #39)			V	basic enable conditions met:	=	see sheet enable tables	-		
							NO Pending or Confirmed DTCs:	=	see sheet inhibit tables	-		
Cylinder 6 Balance System	P0278	Detects if the injector is leaking by Looking at 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 30 s monitor runs with 0.01 s	В
			or fuel balance correction quantity with	>	(c) * (b)	-	and current injection quantity	>	52.00 380.00	mm^3/r ev mm^3/r	rate whenever enable	
			(a) lower limitation (see Look-Up- Table #38)	=	-68 to 0	mm^3/re	current injection quantity engine coolant temperature	>=	39.96	ev °C	conditions are met	
			and with (b) factor for correction quantity and with	=	0.95	factor	ambient pressure engine speed engine speed vehicle speed	>= > < <=	0.00 590.00 3000.00 186.45	kPa rpm rpm mph		
			and with (c) upper limitation (see Look-Up- Table #39)	=	0 to 68	mm^3/re v		=	see sheet enable	mpn -		
							and		tables			

Component / System	Fault Code	Monitor Strategy Description	Primary Malfunction Criteria	L	Threshold ogic and Valu	ue	Secondary Parameters		Enable Conditions		Time Required	MIL Illum.
							NO Pending or Confirmed DTCs:	=	see sheet inhibit tables	-		
Cylinder 7 Balance System	P0281	Detects if the injector is leaking by Looking at 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 30 s monitor runs with 0.01 s	В
			or fuel balance correction quantity	>	(c) * (b)	-	and current injection quantity	>	52.00	mm^3/r ev	rate whenever enable	
			with (a) lower limitation (see Look-Up-	=	-68 to 0	mm^3/re	current injection quantity engine coolant temperature	< >=	380.00 39.96	mm^3/r ev °C	conditions are met	
			Table #38) and with (b) factor for correction quantity and with (c) upper limitation (see Look-Up- Table #39)	= =	0.95 0 to 68	v factor mm^3/re v	ambient pressure engine speed engine speed vehicle speed and basic enable conditions met: and NO Pending or Confirmed DTCs:	>= > < <= = =	0.00 590.00 3000.00 186.45 see sheet enable tables see sheet inhibit tables	kPa rpm rpm mph		
Cylinder 8 Balance System	P0284	Detects if the injector is leaking by Looking at 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 30 s monitor runs with 0.01 s	В
			or fuel balance correction quantity with	>	(c) * (b)	-	and current injection quantity current injection quantity	>	52.00 380.00	mm^3/r ev mm^3/r	rate whenever enable	
			(a) lower limitation (see Look-Up- Table #38)	=	-68 to 0	mm^3/re	engine coolant temperature	>=	39.96	ev °C	conditions are met	
			and with (b) factor for correction quantity and with (c) upper limitation (see Look-Up- Table #39)	=	0.95 0 to 68	factor mm^3/re v	ambient pressure engine speed engine speed vehicle speed and basic enable conditions met:	>= > <= =	0.00 590.00 3000.00 186.45	kPa rpm rpm mph		
							and		tables			

Component /	Fault	Monitor Strategy	Primary Malfunction	Threshold	Secondary		Enable		Time	MIL
System	Code	Description	Criteria	Logic and Value	Parameters NO Pending or Confirmed DTCs:	=	conditions see sheet inhibit tables	-	Required	Illum.
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	filtered charge-air cooler efficiency	< 0.25 -	vehicle speed	>=	37.29	mph	fail conditions exists for 60 s monitor runs once per	В
		and ambient temperature			and air mass flow air mass flow and engine temperature engine temperature and (maximum value of (a) and (b))	>= <= >= <= >=	83.33 152.77 69.96 122.96 -4.00	g/s g/s °C °C	driving cycle with 100 ms rate whenever enable conditions are met	
					the maximum value is then divided by (b) with (a) boost pressure downstream compressor and with (b) ambient pressure	=	measured parameter measured	-		
					and control value of the throttle valve and	<=	5.00	%		
					(a) - (b) with (a) temperature after compressor	>=	40.00 measured parameter	°C -		
					and with (b) ambient air temperature and	=	measured parameter	-		
					injection quantity injection quantity	>=	80.00 200.00	mm^3/r ev mm^3/r		
					and ambient pressure and	>	74.80	ev kPa		
					ambient temperature and basic enable conditions met:	> =	-7.04 see sheet enable	°C -		
					and NO Pending or Confirmed DTCs:	=	tables see sheet inhibit tables	-		

Component /	Fault	Monitor Strategy	Primary Malfunction		Threshold		Secondary		Enable		Time	MIL
System	Code	Description	Criteria		Logic and Value	ıe	Parameters		Conditions		Required	Illum.
0,000			5.115.11 <u>.</u>									
Injection Quantity Too Low	P026C	Monitors the fuel mass observer correction quantity. Detects if the correction quantity exceeds the emissions limit.	Unlimited fuel mass observer correction quantity - emission control correction quantity (see Look-Up-Table #45)	<=	-34.8 to -20	mm^3/re V	((Status of the Observer function's lambda-signal	=	TRUE	-	fail conditions exists for 12 s monitor runs with 0.02 s	В
							means (lambda signal from NOx sensor ready (see parameter definition)	=	TRUE	-	rate whenever enable conditions	
							fuel system is in fuel cut off (see parameter definition)	=	FALSE	-	are met	
							Particulate Filter Regeneration Mode	=	FALSE	-		
							((component of combusted fuel in the engine or	>=	1	-		
							calculated EGR rate	>=	0	-		
							for time)) AND	>	1.00	sec		
							Controller status of the observer means	=	TRUE	-		
							Load dependent release state (see look up table #) (see Look-Up- Table #48) AND	=	0 to 1	-		
							Component Protection release state (see look up table #) (see Look-Up-Table #43)	>	0 to 1	-		
							ongine coolant temperature engine coolant temperature Normal Injection Mode Barometric pressure Ambient temperature Vehicle speed NO Pending or Confirmed DTCs: AND	<=	199.96 64.96 TRUE 74.80 -7.04 1.86 see sheet inhibit tables	°C °C - kPa °C mph -		
							(Engine speed AND	<=	1040	rpm		
							Engine speed	>=	476	rpm		
							AND NO Pending or Confirmed DTCs:	=	see sheet inhibit tables	-		
							for time	>	72.00	sec		

Component / System	Fault Code	Monitor Strategy Description	Primary Malfunction Criteria		Threshold Logic and Value	ie	Secondary Parameters		Enable Conditions		Time Required	MIL Illum.
							basic enable conditions met:	=	see sheet enable tables	-		
Injection Quantity Too High	P026D	Monitors the fuel mass observer correction quantity. Detects if the correction quantity exceeds the emissions limit.	Unlimited fuel mass observer correction quantity - emission control correction quantity (see Look-Up-Table #44)	>=	16 to 34.8	mm^3/re v	((Status of the Observer function's lambda-signal	=	TRUE		fail conditions exists for 12 s monitor runs	В
							means (lambda signal from NOx sensor ready (see parameter definition)	=	TRUE FALSE	-	with 0.02 s rate whenever enable conditions	
							fuel system is in fuel cut off (see parameter definition) Particulate Filter Regeneration Mode	=	FALSE	-	are met	
							((component of combusted fuel in the engine	>=	1	-		
							or calculated EGR rate	>=	0	-		
							for time)) AND	>	1.00	sec		
							Controller status of the observer means	=	TRUE	-		
							(Load dependent release state (see look up table #) (see Look-Up- Table #48) AND	=	0 to 1	-		
							Component Protection release state (see look up table #) (see Look-Up-Table #43)	>	0 to 1	-		
							engine coolant temperature engine coolant temperature	<= >=	199.96 64.96	°C		
							Normal Injection Mode	=	TRUE	-		
							Barometric pressure	>=	74.80	kPa		
							Ambient temperature	>=	-7.04	°C		
							Vehicle speed NO Pending or Confirmed DTCs:	=	1.86 see sheet inhibit tables	mph -		
							AND (
							Engine speed AND	<=	1040	rpm		
							Engine speed)	>=	476	rpm		
							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	-		
) for time	>	72.00	sec		
					basic enable conditions met:	=	see sheet enable tables	-		
Turbocharger Underboost	P0299	Detects an permanent positive control deviation of the boost pressure	control deviation of the boost pressure calculated out of difference between desired and actual value (see Look-Up-Table #61)	> 15 to 40 kPa	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 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 and injection quantity is stable means increase of injection quantity and engine speed is stable	= = <	FALSE TRUE 24.00 TRUE	- (mm^3/r ev)/sec	fail conditions exists for 10 s monitor runs with 0.02 s rate whenever enable conditions are met	В
					means increase of engine speed and	<	25.00	rpm/sec		
					injection Quantity	>=	112.00	mm^3/r ev		
					injection Quantity	<=	1310.68	mm^3/r ev		
					and engine Speed engine Speed and working range of boost pressure is in closed-loop	>= <= =	1600.00 3000.00 TRUE	rpm rpm		

Component /	Fault	Monitor Strategy	Primary Malfunction		Threshold		Secondary		Enable		Time	MIL
System	Code	Description	Criteria		Logic and Value		Parameters means		Conditions		Required	Illum.
							(engine speed and injection quantity	>	550.00 80.00	rpm mm^3/r		
) NO Pending or Confirmed DTCs:	=	see sheet inhibit tables	ev -		
							for time	>	1.00	sec		
							basic enable conditions met:	=	see sheet enable tables	-		
Cylinder 1 Injection Timing Reached Feedback Limit	P02CD	Monitors the correction values for the energizing time of each cylinder. A correction value for the energizing time is learned for each cylinder at three different rail pressure operating point. Detects a fault when the corrected energizing time exceeds the feedback control limit.	corrected energizing time for the rail pressure calibration points and cylinder 1	>	(a) - (b)		environmental temperature and	>	-7.04	°C	fail conditions exists for more than 0.5 s monitor runs with 0.01 s rate whenever enable conditions are met	В
			with (a) maximum injection energizing time (see Look-Up-Table #20)	=	353.2 to 670.8	us	fuel temperature and	>=	0.06	°C		
			and with (b) offset of the maximum filtered energizing time (see Look-Up-Table #21)	=	10 to 16	us	fuel temperature)	<=	79.96	°C		
)				and					
			OR (engine temperature and	>	49.96	°C		
			corrected energizing time for the rail pressure calibration points and cylinder 1	<	(a) + (b)	-	battery voltage	>	10.00	V		
			(with (a) minimum injection energizing time and with (b) offset of the minimum filtered energizing time (see Look-Up-Table #22)	=	107.2 10 to 16	us us	and combustion chamber is not cooled off means time since last combustion (see Look- Up-Table #94)	>=	5 to 30	sec		
)) for				and intake manifold pressure and	>	75.00	kPa		

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	= 30000 to 90000	kPa	intake manifold pressure	<	150.00	kPa		
			#19)			and					
						accelerator pedal position and	<	0.05	%		
						Fuel system status for	=	Fuel cut off	-		
						time and	>	0.00	sec		
						engine speed and	>	(b) - (a)	-		
						engine speed with	<	(a) + (c)	-		
						(a) value of engine speed and with	=	30.00	rpm		
						(b) gear specific minimum engine speed and with	=	950	rpm		
						(c) gear specific maximum engine speed	=	1850	rpm		
						and current gear (see Look-Up-Table #93)	=	0 to 1	-		
						and vehicle speed	>	0	mph		
						and rail pressure deviation from setpoint calculated out of difference between desired and actual value and	<	5000.00	kPa		
						rail pressure is stable for at least	>	0.10	sec		
						no gear change has 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	-		
	2000									1.11	
Cylinder 2 Injection Timing Reached Feedback Limit	P02CF	Monitors the correction values for the energizing time of each cylinder. A correction value for the energizing time is learned for each cylinder at three different rail pressure				environmental temperature	>	-7.04	°C	fail conditions exists for more than 0.5 s monitor runs with 0.01 s	В

Component / System	Fault Code	Monitor Strategy Description	Primary Malfunction Criteria		Threshold Logic and Value		Secondary Parameters		Enable Conditions		Time Required	MIL Illum.
		Detects a fault when the corrected energizing time exceeds the feedback control limit.	corrected energizing time for the rail pressure calibration points and cylinder 1	>	(a) - (b)	-	and				whenever enable conditions are met	
			(with (a) maximum injection energizing time (see Look-Up-Table #20)	=	353.2 to 670.8	us	(fuel temperature and	>=	0.06	°C		
			(b) offset of the maximum filtered energizing time (see Look-Up-Table #21)	=	10 to 16	us	fuel temperature)	<=	79.96	°C		
)				and					
			OR (4 > 4 >		engine temperature and	>	49.96	°C		
			corrected energizing time for the rail pressure calibration points and cylinder 1	<	(a) + (b)	-	battery voltage	>	10.00	V		
			(with (a) minimum injection energizing time and with	=	107.2	us	and combustion chamber is not cooled off means					
			(b) offset of the minimum filtered energizing time (see Look-Up-Table #22)	=	10 to 16	us	time since last combustion (see Look- Up-Table #94)	>=	5 to 30	sec		
)) for				and intake manifold pressure and	>	75.00	kPa		
			rail pressure point (see Look-Up-Table #19)	=	30000 to 90000	kPa	intake manifold pressure	<	150.00	kPa		
							and accelerator pedal position and	<	0.05	%		
							Fuel system status for	=	Fuel cut off	-		
							time and (>	0.00	sec		
							engine speed and engine speed	>	(b) - (a) (a) + (c)	-		
							with (a) value of engine speed	=	(a) + (c) 30.00	rpm		
							and with (b) gear specific minimum engine speed	=	950	rpm		
							and with (c) gear specific maximum engine speed	=	1850	rpm		
							and current gear (see Look-Up-Table #93) and	=	0 to 1	-		
							vehicle speed	>	0	mph		

Component /	Fault	Monitor Strategy	Primary Malfunction		Threshold		Secondary		Enable		Time	MIL
System	Code	Description	Criteria		Logic and Value		Parameters		Conditions		Required	Illum.
							and rail pressure deviation from setpoint calculated out of difference between desired and actual value and	<	5000.00	kPa		
							rail pressure is stable for at least	>	0.10	sec		
							no gear change has 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 Reached Feedback Limit	P02D9	Monitors the correction values for the energizing time of each cylinder. A correction value for the energizing time is learned for each cylinder at three different rail pressure operating point. Detects a fault when the corrected energizing time exceeds the feedback control limit.	corrected energizing time for the rail pressure calibration points and cylinder 1	>	(a) - (b)	-	environmental temperature and	>	-7.04	°C	fail conditions exists for more than 0.5 s monitor runs with 0.01 s rate whenever enable conditions are met	В
		condo mm.	(with (a) maximum injection energizing time	=	353.2 to 670.8	us	(fuel temperature and	>=	0.06	°C	are met	
			(see Look-Up-Table #20) and with (b) offset of the maximum filtered energizing time (see Look-Up-Table #21)	=	10 to 16	us	fuel temperature)	<=	79.96	°C		
)				and					
			OR (engine temperature and	>	49.96	°C		
			corrected energizing time for the rail pressure calibration points and cylinder 1	<	(a) + (b)	-	battery voltage	>	10.00	V		
			(with (a) minimum injection energizing time and with (b) offset of the minimum filtered energizing time (see Look-Up-Table #22)	=	107.2 10 to 16	us us	and combustion chamber is not cooled off means time since last combustion (see Look- Up-Table #94)	>=	5 to 30	sec		
)				and intake manifold pressure	>	75.00	kPa		

Component /	Fault	Monitor Strategy	Primary Malfunction		Threshold		Secondary		Enable		Time	MIL
System	Code	Description	Criteria		Logic and Value		Parameters		Conditions		Required	Illum.
5,555			for rail pressure point (see Look-Up-Table #19)	=	30000 to 90000	kPa	and intake manifold pressure	<	150.00	kPa		
							and accelerator pedal position and	<	0.05	%		
							Fuel system status for	=	Fuel cut off	-		
							time and	>	0.00	sec		
							engine speed and	>	(b) - (a)	-		
							engine speed with	<	(a) + (c)	-		
							(a) value of engine speed and with	=	30.00	rpm		
							(b) gear specific minimum engine speed and with	=	950	rpm		
							(c) gear specific maximum engine speed	=	1850	rpm		
							and current gear (see Look-Up-Table #93) and	=	0 to 1	-		
							vehicle speed and	>	0	mph		
							rail pressure deviation from setpoint calculated out of difference between desired and actual value and	<	5000.00	kPa		
							rail pressure is stable for at least and	>	0.10	sec		
							no gear change has occurred and	=	TRUE	-		
							4 wheel mode and	=	FALSE	-		
							basic enable conditions met:	=	see sheet enable tables	-		
							and NO Pending or Confirmed DTCs:	=	see sheet inhibit tables	-		
Cylinder 8 Injection Timing Reached Feedback Limit	P02DB	Monitors the correction values for the energizing time of each cylinder. A correction value for the energizing time is learned for each cylinder at three different rail pressure operating point.	(environmental temperature	>	-7.04	°C	fail conditions exists for more than 0.5 s monitor runs with 0.01 s rate	В

Component / System	Fault Code	Monitor Strategy Description	Primary Malfunction Criteria		Threshold Logic and Value		Secondary Parameters		Enable Conditions		Time Required	MIL Illum
		Detects a fault when the corrected energizing time exceeds the feedback control limit.	corrected energizing time for the rail pressure calibration points and cylinder 1	>	(a) - (b)	-	and				whenever enable conditions are met	
			with (a) maximum injection energizing time (see Look-Up-Table #20)	=	353.2 to 670.8	us	fuel temperature and	>=	0.06	°C		
			and with (b) offset of the maximum filtered energizing time (see Look-Up-Table #21)	=	10 to 16	us	fuel temperature)	<=	79.96	°C		
)				and					
			OR (() ()		engine temperature and	>	49.96	°C		
			corrected energizing time for the rail pressure calibration points and cylinder 1	<	(a) + (b)	-	battery voltage	>	10.00	V		
			(with (a) minimum injection energizing time and with	=	107.2	us	and combustion chamber is not cooled off means					
			(b) offset of the minimum filtered energizing time (see Look-Up-Table #22)	=	10 to 16	us	time since last combustion (see Look- Up-Table #94)	>=	5 to 30	sec		
)) for				and intake manifold pressure and	>	75.00	kPa		
			rail pressure point (see Look-Up-Table #19)	=	30000 to 90000	kPa	intake manifold pressure	<	150.00	kPa		
							and accelerator pedal position and	<	0.05	%		
							Fuel system status for time	= >	Fuel cut off 0.00	- sec		
							and (
							engine speed and engine speed	> <	(b) - (a) (a) + (c)	-		
							with (a) value of engine speed	=	30.00	rpm		
							and with (b) gear specific minimum engine speed	=	950	rpm		
							and with (c) gear specific maximum engine speed	=	1850	rpm		
							and current gear (see Look-Up-Table #93) and	=	0 to 1	-		
							vehicle speed	>	0	mph		

Component /	Fault	Monitor Strategy	Primary Malfunction		Threshold		Secondary		Enable		Time	MIL
System	Code	Description	Criteria	L	ogic and Value		Parameters		Conditions		Required	Illum.
							and rail pressure deviation from setpoint calculated out of difference between desired and actual value and	<	5000.00	kPa		
							rail pressure is stable for at least	>	0.10	sec		
							no gear change has 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 4 Injection Timing Reached Feedback Limit	P02D3	Monitors the correction values for the energizing time of each cylinder. A correction value for the energizing time is learned for each cylinder at three different rail pressure operating point. Detects a fault when the corrected energizing time exceeds the feedback control limit.	corrected energizing time for the rail pressure calibration points and cylinder 1 (with (a) maximum injection energizing time	>	(a) - (b) 353.2 to 670.8	- us	environmental temperature and (fuel temperature and	>=	-7.04	°C	fail conditions exists for more than 0.5 s monitor runs with 0.01 s rate whenever enable conditions are met	В
			(see Look-Up-Table #20) and with (b) offset of the maximum filtered energizing time (see Look-Up-Table #21)	=	10 to 16	us	fuel temperature)	<=	79.96	°C		
)				and					
			OR (engine temperature and	>	49.96	°C		
			corrected energizing time for the rail pressure calibration points and cylinder 1	<	(a) + (b)	-	battery voltage	>	10.00	V		
			(with (a) minimum injection energizing time and with (b) offset of the minimum filtered energizing time (see Look-Up-Table #22)	=	107.2 10 to 16	us us	and combustion chamber is not cooled off means time since last combustion (see Look- Up-Table #94)	>=	5 to 30	sec		
)				and intake manifold pressure	>	75.00	kPa		

Component /	Fault	Monitor Strategy	Primary Malfunction		Threshold		Secondary		Enable		Time	MIL
System	Code	Description	Criteria		Logic and Value		Parameters		Conditions		Required	Illum.
			for rail pressure point (see Look-Up-Table #19)	=	30000 to 90000	kPa	and intake manifold pressure	<	150.00	kPa		
							and accelerator pedal position and	<	0.05	%		
							Fuel system status for	=	Fuel cut off	-		
							time and	>	0.00	sec		
							(engine speed and	>	(b) - (a)	-		
							engine speed with	<	(a) + (c)	-		
							(a) value of engine speed and with	=	30.00	rpm		
							(b) gear specific minimum engine speed and with	=	950	rpm		
							(c) gear specific maximum engine speed	=	1850	rpm		
							and current gear (see Look-Up-Table #93)	=	0 to 1	_		
							and vehicle speed	>	0	mph		
							and rail pressure deviation from setpoint	<	5000.00	kPa		
							calculated out of difference between desired and actual value and					
							rail pressure is stable for at least and	>	0.10	sec		
							no gear change has occurred and	=	TRUE	-		
							4 wheel mode and	=	FALSE	-		
							basic enable conditions met: and	=	see sheet enable tables	-		
							NO Pending or Confirmed DTCs:	=	see sheet inhibit tables	-		
Cylinder 5	P02D5	Monitors the correction					environmental temporatura		-7.04	°C	fail	В
Injection Timing Reached Feedback Limit	FUZU5	values for the energizing time of each cylinder. A correction value for the energizing time is learned for each cylinder at three					environmental temperature	>	-7.04	-0	conditions exists for more than 0.5 s monitor runs	В
		different rail pressure operating point.									with 0.01 s rate	

Component / System	Fault Code	Monitor Strategy Description	Primary Malfunction Criteria		Threshold Logic and Value		Secondary Parameters		Enable Conditions		Time Required	MIL Illum
		Detects a fault when the corrected energizing time exceeds the feedback control limit.	corrected energizing time for the rail pressure calibration points and cylinder 1	>	(a) - (b)	-	and				whenever enable conditions are met	
			with (a) maximum injection energizing time (see Look-Up-Table #20)	=	353.2 to 670.8	us	fuel temperature and	>=	0.06	°C		
			and with (b) offset of the maximum filtered energizing time (see Look-Up-Table #21)	=	10 to 16	us	fuel temperature)	<=	79.96	°C		
)				and					
			OR (() ()		engine temperature and	>	49.96	°C		
			corrected energizing time for the rail pressure calibration points and cylinder 1	<	(a) + (b)	-	battery voltage	>	10.00	V		
			(with (a) minimum injection energizing time and with	=	107.2	us	and combustion chamber is not cooled off means					
			(b) offset of the minimum filtered energizing time (see Look-Up-Table #22)	=	10 to 16	us	time since last combustion (see Look- Up-Table #94)	>=	5 to 30	sec		
)) for				and intake manifold pressure and	>	75.00	kPa		
			rail pressure point (see Look-Up-Table #19)	=	30000 to 90000	kPa	intake manifold pressure	<	150.00	kPa		
							and accelerator pedal position and	<	0.05	%		
							Fuel system status for time	= >	Fuel cut off 0.00	- sec		
							and (
							engine speed and engine speed	> <	(b) - (a) (a) + (c)	-		
							with (a) value of engine speed	=	30.00	rpm		
							and with (b) gear specific minimum engine speed	=	950	rpm		
							and with (c) gear specific maximum engine speed	=	1850	rpm		
							and current gear (see Look-Up-Table #93) and	=	0 to 1	-		
							vehicle speed	>	0	mph		

Component / System	Fault Code	Monitor Strategy Description	Primary Malfunction Criteria		Threshold Logic and Value		Secondary Parameters		Enable Conditions		Time Required	MIL Illum.
							and rail pressure deviation from setpoint calculated out of difference between desired and actual value and	<	5000.00	kPa		
							rail pressure is stable for at least and	>	0.10	sec		
							no gear change has occurred and	=	TRUE	-		
							4 wheel mode and basic enable conditions met:	=	FALSE see sheet enable	-		
							and		tables			
							NO Pending or Confirmed DTCs:	=	see sheet inhibit tables	-		
					_	_			_	_		
Cylinder 6 Injection Timing Reached Feedback Limit	P02D7	Monitors the correction values for the energizing time of each cylinder. A correction value for the energizing time is learned for each cylinder at three different rail pressure operating point. Detects a fault when the corrected energizing time exceeds the feedback control limit.	corrected energizing time for the rail pressure calibration points and cylinder 1	^	(a) - (b)	-	environmental temperature and	>	-7.04	°C	fail conditions exists for more than 0.5 s monitor runs with 0.01 s rate whenever enable conditions are met	В
			with (a) maximum injection energizing time	=	353.2 to 670.8	us	(fuel temperature and	>=	0.06	°C		
			(see Look-Up-Table #20) and with (b) offset of the maximum filtered energizing time (see Look-Up-Table #21)	=	10 to 16	us	fuel temperature)	<=	79.96	°C		
)				and					
			OR (engine temperature and	>	49.96	°C		
			corrected energizing time for the rail pressure calibration points and cylinder 1	<	(a) + (b)	-	battery voltage	>	10.00	V		
			(with (a) minimum injection energizing time and with (b) offset of the minimum filtered energizing time (see Look-Up-Table #22)	=	107.2 10 to 16	us us	and combustion chamber is not cooled off means time since last combustion (see Look- Up-Table #94)	>=	5 to 30	sec		
))				and intake manifold pressure	>	75.00	kPa		

Component / System	Fault Code	Monitor Strategy Description	Primary Malfunction Criteria		Threshold Logic and Value		Secondary Parameters		Enable Conditions		Time Required	MIL Illum.
			for rail pressure point (see Look-Up-Table	=	30000 to 90000	kPa	and intake manifold pressure	<	150.00	kPa		
			#19)				and accelerator pedal position	<	0.05	%		
							and Fuel system status	=	Fuel cut off	-		
							for time	>	0.00	sec		
							and (engine speed	>	(b) - (a)	_		
							and engine speed	<	(a) + (c)	-		
							with (a) value of engine speed	=	30.00	rpm		
							and with (b) gear specific minimum engine speed	=	950	rpm		
							and with (c) gear specific maximum engine speed	=	1850	rpm		
) and		0.45.4			
							current gear (see Look-Up-Table #93) and vehicle speed	=	0 to 1	- mnh		
							and rail pressure deviation from setpoint	> <	5000.00	mph kPa		
							calculated out of difference between desired and actual value and		0000.00	KI G		
							rail pressure is stable for at least and	>	0.10	sec		
							no gear change has occurred and	=	TRUE	-		
							4 wheel mode and	=	FALSE	-		
							basic enable conditions met: and	=	see sheet enable tables	-		
							NO Pending or Confirmed DTCs:	=	see sheet inhibit tables	-		
Culindar 2	Doop4	Manitore the correction							7.04	00	fail	
Cylinder 3 Injection Timing Reached Feedback Limit	P02D1	Monitors the correction values for the energizing time of each cylinder. A correction value for the energizing time is learned for each cylinder at three different rail pressure operating point.					environmental temperature	>	-7.04	°C	fail conditions exists for more than 0.5 s monitor runs with 0.01 s rate	В

Component / System	Fault Code	Monitor Strategy Description	Primary Malfunction Criteria		Threshold Logic and Value		Secondary Parameters		Enable Conditions		Time Required	MIL Illum.
		Detects a fault when the corrected energizing time exceeds the feedback control limit.	corrected energizing time for the rail pressure calibration points and cylinder 1	>	(a) - (b)	-	and				whenever enable conditions are met	
			(with (a) maximum injection energizing time (see Look-Up-Table #20)	=	353.2 to 670.8	us	fuel temperature and	>=	0.06	°C		
			and with (b) offset of the maximum filtered energizing time (see Look-Up-Table #21)	=	10 to 16	us	fuel temperature)	<=	79.96	°C		
)) OR				and		49.96	°C		
			(corrected energizing time for the rail pressure calibration points and cylinder 1	<	(a) + (b)	-	engine temperature and battery voltage	>	10.00	V		
			(with (a) minimum injection energizing time and with (b) offset of the minimum filtered	=	107.2 10 to 16	us	and combustion chamber is not cooled off means		5 to 30	200		
			energizing time (see Look-Up-Table #22)	=	10 to 16	us	time since last combustion (see Look- Up-Table #94)	>=	5 10 30	sec		
)) for				and intake manifold pressure and	>	75.00	kPa		
			rail pressure point (see Look-Up-Table #19)	=	30000 to 90000	kPa	intake manifold pressure and	<	150.00	kPa		
							accelerator pedal position and	<	0.05	%		
							Fuel system status for time and	>	Fuel cut off 0.00	sec		
							(engine speed and	>	(b) - (a)	-		
							engine speed with	<	(a) + (c)	-		
							(a) value of engine speed and with	=	30.00	rpm		
							(b) gear specific minimum engine speed and with (c) gear specific maximum engine	=	950 1850	rpm		
							speed)	=	1000	rpm		
							and current gear (see Look-Up-Table #93) and	=	0 to 1	-		
1		I	1				vehicle speed	>	0	mph		

Component / System	Fault Code	Monitor Strategy Description	Primary Malfunction Criteria	Threshold Logic and Value	Secondary Parameters		Enable Conditions		Time Required	MIL Illum.
System	Code	Description	Спена	Logic and value	and rail pressure deviation from setpoint calculated out of difference between desired and actual value and rail pressure is stable for at least and no gear change has occurred and 4 wheel mode and basic enable conditions met: and NO Pending or Confirmed DTCs:	< > = = = = = = = = = = = = = = = = = =	5000.00 0.10 TRUE FALSE see sheet enable tables see sheet inhibit tables	kPa sec	Kequireu	
Intake Air Flow Valve Control Circuit	P02E0	Diagnoses the Throttle Valve low side driver circuit for circuit faults.	Voltage low during driver off state (indicates open circuit)	= Open Circuit:≥ - 200 K Ω impedance between ECU pin and load	for time and starter is active cranking for time Throttle Valve Actuator Solenoid Control Circuit and basic enable conditions met and NO Pending or Confirmed DTCs:	> = = = =	3.00 FALSE 3.00 ACTIVE see sheet enable tables see sheet inhibit tables	v sec - sec	fail conditions exists for 7s monitor runs with 0.005 s rate whenever enable conditions are met	В
			The ECM detects that the commanded state of the driver and the actual state of the control circuit do not match.		battery voltage for time and starter is active cranking for time Throttle Valve Actuator Solenoid Control Circuit and	> = > =	3.00 FALSE 3.00 ACTIVE	v sec	fail conditions exists for 3 s monitor runs with 0.005 s rate whenever enable conditions are met	

Component / System	Fault Code	Monitor Strategy Description	Primary Malfunction Criteria	Threshold Logic and Value	Secondary Parameters		Enable Conditions		Time Required	MIL Illum.
					basic enable conditions met	=	see sheet enable tables	-		
					and NO Pending or Confirmed DTCs:	=	see sheet inhibit tables	-		
					and Open Load Diagnosis active	=	FALSE	-		
			The ECM detects that the commanded state of the driver and the actual state of the control circuit do not match.		battery voltage	>	11.00	V	fail conditions exists for 3 s monitor runs	
					for time and	>	3.00	sec	with 0.005 s rate whenever	
					starter is active cranking for	=	FALSE	-	enable conditions	
					time Throttle Valve Actuator Solenoid Control Circuit	> =	3.00 ACTIVE	sec -	are met	
					and basic enable conditions met	=	see sheet enable tables	-		
					and NO Pending or Confirmed DTCs:	=	see sheet inhibit tables	-		
					and Open Load Diagnosis active	=	FALSE	-		
ntake Air Flow	P02E2	Diagnoses the Throttle	Voltage low during driver off state	= Short to ground: -	battery voltage	>	11.00	V	fail	В
Valve Control Circuit 1 Low Voltage		Valve low side driver circuit for circuit faults.	(indicates short-to-ground)	$\leq 0.5 \Omega$ impedance between signal and controller ground					conditions exists for 3 s monitor runs with 0.005 s rate whenever	
					for time	>	3.00	sec	enable conditions are met	
			and starter is active cranking for	=	FALSE	-	are met			
			time Throttle Valve Actuator Solenoid Control Circuit	> =	3.00 ACTIVE	sec -				
			and basic enable conditions met	=	see sheet enable tables	-				
			and NO Pending or Confirmed DTCs:	=	see sheet inhibit tables	-				

Component / System	Fault Code	Monitor Strategy Description	Primary Malfunction Criteria		eshold and Value	Secondary Parameters		Enable Conditions		Time Required	MIL Illum.
						and Open Load Diagnosis active	=	FALSE	-		
Intake Air Flow Valve Control Circuit 1 High Voltage	P02E3	Diagnoses the Throttle Valve low side driver circuit for circuit faults.	Voltage high during driver on state (indicates short to power)	≤ 0.5 Ω impeda	ince n signal	battery voltage	>	11.00	V	fail conditions exists for 3 s monitor runs with 0.005 s rate whenever	В
						for time and starter is active cranking for time Throttle Valve Actuator Solenoid Control Circuit and	> = > =	3.00 FALSE 3.00 ACTIVE	sec - sec -	enable conditions are met	
				basic enable conditions met and NO Pending or Confirmed DTCs: and Open Load Diagnosis active	=	see sheet enable tables see sheet inhibit tables FALSE	-				
Throttle Valve Actuator (TVA) Position Sensor	P02E7	the difference between	throttle valve control deviation calculated out of difference between desired and actual value	< 1	0.00 %	throttle valve controller bypass is active	=	FALSE	•	fail conditions exists for 10	В
Performance		desired and actual TVA position.	or throttle valve control deviation calculated out of difference between desired and actual value	> -1	0.00 %	and throttle valve is driven to a mechanical stop	=	FALSE	-	s monitor runs with 0.005 s rate whenever enable	
						and Throttle Governor Active and Throttle Valve Permanent Control	=	TRUE FALSE	-	conditions are met	
				Deviation and Engine Running (see parameter	=	TRUE	-				
				definition) and basic enable conditions met	=	see sheet enable tables	-				
						NO Pending or Confirmed DTCs:	=	see sheet inhibit tables	-		

Component / System	Fault Code	Monitor Strategy Description	Primary Malfunction Criteria	Thresho Logic and		Secondary Parameters		Enable Conditions		Time Required	MIL Illum.
Diesel Intake Air Flow Position Sensor Circuit Low Voltage	P02E8	Detects low voltage readings on the throttle valve position sensor circuit, indicating an OOR low condition on the throttle valve position sensor circuit	measured throttle valve position voltage	< 0.40	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
Diesel Intake Air Flow Position Sensor Circuit High Voltage	P02E9	Detects high voltage readings on the throttle valve position sensor circuit, indicating an OOR high condition on the throttle valve position sensor circuit	measured throttle valve position voltage	> 4.72	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
Intake Air Flow Valve Control Motor Current Performance	P02EB	Electronic out-put driver circuitry determines circuit integrity on the intake air flow valve.	driver output current	> 7.7	A	for time and starter is active cranking for time Throttle Valve Actuator Solenoid Control Circuit and basic enable conditions met and NO Pending or Confirmed DTCs: and Open Load Diagnosis active	> = = = =	3.00 FALSE 3.00 ACTIVE see sheet enable tables see sheet inhibit tables FALSE	V sec - sec -	fail conditions exists for 2 s monitor runs with 0.005 s rate whenever enable conditions are met	В

Component /	Fault	Monitor Strategy	Primary Malfunction		Threshold		Secondary		Enable		Time	MIL
System	Code	Description	Criteria		Logic and Valu	е	Parameters		Conditions		Required	Illum.
				_	_	_			_	_		
Engine Misfire Detected	P0300	Indicates engine has experienced more than one cylinder misfiring	angular acceleration of the crankshaft	<	-1.40	sec^(2)	(fail conditions exists for	В
			and				Engine Running (see parameter definition)	=	TRUE	-	0.02 ms monitor runs	
			evaluated crankshaft revolutions with	>=	(a) * (b)	-	and engine speed	>	476.00	rpm	with 0.02 s rate	
			(a) number of crankshaft revolutions per block and with	=	20.00	counts	and engine speed	<	1560.00	rpm	whenever enable	
			(b) number of test blocks	=	20.00	counts) and	,	1300.00	тртт	conditions are met	
			misfires exist on more than one cylinder	=	TRUE	-	(a) - (b)	<	200.00	rpm		
							with (a) actual desired idle speed	=	calculated parameter	-		
							and with (b) engine speed	=	measured parameter	-		
						and (
						current injection quantity	>	12.00	mm^3/r ev			
							and current injection quantity	<	400.00	mm^3/r ev		
) and engine coolant temperature	>=	39.96	°C		
							and vehicle speed	>= <=	1.86	mph		
							and time since start	>=	10.00	sec		
							and and deletion of error memory (Mode\$4) not	=	TRUE	-		
							executed since last check of the monitoring conditions and					
							adaptation value for tooth wheel has been learned land	=	TRUE	-		
							number of detected misfires and	>	140.00	counts		
							basic enable conditions met:	=	see sheet enable tables	-		
							NO Pending or Confirmed DTCs:	=	see sheet inhibit tables	-		

Component /	Fault	Monitor Strategy	Primary Malfunction		Threshold		Secondary		Enable		Time	MIL
System	Code	Description	Criteria		Logic and Valu	ıe	Parameters		Conditions		Required	Illur
rlinder 1 Misfire etected	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.		<	-1.40	sec^(2)	(fail conditions exists for 0.02 s monitor runs with 0.02 s rate whenever	В
			and				Engine Running (see parameter definition)	=	TRUE	-	enable conditions are met	
			evaluated crankshaft revolutions with (a) number of crankshaft revolutions	>=	(a) * (b) 20.00	counts	and engine speed and	>	476.00	rpm		
			per block and with (b) number of test blocks	=	20.00	counts	engine speed)	<	1560.00	rpm		
							and (a) - (b) with	<	200.00	rpm		
							(a) actual desired idle speed and with	=	calculated parameter	-		
							(b) engine speed	=	measured parameter	-		
							and (current injection quantity	>	12.00	mm^3/r		
							and current injection quantity	<	400.00	ev mm^3/r ev		
) 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	>=	10.00	sec		
							and deletion of error memory (Mode\$4) not executed since last check of the monitoring conditions	=	TRUE	-		
							and adaptation value for tooth wheel has been learned	=	TRUE	-		
							and number of detected misfires and	>	140.00	counts		

Component / System	Fault Code	Monitor Strategy Description	Primary Malfunction Criteria	Threshold Logic and Valu	ıe	Secondary Parameters		Enable Conditions		Time Required	MIL Illum.
•						basic enable conditions met: and	=	see sheet enable tables	-		
						NO Pending or Confirmed DTCs:	=	see sheet inhibit tables	-		
Cylinder 2 Misfire Detected	P0302	Detects cylinder misfire. The minimum average angle acceleration is calculated every 2 rotations and represents the average angle acceleration that all cylinders are rotating at after a combustion event. Calculates angle acceleration after an injection event for the cylinder under test and	angular acceleration of the crankshaft and evaluated crankshaft revolutions with (a) number of crankshaft revolutions per block and with (b) number of test blocks	< -1.40 >= (a)*(b) = 20.00 = 20.00	sec^(2) - counts counts	Engine Running (see parameter definition) and engine speed and engine speed) and (a) - (b) with (a) actual desired idle speed and with (b) engine speed and (current injection quantity and current injection quantity) and engine coolant temperature and vehicle speed and	=	TRUE 476.00 1560.00 200.00 calculated parameter measured parameter 12.00 400.00 39.96 1.86	rpm rpm mm^3/r ev mm^3/r ev c mph	fail conditions exists for 0.02 ms monitor runs with 0.02 s rate whenever enable conditions are met	В
		compares it to the minimum threshold.				time since start	>=	10.00	sec		

Component / System	Fault Code	Monitor Strategy	Primary Malfunction Criteria		reshold c and Value		Secondary Parameters		Enable Conditions		Time Required	MIL Illum.
System	Code	Description	Gilleria	Logi	and value		and deletion of error memory (Mode\$4) not executed since last check of the	=	TRUE		Keyuirea	mum.
							monitoring conditions and adaptation value for tooth wheel has been learned	=	TRUE	-		
							and number of detected misfires and	>	140.00	counts		
							basic enable conditions met:	=	see sheet enable tables	-		
							and NO Pending or Confirmed DTCs:	=	see sheet inhibit tables	-		
Cylinder 7 Misfire	P0307	Detects cylinder misfire.	angular acceleration of the crankshaft	<	-1.40 sec	c^(2)	(fail	В
Detected		The minimum average angle acceleration is calculated every 2 rotations and represents the average angle acceleration that all									conditions exists for 0.02 ms monitor runs with 0.02 s	
		cylinders are rotating at after a combustion event.									rate whenever	
			and				Engine Running (see parameter definition)	=	TRUE	-	enable conditions are met	
			evaluated crankshaft revolutions with (a) number of crankshaft revolutions		.,,	- unts	and engine speed and	>	476.00	rpm		
			per block and with (b) number of test blocks	=	20.00 co	unts	engine speed)	<	1560.00	rpm		
							and (a) - (b) with	<	200.00	rpm		
							(a) actual desired idle speed	=	calculated parameter	-		
							and with (b) engine speed and	=	measured parameter	-		
							(current injection quantity	>	12.00	mm^3/r ev		
							and current injection quantity	<	400.00	mm^3/r ev		
							and engine coolant temperature and	>=	39.96	°C		
							vehicle speed	<=	1.86	mph		

Component /	Fault	Monitor Strategy	Primary Malfunction	Threshold		Secondary	Enable		Time	MIL
System	Code	Description Calculates angle acceleration after an injection event for the cylinder under test and compares it to the minimum threshold.	Criteria	Logic and Va	lue	Parameters and	Conditions		Required	Illum.
						time since start and and deletion of error memory (Mode\$4) not executed since last check of the monitoring conditions and	>= 10.00 = TRUE	sec -		
						adaptation value for tooth wheel has been learned and number of detected misfires and	= TRUE	- counts		
						basic enable conditions met: and NO Pending or Confirmed DTCs:	= see sheet enable tables = see sheet inhibit tables			
Cylinder 8 Misfire Detected	P0308	Detects cylinder misfire. The minimum average angle acceleration is calculated every 2 rotations and represents the average angle acceleration that all cylinders are rotating at after a combustion event.	angular acceleration of the crankshaft and evaluated crankshaft revolutions with (a) number of crankshaft revolutions per block and with	< -1.40 >= (a) * (b) = 20.00	sec^(2)	Engine Running (see parameter definition) and engine speed and engine speed	= TRUE > 476.00 < 1560.00	- rpm	fail conditions exists for 0.02 ms monitor runs with 0.02 s rate whenever enable conditions are met	В
			(b) number of test blocks	= 20.00	counts	engine speed) and (a) - (b) with (a) actual desired idle speed and with (b) engine speed and (current injection quantity	< 200.00 = calculated parameter = measured parameter > 12.00	rpm mm^3/r ev		

Component / System	Fault Code	Monitor Strategy Description	Primary Malfunction Criteria		Threshold gic and Valu	е	Secondary Parameters		Enable Conditions		Time Required	MIL Illum.
		Calculates angle acceleration after an injection event for the cylinder under test and compares it to the minimum					and current injection quantity) and engine coolant temperature and vehicle speed and	< >= <=	400.00 39.96 1.86	mm^3/r ev °C mph		
		threshold.					time since start and and deletion of error memory (Mode\$4) not executed since last check of the monitoring conditions and adaptation value for tooth wheel has been learned and number of detected misfires and basic enable conditions met: and NO Pending or Confirmed DTCs:	>= = = > = = = = = = = = = = = = = = =	TRUE TRUE 140.00 see sheet enable tables see sheet inhibit tables	sec counts -		
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 and evaluated crankshaft revolutions with (a) number of crankshaft revolutions per block and with (b) number of test blocks	>= = =	-1.40 (a) * (b) 20.00 20.00	sec^(2) - counts counts	Engine Running (see parameter definition) and engine speed and engine speed) and eligine speed) and eligine speed) with	= > <	TRUE 476.00 1560.00 200.00	rpm rpm	fail conditions exists for 0.02 ms monitor runs with 0.02 s rate whenever enable conditions are met	В

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

Component /	Fault	Monitor Strategy	Primary Malfunction		Threshold		Secondary		Enable		Time	MIL
System	Code	Description	Criteria		Logic and Valu	ie	Parameters and an arms and arms are arms and arms are arm		Conditions 476.00	rn m	Required	Illum
			with (a) number of crankshaft revolutions per block	=	20.00	counts	engine speed and	>	476.00	rpm		
			and with (b) number of test blocks	=	20.00	counts	engine speed) and	<	1560.00	rpm		
							(a) - (b) with	<	200.00	rpm		
							(a) actual desired idle speed and with	=	calculated parameter	-		
							(b) engine speed	=	measured parameter	-		
							and (40.00			
							current injection quantity and	>	12.00	mm^3/r ev		
							current injection quantity	<	400.00	mm^3/r ev		
) and engine coolant temperature	>=	39.96	°C		
							and 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 and and	>=	10.00	sec		
							deletion of error memory (Mode\$4) not executed since last check of the monitoring conditions and	=	TRUE	-		
							adaptation value for tooth wheel has been learned and	=	TRUE	-		
							number of detected misfires and	>	140.00	counts		
							basic enable conditions met: and	=	see sheet enable tables	-		
							NO Pending or Confirmed DTCs:	=	see sheet inhibit tables	-		

Component /	Fault	Monitor Strategy	Primary Malfunction		Threshold		Secondary		Enable		Time	MIL
System	Code	Description	Criteria		Logic and Value	ie	Parameters		Conditions		Required	Illum.
Cylinder 6 Misfire Detected	P0306	Detects cylinder misfire. The minimum average angle acceleration is calculated every 2 rotations and	angular acceleration of the crankshaft	<	-1.40	sec^(2)	(fail conditions exists for 0.02 ms	В
		represents the average angle acceleration that all cylinders are rotating at after a combustion event.									monitor runs with 0.02 s rate whenever enable	
			and evaluated crankshaft revolutions		(a) * (b)	_	Engine Running (see parameter definition) and	=	TRUE	-	conditions are met	
			with (a) number of crankshaft revolutions	>=	20.00	counts	engine speed and	>	476.00	rpm		
			per block and with (b) number of test blocks	=	20.00	counts	engine speed	<	1560.00	rpm		
							and (a) - (b) with	<	200.00	rpm		
							(a) actual desired idle speed and with	=	calculated parameter	-		
							(b) engine speed	=	measured parameter	-		
							and (current injection quantity	>	12.00	mm^3/r		
							and current injection quantity	<	400.00	ev mm^3/r		
)		400.00	ev		
							and engine coolant temperature and	>=	39.96	°C		
		Calculates angle					vehicle speed and	<=	1.86	mph		
		acceleration after an injection event for the cylinder under test and										
		compares it to the minimum threshold.					time since start	>=	10.00	sec		
							and deletion of error memory (Mode\$4) not executed since last check of the	=	TRUE	-		
							monitoring conditions and adaptation value for tooth wheel has	=	TRUE	_		
							been learned and number of detected misfires	>	140.00	counts		
							and		140.00	Courits		

Component / System	Fault Code	Monitor Strategy Description	Primary Malfunction Criteria		Threshold ogic and Val	ue	Secondary Parameters		Enable Conditions		Time Required	MIL Illum.
,							basic enable conditions met: and NO Pending or Confirmed DTCs:	=	see sheet enable tables see sheet inhibit tables	-		
Cylinder 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	<	-1.40	sec^(2)	Engine Running (see parameter	=	TRUE	_	fail conditions exists for 0.02 ms monitor runs with 0.02 s rate whenever enable conditions	В
			evaluated crankshaft revolutions with (a) number of crankshaft revolutions	>=	(a) * (b) 20.00	- counts	definition) and engine speed and	>	476.00	rpm	are met	
			per block and with (b) number of test blocks	=	20.00	counts	engine speed)	<	1560.00	rpm		
							and (a) - (b) with (a) actual desired idle speed	< =	200.00 calculated	rpm -		
							and with (b) engine speed	=	parameter measured parameter	-		
							(current injection quantity	>	12.00	mm^3/r ev		
							and current injection quantity)	<	400.00	mm^3/r ev		
							and engine coolant temperature and	>=	39.96	°C		
		Calculates angle acceleration after an injection event for the cylinder under test and compares it to the minimum threshold.					vehicle speed and	<=	1.86	mph		
							time since start and and	>=	10.00	sec		l

Component / System	Fault Code	Monitor Strategy Description	Primary Malfunction Criteria	Lo	Threshold gic and Valu	ıe	Secondary Parameters		Enable Conditions		Time Required	MIL Illum.
							deletion of error memory (Mode\$4) not executed since last check of the monitoring conditions and	=	TRUE	-		
							adaptation value for tooth wheel has been learned	=	TRUE	-		
							and number of detected misfires and	>	140.00	counts		
							basic enable conditions met:	=	see sheet enable tables	-		
							NO Pending or Confirmed DTCs:	=	see sheet inhibit tables	-		
Crankshaft Position System Variation Not Learned	P0315	Wheel Learn - Fuel Balance System - Tooth Wheel Variation and Crankshaft Dynamics not learned quickly enough	fuel balance wheel learn complete	=	FALSE		fuel system is in fuel cut off	=	TRUE	-	fail conditions exists for 5000 s cumulative	В
		quota, onough					and engine speed	>	900	rpm	time, monitor runs	
							engine speed	<	2750	rpm	with 1 s rate whenever	
							No Pending or Confirmed DTCs	=	see sheet inhibit tables	-	enable conditions	
Crankshaft	P0335	Detects crankshaft sensor	ECM has detected reference mark on the	=	FALSE	-	set condition				fail	A
Position [CKP] Sensor Circuit	. 6555	circuit failure by monitoring for valid signals from CKP sensor while CMP sensor is also sending valid signals	crankshaft and number of detected camshaft rotations	>=	6.00	counts	(conditions exists for more than 6 events monitor runs with 0.1 s rate whenever	
							engine speed and	>=	400.00	rpm	enable conditions	
							synchronization completed)	=	TRUE	-	are met	
							starter is active cranking) and	=	TRUE	-		
							(vehicle speed or	=	0	mph		
							vehicle speed and	>	16	mph		
							engine speed)	>=	200.00	rpm		

Component / System	Fault Code	Monitor Strategy Description	Primary Malfunction Criteria		Threshold Logic and Valu	e	Secondary Parameters		Enable Conditions		Time Required	MIL Illum.
							and not reset condition (engine speed and starter is active cranking) and basic enable conditions met:	< = =	200.00 FALSE see sheet enable tables	rpm - -		
Crankshaft Position Sensor Performance	P0336	Detects implausible crankshaft sensor operation by detecting incorrect crank sensor signal patterns.	number of disturbances in crankshaft signal crankshaft signal disturbance detected	>=	10.00	counts	Engine Running (see parameter definition)	=	TRUE		fail conditions exists for 0.1 s monitor runs	В
			under the following conditions:				and				with 0.1 s rate	
			Current tooth time period	>	166667.00	us	basic enable conditions met:	=	see sheet enable tables	-	whenever enable conditions are met	
			Crankshaft tooth counts between detected gaps	>	68.00	counts					are met	
			If gap not expected, ratio of current tooth time to previous tooth time (see Look-Up-Table #18)	>	1.5 to 2	-						
			or If gap expected, ratio of current tooth time to previous tooth time (see Look-Up- Table #17)	>	3.375 to 8	-						
Camshaft Position [CMP] Sensor Circuit	P0340	Detects camshaft sensor circuit failure by monitoring for valid signals from CMP sensor while CKP sensor is also sending valid signals	number of crankshaft revolutions during missed camshaft signal	>=	4.00	counts	ECM has detected reference mark on the crankshaft	=	TRUE		fail conditions exists for 0.01 s test performed continuously	A
							basic enable conditions met:	=	see sheet enable tables	-	0.01 s rate	

Component / System	Fault Code	Monitor Strategy Description	Primary Malfunction Criteria		Threshold Logic and Value)	Secondary Parameters		Enable Conditions		Time Required	MIL Illum.
Camshaft Position [CMP] Sensor Performance	P0341	Detects implausible camshaft sensor operation by detecting incorrect cam sensor patterns	number of camshaft edges	>	4	counts	ECM has detected reference mark on the crankshaft and basic enable conditions met:	=	TRUE see sheet enable tables	-	fail conditions exists for more than 6 events test performed continuously 0.01 s rate	В
Wait to Start (WTS) Lamp Control Circuit	P0381	Diagnoses the Glow Lamp Circuit high side driver circuit for circuit faults.	Voltage low during driver on state (indicates short-to-ground)	=	Short to ground: ≤ 0.5 Ω impedance between signal and controller ground		and battery voltage for time and basic enable conditions met:	> > =	11.00 3.00 see sheet enable tables	V sec	fail conditions exists for 3 s monitor runs with 0.01 s rate whenever enable conditions are met	В
			Voltage high during driver off state (indicates short to power)	=	Short to power: ≤ 0.5 Ω impedance between signal and controller power		lamp is commanded off and battery voltage for time and basic enable conditions met:	> > =	TRUE 11.00 3.00 see sheet enable tables	V sec	fail conditions exists for 0.5 s monitor runs with 0.01 s rate whenever enable conditions are met	

Component /	Fault	Monitor Strategy	Primary Malfunction		Threshold		Secondary		Enable		Time	MIL
System	Code	Description	Criteria Voltage high during driver off state (open circuit)	=	Logic and Value Open Circuit: ≥ 200 K Ω impedance between ECU pin and load signal and controller ground	·	Parameters circuit active at low current and battery voltage for time and basic enable conditions met:	> > =	TRUE 11.00 3.00 see sheet enable tables	V sec	Required fail conditions exists for 0.1 s monitor runs with 0.01 s rate whenever enable conditions are met	Illum.
Exhaust Gas Recirculation(EGR) Flow Excessive	P0400	Detects excessive EGR flow. Actual MAF readings are compared to desired MAF values as an indication of how much EGR is flowing.	controller deviation of the air mass = actual minus desired value (see Look-Up-Table #11)	>	1.6 to 2	g/rev	and VGT offset learning is active and NO Pending or Confirmed DTCs: and basic enable conditions met:	= = =	FALSE see sheet inhibit tables see sheet enable tables	-	fail conditions exists for 15 s monitor runs 0.02 s rate whenever enable conditions are met	A
Exhaust Gas Recirculation(EGR) Flow Insufficient	P0401	Detects insufficient EGR flow. Actual MAF readings are compared to desired MAF values as an indication of how much EGR is flowing.	controller deviation of the exhaust gas recirculation (EGR) - calculated out of desired and actual value with (a) Minimum Controller Deviation (see Look-Up-Table #12) (b) Environmental Pressure correction factor (see Look-Up-Table #8)	> = =	(a)*(b) -1.2 to -0.56 0.71 to 1	g/rev factor	EGR controller is active and change of injection quantity between actual and last received value for time and change of engine speed between actual and last received value for time	= < = < =	TRUE 40.00 0.25 50.00 0.50	(mm^3/r ev)/sec sec rpm/sec sec	fail conditions exists for 10 s monitor runs 0.02 s rate whenever enable conditions are met	В

Component /	Fault	Monitor Strategy	Primary Malfunction		Threshold		Secondary		Enable		Time	MIL
System	Code	Description	Criteria	Lo	ogic and Valu	9	Parameters		Conditions		Required	Illum.
							and VGT offset learning is active	=	FALSE	-		
							maximum setpoint for air-mass flow (see Look-Up-Table #9)	>	0.8 to 1.2	g/rev		
							and Engine speed	<=	950.00	rpm		
							Engine speed and	>=	500.00	rpm		
							Torque generating engine fuel injection quantity	<=	72.00	mm^3/r ev		
							Torque generating engine fuel injection quantity and	>=	4.00	mm^3/r ev		
							setpoint valve position of exhaust-gas recirculation and	>	5.00	%		
							throttle position and	<	5.00	%		
							basic enable conditions met:	=	see sheet enable tables	-		
							and NO Pending or Confirmed DTCs:	=	see sheet inhibit tables	-		
) for time	>=	5.00	sec		
Exhaust Gas Recirculation(EGR Flow Excessive	P0402	Detects excessive EGR flow. Actual MAF readings are compared to desired	controller deviation of the exhaust gas recirculation (EGR) - calculated out of desired and actual value	>	(a)*(b)		(fail conditions exists for 7.5	В
		MAF values as an indication of how much EGR is									s monitor runs	
		flowing.	with (a) Maximum Controller Deviation	=	0.4 to 0.6	g/rev	EGR controller is active and	=	TRUE	-	0.02 s rate whenever enable	
			(see Look-Up-Table #10) (b) Environmental Pressure correction factor	=	1	factor	change of injection quantity between actual and last received value	<	40.00	(mm^3/r ev)/sec	conditions are met	
							for time	=	0.25	sec		
							change of engine speed between actual and last received value	<	50.00	rpm/sec		
							for time and	=	0.50	sec		
							VGT offset learning is active	=	FALSE	-		
							maximum setpoint for EGR mass flow and	<	1.00	g/rev		
							Engine speed Engine speed	<= >=	1400.00 1000.00	rpm rpm		

Component / System	Fault Code	Monitor Strategy Description	Primary Malfunction Criteria	Threshold Logic and Value	Secondary Parameters		Enable Conditions		Time Required	MIL Illum.
					Torque generating engine fuel injection quantity Torque generating engine fuel injection quantity and basic enable conditions met: and NO Pending or Confirmed DTCs:) for time	<= >= = = >=	200.00 50.00 see sheet enable tables see sheet inhibit tables 1.00	mm^3/r ev mm^3/r ev - - sec		
Exhaust Gas Recirculation (EGR) Motor Control Circuit	P0403	Diagnoses the EGR Valve low side driver circuit for circuit faults.	Voltage low during driver off state (indicates short-to-ground)	= Short to ground: - ≤ 0.5 Ω impedance between signal and controller ground	EGR Solenoid Control Circuit	=	ACTIVE	_	fail conditions exists for 7 s monitor runs with 0.005 s rate whenever enable conditions are met	В
					and offset learning for EGR valve is completed and battery voltage for time and starter is active cranking for time and basic enable conditions met: and NO Pending or Confirmed DTCs:	= > > = > >	TRUE 11.00 3.00 FALSE 3.00 see sheet enable tables see sheet inhibit tables	V sec - sec -		
			The ECM detects that the commanded state of the driver and the actual state of the control circuit do not match.		EGR Solenoid Control Circuit and battery voltage for	= >	ACTIVE	- V	fail conditions exists for 3 s monitor runs with 0.005 s rate whenever enable	В

Component / System	Fault Code	Monitor Strategy Description	Primary Malfunction Criteria	Lo	Threshold ogic and Value		Secondary Parameters		Enable Conditions		Time Required	MIL Illum.
							time and	>	3.00	sec	conditions are met	
							starter is active cranking for	=	FALSE	-		
							time and	>	3.00	sec		
							basic enable conditions met:		see sheet enable tables	-		
							and NO Pending or Confirmed DTCs:		see sheet inhibit tables	-		
												_
Exhaust Gas Recirculation(EGR) Position Sensor Circuit Low	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	<	0.25	V	ignition on	=	TRUE	-	fail conditions exists for 5 s test	А
Voltage		EGR position circuit	same as				and				performed continuously 0.005 s rate	
			EGR actuator position	<	-25	%	basic enable conditions met:	=	see sheet enable tables	-	0.000 3 1410	
							NO Pending or Confirmed DTCs:	=	see sheet inhibit tables	-		
Exhaust Gas	P0406	Detects high voltage	raw voltage of EGR actuator position	>	4.80	V	ignition on	=	TRUE		fail	A
Recirculation(EGR) Position Sensor Circuit High		readings on the EGR position circuit, indicating an OOR high condition on the	sensor								conditions exists for 5 s test	
Voltage		EGR position circuit	same as				and				performed continuously	
			EGR actuator position	>	127	%	basic enable conditions met:	=	see sheet enable tables	-	0.005 s rate	
							and NO Pending or Confirmed DTCs:	=	see sheet inhibit tables	-		
Exhaust Gas	P040C	Detects low voltage	EGR temperature sensor 2 voltage	<	0.46	V					fail	В
Recirculation(EGR) Temperature Sensor A Circuit Low Voltage	1 0400	readings on the EGR cooler temperature circuit, indicating an OOR low condition on the EGR cooler temperature 2 circuit	Edit temperature sensor 2 voltage	`	0.40	v	· ·				conditions exists for 5 s monitor runs 0.05 s rate whenever	D
			same as				time since engine start	>	0.00	sec	enable conditions	

Component / System	Fault Code	Monitor Strategy Description	Primary Malfunction Criteria		Threshold Logic and Value		Secondary Parameters		Enable Conditions		Time Required	MIL Illum.
			EGR sensor 2 temperature	>	220	°C	and engine coolant temperature	<	199.96	°C	are met	
							and ambient temperature and	>	-60.04	°C		
							ambient pressure and	>	20.00	kPa		
							setpoint valve position of exhaust-gas recirculation and	>	-100.00	%		
							setpoint valve position of exhaust-gas recirculation	<	200.00	%		
							and Engine Running (see parameter definition) and	=	TRUE	-		
							valve position of EGR cooler bypass and	>	-100.00	%		
							valve position of EGR cooler bypass and	<	200.00	%		
							basic enable conditions met:	=	see sheet enable tables	-		
							and NO Pending or Confirmed DTCs:	=	see sheet inhibit tables	-		
											4.00	
Exhaust Gas Recirculation(EGR) Temperature Sensor A Circuit High Voltage	P040D	Detects high voltage readings on the EGR temperature cooler circuit, indicating an OOR high condition on the EGR cooler temperature 2 circuit	EGR temperature sensor 2 voltage	>	4.84	V					fail conditions exists for 5 s monitor runs 0.05 s rate whenever enable	В
			same as EGR sensor 2 temperature	<	-50	°C	time since engine start and engine coolant temperature	>	0.00 199.96	sec °C	conditions are met	
							and ambient temperature	>	-60.04	°C		
							and ambient pressure and	>	20.00	kPa		
							(setpoint valve position of exhaust-gas recirculation	>	-100.00	%		
							and setpoint valve position of exhaust-gas recirculation	<	200.00	%		
							and					

Component / System	Fault Code	Monitor Strategy Description	Primary Malfunction Criteria		Threshold Logic and Value	,	Secondary Parameters		Enable Conditions		Time Required	MIL Illum.
							Engine Running (see parameter definition) and	=	TRUE	-		
							(valve position of EGR cooler bypass and	>	-100.00	%		ı
							valve position of EGR cooler bypass and	<	200.00	%		ı
							basic enable conditions met:	=	see sheet enable tables	-		İ
							and NO Pending or Confirmed DTCs:	=	see sheet inhibit tables	-		İ
- 1	D0 405											
Exhaust Gas Recirculation(EGR Temperature Sensor Correlation	P040F	Detects biased EGR temperature sensors by comparing the two EGR	Path 1:				minimum engine-off time	>=	28800.00	sec	fail conditions exists for 0.1	В
EGR 1/ EGR 2)		cooler temp sensor after an engine off soak time									s monitor runs with 0.1 s	İ
			(a) - (b) (see Look-Up-Table #4) with (a) captured EGR sensor 2	> =	100 to 999 measured	°C -	and ambient temperature and	>	-60.04	°C	rate whenever enable	İ
			temperature at start and with		parameter		Engine Running (see parameter definition)	=	TRUE	-	conditions are met	İ
			(b) captured EGR sensor 1 temperature at start	=	measured parameter	-	for					İ
			or				time and	>	0.00	sec		ı
			Path 2:				engine post drive/ afterun and	=	FALSE	-		ı
			l(a) - (b)l (see Look-Up-Table #4) with	<=	100 to 999	°C	diagnostic performed in current dc and	=	FALSE	-		ı
			(a) captured EGR sensor 2 temperature at start and with	=	measured parameter	-	basic enable conditions met:	=	see sheet enable tables	-		ı
			(b) captured EGR sensor 1 temperature at start	=	measured parameter	-	NO Pending or Confirmed DTCs:	=	see sheet inhibit tables	-		İ
			and (a) - (b) (see Look-Up-Table #7) with	>	20 to 999	°C						ı
			(a) captured EGR sensor 2 temperature at start and with	=	measured parameter	-						ı
			(b) captured EGR sensor 1 temperature at start and	=	measured parameter	-						I
			(status of block heater (see parameter definition)	=	FALSE	-						ı

Component / System	Fault Code	Monitor Strategy Description	Primary Malfunction Criteria	-17	Threshold ogic and Value		Secondary Parameters		Enable Conditions		Time Required	MIL Illum.
Oystem	Odde	Description	status of sun-load detection (see parameter definition)))	=	FALSE	-	raidileters		Ositations		Required	mum.
Exhaust Gas Recirculation(EGR) Temperature Sensor B Circuit Low Voltage	P041C	Detects low voltage readings on the EGR cooler temperature circuit, indicating an OOR low condition on the EGR cooler temperature 1 circuit	voltage of EGR temperature sensor 1 same as EGR sensor 1 temperature	>	220	°C	time since engine start and engine coolant temperature and ambient temperature and ambient pressure and (setpoint valve position of exhaust-gas recirculation and setpoint valve position of exhaust-gas recirculation) and Engine Running (see parameter definition) and (valve position of EGR cooler bypass and valve position of EGR cooler bypass and basic enable conditions met: and NO Pending or Confirmed DTCs:	\ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \	0.00 199.96 -60.04 20.00 -100.00 200.00 TRUE -100.00 200.00 see sheet enable tables see sheet inhibit	sec °C kPa % - %	fail conditions exists for 5 s monitor runs 0.05 s rate whenever enable conditions are met	В
Exhaust Gas Recirculation(EGR) Temperature Sensor B Circuit High Voltage	P041D	Detects high voltage readings on the EGR cooler temperature circuit, indicating an OOR high condition on the EGR cooler temperature 1 circuit	voltage of EGR temperature sensor 1 same as EGR sensor 1 temperature	>	-50	V °C	time since engine start and engine coolant temperature	> <	0.00 199.96	sec °C	fail conditions exists for 5 s monitor runs 0.05 s rate whenever enable conditions are met	В

Fault	Monitor Strategy	Primary Malfunction	Threshold	Secondary		Enable		Time	MIL
Code	Description	Criteria	Logic and Value	Parameters		Conditions		Required	Illum.
				and ambient temperature	>	-60.04	°C		
				ambient pressure and	>	20.00	kPa		
				setpoint valve position of exhaust-gas recirculation	>	-100.00	%		
				setpoint valve position of exhaust-gas recirculation	<	200.00	%		
				and Engine Running (see parameter definition) and	=	TRUE	-		
				valve position of EGR cooler bypass and	>	-100.00	%		
				valve position of EGR cooler bypass and	<	200.00	%		
					=	see sheet enable tables	-		
				NO Pending or Confirmed DTCs:	=	see sheet inhibit tables	-		
									_
P0420	Detects insufficient conversion rate in oxidation catalyst. Actual conversion rate is compared to a conversion rate threshold as an indication of how much HC is converted in the oxidation catalyst.	Calculated HC conversion rate	< 0.20 -	(Modeled HC mass converted in the oxidation catalyst since monitor start and average HC mass flow and simulated heat quantity in oxidation catalyst and particulate filter regeneration and no reset condition for evaluation is active	> > > =	115.00 0.00 0.00 TRUE	g g/s kJ	fail conditions exists for more than 0.1 seconds monitor runs once per driving cycle with 0.1 s rate whenever enable conditions are met	В
	Code	P0420 Detects insufficient conversion rate in oxidation catalyst. Actual conversion rate is compared to a conversion rate threshold as an indication of how much HC is converted in the	P0420 Detects insufficient conversion rate in oxidation catalyst. Actual conversion rate is compared to a conversion rate threshold as an indication of how much HC is converted in the	P0420 Detects insufficient conversion rate is compared to a conversion rate threshold as an indication of how much HC is converted in the	P0420 Detects insufficient conversion rate in oxidation catalyst. Actual conversion rate the oxidation catalyst. Actual conversion rate the oxidation catalyst. P1420 Detects insufficient conversion rate in oxidation catalyst. Actual conversion rate the oxidation catalyst. Actual conversion rate the oxidation catalyst. Actual conversion rate in oxidation catalyst. Actual conversion rate in oxidation catalyst. Actual conversion rate in oxidation catalyst. Actual conversion rate in oxidation catalyst. Actual conversion rate in oxidation catalyst. Actual conversion rate in oxidation catalyst. Actual conversion rate in oxidation catalyst. Actual conversion rate in oxidation catalyst. Actual conversion rate in oxidation catalyst. Actual conversion rate in oxidation catalyst. Actual conversion rate in oxidation catalyst. Actual conversion rate in oxidation catalyst. Actual conversion rate in oxidation catalyst. Actual conversion rate in oxidation catalyst. Actual conversion rate in oxidation catalyst. Actual conversion rate in oxidation catalyst. Actual conversion rate in oxidation catalyst.	P0420 Detects instiffcient conversion rate in oxidation catalyst. Actual conversion rate the oxidation catalyst. Actual conversion rate in oxidation catalyst. In the oxidation catalyst since monitor start and an oxidation catalyst. In the oxidation catalyst since monitor start and and and and and and and and and and	Code Description Criteria Logic and Value Parameters Conditions	Colde Description Criteria Logic and Value Parameters Conditions	Parameters Par

Description	Criteria	Logic and Value	regeneration was not aborted to assure that HC conversion was not disturbed and evaluation took place one time step before (to ensure P0420 has not already completed)) and there has been sufficient HC integrated in order to evaluate the monitor conversion efficiency.	= =	Conditions TRUE FALSE TRUE	-	Required	Illum.
			assure that HC conversion was not disturbed and evaluation took place one time step before (to ensure P0420 has not already completed)) and there has been sufficient HC integrated in order to evaluate the monitor	=	FALSE			
) and there has been sufficient HC integrated in order to evaluate the monitor	=	TRUE	-		
			means					
			(set condition particulate filter regeneration and measured temperature upstream of	= >	TRUE 249.96	- °C		
			the oxidation catalyst and (engine speed	>	700.00	rpm		
			and engine speed)	<	3400.00	rpm		
			and diagnostic performed in current dc and	=	FALSE	-		
			reset condition which becomes False under following conditions	=	FALSE	-		
			converted HC mass in the oxidation catalyst during monitoring or	<	115.00	g		
			or regeneration was not aborted to assure that HC conversion was	=	FALSE TRUE	-		
			and NO Pending or Confirmed DTCs:	=	see sheet inhibit tables	-		
			and basic enable conditions met:	=	see sheet enable tables	-		
				which becomes False under following conditions (converted HC mass in the oxidation catalyst during monitoring or particulate filter regeneration or regeneration was not aborted to assure that HC conversion was disturbed and NO Pending or Confirmed DTCs:) and	which becomes False under following conditions (converted HC mass in the oxidation catalyst during monitoring or particulate filter regeneration or regeneration was not aborted to assure that HC conversion was disturbed and NO Pending or Confirmed DTCs: No Pending or Confirmed DTCs: =	which becomes False under following conditions (which becomes False under following conditions (which becomes False under following conditions (

Component /	Fault	Monitor Strategy	Primary Malfunction		Threshold		Secondary		Enable		Time	MIL
System	Code	Description	Criteria		Logic and Value		Parameters		Conditions		Required	Illum.
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)	>=	100.00	miles	Engine Running (see parameter definition)	=	TRUE	-	fail conditions exists for 0.02 s monitor runs 0.02 s rate	В
			with (a) total vehicle distance and with (b) saved value of total vehicle	=	measured parameter calculated	-	for time and External fuel pump control request from	>=	60.00 FALSE	sec	whenever enable conditions are met	
			distance at start of test	=	parameter	-	GM specific diagnosis tester commanded and	=	FALSE	-		
			and (c) - (d) with	<	4.00	L	fuel transfer pump active means (=	FALSE	-		
			(c) maximum volume of fuel reached in primary tank during test and with	=	measured parameter	-	filtered fuel volume in primary tank or	>=	1638.35			
		(c) minimum volume of fuel reached in primary tank during test	=	measured parameter	-	filtered fuel volume in secondary tank	<=	0.00	1			
						cumulative transfer pump on time in current ignition cycle or time between activations of transfer	>=	0.00 32767.00	sec			
						pump or fuel transfer pump installed	=	FALSE	sec			
) and	_	TALOL	-			
						tuel level zone 1 means	=	TRUE	-			
						filtered fuel volume in primary tank and	>=	110.70	I			
						filtered fuel volume in secondary tank) or	>=	0.00	I			
						fuel level zone 3 means	=	TRUE	-			
						filtered fuel volume in primary tank	<	110.70	1			
						filtered fuel volume in secondary tank) or	>	0.00	ı			
							fuel level zone 4 means (=	TRUE	-		
							filtered fuel volume in primary tank and	<	110.70	I		

Component /	Fault	Monitor Strategy	Primary Malfunction		Threshold		Secondary		Enable		Time	MIL
System	Code	Description	Criteria	Lo	ogic and Va	lue	Parameters filtered fuel volume in secondary tank)	<=	0.00	I	Required	Illum.
							or fuel level zone 5 means	=	TRUE	-		
							filtered fuel volume in primary tank and	<	110.70	1		
							filtered fuel volume in secondary tank	>	0.00	I		
							and basic enable conditions met:	=	see sheet enable tables	-		
							and NO Pending or Confirmed DTCs:	=	see sheet inhibit tables	-		
Fuel Level Sensor 1 Circuit Low	P0462	Detects low voltage readings in the fuel level	voltage of fuel level sensor 1	<	0.20	V	ignition on	=	TRUE	-	fail conditions	В
		sensor circuit, indicating an OOR low condition on the fuel level sensor circuit	same as	>	123.2	ı	and basic enable conditions met:	=	see sheet enable	_	exists for 24 s test performed continuously	
					.20.2	·			tables		0.1 s rate	
Fuel Level Sensor 1 Circuit High	P0463	Detects high voltage readings in the fuel level sensor circuit, indicating an OOR high condition on the	voltage of fuel level sensor 1	>	4.80	V	ignition on	=	TRUE	-	fail conditions exists for 24 s	В
		fuel level sensor circuit	same as fuel level	<	0	1	and basic enable conditions met:	=	see sheet enable tables	-	test performed continuously	
									tables		0.1 s rate	
Exhaust Gas Recirculation (EGR) Position Sensor	P046C		controller deviation of EGR valve calculated out of difference between desired and actual value	>=	5.00	%	offset learning of EGR actuator active	=	FALSE	-	fail conditions exists for 8 s monitor runs	В
Performance			or				and				with 0.02 s rate	

Component /	Fault Code	Monitor Strategy	Primary Malfunction Criteria		Threshold		Secondary		Enable Conditions		Time	MIL
System	Code	Description	controller deviation of EGR valve calculated out of difference between	<=	-5.00	<u>ue</u> %	Parameters offset learning in the previous driving cycle was complete	=	TRUE	-	Required whenever enable	Illum.
			desired and actual value				and Engine Running (see parameter definition) and	=	TRUE	-	conditions are met	
							duty cycle of the Intake Air Heater output	<	5.00	%		
							and battery voltage and	>=	11.00	٧		
							EGR Valve	=	ACTIVE	-		
							EGR Valve Jammed and NO Pending or Confirmed DTCs:	=	FALSE see sheet inhibit	-		
							and		tables			
							basic enable conditions met:		see sheet enable tables	-		
					_				_			
Cooling Fan Speed Output Circuit	P0480	Diagnoses the Cooling Fan low side driver circuit for circuit faults.	Voltage low during driver off state (indicates short-to-ground)	=	Short to ground ≤ 0.5 Ω impedance between signa and controller ground		battery voltage	>	11.00	V	fail conditions exists for 3 s test performed continuously 0.02 s rate	В
			or Voltage low during driver off state (indicates open circuit)	=	Open Circuit:≥ 200 K Ω impedance between ECU pin and load	-	for time	>	3.00	sec	0.02 S Tale	
							and starter is active cranking for	=	FALSE	-		
							time and	>	3.00	sec		
							ignition on and	=	TRUE	-		
							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.
		Diagnoses the Cooling Fan low side driver circuit for circuit faults.	Voltage high during driver on state (indicates short to power)	=	Short to power: ≤ 0.5 Ω impedance between signal and controller power	-	battery voltage	>	11.00	V	fail conditions exists for 1 s test performed continuously 0.02 s rate	
							for time and	>	3.00	sec		
							starter is active cranking for	=	FALSE	-		
							time and	>	3.00	sec		
							ignition on and basic enable conditions met:	=	TRUE see sheet enable	-		
									tables			
Cooling Fan System Performance	P0483	Detects inability to control fan speed to desired RPM	fan speed difference between actual and commanded value	<=	-500.00	rpm	PWM of fan driver output	>=	36.01	%	fail conditions exists for	В
			or fan speed difference between actual and commanded value	>=	500.00	rpm	and Commanded fan speed and	>=	0.00	rpm	120 s monitor runs with 0.1 s	
			of fan speed difference between actual and commanded value, unfiltered or fan speed difference between actual and	<= >=	-500.00 500.00	rpm	fan speed and	<	5320.00	rpm	rate whenever enable conditions are met	
			commanded value, unfiltered				fan speed	>	400.00	rpm		
) and					
							engine coolant temperature and	>	69.96	°C		
							fan drive speed rate of change and	<	2000.00	rpm		
							fan speed weight factor calculated out of ((a) * (b) * (c) * (d) with	^	0.59	factor		
							(a) factor based on input shaft stability (see Look-Up-Table #33)	=	0 to 1	factor		
							and with (b) factor based on intake air temperature (see Look-Up-Table #35)	=	0 to 1	factor		
							and with (c) factor based on engine coolant temperature (see Look-Up-Table #34)	=	0 to 1	factor		

Component / System	Fault Code	Monitor Strategy Description	Primary Malfunction Criteria	Threshold Logic and Value	Secondary Parameters		Enable Conditions		Time Required	MIL Illum.
					and with (d) factor based on fan drive speed (see Look-Up-Table #32)) and basic enable conditions met:	=	0 to 1 see sheet enable tables	factor		
Exhaust Gas Recirculation (EGR) Motor Control Circuit 1 Low Voltage	P0489	Diagnoses the EGR Valve low side driver circuit for circuit faults.	Voltage low during driver off state (indicates short-to-ground)	= Short to ground: -	and battery voltage for time and starter is active cranking for time and basic enable conditions met:	= > >	ACTIVE 11.00 3.00 FALSE 3.00 see sheet enable tables	V sec - sec -	fail conditions exists for 3 s monitor runs with 0.005 s rate whenever enable conditions are met	В
Exhaust Gas Recirculation (EGR) Motor Control Circuit 1 High Voltage	P0490	Diagnoses the EGR Valve low side driver circuit for circuit faults.	Voltage high during driver on state (indicates short to power)	= Short to power: ≤ 0.5 Ω impedance between signal and controller power	and battery voltage for time and	> >	11.00 3.00	V	fail conditions exists for 3 s monitor runs with 0.005 s rate whenever enable conditions are met	В
					starter is active cranking for time and basic enable conditions met:	>	FALSE 3.00 see sheet enable	sec		

Component / System	Fault Code	Monitor Strategy Description	Primary Malfunction Criteria		Threshold Logic and Value	e	Secondary Parameters		Enable Conditions		Time Required	MIL Illum.
Cooling Fan Speed High	P0495	Detects a locked fan. When fan speed control solenoid is off, the fan speed should follow accessory drive input speed plus some slip.	fan speed (see Look-Up-Table #36)	>	400 to 1500	rpm	fluid volume in Clutch (see Look-Up- Table #37)	<	0.005 to 0.0115	ı	fail conditions exists for 0.02 s monitor runs with 0.1 s	В
			for Error counter equivalent to 80 sec	>=	800.00	counts	or Maximum allowed clutch pump out time when	>=	600 to 65534	sec	rate whenever enable conditions are met	
			·				fan speed and (>	1500.00	rpm		
							PWM of fan driver output and	<=	36.00	%		
							Commanded fan speed) and	<	600.00	rpm		
							ambient pressure and intake air temperature	>	55.00 -40.04	kPa °C		
							and time since engine off	>	0.00	sec		
							and (engine speed (see Look-Up-Table #91)	>	600 to 850	rpm		
							for time) }	>	0.00	sec		
							and basic enable conditions met:	=	see sheet enable tables	-		
5 t 0	20102								TOUE			
Exhaust Gas Recirculation (EGR) Control Position Not Learned	P049D	Detects adaptation values of EGR bypass that are not plausible. Compares the difference between the maximum and minimum adaptation values to a threshold.	Path 1:				offset learning is active	=	TRUE	-	fail conditions exists for 0.005 s monitor runs with 0.005 s rate	В
		a solioid.	(a) - (b) with	>	30.00	%	active under following conditions				whenever enable	
			(a) maximum learned offset value for EGR valve and with	=	measured parameter	-	engine coolant temperature	>=	5.06	°C	conditions are met	
			(b) minimum learned offset value for EGR valve or	=	measured parameter	-	engine coolant temperature	<=	123.06	°C		

Component /	Fault	Monitor Strategy	Primary Malfunction		Threshold		Secondary		Enable		Time	MI
System	Code	Description	Criteria		Logic and Value		Parameters		Conditions		Required	IIIu
			Path 2:				and					
			learned offset value for EGR valve in the present driving cycle	>	23.33	%	battery voltage	>=	10.00	V		
			or learned offset value for EGR valve in the present driving cycle	<	-23.33	%	and battery voltage	<=	30.00	V		
)) and EGR sweep has ended - no movement in EGR valve	=	TRUE	-		
							and engine post drive/ afterun and	=	TRUE	-		
							engine was running during last driving cycle	=	TRUE	-		
							means engine running during last driving cycle and	=	TRUE	-		
							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 valve.	Path 1:				Path 1:				fail conditions exists for	
			EGR valve stuck during opening means	=	TRUE	-	EGR valve is opening or	=	TRUE	-	0.005 s monitor runs	
			((a) + (b) with	>=	20.01	%	Path 2: EGR valve is closing and	=	TRUE	-	with 0.005 s rate whenever	
			(a) position of EGR valve	=	measured parameter	-	engine post drive/ afterun	=	TRUE	-	enable conditions	
			and with (b) learned offset value of EGR valve in the previous driving cycle or	=	measured parameter	-	and offset learning active	=	TRUE	-	are met	
			(a) - (c)	<=	0.01	%	basic enable conditions met:	=	see sheet enable tables	-		
			with (a) position of EGR valve	=	measured parameter	-						
			1	1		_						
			and with (c) position of EGR valve of previous process cycle	=	measured parameter							
			(c) position of EGR valve of previous	= >		sec						

Component / System	Fault Code	Monitor Strategy Description	Primary Malfunction Criteria		Threshold Logic and Value		Secondary Parameters		Enable Conditions		Time Required	MIL Illum.
			EGR valve stuck during closing means	=	TRUE	-						
			position of EGR valve with	<=	(a) * (b)	-						
			(a) reference position of the EGR valve in open position and with	=	measured parameter	-						
			(b) factor for EGR valve close position	=	0.50	-						
			or (c) - (d) with	>	0.02	%						
			(c) position of EGR valve and with	=	measured parameter	-						
			(d) position of EGR valve of previous process cycle	=	measured parameter	-						
			for time	>	5.00	sec						
	_				_				_	-		
Idle Speed Too Low	P0506	Detects an idle speed governor that is unable to achieve the desired idle speed and the idle speed is too low	engine speed	<	maximum value of (a) OR (b - (b * c))		engine speed (see Look-Up-Table #91)	>=	600 to 850	rpm	fail conditions exists for 20 s monitor runs	В
		too low	with		200.00		and				with 0.1 s	
			(a) minimum engine speed and with (b) minimum idle speed setpoint	=	300.00 calculated	rpm -	engine coolant temperature and	<	122.96	°C	rate whenever enable	
			and with (c) factor for calculation of engine speed interval	=	parameter 24.00	%	engine coolant temperature)	>	-7.04	°C	conditions are met	
			speed interval				and idle speed controller active and	=	TRUE	-		
							vehicle speed and	<	1.86	mph		
							no other torque demanding function active and	=	TRUE	-		
							setpoint torque of the speed controller	>	0	NM		
							and engine speed	>	300.00	rpm		
							and basic enable conditions met:	=	see sheet enable tables	-		
							and NO Pending or Confirmed DTCs:	=	see sheet inhibit tables	-		

Component / System	Fault Code	Monitor Strategy Description	Primary Malfunction Criteria		Threshold Logic and Value		Secondary Parameters		Enable Conditions		Time Required	MIL Illum.
Idle Speed Too High	P0507	Detects an idle speed governor that is unable to achieve the desired idle speed and the idle speed is	engine speed	>	minimum value of (a) OR (b + (b * c))		engine speed (see Look-Up-Table #91)	>=	600 to 850	rpm	fail conditions exists for 20	В
		too high.	with (a) maximum engine speed and with (b) minimum idle speed setpoint and with (c) factor for calculation of engine	= =	2500.00 calculated parameter 24.00	rpm - %	and (engine coolant temperature and engine coolant temperature)	< >	122.96 -7.04	°C	monitor runs with 0.1 s rate whenever enable conditions are met	
			speed interval				and idle speed controller active and	=	TRUE	-		
							vehicle speed and no other torque demanding function active	< =	1.86 TRUE	mph -		
							active and setpoint torque of the speed controller and	>	0	NM		
							engine speed and basic enable conditions met:	> =	300.00 see sheet enable	rpm -		
							and NO Pending or Confirmed DTCs:	=	tables see sheet inhibit tables	-		
Cooling Fan Speed Sensor Circuit	P0526	This diagnostic checks the circuit for electrical integrity during operation.	Path 1: period is too long to measure and	>	0.21	sec	engine speed and {	>	550.00	rpm	fail conditions exists for 3 s monitor runs with 0.020 s rate	В
			current state of the signal received from fan is low	=	TRUE	-	PWM of fan driver output	>=	36.00	%	whenever enable conditions	
			or				Commanded fan speed) for	>=	0.00	rpm	are met	
			Path 2: period is too long to measure and	>	0.21	sec	time or vehicle speed	>	30.00 203.65	sec mph		
			(current state of the signal received from fan is high	=	TRUE	-	for time	>	327.67	sec		
			'				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: and NO Pending or Confirmed DTCs:	=	see sheet enable tables see sheet inhibit tables	-		
Exhaust Gas Temperature (EGT) Sensor 1 Circuit Low Voltage	P0545	Detects low voltage readings on the EGT 1 circuit, indicating an OOR low condition on the EGT circuit	voltage of the temperature sensor upstream of oxidation catalyst same as temperature upstream of oxidation catalyst	< 0.65 V	NO Pending or Confirmed DTCs: for time and ignition on and basic enable conditions met:	> =	see sheet inhibit tables 0.00 TRUE see sheet enable tables	sec	fail conditions exists for 3 s monitor runs 0.050 s rate whenever enable conditions are met	В
Exhaust Gas Temperature (EGT) Sensor 1 Circuit High Voltage	P0546	Detects high voltage readings on the EGT 1 circuit, indicating an OOR high condition on the EGT 1 circuit	voltage of the temperature sensor upstream of oxidation catalyst same as temperature upstream of oxidation catalyst	> 2.21 V > 1000 °C	NO Pending or Confirmed DTCs: for time and ignition on and basic enable conditions met:	> =	see sheet inhibit tables 0.00 TRUE see sheet enable tables	sec	fail conditions exists for 3 s monitor runs 0.050 s rate whenever enable conditions are met	В
Idle Control System - Fuel Quantity Lower Than Expected	P054E	Quantity Threshold - Fuel Quantity Lower Than Expected	Current injection quantity	< minimum mm^3/i expected v injection quantity (map) * factor for calculating the minimum threshold out of the reference map	e Current gear	=	unchanged		fail conditions exists for 15 s monitor runs 0.10 s rate whenever enable conditions are met	В

Component / System	Fault Code	Monitor Strategy Description	Primary Malfunction Criteria		Threshold Logic and Value	е	Secondary Parameters		Enable Conditions		Time Required	MIL Illum.
			with Current gear and minimum expected injection quantity (see Look-Up-Table #96)	<> =	Neutral 44 to 148	- mm^3/re v	and Vehicle speed and Particulate filter regeneration	<= =	1.86 not active	mph -		
			and factor for calculating the minimum threshold out of the reference map	=	0.50	factor	and Engine speed and	<=	1040.00	rpm		
							Engine speed and Engine coolant temperature	>=	476.00 -20.04	rpm °C		
							and Idle speed controller all for time)	= >	active 5.00	- sec		
							and Fluctuation range of engine speed and	<	16383.50	rpm		
							Basic enable conditions met	=	see sheet enable tables	-		
Idle Control System - Fuel Quantity Higher Than Expected	P054F	Quantity Threshold - Fuel Quantity Higher Than Expected					((fail conditions exists for 15 s	В
·			Current injection quantity	<	maximum expected injection quantity (map) * factor for	V	Current gear	=	unchanged	-	monitor runs 0.10 s rate whenever enable conditions are met	
			with		calculating the maximum threshold out of the reference map		and					
			Current gear and	<>	Neutral	-	Vehicle speed and	<=	1.86	mph		
			maximum expected injection quantity (see Look-Up-Table #50) and	=	126.8 to 230.8	mm^3/re v	Particulate filter regeneration and	=	not active	-		
			factor for calculating the maximum threshold out of the reference map	=	1.50	factor	Engine speed	<=	1040.00	rpm		
)				and Engine speed and	>=	476.00	rpm		l
							Engine coolant temperature and	>	-20.04	°C		l
							Idle speed controller all for time	>	active 5.00	sec		

Component / System	Fault Code	Monitor Strategy Description	Primary Malfunction Criteria	Threshold Logic and Value	Secondary Parameters	Enable Conditions		Time Required	MIL Illum.
					and Fluctuation range of engine speed and Basic enable conditions met	< 16383.50 = see sheet enable tables	rpm -		
Cruise Control Resume Switch Circuit	P0567	Resume switch state indicates problem with the circuit	Resume Switch CAN message in high / active state	= TRUE -	ignition on and input circuit active and basic enable conditions met and NO Pending or Confirmed DTCs:	= TRUE = TRUE = see sheet enable tables = see sheet inhibit tables	- -	fail conditions exists for 90 s monitor runs with 0.005 s rate whenever enable conditions are met	Special C
Cruise Control Set Switch Circuit	P0568	Set switch state indicates problem with the circuit	Set Switch CAN message in high / active state	= TRUE -	ignition on and input circuit active and basic enable conditions met and NO Pending or Confirmed DTCs:	= TRUE = TRUE = see sheet enable tables = see sheet inhibit tables	-	fail conditions exists for 90 s monitor runs with 0.005 s rate whenever enable conditions are met	Special C
Cruise Control Input Circuit	P0575	Cruise control CAN communication monitoring	amount of errors in consecutive frames with number of consecutive frames	>= 3.00 counts = 10.00 counts	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 ms 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	e	Secondary Parameters		Enable Conditions		Time Required	MIL Illum.
System Brake Pedal Position Sensor "A" Circuit Range/Performanc e	Code P057B	Description		<= = =	neasured parameter measured parameter 0 to 1	factor V V factor	Parameters following conditions for time: (ignition on and starter is active cranking for time and battery voltage for	> = =	TRUE FALSE 3.00 11.00	sec - sec V	Required monitor runs 0.02 s rate whenever enable conditions are met	Illum. A
							time) and gear has been in Park during this driving cycle full test has not been completed this driving cycle gear selector currently not in Park vehicle speed accelerator pedal position 1 and No Pending or Confirmed DTCs: and basic enable conditions met:	\	3.00 TRUE TRUE TRUE 4.35 5.00 see sheet inhibit tables see sheet enable tables	sec mph % -		
Brake Pedal Position Sensor - Circuit Low Voltage	P057C	Brake pedal voltage below threshold of a calibrated period of time	Brake pedal position sensor voltage	<	0.25	V	ignition on and No Pending or Confirmed DTCs: and basic enable conditions met:	= =	TRUE see sheet inhibit tables see sheet enable tables	-	fail conditions exists for 0.5 s monitor runs 0.01 s rate whenever enable conditions are met	A

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 High Voltage	P057D		Brake pedal position sensor voltage	>	4.75	ignition on and No Pending or Confirmed DTCs: and basic enable conditions met:	= =	TRUE see sheet inhibit tables see sheet enable tables	-	fail conditions exists for 0.5 s monitor runs 0.01 s rate whenever enable conditions are met	A
ROM Memory Fault	P0601	Detects a fault in the ROM memory	ECM detects multiple errors in the ROM- memory by comparing a calculated checksum with a check word	=	TRUE	engine post drive/ afterun	=	TRUE		fail conditions exists for 0.01 s test performed once per drive cycle during afterrun	А
Control Module Not Programmed	P0602	Detects if the ECM is programmed.	ECM not programmed	=	TRUE	ignition on and engine pre drive	-	TRUE		fail conditions exists for 0.01 s test performed test performed once per driving cycle during ECU initialization	A

Component /	Fault	Monitor Strategy	Primary Malfunction		Threshold		Secondary		Enable		Time	N
System	Code	Description	Criteria		ogic and Valu		Parameters		Conditions		Required	III
Control Module Internal Performance	improper operation of the	SPI communication, data transfer lost	=	TRUE	-	ignition on	=	TRUE	-	fail conditions exists for 0.5 s test performed continuously with 0.01 s rate	•	
							and basic enable conditions met:	=	see sheet enable conditions	-		
			faults detected in the SPI communication	>	523.00	counts	ignition on and NO Pending or Confirmed DTCs:	=	TRUE see sheet inhibit tables		fail conditions exists for at least 0.64 s monitor runs once per trip during pre drive at least twice every 0.08s rate whenever enable	
						.,					4.11	1
			internal supply voltage or	<	4.2	V	ignition on and	=	TRUE	-	fail conditions	1
			ui internal supply voltage	>	5.25	V	counter of reactivation attempt of power output stage and NO Pending or Confirmed DTCs:	>=	2.00 see sheet inhibit tables	counts -	exists for 0.08s monitor runs once per trip during pre drive at least twice every 0.08s rate whenever	
			(a) - (b)	>	50.00	us	programmed energizing time for fuel	=	TRUE	-	fail	i
			with				injection has been read back means			-	conditions exists for at	ı
			(a) parallel redundant calculation of energizing time for fuel injection and with	=	measured parameter	-	programmed energizing time for fuel injection and	>=	0	-	least 0.05 s monitor runs with 0.01 s	ı

Component / System	Fault Code	Monitor Strategy Description	Primary Malfunction Criteria		Threshold Logic and Valu	ıe	Secondary Parameters		Enable Conditions		Time Required	MIL Illur
,		·	(b) parallel redundant calculation of programmed energizing time for fuel injection	=	measured parameter	-	measured energizing time for fuel injection has been read back	=	TRUE	-	rate whenever enable	
							means measured energizing time for fuel injection	>=	0	-	conditions are met	
							and engine speed and	>	1200.00	rpm		
							rail pressure and	>	20000.00	kPa		
							engine test active via diagnosis tester	=	FALSE	-		
			Path 1:				engine speed	>	1200.00	rpm	fail	
			(parallel redundant calculation of angle for pilot injection 1 quantity	<	-32.98	degrees	and engine test active via diagnosis tester	=	FALSE	-	conditions exists for at least 0.05 s monitor runs	
			or parallel redundant calculation of angle for pilot injection 1 quantity) or Path 2:	>	102.99	degrees					with 0.01 s rate whenever enable conditions are met	
			(parallel redundant calculation of angle for main injection quantity	<	-32.98	degrees					are met	
			or parallel redundant calculation of angle for main injection quantity	>	30.06	degrees						
			or Path 3 :									
			parallel redundant calculation of angle for post injection quantity 1 or	<	-360.00	degrees						
			parallel redundant calculation of angle for post injection quantity 1) or	>	-67.00	degrees						
			Path 4:									
			parallel redundant calculation of angle for post injection quantity 2 or	<	-83.00	degrees						
			parallel redundant calculation of angle for post injection quantity 2) or	>	30.06	degrees						
			Path 5:									

Component / System	Fault Code	Monitor Strategy Description	Primary Malfunction Criteria		Threshold Logic and Valu	ie	Secondary Parameters		Enable Conditions		Time Required	MIL Illum
			parallel redundant calculation of angle for post injection quantity 3 or parallel redundant calculation of angle for post injection quantity 3	>	-83.00 0.00	degrees						
			parallel redundant calculation of energizing these of the correction value	<	-500 to -50	us	redundant engine speed calculation and	>=	1200.00	rpm	fail conditions exists for at least 0.2 s	
			for pilot injection quantity (see Look-Up-Table #56) or parallel redundant calculation of energizing times of the correction value for pilot injection quantity (see Look-Up-Table #55))	>	50 to 500	us	engine test active via diagnosis tester	=	FALSE	-	monitor runs with 0.04 s rate whenever enable conditions are met	
			parallel redundant calculation of post injection 2 quantity	>	130.00	mm^3	engine test active via diagnosis tester and change in injection operation mode requested	=	FALSE TRUE		fail conditions exists for at least 0.4 s monitor runs with 0.04 s rate whenever enable conditions are met	
			parallel redundant calculation of averaged torque creating energizing time per cylinder (see Look-Up-Table #58) and activation counter (intervention) of the surge damper	>=	200 to 6000 72.00	us	fuel system is in fuel cut off for time	= >	TRUE	- sec	fail conditions exists for at least 0.8 s monitor runs with 0.04 s rate	
			suige udilipei				and redundant engine speed calculation and general engine speed demand (see parameter definition line #213) and	> =	2040.00 FALSE	rpm -	whenever enable conditions	

Component / System	Fault Code	Monitor Strategy Description	Primary Malfunction Criteria	L	Threshold ogic and Val	ue	Secondary Parameters		Enable Conditions		Time Required	MI IIIu
		2000		_			external torque demand from stability ECU via CAN	=	FALSE	-		
							and external torque demand from transmission ECU via CAN and	=	FALSE	-		
							((cruise control active or	=	FALSE	-		
							(brake pedal status or	=	TRUE	-		
							redundant brake pedal status	=	TRUE	-		
							for time	>	0.28	sec		
							and (
							pedal position or	=	0	%		
							redundant calculation of pedal position for time	= >	0 0.02	% sec		
							and					
							redundant engine speed calculation after start detected	>	120.00	rpm		
							and redundant engine speed calculation at start (see Look-Up-Table #57)	>	840 to 1080	rpm		
							and engine test active via diagnosis tester	=	FALSE	-		
			parallel redundant calculation of	>=	5.00	mm^3	redundant engine speed calculation	>=	1200.00	rpm	fail	
			averaged wave correction quantity for pilot injection or							.,	conditions exists for at	
			parallel redundant calculation of averaged wave correction quantity for main injection	>=	5.00	mm^3	and engine test is active via diagnosis tester	=	FALSE	-	least 0.2 s monitor runs with 0.04 s rate	
			or parallel redundant calculation of averaged wave correction quantity for post injection 2	>=	5.00	mm^3					whenever enable conditions are met	
			or parallel redundant calculation of averaged wave correction quantity for post injection 3	>=	5.00	mm^3						

Component /	Fault	Monitor Strategy	Primary Malfunction		Threshold		Secondary		Enable		Time	
System	Code	Description	Criteria		Logic and Value		Parameters (Conditions		Required	H
			substitute value of rail pressure	<=	16000.00	kPa	parallel redundant calculation of voltage	<	0.19	V	fail conditions exists for 0.120 s monitor runs	
			or substitute value of rail pressure		204000.00	kPa	of rail pressure sensor or parallel redundant calculation of voltage		4.94	V	with 0.01 s rate	
			substitute value of rail pressure	>=	204000.00	кра	of rail pressure sensor) and	>	4.81		whenever enable conditions are met	
							delay time and	>	0.21	sec		
							parallel redundant calculation of injections active and	=	TRUE	-		
							redundant engine speed calculation and	>	1000.00	rpm		
							engine test active via diagnosis tester and	=	FALSE	-		
							level one signal range check detects fault	=	TRUE	-		
			internal supply voltage or internal supply voltage	>	4.2 5.25	V	ignition on	=	TRUE		fail conditions exists for 0.05 s test performed continuously with 0.01 s rate	
			WDA (watch dog) shut off due to undervoltage	=	TRUE		shut off path test active	-	FALSE		fail conditions	
			means internal supply voltage	<	4.2	V	and battery voltage	>	8.00	V	exists for 0.01 s	
							for time	>	0.10	sec	monitor runs with 0.01 s	
							and WDA (watch dog) line active	=	TRUE	-	rate whenever enable conditions	
			WDA (watch dog) shut off due to	=	TRUE		shut off path test active	=	FALSE	-	fail	
			overvoltage								conditions exists for	

Component / System	Fault Code	Monitor Strategy Description	Primary Malfunction Criteria		Threshold Logic and Value		Secondary Parameters		Enable Conditions	Time Require	
			internal supply voltage	>	5.25	V	WDA (watch dog) line active	=	TRUE	- 0.01 s monitor ri with 0.01 rate wheneving enable condition	uns s er
			WDA (watch dog) shut off due to internal security error	=	TRUE	-	shut off path test active and WDA (watch dog) line active	=	FALSE TRUE	- fail condition exists from the condition exists from the condition of the condition exists and	or uns s er
			WDA (watch dog) shut off because of corrupt question-and-answer	=	TRUE	-	ignition on and WDA (watch dog) line active and shut off path test active	= =	TRUE TRUE FALSE	- fail condition exists from the condition exists from the condition rate whenev enable condition are me	or uns s er
			the actual response time from processor is not equal to the requested response-time	П	TRUE		ignition on and NO Pending or Confirmed DTCs:	=	TRUE see sheet inhibit tables	- fail condition exists for more than 0.08 s monitor mat leas twice every 0.08 s rewherever enable condition	or an uns t ery te

Component / System	Fault Code	Monitor Strategy Description	Primary Malfunction Criteria		Threshold Logic and Value		Secondary Parameters		Enable Conditions		Time Required	M IIIu
			redundant, independent algorithm for plausibility fault of accelerator pedal signal for safety reasons:								conditions exists for	
			Path 1:				ignition on	=	TRUE	-	0.28 s monitor runs with 0.04 s	
			(maximum (a) (b)) - 2 * (maximum (c) (b))	>	0.29	V	and				rate whenever	
			with (a) voltage accelerator pedal 1	=	measured	-	engine test active via diagnosis tester and	=	FALSE	-	enable	
			and with		parameter 0.80	V	Input signal fault present and	=	FALSE	-		
			(b) lower limit for accelerator pedal voltage and with	=	0.00	V	ADC fault present	=	FALSE	_		
			(c) voltage accelerator pedal 2	=	measured parameter	-	Abo laut present		TALOL			
			and (4 47							
			voltage accelerator pedal 1 or voltage accelerator pedal 2	>	1.47 1.47	V						
) or		1.47	v						
			Path 2: (maximum (a) (b)) - 2 * (maximum (c) (b))	>	0.41	V						
			with (a) voltage accelerator pedal 1	=	measured parameter	-						
			and with (b) lower limit for accelerator pedal voltage	=	0.80	٧						
			and with (c) voltage accelerator pedal 2	=	measured parameter	-						
			and (4.47							
			voltage accelerator pedal 1 or voltage accelerator pedal 2	<=	1.47 1.47	V						
)	\= 	1.47	V						
			no response to an injection request	=	TRUE		ignition on	=	TRUE		fail	
			processor internal				and NO Pending or Confirmed DTCs:	=	see sheet inhibit	-	conditions exists for more than 0.08 s	
									tables		monitor runs at least twice every	
											0.08 s rate	

Component / System	Fault Code	Monitor Strategy Description	Primary Malfunction Criteria	Threshold Logic and Value	Secondary Parameters	Enable Conditions	Time Mineral IIIu
							enable
			no response to shut-off path test processor internal	= TRUE -	ignition on and NO Pending or Confirmed DTCs:	= TRUE - = see sheet inhibit - tables	conditions
			no response to hardware activation request processor internal	= TRUE -	ignition on and NO Pending or Confirmed DTCs:	= TRUE - = see sheet inhibit - tables	conditions exists for more than 0.437 monitor runs at least twice every 0.08 s rate whenever enable conditions
			no response from processor operative system processor internal	= TRUE -	ignition on and NO Pending or Confirmed DTCs:	= TRUE - = see sheet inhibit tables	fail conditions exists for more than 0.08 s monitor runs at least twice every 0.08 s rate whenever enable conditions are met
			Path 1:		ignition on	= TRUE -	conditions
			repetitions of injection shut-off path test	>= 523.00 counts	s and		exists for more than 0.64 s

Component / System	Fault Code	Monitor Strategy Description	Primary Malfunction Criteria		Threshold Logic and Val		Secondary Parameters		Enable Conditions	Time Required	MIL Illun
System	Code	Description	or Path 2: (number of a powerstage test too few and number of cylinders)	< >=	2.00 8.00	counts	injection shut-off path test	=	ACTIVE	- monitor runs at least twice every 0.08 s rate whenever enable conditions are met	mun
			prevention of the execution of the shut-off path test	=	TRUE	·	ignition on and injection shut-off path test	=	TRUE ACTIVE	- fail conditions exists for 0.08 s monitor runs at least twice every 0.08 s rate whenever enable conditions are met	
			too few bytes received by monitoring module from CPU means bytes received by monitoring module from CPU as response	= <	TRUE	- Bytes	ignition on	=	TRUE	- fail conditions exists for more than 0.4 s monitor runs at least twice every 0.08 s rate whenever enable conditions are met	
			ECM detects interruption in the SPI communication processor internal	=	TRUE		ignition on	=	TRUE	- fail conditions exists for more than 0.08 s monitor runs at least twice every 0.08 s rate whenever enable conditions are met	

Component / System	Fault Code	Monitor Strategy Description	Primary Malfunction Criteria	Lo	Threshold ogic and Value	е	Secondary Parameters		Enable Conditions		Time Required
			ECM detects plausibility error of the communication between controller and the monitoring module (2 processors in ECU) processor internal	=	TRUE		ignition on	=	TRUE	-	fail conditions exists for more than 0.2 s monitor runs at least twice every 0.08 s rate whenever enable conditions are met
			redundant filtered supply voltage to injector chip 1 or redundant filtered supply voltage to injector chip 1	>	3.10	V	ignition on and battery voltage and basic enable conditions met:	> =	TRUE 8.00 see sheet enable tables	- V -	fail conditions exists for 0.5 s monitor runs with 0.01 s rate whenever enable conditions are met
			redundant filtered supply voltage to injector chip 2 or redundant filtered supply voltage to injector chip 2	>	3.10	V	ignition on and battery voltage and basic enable conditions met:	> =	TRUE 8.00 see sheet enable tables	- V -	fail conditions exists for 0.5 s monitor runs with 0.01 s rate whenever enable conditions are met
			internal injector driver chip 1 error IC internal	=	TRUE		Engine Running and	=	TRUE		fail conditions

Component / System	Fault Code	Monitor Strategy Description	Primary Malfunction Criteria		Threshold Logic and Value	_	Secondary Parameters		Enable Conditions	Time Required	MIL Illum
System	Code	Description	Gilleria	•	ogic and valu		basic enable conditions met:	=	see sheet enable tables	exists for more than 0.1 s monitor runs with 0.01 s rate whenever enable conditions are met	mum
			internal injector driver chip 2 error IC internal	=	TRUE		Engine Running and basic enable conditions met:	=	TRUE - see sheet enable - tables -	fail conditions exists for more than 0.1 s monitor runs with 0.01 s rate whenever enable conditions are met	
			piezo injector actuator internal feedback voltage or piezo injector actuator internal feedback voltage	>	0.00	V	main injection	=	ACTIVE	fail conditions exists for more than 0.1 s monitor runs with 0.01 s rate whenever enable conditions	
			Path 1: engine speed or Path 2: engine speed	>	1500.00 1600.00	rpm rpm	injection cut off demand from ECM internal monitoring	=	TRUE	fail conditions exists for 0.02 s test performed continuously with 0.02 s	

Component / System	Fault Code	Monitor Strategy Description	Primary Malfunction Criteria	Threshold Logic and Value	Secondary Parameters	Enable Conditions	Time Required
			security torque limitation request due to implausible air system control requests	= TRUE -	ignition on	= TRUE -	fail conditions exists for more than 533 events test performed continuously with 0.01 s
			security torque limitation request due to implausible rail pressure request	= TRUE -	ignition on	= TRUE -	fail conditions exists for more than 533 events test performed continuously with 0.01 s
			security torque limitation request due to implausible quantity setpoint control requests	= TRUE -	ignition on	= TRUE -	fail conditions exists for more than 533 events test performed continuously with 0.01 s
			indicated torque with (a) modeled inner engine torque and with (b) torque tolerance offset (see Look-Up-Table #54) and with (c) torque of engine speed controller and with (d) torque of surge damper control	> (a) + (b) + (c) + - (d) = calculated parameter 11.71875 to 99.609375 = calculated parameter = calculated parameter	Engine Running and basic enable conditions met:	= TRUE - = see sheet enable - tables	fail conditions exists for more than 0.28 s monitor runs with 0.04 s rate whenever enable conditions are met

Component / System	Fault Code	Monitor Strategy Description	Primary Malfunction Criteria	L	Threshold ogic and 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	>	210.00	V	ECM is in startup before injections are released	=	TRUE		fail conditions exists for more than 4 events monitor runs with 0.01 s rate whenever enable conditions are met	
			error at startup of DC/DC converter of one bank	=	TRUE		ignition on and DC/DC converter is in startup	=	TRUE		fail conditions exists for 0.01 ms monitor runs with 0.01 s rate whenever enable conditions	
			DC/DC converter cannot be switched off.	=	TRUE		ignition on	=	TRUE	-	are met	
Control Module Analog to Digital Performance	P060B	Electronic ECM circuitry determines if ADC is correctly converting signals within the correct time periods.	time for calibration of ADC	>=	0.30	sec	ignition on	=	TRUE	·	fail conditions exists for 0.01 s test performed continuously 0.01 s	A
			voltage at ADC test voltage input or voltage at ADC test voltage input	< >	4.73	V	ignition on	=	TRUE	-	fail conditions exists for at least 0.15 s	

Component / System	Fault Code	Monitor Strategy Description	Primary Malfunction Criteria		Threshold Logic and Value)	Secondary Parameters		Enable Conditions		Time Required	MIL Illum.
											test performed continuously 0.01 s	
			[(a) (b)]		0.15	V	ignition on	=	TRUE		fail	
			(a) - (b) with (a) voltage accelerator pedal signal 2 at internal ADC	> =	measured parameter	- -	and (=	TRUE	-	conditions exists for at least 0.12 s	
			and with (b) voltage accelerator pedal signal 2 at external ADC	=	measured parameter	-	counter for steady state detection of the internal AD converter means	>=	4.00	counts	monitor runs with 0.01 s rate whenever	
			at external ADC		parameter		(a) - (b) with	<=	0.06	V	enable conditions are met	
							(a) voltage accelerator pedal signal 2 at internal ADC and with	=	measured parameter	-	a.o m.e.	
							(b) voltage of the accelerator pedal signal 2 at the external ADC or	=	measured parameter	-		
							counter for steady state detection of the external AD converter means	>=	4.00	counts		
							(c) - (d) with (c) voltage accelerator pedal signal 2	<=	0.06 measured	V		
							at external ADC and with		parameter			
							(d) voltage of the accelerator pedal signal 2 at the internal ADC)	=	measured parameter	-		
			(ratio metric correction factor	<	0.62		ignition on	=	TRUE		fail conditions	
			or ratio metric correction factor)	>	0.74	-					exists for at least 0.15 s test performed	
											continuously 0.01 s	

Component /	Fault	Monitor Strategy	Primary Malfunction		Threshold		Secondary		Enable		Time	MIL
System	Code	Description	Criteria		Logic and Value		Parameters		Conditions		Required	Illum.
Internal Control Module Engine Speed (RPM) Performance	P061C	Monitors main and redundant engine speed calculations for agreement. Detects failure in engine speed calculation through redundant calculation algorithm.	with (a) redundant calculated engine speed and with (b) engine speed	= =	calculated parameter measured parameter	rpm - -	redundant calculated engine speed and engine synchronization	=	600.00	rpm -	fail conditions exists for more than 0.32 s monitor runs with 0.04 s rate whenever enable conditions are met	В
Fuel Pre-supply Pump Control Circuit Open	P0627	Diagnoses the Fuel Pre- Supply Pump low side driver circuit for circuit faults.	Voltage low during driver off state (indicates open circuit)	=	Open Circuit:≥ 200 K Ω impedance between ECU pin and load		engine post drive/ afterun for time and battery voltage for time and (ignition on and basic enable conditions met:)	> > = =	1.00 11.00 3.00 TRUE see sheet enable tables	sec V sec	fail conditions exists for 1.99s monitor runs with 0.2 s rate whenever enable conditions are met	В
Fuel Pre-supply Pump Control Circuit Low Voltage	P0628	Diagnoses the Fuel Pre- Supply Pump low side driver circuit for circuit faults.	Voltage low during driver off state (indicates short-to-ground)	=	Short to ground: ≤ 0.5 Ω impedance between signal and controller ground	-	engine post drive/ afterun for time and battery voltage for	>	1.00 11.00	sec V	fail conditions exists for 1s monitor runs with 0.2 s rate whenever enable conditions are met	В

Component / System	Fault Code	Monitor Strategy Description	Primary Malfunction Criteria	Threshold Logic and Value		Secondary Parameters		Enable Conditions		Time Required	MIL Illum.
System	Code	Description	Onteria	Logic and value		time and	>	3.00	sec	Required	mum.
						ignition on and	=	TRUE	-		
						basic enable conditions met:)	=	see sheet enable tables	-		
Fuel Pre-supply Pump Control Circuit High Voltage	P0629	Diagnoses the Fuel Pre- Supply Pump low side driver circuit for circuit faults.	Voltage high during driver on state (indicates short to power)	= Short to power: ≤ 0.5 Ω impedance between signal and controller power	-	engine post drive/ afterun	=	FALSE	-	fail conditions exists for 2 s monitor runs with 0.2 s rate whenever	В
						for time and	>	1.00	sec	enable conditions are met	
						battery voltage for	>	11.00	V	are met	
						time and	>	3.00	sec		
						(ignition on and	=	TRUE	-		
						basic enable conditions met:	=	see sheet enable tables	-		
	D0005							TOUE			
Control Module Long Term Memory Performance	P062F	Each data block of memory is read for a check sum error and flags if a fault is found.	EEPROM sector reports faults regarding:			ignition on	=	TRUE	-	fail conditions exists for 0.01 s	А
1 enormance			unable to erase or change whole EEPROM sector	= TRUE	-	and				test performed	
			or read order is not successfully	= 3	counts	basic enable conditions met:	=	see sheet enable tables	-	continuously at the 0.01 s rate	
			accomplished for more than amount of blocks	_ 3	Counts					rate	
			or amount of write errors in current block	= 3	counts						

Component /	Fault	Monitor Strategy	Primary Malfunction	Threshold	Secondary	Enable		Time	MIL
System	Code P0641	Description	Criteria	Logic and Value	Parameters	= Conditions TRUE		Required fail	Illum.
5 Volt Reference 1 Circuit	P0641	Sensor supply voltage circuitry determines if faults related to maintaining the voltage level exist.	sensor supply voltage 1	<= 4.0 V	and basic enable conditions met:	= TRUE = see sheet enable tables		rail conditions exists for 0.1 s test performed continuously 0.01s rate	
Malfunction Indicator Lamp (MIL) Control Circuit	P0650	Diagnoses the Malfunction Indicator Lamp (MIL) low side driver circuit for circuit faults.	Voltage low during driver off state (indicates short-to-ground)	= Short to ground: -	lamp is commanded on	= TRUE		fail conditions exists for 3 s monitor runs with 0.01 s rate whenever	
					and ignition on and /	= TRUE	-	enable conditions are met	
					battery voltage for	> 11.00	٧		
					time and basic enable conditions met:	> 3.00 = see sheet enable tables	sec -		
			Voltage high during driver on state (indicates short to power)	= Short to power: ≤ 0.5 Ω impedance between signal and controller power	lamp is commanded off	= TRUE	-	fail conditions exists for 2 s monitor runs with 0.01 s rate whenever enable	
					ignition on and (= TRUE	-	conditions are met	
					battery voltage for	> 11.00	V		
					time and basic enable conditions met:	> 3.00 = see sheet enable tables	sec -		

Component / System	Fault Code	Monitor Strategy Description	Primary Malfunction Criteria	Threshold Logic and Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
			Voltage low during driver off state (indicates open circuit)	= Open Circuit:2 - 200 K Ω impedance between ECU pin and load	circuit active at low current and ignition on and (= TRUE	- fail conditions exists for 0.2 s monitor runs with 0.01 s rate whenever enable	
					battery voltage for		V conditions are met	ı
					time and basic enable conditions met:	> 3.00 s = see sheet enable tables	sec -	
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	= TRUE	- fail conditions exists for 0.1 s test	A
					and basic enable conditions met:	= see sheet enable tables	performed continuously 0.01s rate	
5 Volt Reference 3	P0697	Sensor supply voltage	sensor supply voltage 3	<= 4.6 V	ignition on	= TRUE	- fail	A
Circuit		circuitry determines if faults related to the voltage level present at the sensor supply voltage exist.					conditions exists for 0.1 s test	
					and basic enable conditions met:	= see sheet enable tables	performed continuously 0.01s rate	
5 Volt Reference 4 Circuit	P06A3	Sensor supply voltage circuitry determines if faults related to the voltage level present at the sensor supply voltage exist.	sensor supply voltage 4	<= 4.6 V	ignition on	= TRUE	- fail conditions exists for 1.0 s test performed	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	-	continuously 0.01s rate	
5 Volt Reference 5 Circuit	P06D2	Sensor supply voltage circuitry determines if faults related to the voltage level	sensor supply voltage 5	<= 4.6 V	ignition on	=	TRUE	-	fail conditions exists for 0.1	В
		present at the sensor supply voltage exist.			and basic enable conditions met:	=	see sheet enable tables	-	s test performed continuously 0.01s rate	
Transmission Control Module (TCM) Requested MIL Illumination	P0700	Monitors Serial Data Communication for request from TCM to illuminate the MIL	Serial data communication from the TCM indicates the TCM has requested the MIL	= TRUE -	ignition on	=	TRUE	-	fail conditions exists for 1 s test performed	А
					for time and new message is received via CAN and basic enable conditions met and	> = =	0.25 TRUE see sheet enable tables	sec - -	continuously 0.5 s rate	
					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 -	(fail conditions exist for more than 3000 events monitor runs with 0.01 s	В
					battery voltage and battery voltage) and	>= <=	11.00 655.34	V	rate whenever enable conditions	
					engine speed and vehicle speed and	>=	650.00 14.92	rpm mph	are met	

Component / System	Fault Code	Monitor Strategy Description	Primary Malfunction Criteria	Threshold Logic and Value	Secondary Parameters		Enable Conditions		Time Required	MIL Illum.
		· ·		· ·	engine torque	>=	120.00	Nm		i
					and accelerator pedal position and	>=	0.00	%		
					(selected gear position is park	=	FALSE	-		
					selected gear position is neutral)	=	FALSE	-		
					and basic enable conditions:	=	see sheet enable tables	-		
					and NO Pending or Confirmed DTCs:	=	see sheet inhibit tables	-		
Park/Neutral Position (PNP) Switch Circuit Low Voltage	P0852	by comparing the ECM sensed input to the broadcasted state from the TCM over GMLAN serial	GMLAN Message for PNP position indicates park neutral and disagrees with ECM (on-board control unit) sensed position based on PNP switch inputs to ECM	= TRUE -					fail conditions exist for more than 3000 events monitor runs	В
		data			battery voltage	>=	11.00	V	with 0.01 s rate	
					and battery voltage)	<=	655.34	V	whenever enable conditions	
					and engine speed and	<=	7000.00	rpm	are met	
					selected gear position is park	=	TRUE	-		
					or selected gear position is neutral	=	TRUE	-		
					and basic enable conditions met:	=	see sheet enable tables	-		
					and NO Pending or Confirmed DTCs:	=	see sheet inhibit tables	-		
Fraction Control nput 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	Error counter for Traction Control torque request message group	>= 8.00 count	S Traction Control Torque Request CAN Message Received	=	TRUE	-	for 1 message group; monitor runs whenever	Special (
		defined message group checksum or rolling count values are incorrect			and					er

Component / System	Fault Code	Monitor Strategy Description	Primary Malfunction Criteria	Threshold Logic and Value	Secondary Parameters		Enable Conditions		Time Required	MIL Illum.
					no rolling count or protection errors on CAN Frame \$1C7 and	=	TRUE	-	are met.	
					ignition on and	=	TRUE	-		
					basic enable conditions met:	=	see sheet enable tables	-		
					and NO Pending or Confirmed DTCs:	=	see sheet inhibit tables	-		
Reductant Pump High Control	P1043	Diagnoses the Reductant Pump Motor high side driver	Voltage low during driver on state	= Short to ground: - ≤ 0.5 Ω	engine pre drive	=	FALSE		fail conditions	A
Circuit Low Voltage		circuit for circuit faults.	(marcates short to ground)	impedance between signal and controller ground					exists for 3 s monitor runs with 0.01 sec rate whenever	
					for time	>	1.00	sec	enable conditions	
					and battery voltage	>	11.00	V	are met	
					for time	>	3.00	sec		
					and battery voltage for	<	655.34	V		
					time and	>	3.00	sec		
					battery voltage correction factor and	>	0.00	factor		
					battery voltage correction factor)	<	4.00	factor		
					for time	>	3.00	sec		
					battery voltage correction factor)	<	4.00	factor		
					for time and	>	3.00	sec		
					basic enable conditions met:	=	see sheet enable tables	-		
Reductant Pump	P1044	Diagnoses the Ruductant	Voltage high during driver off state	= Short to power: -	engine pre drive	=	FALSE		fail	В
High Control Circuit High	1 1044	Pump Motor high side driver circuit for circuit faults.		= Short to power. ≤ 0.5 Ω impedance	longine pre unive	=	IALSE	-	conditions exists for 3 s	ь
Voltage				between signal and controller power					monitor runs with 0.01 sec rate	
				powei	for				whenever	

Component / System	Fault Code	Monitor Strategy Description	Primary Malfunction Criteria	Threshold Logic and Value	Secondary Parameters		Enable Conditions		Time Required	MIL Illum
					time	>	1.00	sec	enable	
					and battery voltage	>	11.00	V	conditions are met	
					for time	>	3.00	sec		
					and battery voltage	<	655.34	V		
					for time	>	3.00	sec		
					and (
					battery voltage correction factor and	>	0.00	factor		
					battery voltage correction factor)	<	4.00	factor		
					for time	>	3.00	sec		
					battery voltage correction factor	<	4.00	factor		
)					
					for					
					time and	>	3.00	sec		
					basic enable conditions met:	=	see sheet enable tables	-		
							lables			
	D.10.10			21			544.05		6.11	
leductant Purge alve High Control ircuit High	P1046	Diagnoses the Reductant Purge Valve high side driver circuit for circuit faults.	Voltage high during driver off state (indicates short to power)	= Short to power: - ≤ 0.5 Ω impedance	engine pre drive	=	FALSE	-	fail conditions exists for 3 s	В
oltage				between signal and controller					monitor runs with 0.01	
				power					sec rate	
					for		1.00	202	whenever	
					time	>	1.00	sec	enable	
						>	1.00 11.00	sec V		
					time and battery voltage for time and				enable conditions	
					time and battery voltage for time	>	11.00	V	enable conditions	
					time and battery voltage for time and battery voltage	> >	11.00 3.00	V sec	enable conditions	
					time and battery voltage for time and battery voltage for time and (battery voltage correction factor	>	11.00 3.00 655.34	V sec V	enable conditions	
					time and battery voltage for time and battery voltage for time and continue time and for time and (>	11.00 3.00 655.34 3.00	V sec V sec	enable conditions	
					time and battery voltage for time and battery voltage for time and battery voltage for time and (battery voltage correction factor and battery voltage correction factor) for	>	11.00 3.00 655.34 3.00 0.00 4.00	V sec V sec factor	enable conditions	
					time and battery voltage for time and battery voltage for time and battery voltage for time and (battery voltage correction factor and battery voltage correction factor) for time	>	11.00 3.00 655.34 3.00 0.00 4.00	V sec V sec factor factor	enable conditions	
					time and battery voltage for time and battery voltage for time and battery voltage for time and (battery voltage correction factor and battery voltage correction factor) for	>	11.00 3.00 655.34 3.00 0.00 4.00	V sec V sec factor	enable conditions	

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	-		
Reductant Injector High Control Circuit Low Voltage	P1048	Diagnoses the Reductant Injector high side driver circuit for circuit faults.	Voltage low during driver on state (indicates short to ground)	= Short to ground: - ≤ 0.5 Ω impedance between signal and controller ground	engine pre drive	=	FALSE	-	fail conditions exists for 3 s monitor runs with 0.01 sec rate whenever enable	A
					time and battery voltage for	>	1.00 11.00	sec V	conditions are met	
					time and battery voltage	> <	3.00 655.34	sec V		
					for time and	>	3.00	sec		
					battery voltage correction factor and	>	0.00	factor		
					battery voltage correction factor) for	<	4.00	factor		
					time battery voltage correction factor)	> <	3.00 4.00	sec factor		
					for time and	>	3.00	sec		
					basic enable conditions met:	=	see sheet enable tables	-		
Reductant Injector High Control Circuit High Voltage	P1049	Diagnoses the Reductant Injector high side driver circuit for circuit faults.	Voltage high during driver off state (indicates short to power)	= Short to power: - ≤ 0.5 Ω impedance between signal and controller power	engine pre drive	=	FALSE	-	fail conditions exists for 3 s monitor runs with 0.01 sec rate	A
					for time and	>	1.00	sec	whenever enable conditions	
					battery voltage for time	>	11.00 3.00	V sec	are met	
					and battery voltage	<	655.34	V		

Component / System	Fault Code	Monitor Strategy Description	Primary Malfunction Criteria	Threshold Logic and Val	ue	Secondary Parameters		Enable Conditions		Time Required	MIL Illum.
						for time and (>	3.00	sec		
						battery voltage correction factor and battery voltage correction factor	>	0.00 4.00	factor factor		ı
						for time battery voltage correction factor) for	> <	3.00 4.00	sec factor		
						time and basic enable conditions met:	> =	3.00 see sheet enable tables	sec -		
Fuel Rail Pressure Performance	P1089	Measured rail pressure is checked against desired rail pressure to detect high rail pressure conditions in fuel	rail pressure deviation from setpoint calculated as the absolute value of difference between desired and actual value	> 5000.00	kPa	rail pressure control commanded during injection timing correction learning phase	=	TRUE		fail conditions exists for 720 crank	В
		cut-off				and NO Pending or Confirmed DTCs limiting rail pressure set point for time and basic enable conditions met:	= > =	see sheet inhibit tables 2.00 see sheet enable tables	- sec	revolutions monitor runs with 0.02 s rate whenever enable conditions are met	
Exhaust Aftertreatment Fuel Injector Control Circuit Shorted	P10CC	Diagnoses the Exhaust Aftertreatment Fuel Injector low side driver circuit for circuit faults.	Voltage high during driver on state (indicates short to power)	= Short to power: ≤ 0.5 Ω impedance between signa and controller power		engine pre drive	=	FALSE	-	fail conditions exists for more than 5 events monitor runs with 0.1 s	В
						time and battery voltage	>	1.00 11.00	sec V	rate whenever enable conditions	ı
						for time	>	3.00	sec	are met	İ
						and starter is active cranking for	=	FALSE	-		l
						time and Diesel dosing valve: fuel injection and	> =	3.00 ACTIVE	sec -		ı

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	-		
Exhaust Aftertreatment Fuel Injector High Control Circuit Low Voltage	P10CD	Electronic out-put driver circuitry determines circuit integrity on the diesel dosing valve control circuit.	The ECM detects that the commanded state of the driver and the actual state of the control circuit do not match.		engine pre drive	=	FALSE		fail conditions exists for more than 30 events monitor runs	В
					time and battery voltage	>	1.00 11.00	sec V	with 0.1 s rate whenever	
					for time and	>	3.00	sec	enable conditions are met	
					starter is active cranking for time	= >	FALSE 3.00	- sec		
					and Diesel dosing valve: fuel injection and	=	ACTIVE	-		
					basic enable conditions met:	=	see sheet enable tables	-		
Exhaust Aftertreatment Fuel Injector High Control Circuit High Voltage	P10CE	Diagnoses the Exhaust Aftertreatment Fuel Injector high side driver circuit for circuit faults.	Voltage high during driver off state (indicates short to power)	= Short to power: ≤ 0.5 Ω impedance between signal and controller power	for time and battery voltage for time and starter is active cranking for time and Diesel dosing valve: fuel injection and basic enable conditions met:	=	1.00 11.00 3.00 FALSE 3.00 ACTIVE see sheet enable tables	sec V sec - sec	fail conditions exists for more than 30 events monitor runs with 0.1 s rate whenever enable conditions are met	В

Component /	Fault	Monitor Strategy	Primary Malfunction		Threshold		Secondary		Enable		Time	MIL
System	Code	Description	Criteria		Logic and Value		Parameters		Conditions		Required	Illum.
Charge Air Cooler Temperature Sensor Performance	P10CF	Detects a biased charge air cooler temperature sensor downstream or charge air cooler temperature sensor upstream by comparing the respective values at startup.	Path 1:				minimum engine-off time	>=	28800.00	sec	fail conditions exists for 0.1 s monitor runs once per trip with 0.1 s	В
			(a) - (b) (see Look-Up-Table #3) with (a) captured charge air cooler downstream temperature at start	> =	100 to 999 measured parameter	°C -	and ambient temperature and	>	-60.04	°C	rate whenever enable conditions are met	
			and with		paramotor		engine speed (see Look-Up-Table #91)	>	600 to 850	rpm	are met	
			(b) captured charge air cooler upstream temperature at start	=	measured parameter	-	for					
			or				time and engine post drive/ afterun	> =	0.00 FALSE	sec -		
			Path 2:				and diagnostic performed in current dc	=	FALSE	_		
			l(a) - (b) (see Look-Up-Table #3)	<=	100 to 999	°C	and					
			with				basic enable conditions met:	=	see sheet enable tables	-		
			(a) captured charge air cooler downstream temperature at start and with	=	measured parameter	-	and NO Pending or Confirmed DTCs:	=	see sheet inhibit tables	-		
			(b) captured charge air cooler upstream temperature at start and	=	measured parameter	-			tables			
			(a) - (b) (see Look-Up-Table #6) with	>	35 to 999	°C						
			(a) captured charge air cooler downstream temperature at start and with	=	measured parameter	-						
			(b) captured charge air cooler upstream temperature at start and	=	measured parameter	-						
			status of block heater (see parameter definition)	=	FALSE	-						
			status of sun-load detection (see parameter definition)	=	FALSE	-						

Component /	Fault	Monitor Strategy	Primary Malfunction		Threshold		Secondary		Enable		Time	MIL
Reductant Injector Temperature - Exhaust Gas Temperature 2 Correlation	P10D0	Description Detects an implausible SCR dosing valve coil temperature by comparing the temperature with a reference temperature	Criteria (a) - (b) (see Look-Up-Table #90)	>	30 to 3276.7	°C	Parameters ignition on	=	Conditions TRUE	-	fail conditions exists for 0.1 s monitor with	Illum. B
			with (a) dosing valve coil temperature and with (b) oxidation catalyst downstream temperature	=	calculated parameter measured parameter	°C	and state of selective catalytic reduction system and active heating phase for dosing valve	=	STANDBY or NO PRESSURE CONTROL FALSE	-	0.1 s rate whenever enable conditions are met	
			composition of the composition o		parameter		and valve already activated within this driving cycle and	=	FALSE	-		
							battery voltage and	>	11.00	V		
							ambient temperature and	>=	-60.04	°C		
							engine run time and engine off time	< >	10.00 28800.00	sec		
							and urea pump motor output duty cycle	=	0.00	%		
							and Max [(a), (b)] - Min [(a), (b)]	<=	7.00	°C		
							where (a) ambient temperature	=	measured parameter	-		
							(b) oxidation catalyst downstream temperature	=	measured parameter	-		
							and urea dosing valve output duty cycle and	>	3.00	%		
							coil current measurement is valid and	=	TRUE	-		
							basic enable conditions met:	=	see sheet enable tables	-		
							and NO Pending or Confirmed DTCs:	=	see sheet inhibit tables	-		
Fuel Temperature Sensor 1 Circuit High	P111F	Detects an error in the fuel pump temperature sensor performance by comparing start-up temperatures between fuel pump	Path 1:				minimum engine-off time	>=	28800.00	sec	fail conditions exists for 0.2 s monitor runs	В
		temperature and fuel rail temperature	(a) - (b) (see Look-Up-Table #41)	>	100 to 999	°C	and				once per trip with 0.2 s rate	

Component / System	Fault Code	Monitor Strategy Description	Primary Malfunction Criteria		Threshold Logic and Value	e	Secondary Parameters		Enable Conditions		Time Required	MIL Illum.
- Cystom		2001.pitch	where ((a) captured fuel temperature 1 at start and with	=	measured parameter	-	ambient temperature and engine speed (see Look-Up-Table #91)	>	-60.04 600 to 850	°C	whenever enable conditions are met	
			(b) captured fuel temperature 2 at start	=	measured parameter	-	for					
			or				time and engine post drive/ afterun	>	0.00 FALSE	sec -		
			Path 2: (a) - (b) (see Look-Up-Table #41) with	<=	100 to 999	°C	and diagnostic performed in current dc and	=	FALSE	-		
			(a) captured fuel temperature 1 at start	=	measured parameter	-	basic enable conditions met:	=	see sheet enable tables	-		
			and with (b) captured fuel temperature 2 at start	=	measured parameter	-	and NO Pending or Confirmed DTCs:	=	see sheet inhibit tables	-		
			and (a) - (b) (see Look-Up-Table #42) where	>	20 to 999	°C						
			(a) captured fuel temperature 1 at start and with	=	measured parameter	-						
			(b) captured fuel temperature 2 at start and	=	measured parameter	-						
			(status of block heater (see parameter definition)	=	FALSE	-						
HO2S Performance - Signal High During Moderate Load Bank 1 Sensor 1	P11A6	Compare the pressure compensated O2 concentration sensor signal with a threshold	Pressure compensated O2 concentration	>	(a) + (b)	factor	engine speed	<	2600.00	rpm	fail conditions exists for more than 2 event	В
			where				engine speed	>	1200	rpm	monitor runs with 0.1 s rate	

Component /	Fault	Monitor Strategy	Primary Malfunction		Threshold		Secondary		Enable		Time	MIL
System	Code	Description	Criteria		Logic and Value		Parameters		Conditions		Required	Illum.
			(a) Filtered calculated O2	=	Please see the	factor	Inner combusted quantity	<	180.00	mm^3/r	whenever	
			concentration based on injection		general					ev	enable	
			quantity, air mass and fuel density		description for						conditions	
					details of this						are met	
					calculated O2							
					concentration							
			(b) Positive O2 concentration margin	=	0.05	factor	Inner combusted quantity	>	108.00	mm^3/r		
			(5) 1 0011110 02 0011001111411011 11141911		0.00	100101	miles compacted quartity	-	100.00	ev		
							Air mass per cylinder	<	4.20	g/rev		
							Air mass per cylinder	>	2.20	g/rev g/rev		
							Status of binary lambda signal valid	=	TRUE	y/iev		
							for time	>	0.50	sec		
							oxidation catalyst upstream temperature	<	999.96	°C		
							oxidation catalyst upstream temperature	>	99.96	°C		
							integrated air mass since all other	>	2.5	g		
							release conditions are fulfilled for O2			9		
							plausibility		44.00	V		
							battery voltage	>	11.00	V		
							Fuel volume in fuel tank	>	-1638.40	ı		
							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	=	measure variable	factor		
							(b) tolerance range of calculated Oxygen concentration	=	0.02	factor		
							for time	>	0.10	sec		
							Engine operation mode (Please see the	=	normal operation	-		
							definition)		·			
							engine speed	<	4500.00	rpm		
							engine speed	>	600.00	rpm		
							ambient temperature	<	122.96	°C		
							ambient temperature	>	-45.04	°C		
							ambient pressure	<	110.00	kPa		
							ambient pressure	>	74.80	kPa		
							NO Pending or Confirmed DTCs:	=	see sheet inhibit	-		
									table			
							basic enable conditions met:	=	see sheet enable	-		
									tables			
1036	P11A9	Compare the procesure	Dressure companyated O2 conservation		(a) (b)	footor	angina angad		2600.00	rn m	fail	В
HO2S Performance - Signal Low During Moderate Load Bank 1 Sensor 1	P11A9	Compare the pressure compensated O2 concentration sensor signal with a threshold	Pressure compensated O2 concentration	<	(a) - (b)	factor	engine speed	<	2600.00	rpm	conditions exists for more than 2 event	В
											monitor runs	
			where				engine speed	>	1200	rpm	with 0.1 s	
		I									rate	

Component /	Fault	Monitor Strategy	Primary Malfunction		Threshold		Secondary		Enable		Time	MIL
System	Code	Description	Criteria		Logic and Value		Parameters		Conditions		Required	Illum.
			(a) Filtered calculated O2	=	Please see the	factor	Inner combusted quantity	<	180.00	mm^3/r	whenever	
			concentration based on injection		general					ev	enable	
			quantity, air mass and fuel density		description for						conditions	
					details of this						are met	
					calculated O2							
					concentration							
			(b) Positive O2 concentration margin	=	0.05	factor	Inner combusted quantity	>	108.00	mm^3/r		
			(b) 1 contro C2 concontration margin	_	0.00	idotoi	miler combacted quartity		100.00	ev		
							Air mass per cylinder	_	4.20	g/rev		
								<				
							Air mass per cylinder	>	2.20	g/rev		
							Status of binary lambda signal valid	=	TRUE	-		
							for time	>	0.50	sec		
							oxidation catalyst upstream temperature	<	999.96	°C		
							oxidation catalyst upstream temperature	>	99.96	°C		
							integrated air mass since all other	>	2.5	g		
							release conditions are fulfilled for O2			9		
							plausibility					
							battery voltage		11.00	V		
								>		V		
							Fuel volume in fuel tank	>	-1638.40	ı		
							Deceleration fuel cut-off	=	FALSE	-		
							Injection active	=	TRUE	-		
							calculated oxygen concentration	<=	(a) + (b)	factor		
							calculated oxygen concentration	>=	(a) - (b)	factor		
							where					
							(a) random start calculated Oxygen	=	measure variable	factor		
							concentration					
							(b) tolerance range of calculated	=	0.02	factor		
							Oxygen concentration	_	0.02	idotoi		
							for time		0.10	sec		
								>				
							Engine operation mode (Please see the	=	normal operation	-		
							definition)					
							engine speed	<	4500.00	rpm		
							engine speed	>	600.00	rpm		
							ambient temperature	<	122.96	°C		
							ambient temperature	>	-45.04	°C		
							ambient pressure	<	110.00	kPa		
							ambient pressure	>	74.80	kPa		
							NO Pending or Confirmed DTCs:	=	see sheet inhibit	-		
							Tro T chaing of Committee B 100.		table			
							basic enable conditions met:	=	see sheet enable			
							Dadio dilabio dell'allidio ilici.	_	tables			
									tables			
IO2S	P11AF	Compare the proceure	Proceure componented O2 concentration		(a) 1 (b)	factor	angina angad		2600.00	rnm	fail	В
	PITAL	Compare the pressure	Pressure compensated O2 concentration	>	(a) + (b)	factor	engine speed	<	∠000.00	rpm		В
Performance -		compensated O2									conditions	
Signal High During		concentration sensor signal									exists for	
loderate Load		with a threshold									more than 2	
ank 1 Sensor 2											event	
											monitor runs	
			where				engine speed	>	1200	rpm	with 0.1 s	

Component /	Fault	Monitor Strategy	Primary Malfunction		Threshold		Secondary		Enable		Time	MIL
System	Code	Description	Criteria		Logic and Value		Parameters		Conditions		Required	Illum.
Gystelli	Coue	Description	(a) Filtered calculated O2	=	Please see the	factor	Inner combusted quantity	<	180.00	mm^3/r	whenever	muni.
			concentration based on injection	_	general		o. combactor quartity	`	100.00	ev	enable	
			quantity, air mass and fuel density		description for					٠.	conditions	
			quantity; an indee and raci density		details of this						are met	
					calculated O2						are met	
					concentration							
			(b) Positive O2 concentration margin	=	0.05	factor	Inner combusted quantity	>	108.00	mm^3/r		
			(b) I contro oz concontration margin		0.00	idotoi	minor combacted quartity		100.00	ev		
							Air mass per cylinder	<	4.20	g/rev		
							Air mass per cylinder	>	2.20	g/rev		
							Status of binary lambda signal valid	=	TRUE	9/101		
							for time	>	0.50	sec		
							SCR downstream temperature	<	999.96	°C		
							SCR downstream temperature	>	99.96	°C		
							integrated air mass since all other	>	2.5			
							release conditions are fulfilled for O2		2.0	g		
							plausibility					
							battery voltage	>	11.00	V		
ļ							Fuel volume in fuel tank	>	-1638.40	V I		
							Deceleration fuel cut-off	> =	FALSE	-		
									TRUE	-		
							Injection active	=		-		
							calculated oxygen concentration	<=	(a) + (b)	factor		
							calculated oxygen concentration	>=	(a) - (b)	factor		
							where					
							(a) random start calculated Oxygen	=	measured	-		
							concentration		parameter			
							(b) tolerance range of calculated	=	0.02	factor		
							Oxygen concentration					
							for time	>	0.10	sec		
							Engine operation mode (Please see the	=	normal operation	-		
							definition)					
							engine speed	<	4500.00	rpm		
							engine speed	>	600.00	rpm		
							ambient temperature	<	122.96	°C		
							ambient temperature	>	-45.04	°C		
							ambient pressure	<	110.00	kPa		
							ambient pressure	>	74.80	kPa		
							NO Pending or Confirmed DTCs:	=	see sheet inhibit	-		
ļ									table			
ļ							basic enable conditions met:	=	see sheet enable	-		
ļ									tables			
HO2S	P11B2	Compare the pressure	Pressure compensated O2 concentration	<	(a) - (b)	factor	engine speed	<	2600.00	rpm	fail	В
Performance -	FIIDZ	compare the pressure compensated O2	r ressure compensated Oz concentration	<	(a) - (b)	iacitii	engine speed	<u> </u>	2000.00	ihiii	conditions	D
Signal Low During											exists for	
		concentration sensor signal										
Moderate Load		with a threshold									more than 2	
Bank 1 Sensor 2											event	
J			whore				angina angad		1000	PD	monitor runs	
			where				engine speed	>	1200	rpm	with 0.1 s	
		I									rate	

Component /	Fault	Monitor Strategy	Primary Malfunction		Threshold		Secondary		Enable		Time	MIL
System	Code	Description	Criteria		Logic and Value		Parameters		Conditions		Required	Illum.
			(a) Filtered calculated O2 concentration based on injection quantity, air mass and fuel density	=	Please see the general description for details of this calculated O2	factor	Inner combusted quantity	<	180.00	mm^3/r ev	whenever enable conditions are met	
			(b) Positive O2 concentration margin	=	concentration 0.05	factor	Inner combusted quantity	>	108.00	mm^3/r		
							Air mass per cylinder Air mass per cylinder Status of binary lambda signal valid for time SCR downstream temperature SCR downstream temperature integrated air mass since all other release conditions are fulfilled for O2 plausibility battery voltage Fuel volume in fuel tank Deceleration fuel cut-off Injection active calculated oxygen concentration calculated oxygen concentration where (a) random start calculated Oxygen concentration (b) tolerance range of calculated Oxygen concentration for time Engine operation mode (Please see the definition) engine speed engine speed	V A A V A A A	4.20 2.20 TRUE 0.50 999.96 99.96 2.5 11.00 -1638.40 FALSE TRUE (a) + (b) (a) - (b) measured parameter 0.02 0.10 normal operation 4500.00 600.00	ev g/rev g/rev g/rev		
							ambient temperature ambient temperature ambient pressure ambient pressure ambient pressure NO Pending or Confirmed DTCs: basic enable conditions met:	< > < < = = = = = = = = = = = = = = = =	122.96 -45.04 110.00 74.80 see sheet inhibit table see sheet enable tables	°C °C kPa kPa -		
HO2S Current Performance Bank 1 Sensor 1	P11B4	Compares the ratio of valid lambda signal time to total time with a threshold	ratio of valid lambda signal time to total time: (a) / (b) where (a) time for which valid lambda signal received over CAN	=	0.1	ratio -	NOx sensor's heater temperature has reached the set point for time Enabling Upstream NOx sensor heater diagnosis (please see the definition)	> =	TRUE 2.00 TRUE	sec	fail conditions exists for more than 60 sec	В
			(b) total time for which diagnosis is enabled	=	parameter calculated parameter	-	Reciprocal lambda change : (a) - (b) (see Look-Up-Table #49) where (a) Reciprocal lambda	<= =	0.1 to 10 measured parameter	factor -	monitor runs with 0.02 s rate whenever enable conditions are met	

Component /	Fault	Monitor Strategy	Primary Malfunction		reshold		Secondary		Enable		Time	MIL
System	Code	Description	Criteria	Logic	and Value		Parameters		Conditions		Required	Illum.
							(b) Filtered reciprocal lambda for time NO Pending or Confirmed DTCs: not disabled during following conditions	> =	calculated parameter 5.00 see sheet inhibit tables see sheet enable tables	sec -		
HO2S Current Performance Bank 1 Sensor 2	P11B5	Compares the ratio of valid lambda signal time to total time with a threshold	ratio of valid lambda signal time to total time: (a) / (b) where (a) time for which valid lambda signal received over CAN (b) total time for which diagnosis is enabled	pa = ca	easured rameter lculated rameter	ratio	NOx sensor's heater temperature has reached the set point for time Enabling Downstream NOx sensor heater diagnosis (please see the definition) Reciprocal lambda change : (a) - (b) (see Look-Up-Table #49) where (a) Reciprocal lambda (b) Filtered reciprocal lambda for time NO Pending or Confirmed DTCs: not disabled during following conditions	= > = = = > =	TRUE 120.00 TRUE 0.1 to 10 measured parameter calculated parameter 5.00 see sheet inhibit tables see sheet enable tables	sec - factor - sec -	fail conditions exists for more than 60 sec monitor runs with 0.02 s rate whenever enable conditions are met	В
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		Status of NOx signal of upstream NOx sensor (please see the definition) Normal Mode (Particulate Filter Regeneration not active) for time ambient pressure ambient pressure ambient temperature ambient temperature ambient temperature ((filtered modeled Nox concentration percent positive deviation filtered modeled Nox concentration percent negative deviation)))) for time time since start Engine Coolant Temperature	=	TRUE 15.00 75.00 106.00 -7.04 37.96 0.050048828125 0.050048828125	sec kPa kPa °C °C °C %	fault exists for more than 1 event; monitor runs at 0.1 s once per trip	В

Component /	Fault	Monitor Strategy	Primary Malfunction	Threshold	Secondary		Enable		Time	MIL
System	Code	Description	Criteria	Logic and Value	Parameters		Conditions		Required	Illum.
.,					Engine Coolant Temperature	<=	104.96	°C		
					Exhaust gas temperature range at Upstream Nox sensor (see Look-Up- Table #81)	>0	0 to 1	factor		
					Fuel Injection pattern (see Look-Up- Table #82)	=	0 to 58	pattern		
							24 = pilot 1 main 56 = pilot 2, pilot 1, main 58 = pilot 2, pilot			
							1, main, post 2 26 = pilot 1 main, post 2 0 = all off			
							(overrun)			
					Ratio of transient factor	>	0.95	factor	l	
1					for time	>	0.50	sec		
i					Vehicle speed	>=	37.29	mph		
i					for time	>	1.00	sec		
					relative humidity	<=	100.00	%		
					relative humidity	>=	0.00	%		
					Enable range for the plausibility check of Upstream Nox sensor (see Look-Up-	≠0	0 to 1	factor		
					Table #74)					
i					for time	>	0.00	sec		
					Air mass per cylinder	>=	0.00	g/rev		
					Air mass per cylinder	<=	6.00	g/rev		
					for time	>	5.00	sec		
					actual valve position of exhaust-gas	>=	0.00	%		
					recirculation	/-	0.00	70		
					actual valve position of exhaust-gas recirculation	<=	100.00	%		
			1		for time	>	0.50	sec		
į					filtered modeled NOx-concentration upstream of the SCR	>=	0.00	ppm		
					filtered modeled NOx-concentration upstream of the SCR	<=	1650.00	ppm		
			1		for time	>	0.50	sec		
					Diagnostic has not completed this driving cycle	=	FALSE	-		
					NO Pending or Confirmed DTCs	=	see sheet inhibit tables	-		
					basic enable conditions met:	=	see sheet enable tables	-		
NOx Sensor	P11CC	Detects a high deviation of	Filtered NOx concentration deviation	< (a) * (b) -	Status of NOx signal of upstream NOx	=	TRUE	_	fault exists	В
Performance -	1 1100	the measured NOx sensor	from model	(α) (υ)	sensor (please see the definition)	-	INOL	•	for more	U
Signal Low Bank 1		concentration from the	Tom model		oonsor (prease see the definition)				than 1 event;	
Sensor 1		modeled Nox concentration							monitor runs	
Selisui I		modeled Nox concentration	1							
ļ		1	I .	I	ı				at 0.1 s once	

Component / System	Fault Code	Monitor Strategy Description	Primary Malfunction Criteria		Threshold Logic and Value		Secondary Parameters		Enable Conditions		Time Required	MIL Illum.
Oystem	Oouc	Description	(a) Table for the base value of the lower	=	-1 to -0.46	-	Normal Mode (Particulate Filter	=	TRUE	-		mum.
			plausibility limit (see Look-Up-Table #80)	=	-1 10 -0.46	-	Regeneration not active)	=	IKUE	-	per trip	
			(b) Factor correction based on Environmental Pressure	=	1	factor	for time		15.00	sec		
							ambient pressure	>=	75.00	kPa		
							ambient pressure	<=	106.00	kPa		
							ambient temperature	>=	-7.04	°C		
							ambient temperature	<=	37.96	°C		
							((
							filtered modeled Nox concentration	<=	0.05	factor		
							percent positive deviation					
							filtered modeled Nox concentration	>=	0.05	factor		
							percent negative deviation					
)					
))					
							for time	>	2.00	sec		
							time since start	>	30.00	sec		
							Engine Coolant Temperature	>=	68.96	°C		
							Engine Coolant Temperature	<=	104.96	°C		
							Exhaust gas temperature range at	>0	0 to 1	factor		
							Upstream Nox sensor (see Look-Up-					
							Table #81)					
							Fuel Injection pattern (see Look-Up-	=	0 to 58	pattern		
							Table #82)					
									24 = pilot 1 main			
									56 = pilot 2, pilot			
									1, main			
									58 = pilot 2, pilot			
									1, main, post 2			
									26 = pilot 1 main,			
									post 2			
									0 = all off			
									(overrun)			
							Ratio of transient factor	>	0.95	factor		
							for time	>	0.50	sec		
							Vehicle speed	>=	37.29	mph		
							for time	>	1.00	sec		
							relative humidity	<=	100.00	%		
							relative humidity	>=	0.00	%		
							Enable range for the plausibility check of Upstream Nox sensor (see Look-Up-	≠0	0 to 1	factor		
							Table #75)					
							for time	>	0.00	sec		
							Air mass per cylinder	>=	0.00	g/rev		
							Air mass per cylinder	<=	6.00	g/rev		
							for time	>	5.00	sec		
							actual valve position of exhaust-gas recirculation	>=	0.00	%		
							actual valve position of exhaust-gas recirculation	<=	100.00	%		
							for time	>	0.50	sec		
							filtered modeled NOx-concentration	>=	0.00	ppm		
							upstream of the SCR					

Component /	Fault	Monitor Strategy	Primary Malfunction	Threshold	Secondary		Enable		Time	MIL
System	Code	Description	Criteria	Logic and Value	Parameters filtered modeled NOx-concentration		Conditions 1650.00		Required	Illum.
					upstream of the SCR	<=	1050.00	ppm		
					for time	>	0.50	sec		
					Diagnostic has not completed this driving	=	FALSE	-		
					cycle					
					NO Pending or Confirmed DTCs		see sheet inhibit tables	-		
					basic enable conditions:		see sheet enable	-		
							tables			
Nox Sensor	P11DB	Detects a failure of the	Ratio of valid to invalid upstream Nox	> 0.90 -	Sufficient number of valid and invalid	>=	20.00	sec	fault exists	В
Current		feedback performance of	sensor status time count		NOx status time (sum of valid and invalid				for more	
Performance Bank 1 Sensor 1		upstream NoX sensor			Nox status for diagnostic determination)				than 3 events;	
i Selisor i					and				monitor runs	
					Engine Running (see parameter	=	TRUE	_	at 0.1 s	
					definition)				when enable	
					for time (required for the NOx sensor	>	20.00	sec	conditions	
					to give valid response)				are met	
					and		TD.1.5			
					Upstream NoX sensor detects a lean A/F	=	TRUE	-		
					mixture and					
					Valid NOx signal from CAN is received	=	TRUE	_		
					(no Nox sensor communication failures)	_	TROE			
					or					
					following conditions for time:	>	45.00	sec		
					battery voltage	>=	11.00	V		
					battery voltage	<=	655.34 94.96	°C		
					SCR upstream temperature SCR upstream temperature	>= <=	3003.56	°C		
					Engine Running (see parameter	=	TRUE	-		
					definition)		INOL			
					for time (required for the NOx	>	20.00	sec		
					sensor to give valid response)					
					and					
					Lambda signal is in steady state	<=	0.1 to 10	-		
					condition (see Look-Up-Table #28) for time		5.00	000		
					Inhibit Status (no inhibiting faults)	>=	see sheet inhibit	sec -		
					(No pending or stored DTC)	_	tables			
					basic enable conditions met:	=	see sheet enable	-		
							tables			
Nox Sensor	P11DC	Detects a failure of the	Ratio of valid to invalid downstream Nox	> 0.90 ratio	Sufficient number of valid and invalid	>=	20.00	sec	fault exists	В
Current		feedback performance of	sensor status time count		downstream NOx sensor status time				for more	
Performance		downstream NoX sensor			(sum of valid and invalid Nox status for				than 3	
Bank1 Sensor 2					diagnostic determination)				events;	
		I	I		and				monitor runs	

Component /	Fault	Monitor Strategy	Primary Malfunction	Threshold	Secondary		Enable		Time	MIL
System	Code	Description	Criteria	Logic and Value	Parameters		Conditions		Required	Illum.
				-	Engine Running (see parameter definition)	=	TRUE	-	at 0.1 s when enable	
					for time (required for the NOx sensor to give valid response) and	>	20.00	sec	conditions are met	
					Downstream NoX sensor detects a lean A/F mixture	=	TRUE	-		
					and Valid NOx signal from CAN is received (no Nox sensor communication failures)	=	TRUE	-		
					or following conditions for time:	>	120.00	sec		
					battery voltage battery voltage	>= <=	11.00 655.34	V V		
					SCR downstream temperature SCR downstream temperature	>= <=	94.96 3003.56	°C		
					Engine Running (see parameter definition)	=	TRUE	-		
					for time (required for the NOx sensor to give valid response)	>	20.00	sec		
					and Downstream Lambda signal is in steady state condition (measured lambda signal - filtered lambda signal) (see	<=	0.2 to 3.2	-		
					Look-Up-Table #27) for time	>=	5.00	sec		
					Inhibit Status (no inhibiting faults) (No pending or stored DTC)	=	see sheet inhibit tables	-		
					basic enable conditions met:	=	see sheet enable tables	-		
Injector 1 Control	P1224	Diagnoses the Injector	Voltage low during driver on state	= Short to ground: -	Engine Running (see parameter	=	TRUE		fail	A
Circuit Shorted		Cylinder #1 high side driver circuit for circuit faults.	(indicates short to ground)	≤ 0.5 Ω impedance between signal and controller	definition)				conditions exists for more than 0.04 s	
				ground					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 2 Control Circuit Shorted	P1227	Diagnoses the Injector Cylinder #2 high side driver circuit for circuit faults.	Voltage low during driver on state (indicates short to ground)	= Short to ground: - ≤ 0.5 Ω impedance between signal and controller ground	Engine Running (see parameter definition)	= TRUE -	fail conditions exists for more than 0.04 s monitor runs with 0.01 s rate whenever enable conditions are met	А
Injector 3 Control Circuit Shorted	P122A	Diagnoses the Injector Cylinder #3 high side driver circuit for circuit faults.	Voltage low during driver on state (indicates short to ground)	= Short to ground: - ≤ 0.5 Ω impedance between signal and controller ground	Engine Running (see parameter definition)	= TRUE -	fail conditions exists for more than 0.04 s monitor runs with 0.01 s rate whenever enable conditions are met	А
Intake Air Flow Valve Control Circuit Shorted	P122C	Electronic out-put driver circuitry determines circuit integrity on the intake air flow valve.	The ECM detects that the commanded state of the driver and the actual state of the control circuit do not match.		for time and starter is active cranking for time Throttle Valve Actuator Solenoid Control Circuit and basic enable conditions met	> 11.00 V > 3.00 sec = FALSE - > 3.00 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	Thresh Logic and		Secondary Parameters		Enable Conditions		Time Required	MIL Illum.
						and NO Pending or Confirmed DTCs: and Open Load Diagnosis active	=	see sheet inhibit tables FALSE	-		
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 or throttle valve control deviation calculated out of difference between desired and actual value	< -10.00 > 10.00		and throttle valve controller bypass is active and throttle valve is driven to a mechanical stop and offset learning for the throttle valve was successful in the previous driving cycle and engine post drive/ afterun and basic enable conditions met and NO Pending or Confirmed DTCs:	= = =	FALSE FALSE TRUE TRUE See sheet enable tables see sheet inhibit tables		fail conditions exists for 10.05 s monitor runs once per driving cycle with 0.005 s rate whenever enable conditions are met	В
		Detects implausible learned offset values.	Path 1: learned throttle valve offset position at open or closed position or learned throttle valve offset position at open or closed position or Path 2: difference between the maximum and minimum positions learned at closed position or Path 3: difference between the maximum and minimum positions learned at open position or Path 3:	< -20.00 > 20.00 > 30.00 > 30.00	%	(engine temperature and engine temperature) and (battery voltage and battery voltage) and Throttle Valve is not frozen consisting of:	>= <= >= <=	4.96 123.06 8.00 30.00	°C °C V	fail conditions exists for 0.005 s monitor runs once per driving cycle with 0.005 s rate whenever enable conditions are met	

Component / System	Fault Code	Monitor Strategy Description	Primary Malfunction Criteria	Threshold Logic and Value	Secondary Parameters		Enable Conditions		Time Required	MIL Illum.
					(charge air cooler downstream temperature or if charge air cooler downstream temperature	>=	5.06 5.06	°C		
					then charge air cooler downstream temperature for	>	6.06	°C		
					time)		10.00	sec		
					and engine speed and	=	0	rpm		
					engine post drive/ afterun and basic enable conditions met	=	TRUE see sheet enable tables	-		
Intake Air Flow Valve Control Circuit 2 Low Voltage	P122E	Diagnoses the Throttle Valve high side driver circuit for circuit faults.	Voltage low during driver on state (indicates short to ground)	= Short to ground: ≤ 0.5 Ω impedance between signal and controller ground	for time and starter is active cranking for time Throttle Valve Actuator Solenoid Control Circuit and basic enable conditions met and NO Pending or Confirmed DTCs: and Open Load Diagnosis active	^	3.00 FALSE 3.00 ACTIVE see sheet enable tables see sheet inhibit tables FALSE	sec - sec -	fail conditions exists for 3 s monitor runs with 0.005 s rate whenever enable conditions are met	В
Intake Air Flow Valve Control Circuit 2 High Voltage	P122F	Diagnoses the Throttle Valve high side driver circuit for circuit faults.	Voltage high during driver off state (indicates short to power)	= Short to power: - ≤ 0.5 Ω impedance between signal and controller power	battery voltage	>	11.00	V	fail conditions exists for 3 s monitor runs with 0.005 s rate	В

Component / System	Fault Code	Monitor Strategy Description	Primary Malfunction Criteria	Threshold Logic and Value	Secondary Parameters	Enable Conditions		Time Required	MIL Illum.
Oyston	Gode	Description	Ontena	Logic und value	for time and starter is active cranking for time Throttle Valve Actuator Solenoid Control Circuit and basic enable conditions met and NO Pending or Confirmed DTCs: and Open Load Diagnosis active	> 3.00 = FALSE > 3.00 = ACTIVE = see sheet enable tables = see sheet inhibit tables = FALSE	sec	whenever enable conditions are met	
Injector 4 Control Circuit Shorted	P1233	Diagnoses the Injector Cylinder #4 high side driver circuit for circuit faults.	Voltage low during driver on state (indicates short to ground)	= Short to ground: - ≤ 0.5 Ω impedance between signal and controller ground	Engine Running (see parameter definition)	= TRUE		fail conditions exists for more than 0.04 s monitor runs with 0.01 s rate whenever enable conditions are met	A
Injector 5 Control Circuit Shorted	P1236	Diagnoses the Injector Cylinder #5 high side driver circuit for circuit faults.	Voltage low during driver on state (indicates short to ground)	= Short to ground: - ≤ 0.5 Ω impedance between signal and controller ground	Engine Running (see parameter definition)	= TRUE		fail conditions exists for more than 0.04 s monitor runs with 0.01 s rate whenever enable conditions are met	А

Component / System	Fault Code	Monitor Strategy Description	Primary Malfunction Criteria	Threshold Logic and Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
Injector 6 Control Circuit Shorted	P1239	Diagnoses the Injector Cylinder #6 high side driver circuit for circuit faults.	Voltage low during driver on state (indicates short to ground)	= Short to ground: - ≤ 0.5 Ω impedance between signal and controller ground	Engine Running (see parameter definition)	= TRUE -	fail conditions exists for more than 0.04 s monitor runs with 0.01 s rate whenever enable conditions are met	A
Injector 7 Control Circuit Shorted	P1242	Diagnoses the Injector Cylinder #7 high side driver circuit for circuit faults.	Voltage low during driver on state (indicates short to ground)	= Short to ground: - ≤ 0.5 Ω impedance between signal and controller ground	Engine Running (see parameter definition)	= TRUE -	fail conditions exists for more than 0.04 s monitor runs with 0.01 s rate whenever enable conditions are met	A
Injector 8 Control Circuit Shorted	P1247	Diagnoses the Injector Cylinder #8 high side driver circuit for circuit faults.	Voltage low during driver on state (indicates short to ground)	= Short to ground: - ≤ 0.5 Ω impedance between signal and controller ground	Engine Running (see parameter definition)	= TRUE -	fail conditions exists for more than 0.04 s monitor runs with 0.01 s rate	A

Component / System	Fault Code	Monitor Strategy Description	Primary Malfunction Criteria	Threshold Logic and Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
				_			whenever enable conditions are met	
Fuel Pressure Regulator 2 High Control Circuit Low Voltage	P125A	Diagnoses the Fuel Rail Pressure Regulator #2 high side driver circuit for circuit faults.	Voltage low during driver on state (indicates short to ground)	= Short to ground: ≤ 0.5 Ω impedance between signal and controller ground	for time and (ignition on and basic enable conditions met:	> 11.00 V > 3.00 sec = TRUE - = see sheet enable - tables	fail conditions exists for 0.5 s monitor runs with 0.01 s rate whenever enable conditions are met	A
Fuel Pressure Regulator 2 High Control Circuit High Voltage	P125B	Diagnoses the Fuel Rail Pressure Regulator #2 high side driver circuit for circuit faults.	Voltage high during driver off state (indicates short to power)	= Short to power: - ≤ 0.5 Ω impedance between signal and controller power	for time and (ignition on and basic enable conditions met:	> 11.00 V > 3.00 sec = TRUE - = see sheet enable - tables	fail conditions exists for 0.1 s monitor runs with 0.1s rate whenever enable conditions are met	В
Fuel Rail Pressure Performance	P128E	Actual rail pressure is compared to fixed absolute value to detect low or high rail pressure conditions.	rail pressure (see Look-Up-Table #67)	< 0 to 15000 kPa	(fail conditions exists for 2 s monitor runs with 0.02 s	А

System	Code	Description	Criteria		Logic and Value	•	Parameters		Conditions		Required	Illun
							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)	=	TRUE	-	rate whenever enable conditions are met	
							or state machine rail pressure control equal transitioning to metering unit pressure control mode)	=	TRUE	-		
							and basic enable conditions met:	=	see sheet enable tables	-		
							NO Pending or Confirmed DTCs:	=	see sheet inhibit tables	-		
			rail pressure (see Look-Up-Table #72)	<	0 to 15000	kPa	(state machine rail pressure control equal to pressure control valve	=	TRUE	-		
							or state machine rail pressure control equal coupled pressure control (rail pressure is controlled by metering unit and pressure control valve)	=	TRUE	-		
							and basic enable conditions met:		see sheet enable tables	-		
							and NO Pending or Confirmed DTCs:		see sheet inhibit tables	-		
									_			
			rail pressure (see Look-Up-Table #70)	<	0 to 15000	kPa	state machine rail pressure control equal to metering unit control mode and	=	TRUE	-		
							basic enable conditions met: and	=	see sheet enable tables	-		
							NO Pending or Confirmed DTCs:	=	see sheet inhibit tables	-		
			rail pressure	>	215000.00	kPa	(fail conditions	

Component / System	Fault Code	Monitor Strategy Description	Primary Malfunction Criteria	Threshold Logic and Value	Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
		·			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	= TRUE -	1.01 s. monitor runs with 0.02 s rate whenever enable conditions are met	
					state machine rail pressure control equal transitioning to metering unit pressure control mode) and basic enable conditions met:	= TRUE - = see sheet enable -		
					and NO Pending or Confirmed DTCs:	tables = see sheet inhibit - tables		
			rail pressure	> 215000.00 kPa	(state machine rail pressure control equal to pressure control valve or state machine rail pressure control equal coupled pressure control (rail pressure is controlled by metering unit and pressure control valve))	= TRUE -		
					and basic enable conditions met: and NO Pending or Confirmed DTCs:	= see sheet enable - tables = see sheet inhibit - tables		
			rail pressure	> 215000.00 kPa	state machine rail pressure control equal to metering unit control mode and basic enable conditions met: and NO Pending or Confirmed DTCs:	= TRUE - = see sheet enable - tables = see sheet inhibit - tables		

Component / System	Fault Code	Monitor Strategy Description	Primary Malfunction Criteria		Threshold Logic and Value		Secondary Parameters		Enable Conditions		Time Required	MIL Illum.
Exhaust Gas Temperature Sensors 3-4 Not Plausible	P113A		(a) - (b) (see Look-Up-Table #95)	>	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	В
			and with				Engine Running (see parameter definition)	=	TRUE	-	whenever enable conditions	
			(a) captured downstream SCR catalyst temperature at start (b) captured downstream Particulate	=	measured parameter measured	-	for time Engine off soak time	>=	0 28800	sec	are met	
			Filter catalyst temperature at start		parameter		ambient temperature and NO Pending or Confirmed DTCs: basic enable conditions met:	> = =	-60.04 see sheet inhibit tables see sheet enable tables	°C - -		
Exhaust Gas Recirculation (EGR) Motor Control Circuit Shorted	P1407	Electronic out-put driver circuitry determines circuit integrity on the EGR solenoid.	The ECM detects that the commanded state of the driver and the actual state of the control circuit do not match.				EGR Solenoid Control Circuit	=	ACTIVE	-	fail conditions exists for 3 s monitor runs with 0.005 s rate	В
							battery voltage for time	> >	11.00 3.00	V sec	whenever enable conditions	
							and starter is active cranking for	=	FALSE	-	are met	
							time and basic enable conditions met:	>	3.00 see sheet enable tables	sec -		
Exhaust Gas Recirculation Slow Response- Increasing Flow	P140B	Detects a negative slow response by comparing expected system dynamics with actual value	average negative gradient of the air mass - calculated by accumulating control deviation (deviation between desired and actual value) over a sampling time and dividing result by sampling time	>	0.32	g/rev	(fail conditions exists for 15 s monitor runs with 0.1s	В
							ambient pressure and engine coolant temperature and EGR control is in closed loop for time and	> > = >	74.80 69.96 TRUE 1.50	kPa °C - sec	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.
					EGR control is active	=	TRUE	-		
					for time	>	0.00	sec	1	
					and	1		,	1	
					exhaust gas system regeneration mode	=	FALSE	-	1	
						1		,	1	
					for time	>	5.00	sec	1	
					and	1			1	
					Engine speed	>=	1000.00	rpm	1	
					Engine speed	<=	2200.00	rpm	1	
					and	`-	2200.00		1	
					injection quantity	>=	80.00	mm^3/r	1	
					injection quantity		00.00	ev	1	
					injection quantity	<=	300.00	mm^3/r	1	
					injection quantity	<=	300.00		1	
					1	1		ev	1	
			1		and	1	0.40		1	
]		desired delta air mass flow	>	0.13	g/s	<i>i</i> 1	
]		desired delta air mass flow	<	-0.02	g/s	<i>i</i> 1	
					and	1			1	
					difference of the air mass	<	0	g/rev	1	
					and	1			1	
					NO Pending or Confirmed DTCs:	=	see sheet inhibit	-	1	
						1	tables		1	
						1			1	
					for time	>	0.10	sec	1	
					and	1			1	
					basic enable conditions met:	=	see sheet enable	-	1	
						1	tables	,	1	
						1		,	1	
						1			1	
xhaust Gas	P140C	Detects a positive slow	average positive gradient of the air mass	>= -0.32 g/rev	(fail	В
ecirculation Slow		response by comparing	calculated by accumulating control	Ţ.	<u> </u> `	1			conditions	
sponse-		expected system dynamics	deviation (deviation between desired and			1			exists for 15	
creasing Flow		with actual value						,	s	
			actual value) over a sampling time and					l l		
			actual value) over a sampling time and dividing result by sampling time							
			actual value) over a sampling time and dividing result by sampling time						monitor runs	
					ambient pressure		74 80	kPa	monitor runs with 0.1s	
					ambient pressure	>	74.80	kPa	monitor runs with 0.1s rate	
					and				monitor runs with 0.1s rate whenever	
					and engine coolant temperature	> >	74.80 69.96	kPa °C	monitor runs with 0.1s rate whenever enable	
					and engine coolant temperature and	>	69.96	°C	monitor runs with 0.1s rate whenever enable conditions	
					and engine coolant temperature and EGR control is in closed loop	> =	69.96 TRUE	°C	monitor runs with 0.1s rate whenever enable	
					and engine coolant temperature and EGR control is in closed loop for time	>	69.96	°C	monitor runs with 0.1s rate whenever enable conditions	
					and engine coolant temperature and EGR control is in closed loop for time and	> = >	69.96 TRUE 1.50	°C - sec	monitor runs with 0.1s rate whenever enable conditions	
					and engine coolant temperature and EGR control is in closed loop for time and EGR control is active	> = >	69.96 TRUE 1.50 TRUE	°C - sec -	monitor runs with 0.1s rate whenever enable conditions	
					and engine coolant temperature and EGR control is in closed loop for time and EGR control is active for time	> = >	69.96 TRUE 1.50	°C - sec	monitor runs with 0.1s rate whenever enable conditions	
					and engine coolant temperature and EGR control is in closed loop for time and EGR control is active for time and	> = >	69.96 TRUE 1.50 TRUE 0.00	°C - sec - sec	monitor runs with 0.1s rate whenever enable conditions	
					and engine coolant temperature and EGR control is in closed loop for time and EGR control is active for time	> = >	69.96 TRUE 1.50 TRUE	°C - sec -	monitor runs with 0.1s rate whenever enable conditions	
					and engine coolant temperature and EGR control is in closed loop for time and EGR control is active for time and exhaust gas system regeneration mode	> = > = > =	69.96 TRUE 1.50 TRUE 0.00 FALSE	°C - sec - sec	monitor runs with 0.1s rate whenever enable conditions	
					and engine coolant temperature and EGR control is in closed loop for time and EGR control is active for time and exhaust gas system regeneration mode for time	> = >	69.96 TRUE 1.50 TRUE 0.00	°C - sec - sec	monitor runs with 0.1s rate whenever enable conditions	
					and engine coolant temperature and EGR control is in closed loop for time and EGR control is active for time and exhaust gas system regeneration mode for time and	> = > = > =	69.96 TRUE 1.50 TRUE 0.00 FALSE 5.00	°C - sec - sec - sec - sec	monitor runs with 0.1s rate whenever enable conditions	
					and engine coolant temperature and EGR control is in closed loop for time and EGR control is active for time and exhaust gas system regeneration mode for time and Engine speed	> = > = > =	69.96 TRUE 1.50 TRUE 0.00 FALSE 5.00 1450.00	°C - sec - sec - sec rpm	monitor runs with 0.1s rate whenever enable conditions	
					and engine coolant temperature and EGR control is in closed loop for time and EGR control is active for time and exhaust gas system regeneration mode for time and Engine speed Engine speed	> = > = >	69.96 TRUE 1.50 TRUE 0.00 FALSE 5.00	°C - sec - sec - sec - sec	monitor runs with 0.1s rate whenever enable conditions	
					and engine coolant temperature and EGR control is in closed loop for time and EGR control is active for time and exhaust gas system regeneration mode for time and Engine speed Engine speed and	> = > = > = >	69.96 TRUE 1.50 TRUE 0.00 FALSE 5.00 1450.00 2200.00	°C - sec - sec - sec rpm rpm	monitor runs with 0.1s rate whenever enable conditions	
					and engine coolant temperature and EGR control is in closed loop for time and EGR control is active for time and exhaust gas system regeneration mode for time and Engine speed Engine speed	> = > = > = >	69.96 TRUE 1.50 TRUE 0.00 FALSE 5.00 1450.00	°C - sec - sec - sec rpm	monitor runs with 0.1s rate whenever enable conditions	

Component / System	Fault Code	Monitor Strategy Description	Primary Malfunction Criteria	Threshold Logic and Value	Secondary Parameters		Enable Conditions		Time Required	MIL Illum.
					injection quantity and desired delta air mass flow desired delta air mass flow and difference of the air mass and NO Pending or Confirmed DTCs: for time and basic enable conditions met:	<= > < = >	300.00 0.13 -0.02 0 see sheet inhibit tables 0.10 see sheet enable tables	mm^3/r ev g/s g/s g/rev - sec		
Exhaust Gas Recirculation (EGR) Motor Control Circuit 2 Low Voltage	P140D	Diagnoses the EGR Valve high side driver circuit for circuit faults.	Voltage low during driver on state (indicates short to ground)	= Short to ground: - ≤ 0.5 Ω impedance between signal and controller ground	and battery voltage for time and starter is active cranking for time and basic enable conditions met:	> > = >	11.00 3.00 FALSE 3.00 see sheet enable tables	V sec - sec -	fail conditions exists for 3 s monitor runs with 0.005 s rate whenever enable conditions are met	В
Exhaust Gas Recirculation (EGR) Motor Control Circuit 2 High Voltage	P140E	Diagnoses the EGR Valve high side driver circuit for circuit faults.	Voltage high during driver off state (indicates short to power)	= Short to power: ≤ 0.5 Ω impedance between signal and controller power	and battery voltage for time and starter is active cranking for time and	= > > = >	11.00 3.00 FALSE 3.00	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	Threshold Logic and Value		Secondary Parameters		Enable Conditions		Time Required	MIL Illum.
						basic enable conditions met:		see sheet enable tables	-		
Exhaust Gas Recirculation (EGR) Motor Current Performance	P140F	Diagnoses the EGR Valve low side driver circuit for circuit faults.	Voltage high during driver on state (indicates short to power)	= Short to power: ≤ 0.5 Ω impedance between signal and controller power	-	EGR Solenoid Control Circuit	=	ACTIVE	·	fail conditions exists for 2 s monitor runs with 0.005 s rate	В
						and battery voltage for time and starter is active cranking for time and basic enable conditions met:	> = >	11.00 3.00 FALSE 3.00 see sheet enable tables	V sec sec	whenever enable conditions are met	
Closed Loop Diesel Particulate Filter (DPF) Regeneration Control At Limit - Stage 1 Temperature Too Low	P144B	Detects insufficient exhaust temperature. Actual inner controller ratio and temperature readings are compared to desired controller ratio and temperature values as an indication of an insufficient exhaust gas temperature.	commanded control value of the inner control loop of the temperature controller	>= 0.99	·	current engine operating point is suitable for monitoring deviation of exhaust gas temperature control - depending on engine speed and injection quantity (see Look-Up-Table #23)	=	0 to 1	-	fail conditions exists for 200 s monitor runs with 0.1 s rate whenever enable	В
			and deviation from the temperature setpoint for inner control loop (with (a) limitation of the temperature threshold	> maximum of (a) and (b)	- °C	for time and release of the exhaust gas temperature outer loop control monitoring means	> =	0.00 TRUE	sec -	conditions are met	
			and with (b) temperature threshold value for maximum deviation	= 100	°C	(active operation mode of the inner control loop means (=	TRUE	-		
						particulate filter regeneration and temperature before oxidation catalyst and temperature after particulate filter and (>	TRUE 99.96	°C		

Component /	Fault	Monitor Strategy	Primary Malfunction		Threshold		Secondary		Enable		Time	MIL
System	Code	Description	Criteria		Logic and Value		Parameters		Conditions		Required	Illum.
							temperature before oxidation catalyst and temperature after particulate filter or temperature before oxidation catalyst and temperature after particulate filter for activated post injection)	v v	649.96 649.96	°C		
							and status maximum governor deviation means	=	TRUE	-		
							vehicle speed and	<=	124.30	mph		
							Relative accelerator pedal position for	>	3.00	%		
							time and basic enable conditions met:	> =	1.00 see sheet enable	sec		
							and	_	tables			
							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	commanded control value of the inner control loop of the temperature controller	<=	0.00	-	current engine operating point is suitable for monitoring deviation of exhaust gas temperature control - depending on engine speed and injection quantity (see Look-Up-Table #24)	=	0 to 1	-	fail conditions exists for 200 s monitor runs with 0.1 s rate whenever	В
		exhaust gas temperature.	and deviation from the temperature setpoint	<	minimum of (a)	-	for time	>	0.00	sec	enable conditions are met	
			for inner control loop (with		and (b)		and release of the exhaust gas temperature	=	TRUE			
			With				outer loop control monitoring	_	INOL			
			(a) limitation of the temperature threshold	=	-100.00	°C	means					
			and with (b) temperature threshold value for minimum deviation	=	100	°C	(active operation mode of the inner control loop means (=	TRUE	-		
							particulate filter regeneration and	=	TRUE	-		
							temperature before oxidation catalyst and temperature after particulate filter	>	99.96	°C		

Component /	Fault	Monitor Strategy	Primary Malfunction		Threshold		Secondary		Enable		Time	MIL
System	Code	Description	Criteria	L	ogic and Val	ue	Parameters		Conditions		Required	Illum.
							and (temperature before oxidation catalyst and temperature after particulate filter	<	649.96	°C		
							or 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 Relative accelerator pedal position	<= >	124.30 3.00	mph %		
							for time	>	1.00	sec		
							and basic enable conditions met:	=	see sheet enable tables	-		
							and NO Pending or Confirmed DTCs:	=	see sheet inhibit tables	-		
TCM Engine Speed Request Signal Message Counter Incorrect	P150C	Detects implausible engine speed request information received from the TCM	Path 1:				ignition on	=	TRUE	-	fail conditions exists for 0.01 s	А
			(number of rolling count / protection values detected	>=	7.00	counts	and basic enable conditions met:	=	see sheet enable tables	-	test performed continuously	
			with number of consecutive frames	=	12.00	counts	and NO Pending or Confirmed DTCs:	=	see sheet inhibit tables	-	0.01 s	
) or Path 2 :									
			internal calculated checksum value for transmission is not equal the received value and	=	TRUE	-						
			number of fault results) or	>	15.00	counts						
			Path 3: time since last frame of validation protection was received from transmission	>	0.08	sec						

Component / System	Fault Code	Monitor Strategy Description	Primary Malfunction Criteria		Threshold Logic and Valu	ie	Secondary Parameters		Enable Conditions		Time Required	MIL Illum.
Validation Error in messages received from Power Take Off	P1591	Rolling counter and protection value evaluation of message received from Power Take Off Control	number of messages with validation errors	>=	4.00	counts	ignition on	=	TRUE	·	fail conditions exists for 0.12 s	Special C
Control Module		Module	in the last number of messages (sliding window) received from power take off control module	=	10.00	counts	for time	>=	3.00	sec	test performed continuously 0.01 s rate	
							basic enable conditions met:	=	see sheet enable tables	-		
							NO Pending or Confirmed DTCs:	=	see sheet inhibit tables	-		
Particulate filter efficiency monitoring	P2002	Statistical evaluation of the present exhaust gas volume flow signal and particulate filter delta pressure signal to determine particulate filter efficiency	particulate filter efficiency factor	>	0.35	-	Calculated exhaust-gas volume flow in the particulate filter	<	3000.00	m^3/h	fail conditions exists for 0.1 s monitor runs with 0.1s	В
							and Calculated exhaust-gas volume flow in the particulate filter and	>	600.00	m^3/h	rate whenever enable conditions are met	
							Temperature upstream of the particulate filter and	<	799.96	°C	are met	
							Temperature upstream of the particulate filter and	>	499.96	°C		
							Temperature downstream particulate filter and	<	799.96	°C		
							Temperature downstream particulate filter and	>	499.96	°C		
							Upstream and downstream particulate filter temperature difference land	<	300.00	°C		
							Upstream and downstream particulate filter temperature difference	>	-300.00	°C		
							and Simulated surface temperature, particulate filter and	<	799.96	°C		
							Simulated surface temperature, particulate filter and	>	499.96	°C		

Component / System	Fault Code	Monitor Strategy Description	Primary Malfunction Criteria	Threshold Logic and Value	Secondary Parameters		Enable Conditions		Time Required	MIL Illum.
Gystem	- Coue	Description	Oricena	Logic and value	Basic enable conditions met	=	see sheet enable tables		required	mann.
					and Number of segments filled with flow rate distributions for DPF efficiency regression analysis and Sum of flow rate distribution for DPF	>=	3.00	counts		
					efficiency regression analysis			_		
Reductant Injector Performance	P202E	This diagnostic checks the Reductant Injector performance during operation.	Number of times the ECM detects that the commanded state of the Reductant Injector driver and the actual state of the control circuit do not match.	> 10.00 counts	Flag for successful measurement of current in opening phase of Reductant Injector	=	TRUE	-	fault exists for more than 80 injection events; monitor runs	A
					Reductant Dosing System Metering control substate of Pressure control state (see definition)	=	TRUE	-	with 100 ms rate whenever enable	
					Calculated Reductant Injector coil temperature	>=	-6.64	°C	conditions are met	
					Calculated Reductant Injector coil temperature	<=	99.96	°C		
					battery voltage	>=	11.00	V		
					battery voltage) (<=	655.34	V		
					Reductant Dosing System pump relative pressure	>=	350.00	kPa		
					Reductant Dosing System pump relative pressure	<=	650.00	kPa		
					ambient pressure	>=	0.00	kPa		
					ambient pressure)	<=	130.00	kPa		
					(NO Pending or Confirmed DTCs	=	see sheet inhibit tables	-		
					(ambient pressure ambient temperature	> >	0.00 -30.04	kPa °C		
) basic enable conditions met:	=	see sheet enable tables	-		

Component /	Fault	Monitor Strategy	Primary Malfunction		Threshold		Secondary		Enable		Time	MIL
System Exhaust Gas Temperature (EGT) Sensor 2 Circuit Low Voltage	P2032	Description Detects low voltage readings on the EGT 2 circuit, indicating an OOR low condition on the EGT 2 circuit	temperature sensor voltage downstream of oxidation catalyst same as temperature downstream of oxidation catalyst	<	0.65 - 50	v °C	Parameters ignition on and basic enable conditions met:	=	TRUE see sheet enable tables		Required fail conditions exists for 3 s monitor runs 0.050 s rate whenever enable conditions are met	A A
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	>	2.21	V °C	ignition on and basic enable conditions met:	=	TRUE see sheet enable tables	-	fail conditions exists for 3 s monitor runs 0.050 s rate whenever enable conditions are met	A
Reductant Level Sensor "A" Circuit Range/Performanc e	P203B	Reductant level plausibility check error from CAN	CAN message "Reductant Level Plausibility Check Error" from reductant tank level evaluation module which means ((measured tank level sensor 2 voltage after 1.5 ms since a test impulse was applied) (measured tank level sensor 1 voltage after 1.5 ms since a test impulse was applied)) or ((measured tank level sensor 3 voltage after 1.5 ms since a test impulse was applied)	= = =	TRUE (0.0 to 1.7) (1.71 to 3.56)	- V V	ignition on and basic enable conditions met: and NO Pending or Confirmed DTCs:	= =	TRUE see sheet enable tables see sheet inhibit tables		fail conditions exists for 5 s test performed continuously 1 s rate	В

Component / System	Fault Code	Monitor Strategy Description	Primary Malfunction Criteria		Threshold Logic and Value		Secondary Parameters		Enable Conditions		Time Required	MIL Illum.
			(measured tank level sensor 1 voltage after 1.5 ms since a test impulse was applied)) or ((measured tank level sensor 3 voltage after 1.5 ms since a test impulse was applied) (measured tank level sensor 2 voltage after 1.5 ms since a test impulse was applied))		(1.71 to 3.56) (0.0 to 1.7) (1.71 to 3.56)	V						
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	A
LOW		grouna error	(tank level sensor 1 voltage directly measured after a test impulse was	<	(0.17)	V	battery voltage	>	8	V	more than 3 sec.	
			applied)				basic enable conditions met:	=	see sheet enable tables	-	monitor runs with 1 s rate whenever enable conditions are met	
Reductant Level	P203D	Path 1:									fail	А
Sensor 1 Circuit High		level sensor 1 open load	Reductant Tank Level 1 Error Status	=	3	-	ignition on	=	TRUE	-	conditions exists for more than 3 sec.	
		error	(measured tank level sensor 1 voltage after 1.5 ms since a test impulse was	>	(3.56)	V	battery voltage	>	8	٧	monitor runs with 1 s rate whenever	
			applied) (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	-	enable conditions are met	
		Path 2: CAN message: Discrete	Reductant Tank Level 1 Error Status	=	2	_	ignition on	_	TRUE	_		
		level sensor 1 short to battery error	ineduciant fank Level i Enoi Status	=	۷	-	ignition on		INUE	-		
			(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	-		

Component / System	Fault Code	Monitor Strategy Description	Primary Malfunction Criteria	Threshold Logic and Value	Secondary Parameters		Enable Conditions		Time Required	MIL Illum.
Reductant Injector Control Circuit	P2047	Diagnoses the Reductant Injector low side driver circuit for circuit faults.	Voltage low during driver off state (indicates open circuit)	= Open Circuit:≥ - 200 K Ω impedance between ECU pin and load	engine pre drive	=	FALSE	-	fail conditions exists for 3 s monitor runs with 0.01 sec rate	A
					time and	>	1.00	sec	whenever enable	
					battery voltage for	>	11.00	V	conditions are met	
					time and battery voltage	> <	3.00 655.34	sec V		
					for time	>	3.00	sec		
					and (
					battery voltage correction factor and battery voltage correction factor	> <	0.00 4.00	factor		
) for		4.00	iacioi			
				time and	>	3.00	sec			
				basic enable conditions met:	=	see sheet enable tables	-			
Reductant Injector Control Circuit Low Voltage			= Short to ground: - ≤ 0.5 Ω impedance between signal and controller ground	engine pre drive	=	FALSE		fail conditions exists for 2 s monitor runs with 0.01 sec rate whenever enable	А	
					for time and	>	1.00	sec	conditions are met	
					battery voltage for	>	11.00	V		
				time and	>	3.00	sec			
			battery voltage for time	>	655.34 3.00	V				
				and (5.00	300			
					battery voltage correction factor and	>	0.00	factor		
					battery voltage correction factor) for	<	4.00	factor		

Component / System	Fault Code	Monitor Strategy Description	Primary Malfunction Criteria	Threshold Logic and Value	Secondary Parameters		Enable Conditions		Time Required	MIL Illum.
System	Code	Description	Griteria	Logic and value	time and basic enable conditions met:	> =	3.00 see sheet enable tables	sec -	Required	mum.
Reductant Injector Control Circuit High Voltage	P2049	Diagnoses the Reductant Injector low side driver circuit for circuit faults.	Voltage high during driver on state (indicates short to power)	= Short to power: - ≤ 0.5 Ω impedance between signal and controller power	engine pre drive for time and battery voltage for time and battery voltage for time and battery voltage for time and (battery voltage correction factor and battery voltage correction factor and battery voltage correction factor) for time and basic enable conditions met:		1.00 11.00 3.00 655.34 3.00 0.00 4.00 3.00 see sheet enable tables	sec V sec V sec factor factor	fail conditions exists for 3 s monitor runs with 0.01 sec rate whenever enable conditions are met	A
Reductant Pump Pressure Sensor Performance	P204B	Unfiltered reductant pressure is compared to a threshold while the SCR system is in No Pressure Control state	Unfiltered Reductant Pump Module Pressure	> 50.00 kPa	Reductant filling state in the pressure line status of SCR control state (please see the definition) State of the defrosting check of pressure line (please see the definition) ambient pressure ambient temperature NO Pending or Confirmed DTCs: basic enable conditions met:	= = > > = =	0.00 No Pressure Control TRUE 0.00 -30.04 see sheet inhibit tables see sheet enable tables	% kPa °C	fail conditions exists for more than 0.6 sec monitor runs with 0.01 s rate whenever enable conditions are met	A

Component / System	Fault Code	Monitor Strategy Description	Primary Malfunction Criteria		Threshold Logic and Valu	le	Secondary Parameters		Enable Conditions		Time Required	MIL Illum.
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	<	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	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	>	4.80	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	Α
Reductant System Performance Bank 1	P204F	Unsuccessful reductant pressure build up	Reductant Pump Module Pressure	<=	350.00	kPa	status of SCR control sub state (please see the definition) and Reductant Defrost check (please see the definition) and ambient pressure and ambient temperature and number of pressure build-up attempts in pressure buildup and ventilation states with (Dwell time in Pressure Build up substate Dwell time in ventilation substate	= = > > > >= >= >= >= >=	PRESSURE BUILDUP 1.00 0.00 -30.04 30.00 10.00 10.00	- kPa °C counts	fail conditions exists for 1 event 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
- Cyclem		2000	5.10.12				Urea heater release reason and	!=	COMPONENT PROTECTION	-	rtoquiiou	
							NO Pending or Confirmed DTCs: basic enable conditions met:	=	see sheet inhibit tables see sheet enable tables	-		
eductant Tank emperature ensor erformance	P205B	Path 1: The temperature difference between reductant tank temperature and diesel fuel temperature are compared to an upper threshold after sufficient engine-off duration	(a) - (b)	>	34.96	°C	ignition on	=	TRUE		fail conditions exists for more than 0.5 sec monitor runs with 0.01 s rate whenever enable	В
			where (a) Reductant tank temperature (b) fuel temperature	= =	measured parameter measured parameter		status of SCR control state (please see the definition) Engine off Time time since start Max [(a), (b), (c)] - Min [(a), (b), (c)] where (a) Oxidation Catalyst upstream temperature (b) fuel temperature (c) Particulate filter downstream temperature NO Pending or Confirmed DTCs: basic enable conditions met:	= > > = = = = =	No Pressure control 28800.00 6.00 6.96 measured parameter measured parameter measured parameter see sheet inhibit tables see sheet enable tables	sec sec °C	conditions are met	
		Path 2:					ignition on	=	TRUE	\	fail conditions	

Component /	Fault	Monitor Strategy	Primary Malfunction		Threshold		Secondary		Enable		Time	MIL
System	Code	Description	Criteria		Logic and Value		Parameters		Conditions		Required	Illum.
		The temperature difference between reductant tank temperature and diesel fuel temperature are compared to a lower threshold after sufficient engine-off duration	(a) - (b)	V	-35.04	°C	status of SCR control state (please see the definition)	Ш	No Pressure control	-	exists for more than 0.5 sec monitor runs with 0.01 s rate whenever enable	
			where				Engine off Time	>	28800.00	sec	conditions	
			(a) Reductant tank temperature	=	measured	-	time since start	>	6.00	sec	are met	
			(b) fuel temperature	=	parameter measured parameter	-	Max [(a), (b), (c)] - Min [(a), (b), (c)]	<=	6.96	°C		
					parameter		where (a) Oxidation Catalyst upstream temperature (b) fuel temperature	=	measured parameter measured	-		
							(c) Particulate filter downstream	=	parameter measured	-		
							temperature		parameter			
							NO Pending or Confirmed DTCs:	=	see sheet inhibit tables	-		
							basic enable conditions met:	=	see sheet enable tables	-		
												_
Reductant Tank Temperature Sensor Circuit Low	P205C	Detects an out of range low reading of the Reductant Tank Temperature Sensor via CAN Message	Raw value of the CAN message for the Reductant Tank Temperature	<	1.00	hex	basic enable conditions met:	=	see sheet enable tables		fault exists for more than 3 seconds; monitor runs at 1 s	A
			Corresponds to a temperature of	<=	-55.0	°C	and				whenever enable	
			Corresponds to a resistance of	>=	1200	kOhm	No rolling count or protection value errors. (sliding window errors) in the CAN	=	TRUE	-	conditions are met	
			Corresponds to a voltage of	>=	5.0	V	frame					
			corresponds to a voltage of	/-	3.0	V						
Reductant Tank Temperature Sensor Circuit High	P205D	Detects an out of range high reading of the Reductant Tank Temperature Sensor via CAN Message or an invalid (initialization) value of the Reductant Tank Temperature CAN message	Raw value of the CAN message for the Reductant Tank Temperature	>	1022.00	hex	basic enable conditions met:	=	see sheet enable tables	-	fault exists for more than 6 seconds; monitor runs at 1 s whenever enable	В
			Corresponds to a temperature of Corresponds to a resistance of	>= <=	160.0 0.153	°C kOhm	and No rolling count or protection value errors. (sliding window errors) in the CAN frame	=	TRUE	-	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.
			Corresponds to a voltage of OR Path2: Raw value of the CAN message for the Reductant Tank Temperature	=	0.270 0x3FF	V						
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 xxs monitor runs with 0.1 s rate	В
			or integrated heat quantity of exhaust gas temperature sensor 1	>	(a) / (b) * (c) / (d) * (e) * (g)	-	for time	>	1500.00	sec	whenever enable conditions	
			with (a) exhaust gas mass flow	=	calculated parameter	-	and time since start	>	327.00	sec	are met	
			and with (b) factor and with	=	3.600	g/s	and (exhaust-gas temperature sensor 1	>	-60.04	°C		
			(c) heat capacity and with	=	1050.00	J/Kg/°C	and exhaust-gas temperature sensor 1	<	1999.96	°C		
			(d) factor and with (e) correction factor for heat flow quantity depending on exhaust gas mass flow for temperature sensor 1	=	1.00	kW/°C factor) and change in exhaust-gas temperature sensor 1	<	7.00	°C		
			and with (f) minimum permissible temperature deviation for exhaust gas temperature sensor 1	=	-100.00	°C	for time and	=	5.00	sec		
			and with (g) maximum permissible temperature deviation for exhaust gas temperature	=	100.00	°C	engine operation point suitable for diagnostic (see Look-Up-Table #29) for	=255	0 to 255	-		
			sensor 1				time	>=	0.05	sec		
							and change in modeled exhaust-gas temperature sensor 1 and	>	4.00	°C		
							(heat quantity for exhaust gas temperature sensor 1 and	>	10.00	kJ		
							heat quantity for exhaust gas temperature sensor 1	<	12.00	kJ		
							and					

Component / System	Fault Code	Monitor Strategy Description	Primary Malfunction Criteria		Threshold Logic and Value		Secondary Parameters		Enable Conditions		Time Required	MIL Illum.
,							engine has been in normal mode for time	>=	1.00	sec		
							or engine has been in exhaust warm-up mode for time	>=	1.00	sec		
							and basic enable conditions met:	=	see sheet enable tables	-		
							and NO Pending or Confirmed DTCs:	=	see sheet inhibit tables	-		
						_						_
Exhaust 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 xxs monitor runs with 0.1 s rate	В
			or integrated heat quantity of exhaust gas temperature sensor 2 with	>	(a) / (b) * (c) / (d) * (e) * (g)	-	for time	>	1500.00	sec	whenever enable conditions	
			(a) exhaust gas mass flow	=	calculated parameter	-	and time since start	>	327.00	sec	are met	
			and with (b) factor and with	=	3.600	g/s	and (exhaust-gas temperature sensor 2	>	-60.04	°C		
			(c) heat capacity and with (d) factor	=	1050.00 1000	J/Kg/°C kW/°C	and exhaust-gas temperature sensor 2	<	1999.96	°C		
			and with (e) correction factor for heat flow quantity depending on exhaust gas mass flow for temperature sensor 2	=	1.00	factor	and change in exhaust-gas temperature sensor 2	<	7.00	°C		
			and with (f) minimum permissible temperature deviation for exhaust gas temperature	=	-100.00	°C	for time and	=	5.00	sec		
			sensor 2 and with (g) maximum permissible temperature	=	100.00	°C	engine operation point suitable for diagnostic (see Look-Up-Table #29) for	=	0 to 255	-		
			deviation for exhaust gas temperature sensor 2									
							time and	>=	0.05	sec		
							change in modeled exhaust-gas temperature sensor 2 and	>	4.00	°C		
							(heat quantity for exhaust gas temperature sensor 2 and	>	10.00	kJ		

Component /	Fault	Monitor Strategy	Primary Malfunction	Threshold	Secondary		Enable		Time	MIL
System	Code	Description	Criteria	Logic and Value	Parameters		Conditions 12.00	kJ	Required	Illum.
					heat quantity for exhaust gas temperature sensor 2) and engine has been in normal mode for time	< >=	1.00	KJ Sec		
					or engine has been in exhaust warm-up mode for time and	>=	1.00	sec		
					basic enable conditions met:	=	see sheet enable tables	-		
					and NO Pending or Confirmed DTCs:	=	see sheet inhibit tables	-		
Reductant Pump Control Circuit	P208A	Detects an open circuit or an overtemperature condition in the Reductant Pump Control Circuit	Voltage low during driver off state (indicates open circuit) Voltage high during driver off state (open circuit)	= Open Circuit:≥ - 200 K Ω impedance between ECU pin and load = Open Circuit: ≥ - 200 K Ω impedance between ECU pin and load signal and controller ground	((Battery voltage for time OR	۷ ۷	10.5 3	V sec	fail conditions exists for 6.2 s monitor runs with 0.010 s rate whenever enable conditions are met	В
					Battery voltage))	>	11	V		
					(() SCR system waiting for shut down in afterrun OR	=	TRUE	-		
					SCR system in standby in afterun)	=	TRUE	-		
					ignition) NO Pending or Confirmed DTCs basic enable conditions met:	=	FALSE see sheet inhibit tables see sheet enable	-		
	_						tables	_		

Component / System	Fault Code	Monitor Strategy Description	Primary Malfunction Criteria		Threshold Logic and Value		Secondary Parameters		Enable Conditions		Time Required	MIL Illum.
Reductant Pump Performance	P208B	The ECM detects that the commanded state of the Reductant Pump driver and the actual state of the control circuit do not match.	timer for functional acknowledgement of the reductant pump motor	^	4.00	sec	(fault exists for more than 30 s; monitor runs at 0.1 s whenever	А
			timer for functional acknowledgement of the reductant pump motor	<=	6.00	sec	ambient pressure	>	0.00	kPa	enable conditions	
							ambient temperature)	>	-30.04	°C	are met	
							basic enable conditions met:	=	see sheet enable tables	-		
Reductant Pump Control Circuit High Voltage	P208D	Diagnoses the Reductant Pump Motor low side driver circuit for circuit faults.	Voltage high during driver on state (indicates short to power)	=	Short to power: ≤ 0.5 Ω impedance between signal and controller power	-	engine pre drive	=	FALSE		fail conditions exists for 3 s monitor runs with 0.01 sec rate	A
				power		for time and battery voltage	>	1.00 11.00	sec V	whenever enable conditions are met		
							for time	>	3.00	sec		
							and battery voltage	<	655.34	V		
							for time and	>	3.00	sec		
							battery voltage correction factor	>	0.00	factor		
							battery voltage correction factor) for	<	4.00	factor		
							time and	>	3.00	sec		
							basic enable conditions met:	=	see sheet enable tables	-		
Reductant Purge	P20A0	Diagnoses the Reductant	Voltage low during driver off state	=	Open Circuit:≥		engine pre drive	=	FALSE		fail	A
Valve Control Circuit		Purge Valve low side driver circuit for circuit faults.	(indicates open circuit)		200 K Ω impedance between ECU pin and load		for				conditions exists for 3 s monitor runs with 0.01 sec rate	••
							time and	>	1.00	sec	whenever enable	

Component / System	Fault Code	Monitor Strategy Description	Primary Malfunction Criteria	Threshold Logic and Value	Secondary Parameters		Enable Conditions		Time Required	MIL Illum.
	0.00.0	20000,			battery voltage	>	11.00	V	conditions	
					for time		3.00		are met	
					and	>	3.00	sec		
					battery voltage	<	655.34	V		
					for time	>	3.00	sec		
					and					
					(battery voltage correction factor	>	0.00	factor		
					and			idotoi		
					battery voltage correction factor	<	4.00	factor		
					for					
					time	>	3.00	sec		
					and basic enable conditions met:	=	see sheet enable	_		
							tables			
Reductant Purge	P20A1	This diagnostic checks the	Difference between reductant pump	< 50.00 kPa	(fault exists	A
alve	1 20/(1	Reductant Purge valve	pressure at beginning and end of	30.00 Ki a					for more	
erformance		performance during	pressure reduction phase						than 1 event monitor runs	
		operation by detecting a lack of reduction of the reductant							with 100 ms	
		pressure					T0115		rate	
					Reductant Dosing System state pressure reduction	=	TRUE	-	whenever enable	
					Reductant Dosing System pump relative	>=	350.00	kPa	conditions	
					pressure to initiate test				are met	
					AND					
					((Time attempting to reduce dosing	>=	5.00	sec		
					pressure	>=	5.00	SEC.		
					AND					
					Reductant Dosing System pump relative	>	50.00	kPa		
					pressure after attempting to reduce					
					pressure)					
					OR					
					Reductant Dosing System pump relative pressure after attempting to reduce	<=	50.00	kPa		
					pressure					
),					
					ambient pressure	>	0.00	kPa		
					ambient temperature	>	-100.04	°C		
) NO Pending or Confirmed DTCs	=	see sheet inhibit	-		
							tables			
		1			basic enable conditions met:	=	see sheet enable	-		

Component / System	Fault Code	Monitor Strategy Description	Primary Malfunction Criteria	Threshold Logic and Value	Secondary Parameters		Enable Conditions		Time Required	MIL Illum.
Reductant Purge Valve Control Circuit Low Voltage	P20A2	Diagnoses the Reductant	Voltage low during driver off state (indicates short-to-ground)	Experience Short to ground: Solo Ω Impedance between signal and controller ground	engine pre drive for time and battery voltage for time and battery voltage	> > <	1.00 11.00 3.00 655.34	sec V sec V	fail conditions exists for 2 s monitor runs with 0.01 sec rate whenever enable conditions are met	A A
					for time and (battery voltage correction factor and battery voltage correction factor) for time and basic enable conditions met:	>	3.00 0.00 4.00 3.00 see sheet enable tables	sec factor factor sec		
Reductant Purge Valve Control Circuit High Voltage	P20A3	Diagnoses the Reductant Purge Valve low side driver circuit for circuit faults.	Voltage high during driver on state (indicates short to power)	= Short to power: ≤ 0.5 Ω impedance between signal and controller power	for time and battery voltage for time and battery voltage for time and battery voltage for time and contains the same and	> > > > > > > > > > > > > > > > > > > >	1.00 11.00 3.00 655.34 3.00	sec V sec V sec factor	fail conditions exists for 3 s monitor runs with 0.01 sec rate whenever enable conditions are met	A

Component / System	Fault Code	Monitor Strategy Description	Primary Malfunction Criteria	Lo	Threshold gic and Val	ue	Secondary Parameters		Enable Conditions		Time Required	MIL Illum.
							and battery voltage correction factor	<	4.00	factor		
							for time and	>	3.00	sec		
							basic enable conditions met:	=	see sheet enable tables	-		
Exhaust Aftertreatment Fuel Injector Control Circuit	P20CB	Electronic output driver circuitry determines circuit integrity on the exhaust aftertreatment fuel injector control circuit.	The ECM detects that the commanded state of the driver and the actual state of the control circuit do not match.				engine pre drive	=	FALSE	-	fail conditions exists for more than 30 events	В
							time and	>	1.00	sec	monitor runs with 0.1 s rate	
							battery voltage for	>	11.00	V	whenever enable	
							time and	>	3.00	sec	conditions are met	
							starter is active cranking for	=	FALSE 3.00	-		
							time and basic enable conditions met:	>	see sheet enable tables	sec -		
xhaust Aftertreatment Guel Injector	P20CC	Detects high exhaust temperatures in order to protect the engine	oxidation catalyst downstream temperature - oxidation catalyst upstream temperature	>	300	°C	(fail conditions exists for	A
Performance			OR				oxidation catalyst upstream temperature	<	50.00	°C	180 s test	
			particulate filter downstream temperature - SCR downstream temperature	>	300	°C	change for time	>	10.00	sec	performed continuously 0.1 s rate	
) and					
							time since last successful regeneration	>	900.00	sec		
) and					
							((Normal Mode (Particulate Filter Regeneration not active)	=	TRUE	-		
							or Exhaust Gas Temperature (Active) Management Mode	=	TRUE	-		

Component / System	Fault Code	Monitor Strategy	Primary Malfunction Criteria	Threshold	Secondary		Enable Conditions		Time	MIL Illum.
System	Code	Description	Criteria	Logic and Value	Parameters for time	>	300.00	sec	Required	illum.
					and (time since the end of the last tip cleaning request of the Exhaust Aftertreatment Fuel Injector	>	300.00	sec		
					AND basic enable conditions met:	=	see sheet enable tables	-		
					NO Pending or Confirmed DTCs:	=	see sheet inhibit tables	-		
Exhaust Aftertreatment Fuel Injector Control Circuit Low Voltage	P20CD	Electronic out-put driver circuitry determines circuit integrity on the exhaust aftertreatment fuel injector control circuit.	The ECM detects that the commanded state of the driver and the actual state of the control circuit do not match.		engine pre drive	=	FALSE		fail conditions exists for more than 30 events	В
					for time and	>	1.00	sec	monitor runs with 0.1 s	
					battery voltage for	>	11.00	V	rate whenever enable	
					time and	>	3.00	sec	conditions are met	
					starter is active cranking for	=	FALSE	-		
					time and basic enable conditions met:	> =	3.00 see sheet enable tables	sec -		
					and Diesel dosing valve: fuel injection	=	INACTIVE	-		
Exhaust Aftertreatment Fuel Injector Control Circuit High Voltage	P20CE	Diagnoses the Exhaust Aftertreatment Fuel Injector low side driver circuit for circuit faults.	Voltage high during driver on state (indicates short to power)	= Short to power: - ≤ 0.5 Ω impedance between signal and controller power	engine pre drive	=	FALSE	-	fail conditions exists for more than 30 events monitor runs with 0.1 s	В
					time and battery voltage	>	1.00 11.00	sec V	whenever enable conditions	
					for time	>	3.00	sec	are met	
					and starter is active cranking	=	FALSE	-		

Component / System	Fault Code	Monitor Strategy Description	Primary Malfunction Criteria		Threshold Logic and Value		Secondary Parameters		Enable Conditions		Time Required	MIL Illum.
- Cyclem		2001,5101					for time and basic enable conditions met:	> =	3.00 see sheet enable tables	sec -	roquiou	
Exhaust Gas Temperature (EGT) Sensors 1-2 not plausible	P20E2	Detects biased exhaust temperature sensors by comparing the upstream and downstream oxidation catalyst temperature sensors after a calibrated engine off soak time	Path 1: (a) - (b) (see Look-Up-Table #30) with (a) captured oxidation catalyst downstream temperature at start and with (b) captured oxidation catalyst upstream temperature at start as reference temperature or Path 2: ((a) - (b) (see Look-Up-Table #30) with (a) captured oxidation catalyst downstream temperature at start and with (b) captured oxidation catalyst upstream temperature at start as reference temperature at start as reference temperature at start and with (a) captured oxidation catalyst downstream temperature at start and with (a) captured oxidation catalyst downstream temperature at start and with (b) captured oxidation catalyst upstream temperature at start as reference temperature at start as	> = = = = = = = = = = = = = = = = = = =	100 to 999 measured parameter measured parameter 100 to 999 measured parameter measured parameter 30 to 999 measured parameter measured parameter measured parameter measured parameter measured parameter	°C °C	and ambient temperature and Engine Running (see parameter definition) for time and engine post drive/ afterun and diagnostic performed in current dc and basic enable conditions met: and NO Pending or Confirmed DTCs:	>=	-60.04 TRUE 0.00 FALSE FALSE see sheet enable tables see sheet inhibit tables	sec	fail conditions exists for 0.050 s monitor runs with 0.050 s rate whenever enable conditions are met	В
Delivery performance bank 1	P20E8	Compare Reductant tank pressure with lower thresholds under metering control	Reductant Pump Module Pressure	<	400.00	kPa	status of SCR control sub state (please see the definition)	=	Metering control	-	fail conditions exists for more than	A

Component / System	Fault Code	Monitor Strategy Description	Primary Malfunction Criteria		reshold and Value	Secondary Parameters		Enable Conditions		Time Required	MIL Illum.
				200		status byte in substate METERING CONTROL Dwell time in Metering control substate ambient pressure ambient temperature NO Pending or Confirmed DTCs: basic enable conditions met:	= > >= = =	Running 1.00 0.00 -30.04 see sheet inhibit tables see sheet enable tables	sec kPa °C -	60.0 s monitor runs with 0.1 s rate whenever enable conditions are met	
Reductant System Performance Bank 1	P20E9	Path 1: Compare Reductant tank pressure with upper threshold under metering control	Reductant Pump Module Pressure	> 6	50.00 kPa	status of SCR control sub state (please see the definition) status byte in substate METERING CONTROL Dwell time in Metering control substate ambient pressure ambient temperature NO Pending or Confirmed DTCs: basic enable conditions met:	= > >= == ==	Running 1.00 0.00 -30.04 see sheet inhibit tables see sheet enable tables	sec kPa °C -	fail conditions exists for more than 10 s monitor runs with 0.1 s rate whenever enable conditions are met	A
		Path 2: Or Reductant tank pressure high	Unfiltered Reductant Pump Module Pressure	>= 7	95.00 kPa	ambient pressure ambient temperature basic enable conditions met:	> =	0.00 -30.04 see sheet enable tables	kPa °C -	fail conditions exists for more than 1 s monitor runs with 0.1 s rate whenever enable conditions	
SCR Nox Catalyst Efficiency Below Threshold Bank 1	P20EE	Compare EWMA filtered NOx conversion efficiency of SCR catalyst with a threshold value	EWMA filtered delta SCR catalyst efficiency of (a) - (b) where	<	0.00 factor	NO Pending or Confirmed DTCs:	= >	see sheet inhibit tables 300.00	sec	fail conditions exists for more than 1 event	A

Component /	Fault	Monitor Strategy	Primary Malfunction	Threshold	Secondary	Enab		Time	MIL
System	Code	Description	Criteria	Logic and Value	Parameters	Condit	ions	Required	Illum.
			(a) measured SCR catalyst efficiency	= calculated -				monitor runs	
			(b) effect competed modeled CCD	parameter	Status of NOv signal of vantages NOv	A =4:-	_	with 0.01 s	
			(b) offset-corrected modeled SCR catalyst efficiency (please see the	= calculated - parameter	Status of NOx signal of upstream NOx sensor (please see the definition)	= Activ	е -	rate	
			general description for details)	parameter	sensor (prease see the definition)			whenever enable	
			general description for details)		for time	> 60.0	0 sec	conditions	
					Status of NOx signal of downstream NOx	= Activ		are met	
					sensor (please see the definition)				
					for time	> 60.0	0 sec		
					(TDU	_		
					Release of dosing strategy (please see the definition)	= TRU	E -		
					for time	>= (a) +	(b) sec		
					(a) Turn on delay time 1 of status	380.0			
					metering strategy	000.0	.0		
					(b) Turn on delay time 2 of status	20.0	0 sec		
					metering strategy				
)				
					,				
					(Status for disabling SCR Efficiency	= FALS	:F -		
					Status for disabling SCR Efficiency monitoring following an SCR Adaptation	= FALS	-		
					completion (please see the definition)				
					completion (picase see the definition)				
					for time	> (a) +	(b) sec		
					(a) Debounce time after pre controlled	> 0.50			
					dosing over				
					(b) delay time the status of disabling	> 80.0	0 sec		
					SCR Efficiency monitoring				
					or integrated upstream NOx	>= 3276.	70 ~		
					nitegrated upstream NOX	>= 3276.	70 g		
					,				
					(
					Status of pre controlled dosing (please	= FALS	iΕ -		
					see the definition)				
					for time	> (a) +			
					(a) Debounce time after pre controlled	= 0.50) sec		
					dosing off	= 180.0	000		
					(b) Delay time after pre controlled dosing off	= 180.0	00 sec		
					or				
					integrated upstream NOx	>= 3276.	70 g		
)				
					[_		
					Decrease of Reductant load level (please	= FALS	E -		
					see the definition)	. 000	00		
					for time	> 300.0	00 sec		
					['				
					(
					Average slow filtered NOx mass flow	<= 0.12	g/sec		
					upstream SCR		9		

Component /	Fault	Monitor Strategy	Primary Malfunction	Threshold	Secondary		Enable		Time	MIL
System	Code	Description	Criteria	Logic and Value	Parameters		Conditions		Required	Illum.
					for time Monitor disable time based on average NOx mass flow and the time (see Look- Up-Table #88)	>	0.50 0 to 85	sec sec		
					for time with	>	15.00	sec		
					(() Delta SCR temperature (see Look-Up- Table #85) or	<=	23.96 to 74.96	°C		
					Delta SCR temperature Delta SCR temperature	> <	524.96 199.96	°C		
					or Initialization time of temperature gradient calculation	<	2.50	sec		
					or Delta SCR temperature	<	229.96	°C		
					Delta SCR temperature for time	> >	499.96 10.00	°C sec		
					(normalized HC load in SCR catalyst)	>	21.00	-		
					(ambient pressure ambient temperature	>= >=	74.80 -7.04	kPa °C		
					(Stuck reductant dosing valve fault was healed	=	FALSE	-		
					last particulate filter regeneration successful	=	TRUE	-		
					(State of the NH3 slip detection integrated upstream NOx during SCR	= >=	FALSE 20.00	-		
					adaptation plausibility check active Status of the SCR adaptation plausibility	=	FALSE	g -		
					check active (please see the definition) for time	>	600.00	sec		
) SCR NOx Catalyst Efficiency Below Threshold Bank 1 was performed this drive cycle	=	FALSE	-		
					(engine speed engine speed	>= <=	1000.00 3000.00	rpm		
					for time	>	0.00	sec		

Component /	Fault	Monitor Strategy	Primary Malfunction	Threshold	Secondary		Enable		Time	MIL
System	Code	Description	Criteria	Logic and Value	Parameters		Conditions		Required	Illum.
					SCR estimated current Reductant load	>=	0.06 to 1.3	g		
					(see Look-Up-Table #77)					
					SCR estimated current Reductant load	<=	0.2 to 2.7	g		
					(see Look-Up-Table #76) Difference between nominal and	>=	-0.35 to -0.05	~		
					estimated Reductant (see Look-Up-Table	>=	-0.33 10 -0.03	g		
					#79)					
					Difference between nominal and	<=	0.05 to 0.2	g		
					estimated Reductant (see Look-Up-Table			J		
					#78)					
					SCR in Pre-Control State (please see the	=	FALSE	-		
					definition)					
					(
					Disable after adaptation	=	FALSE			
					with for time	>	600.00	sec		
)	_	000.00	Sec		
					((
					(a) - (b) (see Look-Up-Table #86)	<=	44.96 to 74.96	°C		
					for time	>	0.00	sec		
)					
					or (
					(a) - (b) (see Look-Up-Table #87)	>=	-40.04 to -0.04	°C		
					for time	>	0.00	sec		
					(a) upstream SCR catalyst	=	measured	-		
					temperature		parameter			
					(b) downstream SCR catalyst	=	measured	-		
					temperature		parameter			
)) Integrated NOx mass upstream SCR	>	1.50	α.		
					for time	>	0.00	g sec		
					Tor time		0.00	300		
					Average SCR Temperature	<=	399.96	°C		
					Average SCR Temperature	>=	-3549.94	°C		
					Downstream SCR catalyst temperature	>=	3003.56	°C		
					Downstream SCR catalyst temperature	<=	-3549.94	°C		
					E11.		475.00			
					Filtered and delayed upstream NOx raw	>=	475.00	ppm		
					emission Filtered and delayed upstream NOx raw	<=	100.00	nnm		
					emission	\=	100.00	ppm		
					Filtered and delayed NOx raw emission	<=	0.25	g/sec		
					mass flow upstream of SCR			3		
					Filtered and delayed NOx raw emission	>=	0.01	g/sec		
					mass flow upstream of SCR	/-	0.01	9/300		
					·					
					Filtered exhaust gas mass flow	<=	236.11	g/sec		
					Filtered exhaust gas mass flow	>=	-910.20	g/sec		
					MAP for valid engine operation points for SCR efficiency monitoring (see Look-Up-	=	0 to 1	factor		
				I	SON Elliciency monitoring (see Look-Up-					

	Component /	Fault	Monitor Strategy	Primary Malfunction	Threshold	Secondary		Enable		Time	MIL
Inverse calculated accelerator pedal value (for time > 0.00 sec EWMA fast initialization mode: filter coefficient for fast initialization number of SCR efficiency >= 2.00 count measurements for fast initialization mode: EWMA Rapid Response mode: EWMA Rapid Response mode: EWMA Rapid Response mode: (b) offset-corrected modeled SCR catalyst efficiency (size as see the agreement of the state of the second or see the second or secon											Illum.
Inverse calculated accelerator pedal value (for time > 0.00 sec EWMA fast initialization mode: filter coefficient for fast initialization number of SCR efficiency >= 2.00 count measurements for fast initialization mode: EWMA Rapid Response mode: EWMA Rapid Response mode: EWMA Rapid Response mode: (b) offset-corrected modeled SCR catalyst efficiency (size as see the agreement of the state of the second or see the second or secon	·		·			for time	>		sec		
value for time > 0.00 sec						Inverse calculated accelerator pedal					
EWMA fast initialization mode: filter coefficient for fast initialization number of SCR efficiency measurements for fast initialization number of SCR efficiency measurements for fast initialization number of SCR efficiency filter of SCR efficiency filter of SCR efficiency (a) - (b) (a) - (b) (a) - (b) (a) - (b) (a) measured SCR catalyst efficiency efficiency efficiency efficiency classes are the general description for details) filter coefficient for fedalis) filter coefficient for fedalis) filter coefficient for fedalis) filter coefficient for fedalis efficiency measurements for Rapid Response mode EWMA filtered data SCR catalyst efficiency efficiency filter of SCR efficiency measurements for Rapid Response mode EWMA filtered data SCR catalyst efficiency (b) - (b) efficiency efficiency (c) - (c) - (c) efficiency efficiency (c) - (c) - (c) efficiency (c) - (c) efficiency efficien											
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								tables			

Component / System	Fault Code	Monitor Strategy Description	Primary Malfunction Criteria		Threshold Logic and Value		Secondary Parameters		Enable Conditions		Time Required	MIL Illum.
Accelerator Pedal Position (APP) Sensor 1 Circuit Low Voltage	P2122	Detects low voltage readings on the APP circuit, indicating an OOR low condition on the APP 1 circuit	voltage of acceleration pedal sensor 1 same as acceleration pedal position	<=	-6.6	V %	ignition on and basic enable conditions met: and NO Pending or Confirmed DTCs:	=	TRUE see sheet enable tables see sheet inhibit tables		fail conditions exists for 0.19 s monitor runs with 0.01 s rate whenever enable conditions are met	A
Accelerator Pedal Position (APP) Sensor 1 Circuit High Voltage	P2123	Detects high voltage readings on the APP circuit, indicating an OOR high condition on the APP 1 circuit	voltage of acceleration pedal sensor 1 same as acceleration pedal position	>=	4.75 125.6	V %	ignition on and basic enable conditions met: and NO Pending or Confirmed DTCs:	= =	TRUE see sheet enable tables see sheet inhibit tables		fail conditions exists for 0.19 s monitor runs with 0.01 s rate whenever enable conditions are met	А
Accelerator Pedal Position (APP) Sensor 2 Circuit Low Voltage	P2127	Detects low voltage readings on the APP circuit, indicating an OOR low condition on the APP 2 circuit	voltage of acceleration pedal sensor 2 same as acceleration pedal position	<= <=	-13.9	V %	ignition on and basic enable conditions met: and NO Pending or Confirmed DTCs:	=	TRUE see sheet enable tables see sheet inhibit tables		fail conditions exists for 0.19 s monitor runs with 0.01 s rate whenever enable conditions are met	А
Accelerator Pedal Position (APP) Sensor 2 Circuit High Voltage	P2128	Detects high voltage readings on the APP circuit, indicating an OOR high condition on the APP 2 circuit	voltage of acceleration pedal sensor 2 same as acceleration pedal position	>=	2.32	V %	ignition on and basic enable conditions met: and	=	TRUE see sheet enable tables	-	fail conditions exists for 0.19 s monitor runs with 0.01 s rate whenever enable	A

Component / System	Fault Code	Monitor Strategy Description	Primary Malfunction Criteria		Threshold gic and Value	Secondary Parameters		Enable Conditions	Time Required	MIL Illum.
						NO Pending or Confirmed DTCs:	=	see sheet inhibit tables	- conditions are met	•
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 #13) with (a) voltage of acceleration pedal position sensor 1 and with (b) factor between sensor raw values and with (c) minimum voltage and with (d) redundant voltage of acceleration pedal (from pedal position sensor 2)	= = =	measured parameter 2.00 0.45 calculated parameter	ignition on and basic enable conditions met: and NO Pending or Confirmed DTCs:	= =	TRUE see sheet enable tables see sheet inhibit tables	- fail conditions exists for 0 s monitor rur with 0.01 rate whenever enable conditions are met	2 is
Injector Positive Voltage Control Circuit Group 1	P2146	ECM Electronic out-put driver circuitry determines if faults (open/short/no load) exist on injector charging bank #1.	Voltage high during driver off state (indicates short to power, short to ground, or open circuit)	≤ 0 imp bet and pove 200 imp bet pin sigg cor	ort to power: .5 Ω .5 Ω .5 α .5 α .5 α .5 α .5 α .5 α .6 α .7 α .	Engine Running (see parameter definition) and fuel system status	=	TRUE	- fail conditions exists for more than 0.04 s monitor rur with 0.01 rate whenever enable conditions are met	as S

Component / System	Fault Code	Monitor Strategy Description	Primary Malfunction Criteria	Threshold Logic and Value	Secondary Parameters	Enable Condition	s	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.	Voltage high during driver off state (indicates short to power, short to ground, or open circuit)	= Short to power: ≤ 0.5 Ω impedance between signal and controller power Open Circuit: ≥ 200 K Ω impedance between ECU pin and load signal and controller ground Short to ground: ≤ 0.5 Ω impedance between signal and controller ground	Engine Running (see parameter definition)	= TRUE		fail conditions exists for more than 0.04 s monitor runs with 0.01 s rate whenever enable conditions are met	A
					and fuel system status	= no fuel cut (off -		
Reductant Heater "A" Current Too High	P214F	Detects a tank heater short circuit by detecting high conductance in the heater	with (a) maximum conductance of the urea tank heater and with (b) maximum tolerance threshold of the conductance for the urea tank heater	= TRUE - = calculated 1/Ohn parameter = 0.56 1/Ohn	and	= TRUE = TRUE >= 11.00 <= 100.00 >= 5400.00 <= 41.96	- V V sec	fail conditions exists for 0.1 s monitor runs once per trip with 0.1 s rate whenever enable conditions are met	В

Component /	Fault	Monitor Strategy	Primary Malfunction	Threshold	Secondary	Enable	Time	MIL
System	Code	Description	Criteria	Logic and Value	and ((conductance of the urea tank heater is steady or falling for time or heater activation time) and basic enable conditions met: and NO Pending or Confirmed DTCs:	> 1000.00 >= 600.00 = see sheet enable tables = see sheet inhibit tables	sec sec	Illum.
Injector Positive Voltage Control Circuit Group 3	P2152		Voltage high during driver off state (indicates short to power, short to ground, or open circuit)	= Short to power: ≤ 0.5 Ω impedance between signal and controller power Open Circuit: ≥ 200 K Ω impedance between ECU pin and load signal and controller ground Short to ground: ≤ 0.5 Ω impedance between signal and controller ground	Engine Running (see parameter definition) and fuel system status	= TRUE	- fail conditions exists for more than 0.04 s monitor runs with 0.01 s rate whenever enable conditions are met	A

Component / 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 4	P2155	ECM Electronic out-put driver circuitry determines if faults (open/short/no load) exist on injector charging bank #4.	Voltage high during driver off state (indicates short to power, short to ground, or open circuit)	=	Short to power: ≤ 0.5 Ω impedance between signal and controller power Open Circuit: ≥ 200 K Ω impedance between ECU	-	Engine Running (see parameter definition) and fuel system status	=	TRUE	-	fail conditions exists for more than 0.04 s monitor runs with 0.01 s rate whenever enable conditions are met	A
Intake Air Temp Sensor 1 / 2 Correlation	P2199	Detects biased Humidity Temperature Sensor or MAF Intake Air Temperature Sensor by comparing the	Path 1:				minimum engine-off time	>=	28800.00	sec	fail conditions exists for 0.1	В
		Sensor by comparing the measured temperatures at start.	(a) - (b) (see Look-Up-Table #2) where (a) captured intake air temperature at	> =	100 to 999 measured	°C -	and ambient air temperature and	>	-60.04	°C	monitor runs once per trip with 0.1 s rate whenever	
			start and (b) captured humidity temperature at	=	parameter measured	_	Engine Running (see parameter definition) for	=	TRUE	-	enable conditions are met	
			start		parameter		time and	>	0.00	sec		
			Path 2: ((a) - (b) (see Look-Up-Table #2)	<=	100 to 999	°C	engine post drive/ afterun and diagnostic performed in current dc	=	FALSE FALSE	-		
			where (a) captured intake air temperature at start	=	measured parameter	-	and basic enable conditions met:	=	see sheet enable tables	-		
			and (b) captured humidity temperature at start and	=	measured parameter	-	and NO Pending or Confirmed DTCs:	=	see sheet inhibit tables	-		
			(a) - (b) (see Look-Up-Table #5)	>	20 to 999	°C						
			where (a) captured intake air temperature at start and	=	measured parameter	-						

Component /	Fault	Monitor Strategy	Primary Malfunction		Threshold		Secondary		Enable		Time	MIL
System	Code	Description	Criteria		Logic and Value		Parameters		Conditions		Required	Illum.
			(b) captured humidity temperature at start and (status of block heater (see parameter definition) or	=	measured parameter FALSE	-						
			status of sun-load detection (see parameter definition))	=	FALSE	_						
Reductant Level Sensor 2 Circuit Low	P21AA	CAN message: Discrete level sensor level 2 short to ground error	Reductant Tank Level 2 Error Status	=	1	-	ignition on	=	TRUE	-	fail conditions exists for	А
Low		ground error	(tank level sensor 2 voltage directly measured after a test impulse was	<	(0.17)	V	battery voltage	>	8	V	more than 3 sec	
			applied)				basic enable conditions met:	=	see sheet enable tables	-	monitor runs with 1 s rate whenever enable conditions	
Reductant Level Sensor 2 Circuit	P21AB	Path 1:									are met	
High		CAN message: Discrete level sensor 2 open load error	Reductant Tank Level 2 Error Status	=	3	-	ignition on	=	TRUE	-		
		enoi	(measured tank level sensor 2 voltage after 1.5 ms since a test impulse was applied)	>	(3.56)	V	battery voltage	>	8	V		
			applied) (measured tank level sensor 2 voltage after 1.5 ms since a test impulse was applied)	<	(4.74)	V	basic enable conditions met:	=	see sheet enable tables	-		
		Path 2: CAN message: Discrete level sensor 2 short to	Reductant Tank Level 2 Error Status	=	2	-	ignition on	=	TRUE	-		
		battery error	(measured tank level sensor 2 voltage after 1.5 ms since a test impulse was	>	(4.74)	V	battery voltage	>	8	V		
			applied)				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	-		

Fault Code	Monitor Strategy Description	Primary Malfunction Criteria		Threshold Logic and Value	•	Secondary Parameters		Enable Conditions		Time Required	MIL Illum.
		(tank level sensor 3 voltage directly measured after a test impulse was applied)	<	(0.17)	V	battery voltage basic enable conditions met:	=	8 see sheet enable tables	V -		
P21B0	Path 1: CAN message: Discrete	Reductant Tank Level 3 Error Status	=	3		ignition on	=	TRUE		fail conditions exists for more than 3	A
	level sensor 3 open load error	(measured tank level sensor 3 voltage after 1.5 ms since a test impulse was applied) (measured tank level sensor 3 voltage after 1.5 ms since a test impulse was applied)	> <	(3.56)	V	battery voltage basic enable conditions met:	> =	8 see sheet enable tables	V -	monitor runs with 1 s rate whenever enable conditions are met	
	Path 2: CAN message: Discrete level sensor 3 short to battery error	Reductant Tank Level 3 Error Status (measured tank level sensor 3 voltage after 1.5 ms since a test impulse was applied)	= >	2 (4.74)	- V	ignition on battery voltage basic enable conditions met:	= >	TRUE 8 see sheet enable	- V		
P21DD	Detects a tank heater open	(a) <= (b)	=	TRUE		ignition switch on	=	tables TRUE		fail	В
	circuit by detecting low conductance in the heater	with (a) maximum conductance of the urea tank heater and with	=	calculated parameter	1/Ohm	and urea tank heater powerstage on and	=	TRUE	-	exists for 0.05 s monitor runs once per trip with 0.05 s	
		(b) minimum tolerance threshold of the conductance for the urea tank heater	=	0.35	1/Ohm	battery voltage and battery voltage	>= <=	11.00	V	rate whenever enable conditions are met	
						and engine off time and	>=	300.00	sec		
	P21B0	P21DD Detects a tank heater open circuit by detecting low	P21B0 Path 1: CAN message: Discrete level sensor 3 open load error Reductant Tank Level 3 Error Status (measured tank level sensor 3 voltage after 1.5 ms since a test impulse was applied) Path 2: CAN message: Discrete level sensor 3 voltage after 1.5 ms since a test impulse was applied) (measured tank level sensor 3 voltage after 1.5 ms since a test impulse was applied) Path 2: CAN message: Discrete level sensor 3 voltage after 1.5 ms since a test impulse was applied) Reductant Tank Level 3 Error Status (measured tank level sensor 3 voltage after 1.5 ms since a test impulse was applied) P21DD Detects a tank heater open circuit by detecting low conductance in the heater with (a) maximum conductance of the urea tank heater and with (b) minimum tolerance threshold of the conductance for the urea tank	P21B0 Path 1: CAN message: Discrete level sensor 3 open load error Reductant Tank Level 3 Error Status = (measured tank level sensor 3 voltage after 1.5 ms since a test impulse was applied) (measured tank level sensor 3 voltage after 1.5 ms since a test impulse was applied) (measured tank level sensor 3 voltage after 1.5 ms since a test impulse was applied) Path 2: CAN message: Discrete level sensor 3 voltage after 1.5 ms since a test impulse was applied) (measured tank level sensor 3 voltage after 1.5 ms since a test impulse was applied) Reductant Tank Level 3 Error Status = (measured tank level sensor 3 voltage after 1.5 ms since a test impulse was applied) P21DD Detects a tank heater open circuit by detecting low conductance in the heater with (a) maximum conductance of the urea tank heater and with (b) minimum tolerance threshold of the conductance for the urea tank	Path 1: CAN message: Discrete level sensor 3 open load error Reductant Tank Level 3 Error Status = 3 (3.56) (measured tank level sensor 3 voltage after 1.5 ms since a test impulse was applied) Path 2: CAN message: Discrete level sensor 3 open load error (measured tank level sensor 3 voltage after 1.5 ms since a test impulse was applied) (measured tank level sensor 3 voltage after 1.5 ms since a test impulse was applied) (measured tank level sensor 3 voltage after 1.5 ms since a test impulse was applied)	Path 1: CAN message: Discrete level sensor 3 open load error	Code Description Citraria Logic and Value Parameters	Code Description Cinter Cinter Control Contr	Cank Cank	Content Criteria City Content Criteria City Control Value Conditions met: Control Value	Path 1: Conditions with parameters Par

Dx Sensor					conductance of the urea tank heater is steady or falling for time or heater activation time) and	>=	1000.00 600.00	sec sec	Required	
Dy Sansor										
Ov Sancar					basic enable conditions met: and NO Pending or Confirmed DTCs:	=	see sheet enable tables			
Ov Sensor							tables			
rcuit Bank 1 ensor 1	P2200	Detects a failure when open circuit status message from NOx sensor is received continuously for a time period	Open circuit NOx signal error	= TRUE -	following conditions for time	>	0.50	sec	fail conditions exists for more than 13 sec. monitor runs	A
					battery voltage	>=	11.00	V	with 0.01 s	
					battery voltage	<=	655.34	V	rate	
					SCR upstream temperature	>=	94.96	°C	whenever enable	
					SCR upstream temperature	<=	3003.56	°C	conditions are met	
					Engine Running	=	TRUE	-		
					for time Can Bus Initialized (CAN Bus is Active)	>=	20.00 TRUE	sec -		
					consisting of: ignition on	=	TRUE	_		
					for time	>=	3	sec		
					battery voltage	>	9.8	V		
					battery voltage Upstream NOx sensor dewpoint	< =	655.34 TRUE	V -		
					achieved (please see the definition) no pending or confirmed faults	=	see sheet inhibit	-		
					basic enable conditions met:	=	tables see sheet enable tables	-		
							tabics			
		Detects a failure when open circuit status message from binary lambda signal from the NOx sensor is received continuously for a time period	Open circuit binary lambda signal error	= TRUE -	following conditions for time	>	0.50	sec	fail conditions exists for more than 13 sec. monitor runs	
		•			battery voltage	>=	11.00	V	with 0.01 s	

Component / System	Fault Code	Monitor Strategy Description	Primary Malfunction Criteria	Threshold Logic and Value	Secondary Parameters		Enable Conditions		Time Required	MI IIIu
					battery voltage	<=	655.34	V	whenever	
					SCR upstream temperature	>=	94.96	°C	enable	
					SCK upstream temperature	/=	94.90	C	conditions	
					SCR upstream temperature	<=	3003.56	°C	are met	
					Engine Running	=	TRUE	-		
					for time	>=	20.00	sec		
					Can Bus Initialized (CAN Bus is Active)	=	TRUE	-		
					consisting of: ignition on	_	TRUE	_		
					for time	= >=	3	sec		
					battery voltage	>	9.8	V		
					battery voltage	<	655.34	V		
					Upstream NOx sensor dewpoint	=	TRUE	-		
					achieved (please see the definition)	-	INOL			
					no pending or confirmed faults	=	see sheet inhibit			
					no pending of confining tautis	_	tables	-		
					basic enable conditions met:	=	see sheet enable	-		
							tables			
		Detects a failure when onen	Open circuit linear lambda signal error	= TRUE -	following conditions for time	>	0.50	sec	fail	
		circuit status message from linear lambda signal from the NOx sensor is received continuously for a time period							conditions exists for more than 13 sec. monitor runs with 0.01 s	
					battery voltage	>=	11.00	V	rate	
					battery voltage	<=	655.34	V	whenever	
					SCR upstream temperature	>=	94.96	°C	enable	
					SCR upstream temperature	<=	3003.56	°C	conditions are met	
					Engine Running	=	TRUE			
					for time Can Bus Initialized (CAN Bus is	>=	20.00 TRUE	sec		
					Active) consisting of:	_	INOL	-		
					ignition on	=	TRUE	_		
					for time	>=	3	sec		
					battery voltage	>	9.8	V		
					battery voltage	<	655.34	V		
					Upstream NOx sensor dewpoint	=	TRUE	-		
					achieved (please see the definition)					
					no pending or confirmed faults	=	see sheet inhibit tables	-		
					basic enable conditions met:	=	see sheet enable tables	-		

Component /	Fault	Monitor Strategy	Primary Malfunction	Threshold	Secondary		Enable		Time
System	Code	Description	Criteria	Logic and Value	Parameters		Conditions		Required
		Detects a failure when short circuit status message from NOx sensor is received continuously for a time period	Short Circuit Nox signal error	= TRUE -	following conditions for time	>	0.50	sec	fail conditions exists for more than 13 sec.
					battery voltage battery voltage SCR upstream temperature	>= <= >=	11.00 655.34 94.96	V V °C	monitor runs with 0.01 s rate whenever
					SCR upstream temperature	<=	3003.56	°C	enable conditions
					Engine Running for time	= >=	TRUE 20.00	- sec	are met
					Can Bus Initialized (CAN Bus is Active) consisting of: ianition on for time battery voltage battery voltage Upstream NOx sensor dewpoint achieved (please see the definition) no pending or confirmed faults basic enable conditions met:	= >= > < = = = =	TRUE 3 9.8 655.34 TRUE see sheet inhibit tables see sheet enable tables	sec V V	
		Detects a failure when short circuit status message from binary lambda signal form the NOx sensor is received continuously for a time period	Short Circuit binary lambda signal error	= TRUE -	following conditions for time	>	0.50	sec	fail conditions exists for more than 13 sec. monitor runs
					battery voltage	>=	11.00	V	with 0.01 s rate whenever
					battery voltage	<=	655.34	٧	enable
					SCR upstream temperature	>=	94.96	°C	conditions are met
					SCR upstream temperature	<=	3003.56	°C	
					Engine Running	=	TRUE	-	
					for time	>=	20.00 TRUE	sec	
					Can Bus Initialized (CAN Bus is consisting of: ignition on for time battery voltage battery voltage	= = >= > <	TRUE TRUE 3 9.8 655.34	sec V V	

Component / System	Fault Code	Monitor Strategy Description	Primary Malfunction Criteria	Thresho Logic and \		Secondary Parameters		Enable Conditions		Time Required	MIL
·						Upstream NOx sensor dewpoint no pending or confirmed faults basic enable conditions met:	= =	TRUE see sheet inhibit tables see sheet enable tables	-		
		Detects a failure when short circuit status message from linear lambda signal from the NOx sensor is received continuously for a time period	Short Circuit linear lambda signal error	= TRUE		following conditions for time	>	0.50	sec	fail conditions exists for more than 13 sec. monitor runs with 0.01 s	
						battery voltage	>=	11.00	V	rate	
						battery voltage	<=	655.34	V	whenever enable	
						SCR upstream temperature	>=	94.96	°C	conditions are met	
						SCR upstream temperature	<=	3003.56	°C	are met	
						Engine Running	=	TRUE	-		
						for time	>=	20.00	sec		
						Can Bus Initialized (CAN Bus is consisting of: ignition on for time battery voltage battery voltage Ubstream NOx sensor dewpoint no pending or confirmed faults basic enable conditions met:	= >= > < = = =	TRUE 3 9.8 655.34 TRUE see sheet inhibit tables see sheet enable tables	sec V V		
0x Sensor Circuit igh Bank 1 ensor 1	P2203	Detects an out of range high fault of the upstream NoX Sensor	Nox sensor signal (raw information received via CAN from Nox sensor)	> 2500.00	ppm	Nox sensor 1 ready status (see parameter definition) Valid NOx signal from CAN is received (no Nox sensor communication failures)	=	TRUE TRUE	-	fault exists for more than 10 sec; monitor runs at 0.1 s	В
								TDUE		when enable	
						Engine Running (see parameter definition)	=	TRUE	-	conditions are met	
0x Sensor Circuit ow Bank 1	P2202	Detects an out of range low fault of the upstream NoX	Nox sensor signal (raw information received via CAN from Nox sensor)	< -90.00	ppm	for time and	>	20.00	sec		
ensor 1		Sensor				Injection Quantity	>	8.00	mm^3/r ev		
						Upstream NOx sensor dewpoint achieved (please see the definition)	=	TRUE	-		

Component / System	Fault Code	Monitor Strategy Description	Primary Malfunction Criteria	Threshold Logic and Value	Secondary Parameters		Enable Conditions		Time Required	MIL Illum
					for time	>	600.00	sec		
lox Sensor Heater control Circuit ank 1 Sensor 1	P2205	Detects a failure when open circuit status message from NOx sensor heater is received continuously for a time period	Open Circuit Nox Heater signal error	= TRUE -	following conditions for time	>	0.50	sec	fail conditions exists for more than 13 sec. monitor runs	А
					battery voltage	>=	11.00	٧	with 0.01 s	
					battery voltage SCR upstream temperature	<= >=	655.34 94.96	°C	rate whenever	
					SCR upstream temperature	<=	3003.56	°C	enable conditions	
					Engine Running	=	TRUE	-	are met	
					for time		20.00			
					Can Bus Initialized (CAN Bus is	>=	TRUE	sec		
					Active)	=	TRUE	-		
					consisting of:		TRUE			
					ignition on for time	= >=	3	- sec		
					battery voltage	>	9.8	V		
					battery voltage Upstream NOx sensor dewpoint	< =	655.34 TRUE	V		
					no pending or confirmed faults	=	see sheet inhibit	-		
					The personnel of the second		tables			
					basic enable conditions met:	=	see sheet enable tables	-		
		Detects a failure when short	Short Circuit Nox heater signal error	= TRUE -	following conditions for time	>	0.50	sec	fail	
		circuit status message from		_					conditions	
		NOx sensor heater is							exists for	
		received continuously for a time period							more than 13 sec.	
		anno poriod							monitor runs	
					battery voltage	>=	11.00	V	with 0.01 s	
					battery voltage	<=	655.34	V	rate whenever	
					SCR upstream temperature	>=	94.96	°C	enable	
					SCR upstream temperature	<=	3003.56	°C	conditions are met	
					Engine Running for time	= >=	TRUE 20.00	- sec		
					Can Bus Initialized (CAN Bus is	=	TRUE	-		

Component / System	Fault Code	Monitor Strategy Description	Primary Malfunction Criteria		Threshold Logic and Valu	e	Secondary Parameters		Enable Conditions		Time Required	MIL Illum.
							consisting of: iqnition on for time battery voltage battery voltage Upstream NOx sensor dewpoint no pending or confirmed faults basic enable conditions met:	= >= > < = =	TRUE 3 9.8 655.34 TRUE see sheet inhibit tables see sheet enable tables	sec V V		
NOx Heater Performance Bank 1 Sensor 1	P2209	Monitoring of the upstream NOx sensor signal readiness	Upstream NOx sensor heater temperature has reached setpoint	=	FALSE		battery voltage and battery voltage and Oxidation Catalyst upstream temperature and Oxidation Catalyst upstream temperature and Engine running for time and Upstream NOx sensor dewpoint end is reached (please see parameter definition)) for time and basic enable conditions met: No Pending or Confirmed DTC	>= <= >= > = >	11.00 655.34 94.96 3003.56 TRUE 20.00 TRUE 150.5 see sheet enable tables see sheet inhibit tables	V V °C °C - sec -	fault exists for more than 1 event when dewpoint end is reached; monitor runs at 0.02 s when enable conditions are met	В
Reductant Heater "B" Current Too Low	P221C	Detects a pressure line heater open circuit by detecting low conductance in the heater	(a) <= (b) with (a) conductance of the urea pressure line heater and with (b) minimum tolerance threshold of the conductance for the urea pressure line heater	= =	TRUE calculated parameter 0.28	1/Ohm	ignition switch on and urea pressure line heater powerstage on and battery voltage and	= = >=	TRUE TRUE	- - V	fail conditions exists for 0.05 s monitor runs with 0.05 s rate whenever enable conditions are met	В

Component /	Fault	Monitor Strategy	Primary Malfunction		Threshold		Secondary		Enable		Time	MIL
System	Code	Description	Criteria		Logic and Valu	e	Parameters battery voltage	<=	Conditions 100.00	V	Required	Illum.
							and engine off time and heater activation time and basic enable conditions met: and NO Pending or Confirmed DTCs:	>= >= = =	0.00 81.00 see sheet enable tables see sheet inhibit tables	sec sec		
Reductant Heater "B" Current Too High	P221D	Detects a pressure line heater short circuit by detecting high conductance in the heater	(a) >= (b) with	=	TRUE		ignition switch on	=	TRUE		fail conditions exists for 0.05 s	В
			(a) conductance of the urea pressure line heater and with	=	calculated parameter	1/Ohm	urea pressure line heater powerstage on and	=	TRUE	-	monitor runs with 0.05 s rate	l
			(b) maximum tolerance threshold of the conductance for the urea pressure line heater	=	0.92	1/Ohm	battery voltage	>=	11.00	V	whenever enable conditions	İ
			ine react				and battery voltage	<=	100.00	V	are met	ı
							and engine off time and	>=	0.00	sec		I
							heater activation time and	>=	81.00	sec		İ
							basic enable conditions met:	=	see sheet enable tables	-		İ
							and NO Pending or Confirmed DTCs:	=	see sheet inhibit tables	-		1
Reductant Heater "C" Current Too Low	P221E	Detects a supply module heater open circuit by detecting low conductance	(a) <= (b)	=	TRUE		ignition switch on	=	TRUE	-	fail conditions exists for 0.1	В
		in the heater	with (a) maximum conductance of the supply module heater	=	calculated parameter	1/Ohm	and supply module heater powerstage on	=	TRUE	-	s monitor runs once per trip	l
			and with (b) minimum tolerance threshold of the conductance for the supply module heater	=	0.14	1/Ohm	and battery voltage	>=	11.00	V	with 0.1 s rate whenever	ı
			module fleater				and battery voltage	<=	100.00	V	enable conditions are met	l

Component / System	Fault Code	Monitor Strategy Description	Primary Malfunction Criteria		Threshold Logic and Valu	e	Secondary Parameters		Enable Conditions		Time Required	MIL Illum.
							and engine off time and (conductance of the urea tank heater is steady or falling	>=	7600.00	sec		
							for time	>	100.00	sec		İ
							or heater activation time)	>=	10.00	sec		l
							and basic enable conditions met:	=	see sheet enable tables	-		ı
							NO Pending or Confirmed DTCs:	=	see sheet inhibit tables	-		ı
Reductant Heater "C" Current Too High	P221F	Detects a supply module heater short circuit by detecting high conductance	(a) >= (b)	=	TRUE	-	ignition switch on	=	TRUE	-	fail conditions exists for 0.1	В
		in the heater	with (a) maximum conductance of the supply module heater and with	=	calculated parameter	1/Ohm	and supply module heater powerstage on and	=	TRUE	-	s monitor runs once per trip with 0.1 s	ı
			(b) maximum tolerance threshold of the conductance for the supply module heater	=	0.35	1/Ohm	battery voltage	>=	11.00	V	rate whenever enable	ı
							and battery voltage	<=	100.00	V	conditions are met	I
							and engine off time and	>=	7600.00	sec		ı
							conductance of the urea tank heater is steady or falling for					İ
							time or	>	100.00	sec		ı
							heater activation time)	>=	10.00	sec		İ
							and basic enable conditions met:	=	see sheet enable tables	-		l
							and NO Pending or Confirmed DTCs:	=	see sheet inhibit tables	-		l
	-					-						

Component / System	Fault Code	Monitor Strategy Description	Primary Malfunction Criteria	ı	Threshold Logic and Value	е	Secondary Parameters		Enable Conditions		Time Required	MIL Illum.
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 ambient pressure	<=	1.97 50.00	V kPa	ignition on and basic enable conditions met:	=	TRUE see sheet enable tables	-	fail conditions exists for 0.8 s monitor runs 0.1 s rate whenever enable conditions are met	A
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	>=	4.54	V kPa	ignition on and basic enable conditions met:	=	TRUE see sheet enable tables	-	fail conditions exists for 0.8 s monitor runs 0.1 s rate whenever enable conditions are met	A
Turbo Boost System Performance	P2263	Detects if the Turbocharger is severely over or under boosting based on control deviation	Path 1: control deviation of the boost pressure calculated out of difference between desired and actual value with (a) control deviation threshold (see Look-Up-Table #64) (b) environmental pressure correction factor(see Look-Up-Table #59)	> = =	(a)*(b) 80 to 100 0.67 to 1	- kPa factor	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 and	=	FALSE	-	fail conditions exists for 15 s test performed continuously 0.01 s rate	A

Component /	Fault	Monitor Strategy	Primary Malfunction	Threshold	Secondary	Enable		Time	MIL
System	Code	Description	Criteria	Logic and Value	Parameters	Conditions		Required	Illun
					- in order to prevent soot accumulation				
					e.g. in a long idle operation under cold				
					engine condition on the turbine the				
					desired value of the boost pressure				
					actuator position governor is assigned				
					from the set-point value				
					and				
					injection quantity is stable	= TRUE	_		
					means				
					increase of injection quantity	< 24.00	(mm^3/r		
					morease of injection quantity	24.00	ev)/sec		
							ev//sec		
					and				
					and	= TRUE			
					engine speed is stable	= TRUE	-		
					means				
					increase of engine speed	< 100.00	rpm/sec		
					and				
					injection Quantity	>= 80.00	mm^3/r		
							ev		
					injection Quantity	<= 480.00	mm^3/r		
							ev		
					and				
					engine Speed	>= 1200.00	rpm		
					engine Speed	<= 3400.00	rpm		
					and				
					working range of boost pressure is in	= TRUE	-		
					closed-loop				
					means				
					/				
					ongine anded	5 EEO 00	ro m		
					engine speed and	> 550.00	rpm		
							02/-		
					injection quantity	> 80.00	mm^3/r		
					,		ev		
)				
					NO Pending or Confirmed DTCs:	= see sheet inhibi	t -		
						tables			
							l		
					for time	> 2.00	sec		
					and		l		
					basic enable conditions met:	= see sheet enable	e -		
						tables			
			Path 2					fail	
			control deviation of the boost pressure	< (a)*(b) -	offset learning for turbo charger (VNT)	= FALSE	_	conditions	
			calculated out of difference between	(~) (~)	actuator position sensor is active during		l	exists for 15	
			calcalated out of difference between		actuate. Position concer to don'to during				1

Component /	Fault	Monitor Strategy	Primary Malfunction	Threshold		Secondary		Enable		Time	MIL
System	Code	Description	Criteria	Logic and Value		Parameters		Conditions		Required	Illum.
			with		1	 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 				performed continuously 0.01 s rate	
			(a) control deviation threshold (see Look-Up-Table #63)	= -50 to -40	кРа	and					
			(b) environmental pressure correction factor	= 1.00 fa	actor	turbo charger (VNT) wiping is active	=	FALSE	-		
						 in order to prevent soot accumulation e.g. in a long idle operation under cold engine condition on the turbine the desired value of the boost pressure actuator position governor is assigned from the set-point value 					
						and					
						injection quantity is stable means	=	TRUE	-		
						increase of injection quantity	<	24.00	(mm^3/r ev)/sec		
						and engine speed is stable means	=	TRUE	-		
						increase of engine speed	<	100.00	rpm/sec		
						and injection Quantity	>=	80.00	mm^3/r ev		
						injection Quantity	<=	480.00	mm^3/r ev		
						and	>=	4200.00			
						engine Speed engine Speed	>= <=	1200.00 3400.00	rpm rpm		
						and working range of boost pressure is in closed-loop means	=	TRUE	-		
						engine speed and	>	550.00	rpm		
						injection quantity	>	80.00	mm^3/r ev		
) NO Pending or Confirmed DTCs:	=	see sheet inhibit tables	-		
						for time and	>	2.00	sec		
						basic enable conditions met:	=	see sheet enable tables	-		

Component / System	Fault Code	Monitor Strategy Description	Primary Malfunction Criteria	Threshold Logic and Value	Secondary Parameters	Enable Conditions		Time Required	MIL Illum.
Fuel Pressure Regulator 2 Control Circuit	P2294	Diagnoses the Fuel Pressure Regulator 2 low side driver circuit for circuit faults.	Voltage low during driver off state (indicates short-to-ground)	= Open Circuit: ≥ - 200 K Ω impedance between ECU pin and load signal and controller ground	for time and ignition on and basic enable conditions met:	> 11.00 > 3.00 = TRUE = see sheet enable tables	sec	fail conditions exists for 0.75 s monitor runs with 0.01 s rate whenever enable conditions are met	A
			Electronic power stage circuitry determines over temperature on the fuel pressure regulator 2 control circuit.		battery voltage for time and ignition on and basic enable conditions met:	> 11.00 > 3.00 = TRUE = see sheet enable tables	V sec	fail conditions exists for 1 s monitor runs with 0.01 s rate whenever enable conditions are met	A
Fuel Pressure Regulator 2 Control Circuit Low Voltage	P2295	Diagnoses the Fuel Pressure Regulator 2 low side driver circuit for circuit faults.	Voltage low during driver off state (indicates short-to-ground)	= Short to ground: -	for time and ignition on and basic enable conditions met:	> 11.00 > 3.00 = 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	А

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 High Voltage	P2296	Diagnoses the Fuel Pressure Regulator 2 low side driver circuit for circuit faults.	Voltage high during driver on state (indicates short to power)	= Short to power: - ≤ 0.5 Ω impedance between signal and controller power	for time and ignition on and basic enable conditions met:	> = =	3.00 TRUE see sheet enable tables	V sec	fail conditions exists for 0.50 s monitor runs with 0.01 s rate whenever enable conditions are met	A
NOx Sensor Circuit Bank 1 Sensor 2	P229E	Detects a failure when open circuit status message from downstream NOx sensor is received continuously for a time period	Open circuit downstream NOx signal error	= TRUE -	battery voltage battery voltage battery voltage SCR downstream temperature SCR downstream temperature Engine Running for time Can Bus Initialized (CAN Bus is Active) consisting of: ignition on for time battery voltage battery voltage Downstream NOx sensor dewpoint achieved (please see the definition)	> = <= = : : : : : : : : : : : : : : : :	11.00 655.34 94.96 3003.56 TRUE 20.00 TRUE TRUE 3 9.8 655.34 TRUE	sec V V °C °C - sec - sec V V V	fail conditions exists for more than 13 s monitor runs with 0.1 s rate whenever enable conditions are met	A
					no pending or confirmed faults basic enable conditions met:	=	see sheet inhibit tables see sheet enable tables	-		
		Open circuit error of the binary lambda signal of Downstream NOx sensor via the CAN message	Open circuit lambda binary error of downstream NOx sensor via CAN message	= TRUE -	battery voltage battery voltage battery voltage SCR downstream temperature SCR downstream temperature Engine Running for time	>= <= >= = = >=	0.50 11.00 655.34 94.96 3003.56 TRUE 20.00	V V °C °C -	fail conditions exists for more than 13 s monitor runs with 0.1 s rate whenever enable	

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

component / System	Fault Code	Monitor Strategy Description	Primary Malfunction Criteria	Threshold Logic and Value	Secondary Parameters		Enable Conditions		Time Required	N III
,					for time	>=	3	sec		
ļ					battery voltage	>	9.8	V		ĺ
ļ					battery voltage	<	655.34	V		ĺ
ļ					Downstream NOx sensor dewpoint	=	TRUE	-		ĺ
ļ					achieved (please see the definition)	_	INOL			ĺ
ļ					no pending or confirmed faults	=	see sheet inhibit	_		ĺ
ļ					no pending of confirmed faults	-	tables			ĺ
					hania anakia anadisiana mass					1
					basic enable conditions met:	=	see sheet enable	-		l
							tables			ĺ
		Short circuit error of binary	Short circuit lambda binary error of	= TRUE -	following conditions for time	>	0.50	sec	fail	ĺ
ļ		lambda signal of	downstream NOx sensor via CAN		, and the second				conditions	ĺ
		Downstream NOx sensor via	message						exists for	1
		the CAN message							more than	1
J				1	battery voltage	>=	11.00	V	13 s	1
J				1	battery voltage	<=	655.34	V	monitor runs	1
J				1	SCR downstream temperature	>=	94.96	°C	with 0.1 s	1
ļ					SCR downstream temperature		3003.56	°C		l
ļ						<=	TRUE		rate	1
					Engine Running	=		-	whenever	1
ļ					for time	>=	20.00	sec	enable	l
ļ					Can Bus Initialized (CAN Bus is	=	TRUE	-	conditions	l
					Active)				are met	1
ļ					consisting of:					1
ļ					ignition on	=	TRUE	-		1
					for time	>=	3	sec		1
					battery voltage	>	9.8	V		1
					battery voltage	<	655.34	V		1
					Downstream NOx sensor dewpoint	=	TRUE	-		ĺ
					achieved (please see the definition)	_	IIIOL			1
					no pending or confirmed faults	=	see sheet inhibit			l
					no pending or confirmed radius	_		-		1
ļ							tables			l
					basic enable conditions met:	=	see sheet enable	-		1
							tables			ĺ
			Short circuit lambda linear error of	= TRUE -	following conditions for time	>	0.50	sec	fail	ĺ
		lambda signal of	downstream NOx sensor via CAN						conditions	1
		Downstream NOx sensor via	message						exists for	1
		the CAN message							more than	1
J				1	battery voltage	>=	11.00	V	13 s	1
J				1	battery voltage	<=	655.34	V	monitor runs	1
J				1	SCR downstream temperature	>=	94.96	°C	with 0.1 s	1
J				1	SCR downstream temperature	<=	3003.56	°Č	rate	1
J				1	Engine Running	=	TRUE	-	whenever	1
J				1						1
J				1	for time	>=	20.00	sec	enable	1
J				1	Can Bus Initialized (CAN Bus is	=	TRUE	-	conditions	1
J				1	Active)				are met	1
J				1	consisting of:					1
				1	ignition on	=	TRUE	-		1
l		ī	l .		for time	>=	3	sec		1
					I for time					
					battery voltage	>=	9.8	V		ļ

Component / System	Fault Code	Monitor Strategy Description	Primary Malfunction Criteria		Threshold Logic and Value		Secondary Parameters		Enable Conditions		Time Required	MIL Illum.
							Downstream NOx sensor dewpoint achieved (please see the definition) no pending or confirmed faults basic enable conditions met:	= =	TRUE see sheet inhibit tables see sheet enable tables	-		
NOx Sensor Range / Performance - Bank 1 Sensor 2	P229F	Compares Delta NOx concentration of downstream NOx sensor with a threshold after upstream Nox concentration change is detected	Maximum deviation of downstream NOx concentration from the state machine_5 and with ((a) Limit value for Stuck in range check of downstrean NOx concentration and (b) = (c) * (d) and with ((c) Weighting factor for calculating the peak limit value based on the SCR temperature and the NOx mass flow (d) Average upstream NOx concentration)	= = =	Min [(a) or (b)] 5.00 32.767 measured parameter	ppm ppm	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 exhaust gas mass flow engine speed for time Status of the SCR adaptation plausibility check active (please see the definition) for time ((SCR catalyst average temperature SCR catalyst average temperature SCR catalyst average temperature SCR catalyst average temperature SCR catalyst average temperature SCR catalyst average temperature	=	See sheet inhibit table TRUE 0.50 TRUE 0.50 2.78 100.00 10.00 FALSE 0.00 299.96 -0.04	- sec - sec g/sec rpm sec - sec °C °C	fail conditions exists for more than 2 event monitor runs with 0.01s rate whenever enable conditions are met	В
							State of Reductant injection valve Component Protection (please see definition) for time (State machine_0 : starting state and waiting for low upstream NOx mass flow / concentration	>	FALSE 120.00	sec		
							Filtered upstream NOx mass flow Filtered NOx concentration Exhaust mass flow	< < <	0.02 170.00 69.40	g/sec ppm g/sec		

Component /	Fault	Monitor Strategy	Primary Malfunction	Threshold	Secondary		Enable		Time	MIL
System	Code	Description	Criteria	Logic and Value	Parameters		Conditions		Required	Illum.
					for time	<	1.00	sec		
)					
					State machine_1 : low upstream NOx					
					mass flow /concentration reached					
					(
					Old State machine_0 : starting state and	=	TRUE	-		
					waiting for low upstream NOx mass flow					
					/ concentration					
					for time	>=	1.00	sec		
					Filtered upstream NOx mass flow	<	0.02	g/sec		
					Filtered NOx concentration	<	170.00	ppm		
					Exhaust mass flow	<	69.40	g/sec		
					captured minimum downstream NOx	=	Measured	-		
					concentration in State machine 1		parameter			
])					
					State machine_2 : start Upstream NOx					
					peak					
					(
					Old State machine_1 : low upstream	=	TRUE	-		
					NOx mass flow /concentration reached					
					(
					Filtered upstream NOx mass flow	>	0.02	g/sec		
					or					
					Filtered NOx concentration	>	170.00	ppm		
					or					
					Exhaust mass flow	>	69.40	g/sec		
)					
					for time	<	2.00	sec		
					Absolute deviation of downstream NOx	=	Measured	-		
					concentration: (a) - (b)		parameter			
					and with					
					(a) Filtered downstream NOx	=	Measured	-		
					concentration		parameter			
					(b) captured minimum downstream	=	Measured	-		
					NOx concentration in State		parameter			
					machine 1, 2, and 3					
)					
					Otata analisa o Hastara NO. anal					
					State machine_3 : Upstream NOx peak					
					detection					
					Old State machine 2 : etert In-t		TRUE			
					Old State machine_2 : start Upstream	=	IKUE	-		
					NOx peak	_	2.00			
					for time	>=	2.00	sec		
					Filtered upstream NOx mass flow	>=	0.04	g/sec		
					Filtered NOx concentration	>=	190.00	ppm		
					Exhaust mass flow message	>=	125.00	g/sec		
					for time	<	0.50	sec		
					Absolute deviation of downstream NOx	=	Measured	ppm		
					concentration: (a) - (b)		parameter			
					and with					
					(a) Filtered downstream NOx	=	Measured	ppm		
		ı			concentration		parameter			

Component /	Fault	Monitor Strategy	Primary Malfunction	Threshold	Secondary		Enable		Time	MIL
System	Code	Description	Criteria	Logic and Value	Parameters		Conditions		Required	Illum.
					(b) captured minimum downstream NOx concentration in State machine 1, 2, and 3	=	Measured parameter	ppm		
					State machine_4 : delay for downstream NOx peak evaluation					
					Old State machine_3 : Upstream NOx peak detection	=	TRUE	-		
					for time	>=	0.50	sec		
					Filtered and estimated NOx conversion efficiency of SCR catalyst	<=	0.60	factor		
					Absolute deviation of downstream NOx concentration: (a) - (b) and with	=	Measured parameter	ppm		
					(a) Filtered downstream NOx	=	Measured parameter	ppm		
					(b) captured minimum downstream	=	Measured	ppm		
					NOx concentration in State machine 1, 2, and 3		parameter			
					for time (see Look-Up-Table #89)	<	4.5 to 5.5	sec		
					State machine_5 : end of downstream NOx peak and evaluation					
					Filtered and estimated NOx conversion efficiency of SCR catalyst	<=	0.80	-		
					for time	>	0.10	sec		
					Old State machine_4 : delay for downstream NOx peak evaluation	=	TRUE	-		
					for time (see Look-Up-Table #89)	>=	3 to 5.5	sec		
					Maximum deviation of downstream NOx concentration among different states of	=	Measured parameter	ppm		
					state machine Average SCR catalyst temperature	>	149.96	°C		
					Average upstream NOx mass flow in state machine 3 and 4	>=	0.04	mg/s		
					Average upstream NOx concentration in state machine 3 and 4	>=	190.00	ppm		
					NO Pending or Confirmed DTCs:	=	see sheet inhibit tables	-		
)					
					basic enable conditions met:	=	see sheet enable tables	-		
NOx Sensor	P22A1		Downstream Nox sensor signal (raw	> 2500.00 p	ppm Downstream Nox sensor ready status	=	TRUE	-	fault exists	В
Circuit High Bank 1 Sensor 2			information received via CAN from Nox sensor)		(see parameter definition)				for more than 10 sec;	

Component / System	Fault Code	Monitor Strategy Description	Primary Malfunction Criteria		Threshold gic and Value		Secondary Parameters		Enable Conditions		Time Required	MIL Illum
		·					Valid NOx signal from CAN is received (no Nox sensor communication failures)	=	TRUE	-	monitor runs at 0.1 s when enable	
NOx Sensor Circuit Low Bank 1 Sensor 2	P22A0	Detects an out of range low fault of the downstream NoX Sensor	Downstream Nox sensor signal (raw information received via CAN from Nox sensor)	<	-90.00	ppm	Engine Running (see parameter definition)	=	TRUE	-	conditions are met	
JC11301 Z		Consor	SCHSOT)				for time and	>	20.00	sec		
							Injection Quantity	>	8.00	mm^3/r ev		
							or Downstream NOx sensor dewpoint achieved (please see the definition)	=	TRUE	-		
							for time	>	600.00	sec		
NOx Heater Control Circuit Bank 1 Sensor 2	P22A3	Downstream NOx sensor heater open circuit error via the CAN message	Open circuit heater error of downstream NOx sensor via CAN message	=	TRUE	-	following conditions for time	>	0.50	sec	fail conditions exists for	А
sank i Sensor 2		the CAN message					battery voltage	>=	11.00	V	more than	
							battery voltage	<=	655.34	°C	13 s	
							SCR downstream temperature SCR downstream temperature	>= <=	94.96 3003.56	°C	monitor runs with 0.1 s	
							Engine Running	=	TRUE	-	rate	
							for time	>=	20.00	sec	whenever	
							Can Bus Initialized (CAN Bus is Active)	=	TRUE	-	enable conditions	
							consisting of: ignition on	=	TRUE	_	are met	
							for time	>=	3	sec		
							battery voltage	>	9.8	V		
							battery voltage	<	655.34	V		
							Downstream NOx sensor dewpoint achieved (please see the definition)	=	TRUE	-		
							no pending or confirmed faults	=	see sheet inhibit tables	-		
							basic enable conditions met:	=	see sheet enable tables	-		
		Downstream NOx sensor	Short circuit heater error of downstream	=	TRUE		following conditions for time	>	0.50	sec	fail	
			NOx sensor via CAN message	_							conditions exists for	
							battery voltage	>=	11.00	V	more than	
							battery voltage	<=	655.34	V	13 s	
							SCR downstream temperature	>=	94.96	°C	monitor runs	
ļ							SCR downstream temperature Engine Running	<= =	3003.56 TRUE	°C	with 0.1 s	
							for time	= >=	20.00	sec	rate whenever	
ļ							Can Bus Initialized (CAN Bus is	=	TRUE	-	enable	
							Active)				conditions	
		1	I				consisting of:	I			are met	

Component / System	Fault Code	Monitor Strategy Description	Primary Malfunction Criteria		Threshold Logic and Value		Secondary Parameters		Enable Conditions		Time Required	MIL Illum.
System	Code	Description	Griteria		Logic and value		ignition on for time battery voltage battery voltage Downstream NOx sensor dewpoint achieved (please see the definition) no pending or confirmed faults basic enable conditions met:	= >= > < = = =	TRUE 3 9.8 655.34 TRUE see sheet inhibit tables see sheet enable tables	sec V V -	Kequired	
NOx Heater Performance Bank 1 Sensor 2	P22A7	Monitoring of the downstream NoX sensor signal readiness	Downstream NOx sensor heater temperature has reached setpoint	=	FALSE		battery voltage and battery voltage and SCR downstream temperature and SCR downstream temperature and Engine running for time and Downstream Nox Sensor Dewpoint end is reached (please see the parameter definition)) for time and basic enable conditions met: No Pending or Confirmed DTCs	>= <= >= = = = = = = = = = = = = = = = =	11.00 655.34 94.96 3003.56 TRUE 20.00 TRUE 150.5 see sheet enable tables see sheet inhibit tables	V V °C °C sec - sec	fault exists for more than 1 event when dewpoint end is reached; monitor runs at 0.02 s when enable conditions are met	В
NOx Sensor Performance - Slow Response High to Low Bank 1 Sensor 1	P22FA	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 or Downstream NOx concentration for time	> >	40% of Initial Nox Concentration Level 5.00	sec -	State of the NOx sensor dynamic monitoring state machine and Injection quantity for current cylinder for time	= <	Evaluate falling edge of NOx concentration signal 2.00	mm^3/r ev sec	fail conditions exist for 1 event, test is performed in the 0.01 ms rate when enable conditions are met	В

Component / System	Fault Code	Monitor Strategy Description	Primary Malfunction Criteria		Threshold Logic and Value)	Secondary Parameters		Enable Conditions		Time Required	MIL Illum.
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)) with (a) oxidation catalyst upstream temperature and with (b) oxidation catalyst downstream temperature and with (c) SCR downstream temperature and with (d) particulate filter downstream temperature	> > > > > > > > > > > > > > > > > > > >	799.96 799.96 799.96 799.96	°C °C °C	basic enable conditions met: and NO Pending or Confirmed DTCs:	=	see sheet enable tables see sheet inhibit tables		fail conditions exists for 6 s test performed continuously 0.1 s rate	A
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 xxs monitor runs with 0.1 s rate	В
			or integrated heat quantity of exhaust gas temperature sensor 3 with	>	(a) / (b) * (c) / (d) * (e) * (g)		for time	>	1500.00	sec	whenever enable conditions are met	
			(a) exhaust gas mass flow and with	=	calculated parameter	-	time since start	>	327.00	sec		
			(b) factor and with	=	3.60	g/sec	(exhaust-gas temperature sensor 3	>	-60.04	°C		
			(c) heat capacity and with (d) factor	=	1050.00 1000	J/Kg/°C kW/°C	and exhaust-gas temperature sensor 3)	<	1999.96	°C		
			and with (e) correction factor for heat flow quantity depending on exhaust gas mass flow for temperature sensor 3	=	1.00	factor	land change in exhaust-gas temperature sensor 3	<	7.00	°C		
			and with (f) minimum permissible temperature deviation for exhaust gas temperature sensor 3 and with	=	-100.00	°C	for time and engine operation point suitable for	=	5.00 0 to 255	sec		
			(g) maximum permissible temperature deviation for exhaust gas temperature sensor 3	=	100.00	°C	diagnostic (see Look-Up-Table #29) for	_	0 10 200			
							time	>=	0.05	sec		

Component /	Fault	Monitor Strategy	Primary Malfunction		Threshold		Secondary		Enable		Time	MIL
System	Code	Description	Criteria	Lo	gic and Value		Parameters and change in modeled exhaust-gas temperature sensor 3 and	>	4.00	°C	Required	Illum.
							heat quantity for exhaust gas temperature sensor 3 and	>	10.00	kJ		
							heat quantity for exhaust gas temperature sensor 3)	<	12.00	kJ		
							and engine has been in normal mode for time	>=	1.00	sec		
							or engine has been in exhaust warm-up mode for time and	>=	1.00	sec		
							basic enable conditions met:	=	see sheet enable tables	-		
							NO Pending or Confirmed DTCs:	=	see sheet inhibit tables	-		
Exhaust Gas Temperature	P242C	Detects low voltage condition of the downstream	voltage of SCR downstream catalyst	<	0.65	V	((fail conditions	A
(EGT) Sensor 3 Circuit Low Voltage		SCR catalyst temperature sensor circuit, indicating an OOR low condition	temperature sensor								exists for more than 5.0 sec.	
			same as Downstream SCR Catalyst temperature	<	-50	°C	engine speed engine speed	<= >=	6000.00 0.00	rpm rpm	monitor runs with 0.1 s rate whenever	
							current injection quantity current injection quantity	<= >=		mm^3/r ev mm^3/r	enable conditions are met	
							engine coolant temperature time since engine start exhaust-gas mass flow downstream of the exhaust manifold	> >	-50.04 0.00 0.00	ev °C sec g/sec		
							or SCR catalyst temperature	>	-45.04	°C		
							for time NO Pending or Confirmed DTCs: basic enable conditions met:	> = =	0.00 see sheet inhibit tables see sheet enable tables	sec -		
	_											

Component /	Fault	Monitor Strategy	Primary Malfunction		Threshold		Secondary		Enable		Time	MIL
System	Code	Description	Criteria		Logic and Valu	е	Parameters		Conditions		Required	Illum.
Exhaust Gas Temperature (EGT) Sensor 3 Circuit High Voltage	P242D	Detects high voltage condition of the downstream SCR catalyst temperature sensor circuit, indicating an OOR high condition	voltage of SCR downstream catalyst temperature sensor	>	2.21	V	((fail conditions exists for more than 5.0 sec.	A
vollage		CONTINUEDIDA	same as Downstream SCR Catalyst temperature	>	1000	°C	engine speed engine speed current injection quantity current injection quantity engine coolant temperature time since engine start exhaust-gas mass flow downstream of the exhaust manifold) or SCR catalyst temperature) for time NO Pending or Confirmed DTCs: basic enable conditions met:	<= >= <= > > > > = = = = = = = = = = = =	6000.00 0.00 800.00 0.00 -50.04 0.00 0.00 -45.04 0.00 see sheet inhibit tables see sheet enable tables	rpm rpm mm^3/r ev mm^3/r ev °C sec	monitor runs with 0.1 s rate whenever enable conditions are met	
Diesel Particulate Filter Differential Pressure Sensor Performance	P2453	Detects in range faults on the DPF differential pressures sensor.	Path 1: change in differential pressure or change in differential pressure	>	-1.00 1.00		change in exhaust gas volume flow or change in exhaust gas volume flow) and current exhaust gas volume flow and basic enable conditions met: and NO Pending or Confirmed DTCs:	> < > = =	0.10 -0.10 0.10 see sheet enable tables see sheet inhibit tables	m^3/s^2 m^3/s^2 m^3/s -	0.1 s rate	В
			Path 2: differential pressure sensor	>	3.20	kPa	Engine State for time	= >	After Run 35.00	- sec	fail conditions exists for 0.5 s	

Component / System	Fault Code	Monitor Strategy Description	Primary Malfunction Criteria		Threshold gic and Valu	e	Secondary Parameters		Enable Conditions		Time Required	MIL Illum.
							and basic enable conditions met: and NO Pending or Confirmed DTCs:	=	see sheet enable tables see sheet inhibit tables	-	monitor runs with 0.1 s rate whenever enable conditions	
Diesel Particulate Filter Differential Pressure Sensor Circuit Low Voltage	P2454	Detects low voltage readings on the DPF differential pressure sensor circuit, indicating an OOR low condition on the circuit	voltage of differential pressure sensor same as differential pressure	<	-4.20	V kPa	ignition on and basic enable conditions met: and NO Pending or Confirmed DTCs:	= =	TRUE see sheet enable tables see sheet inhibit tables		fail conditions exists for 3 s test performed continuously 0.020 s rate	В
Diesel Particulate Filter Differential Pressure Sensor Circuit High Voltage	P2455	Detects high voltage readings on the DPF differential pressure sensor circuit, indicating an OOR high condition on the circuit	voltage of differential pressure sensor same as differential pressure	>	91.70	V 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 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	<	0.45		(engine speed and engine speed	>= <=	1400.00 2800.00	rpm rpm	fail conditions exists for 0.1 s monitor runs with 0.1 s rate whenever enable conditions are met	В

Component /	Fault	Monitor Strategy	Primary Malfunction	Threshold	Secondary		Enable		Time	MIL
System	Code	Description	Criteria	Logic and Value	Parameters		Conditions		Required	Illum.
) and					
					(
					injection quantity	>=	20.00	mm^3/r ev		
					and			ev		
					injection quantity	<=	320.00	mm^3/r		
)			ev		
					and					
					(12.50	a/222		
					recirculated exhaust-gas mass flow downstream of the EGR cooler	>=	12.50	g/sec		
					and					
					recirculated exhaust-gas mass flow downstream of the EGR cooler	<=	34.72	g/sec		
)					
					and		T0.15			
					EGR controller is active and DPF is not in regeneration mode	=	TRUE	-		
					and					
					(engine temperature		69.96	°C		
					and	>=	09.90	C		
					engine temperature	<=	122.96	°C		
) and					
					(
					actual valve position of exhaust-gas	>=	10.00	%		
					recirculation					
					and					
					(and					
l					control value provided for EGR cooling	<=	5.00	%		
					bypass					
) and					
					ambient pressure	>=	74.80	kPa		
					and (
					ambient temperature	>=	-7.04	°C		
					and					
					ambient temperature	<=	3003.56	°C		
					and					
					diagnostic performed in current dc and	=	FALSE	-		
					NO Pending or Confirmed DTCs:	=	see sheet inhibit	-		
							tables			
) for					
					time	>=	90.00	sec		
					and	l				

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	-		
Diesel Particulate Filter Regeneration Frequency	P2459	Detects a DPF that is regeneration too frequently by comparing a threshold to a soot model.	with (a) engine out soot mass flow in the exhaust-qas and with (b) delta time step and with (c) simulated maximum base soot mass from previous time step and with (d) factor for calculation of a soot mass value offset depending on the simulated maximum base soot mass (see Look-Up-Table #65) and with (e) factor for determination of correction factor for ash in the particulate filter and with (f) amount of remaining soot from previous regen cycle		minimum of (((a) * (b) + (c)) - (f)) + ((((a) * (b) + (c)) - (f)) * ((d)) * (((a) * (b) + (c)) - (f)) * (e))) or 327.67 measured parameter calculated parameter measured parameter 0 to 450	g g factor	and last 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: and NO Pending or Confirmed DTCs:	= = =	TRUE TRUE TRUE see sheet enable tables see sheet inhibit tables		fail conditions exists for more than 1 event monitor runs 0.1 s rate whenever enable conditions are met	В
Diesel Particulate Filter - Soot Accumulation	P2463	Detects high levels of soot in the DPF as indicated by the soot model.	soot mass in the particulate filter	>	69.60	g	ignition on and basic enable conditions met: and NO Pending or Confirmed DTCs:	=	TRUE see sheet enable tables see sheet inhibit tables		fail conditions exists for 30 s test performed continuously 0.1 s rate	A

Component / System	Fault Code	Monitor Strategy Description	Primary Malfunction Criteria		Threshold Logic and Value		Secondary Parameters		Enable Conditions		Time Required	MIL Illum
Exhaust Femperature 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 xxs monitor runs with 0.1 s rate	В
			or integrated heat quantity of exhaust gas temperature sensor 4 with	>	(a) / (b) * (c) / (d) * (e) * (g)	-	for time	>	1500.00	sec	whenever enable conditions are met	
			(a) exhaust gas mass flow and with	=	calculated parameter	-	time since start	>	327.00	sec		
			(b) factor and with (c) heat capacity	=	4.60 1050.00	g/sec J/Kg/°C	(exhaust-gas temperature sensor 4 and	>	-60.04	°C		
			and with (d) factor and with	=	1000	kW/°C	exhaust-gas temperature sensor 4)	<	1999.96	°C		
			(e) correction factor for heat flow quantity depending on exhaust gas mass flow for temperature sensor 4	=	1.00	factor	and change in exhaust-gas temperature sensor 4	<	7.00	°C		
			and with (f) minimum permissible temperature deviation for exhaust gas temperature	=	-100.00	°C	for time and	=	5.00	sec		
			sensor 4 and with				engine operation point suitable for diagnostic (see Look-Up-Table #29)	=	0 to 255	-		
			(g) maximum permissible temperature deviation for exhaust gas temperature sensor 4	=	100.00	°C	for					
							time and	>=	0.05	sec °C		
							change in modeled exhaust-gas temperature sensor 4 and	>	4.00	°C		
							heat quantity for exhaust gas temperature sensor 4 land	>	10.00	kJ		
							heat quantity for exhaust gas temperature sensor 4	<	12.00	kJ		
							and engine has been in normal mode for time	>=	1.00	sec		
							or engine has been in exhaust warm-up mode for time and	>=	1.00	sec		
							basic enable conditions met:	=	see sheet enable tables	-		

Component / System	Fault Code	Monitor Strategy Description	Primary Malfunction Criteria	L	Threshold ogic and Valu	ıe	Secondary Parameters		Enable Conditions		Time Required	MIL Illum.
							NO Pending or Confirmed DTCs:	=	see sheet inhibit tables	-		
Exhaust Gas Temperature (EGT) Sensor 4 Sensor Circuit Low Voltage	P2470	Detects low voltage readings on the EGT 4 circuit, indicating an OOR low condition on the EGT 4	particulate filter downstream temperature sensor voltage same as particulate filter downstream temperature	<	-60	v °C	ignition on and basic enable 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
Exhaust Gas Temperature (EGT) Sensor 4 Circuit High Voltage	P2471	Detects high voltage readings on the EGT 4 circuit, indicating an OOR high condition on the EGT 4	particulate filter downstream temperature sensor voltage same as particulate filter downstream temperature	>	2.21 999.6	v °C	ignition on and basic enable 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
Closed loop Reductant Injection Control at Limit-Flow too high	P249D	Detects an out of range high of the long term Reductant quantity adaptation factor	long term adaptation factor of Reductant quantity	>	1.69	factor	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
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	factor	long term adaptation triggered	=	TRUE	-	fault exists for more than 0.1 s; monitor runs at 0.1 s	В

Component /	Fault	Monitor Strategy	Primary Malfunction Criteria		Threshold		Secondary		Enable		Time	MIL
System	Code	Description	Criteria		Logic and Value		Parameters NO Pending or Confirmed DTCs basic enable conditions met:	=	see sheet inhibit tables see sheet enable tables	-	Required whenever enable conditions are met	Illum.
Closed Loop Particulate Filter Regeneration Control At Limit - Temperature Too Low	P24A0	Detects insufficient HCI temperature. Temperature readings are compared to desired temperature values as an indication of an insufficient exhaust gas temperature.	and deviation from the temperature setpoint for HCl control loop with (a) temperature threshold value and with (b) temperature value for threshold of monitoring and with (c) basic temperature threshold value for monitoring	>======================================	0.00 maximum of (a) and (b+c) 100.00 0 100	- °C °C	current engine operating point is suitable for monitoring deviation of exhaust gas temperature control - depending on engine speed and injection quantity (see Look-Up-Table #25) for time and ((exhaust gas temperature control is active means (temperature upstream of the oxidation catalyst and (particulate filter temperature and (particulate filter temperature for activated post injection)) and release status means (vehicle speed and vehicle speed and Actual time spent in coastdown mode) and	= > > < < < > > < < < < > < < < < < > > = < < < <	30.00 TRUE 224.96 229.96 719.96 749.96 TRUE 14.92 124.30 60.00	sec °C °C °C rmph mph sec	fail conditions exists for 300 s monitor runs with 0.1 s rate whenever enable conditions are met	В
							and basic enable conditions met: and NO Pending or Confirmed DTCs:	=	see sheet enable tables see sheet inhibit tables	-		

Component / System	Fault Code	Monitor Strategy Description	Primary Malfunction Criteria		Threshold Logic and Value		Secondary Parameters		Enable Conditions		Time Required	MIL Illum.
Оублен		Боотран	Ontona		Logio ana valao		ramino		Conditions		rtoquirou	mann
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	<=	0.00		current engine operating point is suitable for monitoring deviation of exhaust gas temperature control - depending on engine speed and injection quantity (see Look-Up-Table #26)	=	0 to 1		fail conditions exists for 300 s monitor runs with 0.1 s rate whenever enable	В
			and deviation from the temperature setpoint for HCl control loop with (a)	<	minimum of (a) and (b+c-(d-e)) -75.00	- °C	for time and (>	30.00	sec	conditions are met	
			and with (b) temperature value for threshold of monitoring with		0	°C	exhaust gas temperature control is active means	=	TRUE			
			(c) basic temperature threshold value for monitoring		100	°C	temperature upstream of the oxidation catalyst and	>	224.96	°C		
							particulate filter temperature and (>	229.96	°C		
							particulate filter temperature or particulate filter temperature for activated post injection	<	719.96 749.96	°C		
)) and					
							release status means (=	TRUE	-		
							vehicle speed and vehicle speed	>=	14.92 124.30	mph mph		
							and Actual time spent in coastdown mode	<	60.00	sec		
							and basic enable conditions met:	=	see sheet enable tables	-		
							and NO Pending or Confirmed DTCs:	=	see sheet inhibit tables	-		

Component /	Fault	Monitor Strategy	Primary Malfunction		Threshold		Secondary		Enable		Time	MIL
System	Code	Description	Criteria	Lo	ogic and Value)	Parameters		Conditions		Required	Illum.
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	>	1.00	-	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
		Opening too soon is indicated by a lack of EEPROM write at the last after run.	sticky main relay is detected means time after request to open the main relay	= >	TRUE 1.40	sec	ignition off and engine pre drive and battery voltage and basic enable conditions met: and NO Pending or Confirmed DTCs:	= > = =	FALSE 0.50 see sheet enable conditions see sheet inhibit tables	- V -	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	
Transition Torque Request Signal Message Counter Incorrect	P2544	Detects implausible torque request information received from the TCM	Path 1: amount of errors in consecutive frames received from TCM with number of consecutive frames or	>=	7.00 15.00		ignition on and new message received and basic enable conditions met:	= = =	TRUE TRUE see sheet enable tables	-	fail conditions exist for 0.005 s test performed continuously 0.005 s rate	В

Component / System	Fault Code	Monitor Strategy Description	Primary Malfunction Criteria		Threshold Logic and Value	e	Secondary Parameters		Enable Conditions		Time Required	MIL Illum.
			Path 2: number of protection value errors in TCM message	>	15.00	counts	and NO Pending or Confirmed DTCs:	=	see sheet inhibit tables	-		
Turbocharger Boost Control Position Sensor Circuit Low Voltage	P2564	Detects low voltage readings on the turbo boost control position sensor circuit, indicating an OOR low condition on the circuit	voltage of boost pressure position sensor same as boost pressure position	<	0.15	V %	ignition on and basic enable conditions met:	=	TRUE see sheet enable tables		fail conditions exists for 5 s test performed continuously 0.01 s rate	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	>	4.75 95	V %	ignition on and basic enable conditions met:	=	TRUE see sheet enable tables		fail conditions exists for 5 s test performed continuously 0.01 s rate	A
Turbocharger Boost Control Position Sensor "A" Circuit Range/Performanc e - Stuck Low	P2598		turbo charger control deviation calculated out of difference between desired and actual value	>	15.00	%	engine speed and engine speed (see Look-Up-Table #91)	>=	-16384.00 600 to 850	rpm	fail conditions exists for 10 s monitor runs with 0.02 s rate whenever enable	В
Turbocharger Boost Control Position Sensor "A" Circuit Range/Performanc e - Stuck High	P2599	Detects in range Turbo vane position errors by comparing desired vane position to actual vane position	turbo charger control deviation calculated out of difference between desired and actual value	<	-15.00	%	for time (see Look-Up-Table #92) and (engine coolant temperature and engine coolant temperature	>= <=	30to 327.67 69.96 122.96	sec °C °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.
) and ((ambient temperature and ambient temperature) and offset learning for turbo charger (VNT) actuator position sensor is active during idling	>= -15.04 <= 199.86 = FALSE = TRUE = see sheet enable tables = see sheet inhibit tables	°C - -		
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	> 5.00 counts	ignition on and engine pre drive and basic enable conditions met:	= TRUE = TRUE = see sheet enable tables		fail conditions exists for 0.01 s monitor runs once per driving cycle with 0.01 s rate whenever enable conditions are met	В

Component /	Fault	Monitor Strategy	Primary Malfunction	Threshold	Secondary		Enable		Time	MIL
System	Code	Description Detects a failure in the engine off timer if during the after run the internal SW timer and the EOT do not correlate. A failure is detected when the respective timers are started after a calibration time then both are stopped	Criteria Path 1: acquired stop counter time or Path 2: acquired stop counter time (where (a) and (b) tolerance threshold and (c) correction factor and (d) system time since engine post drive/ afterun)	 ((a) - (b - c))*d ((a) + (b - c))*d 100 17.19 7.5 calculated parameter 	time since engine post drive/ afterun and engine post drive/ afterun and basic enable conditions met:	= =	TRUE see sheet enable tables	sec	fail conditions exists for 0.01 s monitor runs once per driving cycle with 0.01 s rate whenever enable conditions are met	Illum.
		Detects an interrupted supply voltage.	permanent supply voltage is interrupted	= TRUE	ignition on and basic enable conditions met:	=	TRUE see sheet enable tables		fail conditions exists for more than 1 event monitor runs once per driving cycle with 0.01 s rate whenever enable conditions	
Fuel Injector Calibration Not Programmed	P268A	Detects un-programmed Injector Calibration Data (IQA) in ECM	Path 1: the checksum of the injector adjustment code words is correct	= FALSE	engine pre drive and basic enable conditions met:	=	TRUE see sheet enable tables	-	fail conditions exist for 1 s monitor runs once per driving cycle during predrive with	A

Component / System	Fault Code	Monitor Strategy Description	Primary Malfunction Criteria	Threshold Logic and Value	Secondary Parameters	Enable Conditions	Time Required 1 s rate	MIL Illum.
Cylinder 1 Injector Data Incorrect (IQA)	P268C	Detects a miss match in IQA values between ECM and GPCM	IQA (injection quantity adjustment) value of injector 1 transmitted via CAN from GPCM (glow plug module) match with the stored ECM value	= FALSE -	transmitted IQA data from GPCM (glow plug module) for cylinder 1 are valid and basic enable conditions met: and NO Pending or Confirmed DTCs:	= TRUE - = see sheet enable tables = see sheet inhibit tables	fail conditions exist for 1 s test performed continuously with 1 s rate	A
Cylinder 2 Injector Data Incorrect (IQA)	P268D	Detects a miss match in IQA values between ECM and GPCM	IQA (injection quantity adjustment) value of injector 2 transmitted via CAN from GPCM (glow plug module) match with the stored ECM value	= FALSE -	transmitted IQA data from GPCM (glow plug module) for cylinder 2 are valid and basic enable conditions met: and NO Pending or Confirmed DTCs:	= TRUE - = see sheet enable - tables = see sheet inhibit - tables	fail conditions exist for 1 s test performed continuously with 1 s rate	A
Cylinder 3 Injector Data Incorrect (IQA)	P268E	Detects a miss match in IQA values between ECM and GPCM	IQA (injection quantity adjustment) value of injector 3 transmitted via CAN from GPCM (glow plug module) match with the stored ECM value	= FALSE -	transmitted IQA data from GPCM (glow plug module) for cylinder 3 are valid and basic enable conditions met: and NO Pending or Confirmed DTCs:	= TRUE - = see sheet enable - tables = see sheet inhibit - tables	fail conditions exist for 1 s test performed continuously with 1 s rate	A
Cylinder 4 Injector Data Incorrect (IQA)	P268F	Detects a miss match in IQA values between ECM and GPCM	IQA (injection quantity adjustment) value of injector 4 transmitted via CAN from GPCM (glow plug module) match with the stored ECM value	= FALSE -	transmitted IQA data from GPCM (glow plug module) for cylinder 4 are valid and	= TRUE -	fail conditions exist for 1 s test performed continuously	A

Component / System	Fault Code	Monitor Strategy Description	Primary Malfunction Criteria	Threshold Logic and Value	Secondary Parameters		Enable Conditions		Time Required	MIL Illum.
					basic enable conditions met: and NO Pending or Confirmed DTCs:	=	see sheet enable tables see sheet inhibit tables	-	with 1 s rate	
Cylinder 5 Injector Data Incorrect (IQA)	P2690	Detects a miss match in IQA values between ECM and GPCM	IQA (injection quantity adjustment) value of injector 5 transmitted via CAN from GPCM (glow plug module) match with the stored ECM value	= FALSE -	transmitted IQA data from GPCM (glow plug module) for cylinder 5 are valid and basic enable conditions met: and NO Pending or Confirmed DTCs:	= =	TRUE see sheet enable tables see sheet inhibit tables		fail conditions exist for 1 s test performed continuously with 1 s rate	A
Cylinder 6 Injector Data Incorrect (IQA)	P2691	Detects a miss match in IQA values between ECM and GPCM	IQA (injection quantity adjustment) value of injector 6 transmitted via CAN from GPCM (glow plug module) match with the stored ECM value	= FALSE -	transmitted IQA data from GPCM (glow plug module) for cylinder 6 are valid and basic enable conditions met: and NO Pending or Confirmed DTCs:	=	TRUE see sheet enable tables see sheet inhibit tables	-	fail conditions exist for 1 s test performed continuously with 1 s rate	A
Cylinder 7 Injector Data Incorrect (IQA)	P2692	Detects a miss match in IQA values between ECM and GPCM	IQA (injection quantity adjustment) value of injector 7 transmitted via CAN from GPCM (glow plug module) match with the stored ECM value	= FALSE -	transmitted IQA data from GPCM (glow plug module) for cylinder 7 are valid and basic enable conditions met: and NO Pending or Confirmed DTCs:	=	TRUE see sheet enable tables see sheet inhibit tables		fail conditions exist for 1 s test performed continuously with 1 s rate	A

Component / System	Fault Code	Monitor Strategy Description	Primary Malfunction Criteria		Threshold Logic and Value		Secondary Parameters		Enable Conditions		Time Required	MIL Illum.
Cylinder 8 Injector Data Incorrect (IQA)	P2693	Detects a miss match in IQA values between ECM and GPCM	IQA (injection quantity adjustment) value of injector 8 transmitted via CAN from GPCM (glow plug module) match with the stored ECM value	=	FALSE	-	transmitted IQA data from GPCM (glow plug module) for cylinder 8 are valid and basic enable conditions met: and NO Pending or Confirmed DTCs:	=	TRUE see sheet enable tables see sheet inhibit tables	-	fail conditions exist for 1 s test performed continuously with 1 s rate	A
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)	<	0.00	factor	NO Pending or Confirmed DTCs:	=	see sheet inhibit tables	-	fail conditions exists for more than 1	А
			where (a) measured SCR catalyst efficiency	=	calculated parameter	-	for time	>	300.00	sec	event monitor runs with 0.01 s	
			(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	-	rate whenever enable	
			J				for time	>	60.00	sec	conditions	
							Status of NOx signal of downstream NOx sensor (please see the definition) for time	= >	Active 60.00	sec	are met	
							(Release of dosing strategy (please see	=	TRUE	-		
							the definition) for time	>=	(a) + (b)	sec		
							(a) Turn on delay time 1 of status metering strategy		380.00	sec		
							(b) Turn on delay time 2 of status metering strategy		20.00	sec		
							(Status for disabling SCR Efficiency monitoring following an SCR Adaptation completion (please see the definition)	=	FALSE	-		
							for time	>	(a) + (b)	sec		
							(a) Debounce time after pre controlled dosing over	>	0.50	sec		
							(b) delay time the status of disabling SCR Efficiency monitoring	>	80.00	sec		
							or integrated upstream NOx)	>=	3276.70	g		

Component /	Fault	Monitor Strategy	Primary Malfunction	Threshold	Secondary		Enable		Time	MIL
System	Code	Description	Criteria	Logic and Value	Parameters		Conditions		Required	Illum.
					Status of pre controlled dosing (please	=	FALSE	-		
					see the definition)					
					for time	>	(a) + (b)			
					(a) Debounce time after pre controlled dosing off	=	0.50	sec		
					(b) Delay time after pre controlled dosing off	=	180.00	sec		
					or integrated upstream NOx	>=	3276.70	g		
)			3		
					Decrease of Reductant load level (please see the definition)	=	FALSE	-		
					for time	>	300.00	sec		
)					
					(Average slow filtered NOx mass flow	<=	0.12	g/sec		
					upstream SCR for time	>	0.50	sec		
					Monitor disable time based on average	>	0.50 0 to 85	sec		
					NOx mass flow and the time (see Look- Up-Table #88)	,	0 10 85	Sec		
					for time with	>	15.00	sec		
					Delta SCR temperature (see Look-Up- Table #85)	<=	23.96 to 74.96	°C		
					Delta SCR temperature	>	524.96	°C		
					Delta SCR temperature	<	199.96	°C		
					or Initialization time of temperature gradient calculation	<	2.50	sec		
) or					
					Delta SCR temperature	<	229.96	°C		
					or Delta SCR temperature	>	499.96	°C		
					for time		10.00	sec		
					(normalized HC load in SCR catalyst	>	21.00	factor		
)					
					(ambient pressure	>=	74.80	kPa		
					ambient temperature)	>=	-7.04	°C		
					Stuck reductant dosing valve fault was	=	FALSE	-		
					healed last particulate filter regeneration successful	=	TRUE	-		

Component /	Fault	Monitor Strategy	Primary Malfunction	Threshold	Secondary		Enable		Time	MIL
System	Code	Description	Criteria	Logic and Value	Parameters		Conditions		Required	Illum.
					(Status of the SCR adaptation plausibility check active (please see the definition)	=	FALSE	-		
					for time	>	600.00	sec		
) Reductant Delivery performance	=	FALSE	-		
					completed this drive cycle	-	TALGE	-		
					(engine speed	>=	1000.00	rpm		
					engine speed	<=	3000.00	rpm		
					for time)	>	0.00	sec		
					SCR estimated current Reductant load (see Look-Up-Table #77)	>=	0.06 to 1.3	g		
					SCR estimated current Reductant load (see Look-Up-Table #76)	<=	0.2 to 2.7	g		
					Difference between nominal and estimated Reductant (see Look-Up-Table #79)	>=	-0.35 to -0.05	g		
					Difference between nominal and estimated Reductant (see Look-Up-Table #78)	<=	0.05 to 0.2	g		
					SCR in Pre-Control State (please see the definition)	=	FALSE	-		
					(Disable after adaptation with	=	FALSE	-		
					for time	>	600.00	sec		
					(((a) - (b) (see Look-Up-Table #86)	<=	74.96	°C		
					for time	>	0.00	sec		
					or (
					(a) - (b) (see Look-Up-Table #87) for time	>=	-40.04 to -0.04 0.00	°C sec		
					(a) upstream SCR catalyst	=	measured	-		
					temperature		parameter			
					(b) downstream SCR catalyst	=	measured	-		
					temperature))		parameter			
					Integrated NOx mass upstream SCR for time	> >	1.50 0.00	g sec		
					Average SCR Temperature	<=	399.96	°C		
					Average SCR Temperature Average SCR Temperature	>=	-3549.94	°C		
					Downstream SCR catalyst temperature	<=	3003.56	°C		
					1					

Component / System	Fault Code	Monitor Strategy Description	Primary Malfunction Criteria	Threshold Logic and Value	Secondary Parameters		Enable Conditions		Time Required	MIL Illum.
System	Code	Description	Citteria	Logic and value	Downstream SCR catalyst temperature	>=	-3549.94	°C	Required	mum.
					Filtered and delayed upstream NOx raw	<=	750.00	ppm		
					emission Filtered and delayed upstream NOx raw	>=	100.00	ppm		
					emission Filtered and delayed NOx raw emission	<=	250.00	mg/s		
					mass flow upstream of SCR Filtered and delayed NOx raw emission	>=	0.07	g/sec		
					mass flow upstream of SCR Filtered exhaust gas mass flow	<=	236.11	g/sec		
					Filtered exhaust gas mass flow	>=	-910.22	g/sec		
							0 to 1			
					MAP for valid engine operation points for SCR efficiency monitoring (see Look-Up- Table #84)	=		factor		
i					for time	>	0.00	sec		
					Inverse calculated accelerator pedal value	>	5.00	%		
					for time	>	0.00	sec		
					EWMA fast initialization mode: filter coefficient for fast initialization	=	0.30	factor		
					number of SCR efficiency measurements for fast initialization mode	>=	2.00	count		
					EWMA Rapid Response mode: EWMA filtered delta SCR catalyst efficiency	>	0.12	factor		
					(a) - (b)	<	-0.01	factor		
					(a) measured SCR catalyst efficiency	=	measured parameter	-		
					(b) offset-corrected modeled SCR catalyst efficiency (please see the general description for details)	=	measured parameter	-		
					offset-corrected modeled SCR catalyst efficiency (please see the general description for details)	>	0.00	factor		
					filter coefficient for Rapid Response mode	=	0.10	factor		
					number of SCR efficiency measurements for Rapid Response mode	>=	6.00	count		
					EWMA filtered value too small in Fast Init. And Rapid Response modes:					
					EWMA filtered delta SCR catalyst efficiency of (a) - (b)	<	0.00	factor		
					(a) measured SCR catalyst efficiency	=	measured parameter	-		

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) EWMA stabilized mode: filter coefficient for stabilized mode number of SCR efficiency measurements for stabilized mode basic enable conditions met:	= = =	measured parameter 0.05 1 see sheet enable tables	factor count		
CAN A BUS OFF	U0073	BUS A off monitoring	CAN A Bus-Off reported by CAN hardware	= TRUE -	ignition on and basic enable conditions met:	=	TRUE see sheet enable tables		fail conditions exists for 5 s test performed continuously 0.01 s rate	В
CAN B BUS OFF	U0074	BUS B off monitoring	CAN B Bus-Off reported by CAN hardware	= TRUE -	ignition on and basic enable conditions met:	=	TRUE see sheet enable tables		fail conditions exists for 5 s test performed continuously 0.01 s rate	В
Lost Communications with Transmission Control Module	U0101	Detects loss of communication between ECM (on-board control unit) and TCM (transmission control module)	time since last message from transmission control module was received	> 0.18 sec	ignition on for time and battery voltage and battery voltage and basic enable conditions met: and	>= >= >= <= =	3.00 9.00 16.00 see sheet enable tables	sec V V	fail conditions exists for 10 s test performed continuously 0.01 s rate	В

Component / System	Fault Code	Monitor Strategy Description	Primary Malfunction Criteria	L	Threshold ogic and Valu	ıe	Secondary Parameters		Enable Conditions		Time Required	MIL Illum.
					-		NO Pending or Confirmed DTCs:	=	see sheet inhibit tables	-		
ost Communications	U0106	Detects loss of communication between	time since last message from glow plug control module was received	>	0.25	sec	ignition on	=	TRUE		fail conditions	В
vith Glow Plug Control Module		ECM (on-board control unit) and GPCM (Glow Plug Control Module)					for time	>=	3.00	sec	exists for 10 s test performed continuously	ı
							battery voltage and	>=	9.00	V	0.02 s rate	İ
							battery voltage and basic enable conditions met:	<=	16.00 see sheet enable	V -		İ
							and NO Pending or Confirmed DTCs:	=	tables see sheet inhibit	_		l
							Ü		tables			İ
Lost Communication	U010E	CAN frame not received	counts up when message is not received	>	40.00	counts	CAN Bus is Active	=	TRUE	-	fail conditions	А
with Reductant Control Module		after the specified number of times	in the time out interval				Can Bus Initialized (CAN Bus is Active)				exists for more than 5	ı
							consisting of: ignition	=	TRUE	-	sec monitor runs with 0.1 s	ı
							for time battery voltage	> <	5.00 16.00	sec V	rate	İ
							batterv voltage	>	9.00	V		i
		window detection	DLS1 Sliding Window error counter	>=	8.00	counts	CAN Bus is Active	=	TRUE	-	monitor runs with 1 s rate	ì
		Check of level sensor	within a number of message frames	=	9.00	counts	Can Bus Initialized (CAN Bus is Active)					ı
							consisting of: ignition for	=	TRUE	-		İ
							time batterv voltage	> <	5.00 16.00	sec V		i
							battery voltage	>	9.00	V		İ
		CAN message sliding window detection	DLS2 Sliding Window error counter	>=	8.00	counts	CAN Bus is Active	=	TRUE	-	monitor runs with 1 s rate	ı
			within a number of message frames	=	9.00	counts	Can Bus Initialized (CAN Bus is Active)				with 1 5 late	ì
							consisting of: ianition	=	TRUE	_		ì

Component / System	Fault Code	Monitor Strategy Description	Primary Malfunction Criteria		Threshold gic and Valu	ue	Secondary Parameters		Enable Conditions		Time Required	MIL Illum.
							for time battery voltage battery voltage	> < >	5.00 16.00 9.00	sec V V		
		CAN message sliding window detection Check of error states	DLS3 Sliding Window error counter within a number of message frames	>= =	8.00 9.00	counts	CAN Bus is Active Can Bus Initialized (CAN Bus is Active)	=	TRUE	-	monitor runs with 1 s rate	
							consisting of: ignition for time batterv voltage batterv voltage	=	TRUE 5.00 16.00 9.00	sec V V		
Lost Communications with Auxiliary Heater Control Module	U0166	Detects loss of communication between ECM (on-board control unit) and Auxiliary Heater Control Module	time since last message from auxiliary heater control module was received	>	2.50	sec	ignition on	=	TRUE	-	fail conditions exists for 12 s test	Special C
							for time and battery voltage and	>= >=	3.00 9.00	sec V	performed continuously 0.01 s rate	
							battery voltage and basic enable conditions met:	<= =	16.00 see sheet enable tables	- -		
							and NO Pending or Confirmed DTCs:	=	see sheet inhibit tables	-		
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	Error count for engine out NOx relative NOx concentration message group	>=	8.00	counts	Engine out NOx sensor CAN Message 1 Received	=	TRUE		fault exists for 1 message group; monitor runs whenever enable	A
		incorrect					and Inhibit Status (no inhibiting faults) (No pending or stored DTC) and	=	FALSE	-	conditions are met.	
							Engine out NOx sensor CAN Message 1 Enabled and No rolling count or protection value	=	TRUE TRUE	-		

Fault Code	Monitor Strategy Description	Primary Malfunction Criteria			Secondary Parameters		Enable Conditions		Time Required	MIL Illum
					and ignition on	=	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	>= 8.0) counts	Engine out NOx sensor CAN Message 1 Received	=	TRUE	-	fault exists for 1 message group; monitor runs whenever enable	
					Inhibit Status (no inhibiting faults) (No pending or stored DTC) and Engine out NOx sensor CAN Message 1	=	FALSE TRUE	-	are met.	
					Enabled and No rolling count or protection value errors. (sliding window errors)	=	TRUE	-		
					and ignition on	=	TRUE	-		
	Engine out 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	> 5.0) counts	Can Bus Initialized (CAN Bus is Active) consisting of: ignition for time battery voltage battery voltage	= > > <	TRUE 3 9.8 18.1	sec V V	fault exists for more than 20 seconds; monitor runs every 0.05 s whenever enable conditions are met.	
U029D	Detects a failure when a certain number of Engine Out NOx sensor error messages within a defined message group checksum or rolling count values are incorrect	Error count for engine out NOx sensor error status message group	>= 8.0) counts	Engine out NOx sensor CAN Message 2 Received and	=	TRUE	•	fault exists for 1 message group; monitor runs whenever enable conditions	
	Code	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 Engine out NOx sensor CAN message #1 frame not received after the specified number of times U029D Detects a failure when a certain number of Engine Out NOx sensor error messages within a defined message group checksum or rolling count values are	Detects a failure when a certain number of Engine Out NOx sensor CAN message #1 frame not received after the specified number of times Detects a failure when a certain number of Engine Out NOx sensor CAN message #1 frame not received after the specified number of times Detects a failure when a certain number of Engine Out NOx sensor error message within a defined message group checksum or rolling count values are	Detects a failure when a certain number of Engine Out NOx sensor linear lambda messages within a defined message #1 frame not received after the specified number of times Error count for engine out NOx sensor >= 8.00	Detects a failure when a certain number of Engine Out NOx sensor linear lambda message group checksum or rolling count values are incorrect Engine out NOx sensor CAN message #1 frame not received after the specified number of times U029D Detects a failure when a certain number of Engine Out NOx sensor error status message group Error count for engine out NOx sensor >= 8.00 counts in the base time interval in the base time interval > 5.00 counts in the base time interval > 8.00 counts out to the bas	Detects a failure when a certain number of Engine Out NOx sensor linear lambda messages within a defined message swithin a defined message swithin a defined message swithin a defined message within a defined message similar and search and sea	Detects a failure when a certain number of Engine Out NOx sensor linear lambda messages within a defined message within a	Detects a failure when a certain number of Engine out NOx sensor CAN Message is not received number of times are performed to the base time interval necessage group Sensor CAN Message is not received number of times Sensor CAN Message is not received Sensor CAN Message is not received Sensor CAN Message is not received Sensor CAN Message is not received Sensor CAN Message is not received Sensor CAN Message is not received Sensor CAN Message is not received Sensor CAN Message is not received Sensor CAN Message is not received Sensor	Content Cont	Detects a failure when a cortain number of Engine Out NOx sensor CAN Message of Engine Out NOx sensor intension message group of the base time interval received and the base time interval received number of Engine out NOx sensor CAN Message in the base time interval received number of Engine out NOx sensor CAN Message in the base time interval received number of Engine out NOx sensor CAN Message in the base time interval received number of times U023D Detects a failure when a cortain number of Engine out NOx sensor CAN Message in the base time interval received number of times Engine out NOx sensor CAN counts up when message is not received in the base time interval received number of times U023D Detects a failure when a cortain number of Engine Out NOx sensor CAN Message 2 = TRUE - fault exists for more than 20 times and interval received number of times U023D Detects a failure when a cortain number of Engine Out NOx sensor CAN Message 2 = TRUE - fault exists for more than 20 times are met. U023D Detects a failure when a cortain number of Engine Out NOx sensor CAN Message 2 = TRUE - fault exists for more than 20 times are met. U023D Detects a failure when a cortain number of Engine Out NOx sensor can be find that the peculiar of times are met. U023D Detects a failure when a cortain number of Engine Out NOx sensor can be find that the peculiar of times are met. U023D Detects a failure when a cortain number of Engine Out NOx sensor can be find on the peculiar of the pecu

Fault	Monitor Strategy	Primary Malfunction	Threshold		Secondary		Enable		Time	MI
Code	Description	Criteria	Logic and Val	ue	Parameters		Conditions		Required	Illu
					Enabled and	=	TRUE TRUE	-		
					errors. (sliding window errors) and					
					ignition on	=	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 linear lambda signal message group	>= 8.00	counts	Received	=	TRUE	-	for 1 message group; monitor runs whenever enable	
					Inhibit Status (no inhibiting faults) (No pending or stored DTC)	=	FALSE	-	conditions are met.	
					Engine out NOx sensor CAN Message 2 Enabled	=	TRUE	-		
					No rolling count or protection value errors. (sliding window errors)		TRUE	-		
					ignition on	=	TRUE	-		
	NOx Sensor CAN Message	counts up when message is not received	> 5.00	counts	Can Bus Initialized (CAN Bus is Active)				fault exists	
	#2 frame not received after the specified number of times	in the base time interval							for more than 20 seconds;	
					consisting of:		TDUE		monitor runs	
					ignition for	=	IRUE	-		
					time	>	3	sec	enable	
					battery voltage battery voltage	> <	9.8 18.1	V	conditions are met.	
U029D	Engine out NOx sensor CAN	counts up when message is not received	> 5.00	counts	Can Bus Initialized (CAN Bus is Active)				fault exists	
30202	message #3 frame not received after the specified	in the base time interval	5.50	3040					for more than 20	
	Thurnbel Of times				consisting of: ignition	=	TRUE		monitor runs every 5 ms	
		Detects a failure when a certain number of Engine Out NOx sensor linear lambda message within a defined message group checksum or rolling count values are incorrect NOx Sensor CAN Message #2 frame not received after the specified number of times U029D Engine out NOx sensor CAN message #3 frame not	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 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 counts up when message is not received in the base time interval counts up when message is not received in the base time interval	Detects a failure when a certain number of Engine Out NOx sensor linear lambda message group checksum or rolling count values are incorrect NOx Sensor CAN Message #2 frame not received after the specified number of times U029D Engine out NOx sensor CAN message #3 frame not received after the specified number of times Error count for engine out NOx linear lambda signal message group Counts up when message is not received in the base time interval Counts up when message is not received in the base time interval Counts up when message is not received in the base time interval	Detects a failure when a certain number of Engine Out NOX linear lambda messages within a defined message group checksum or rolling count values are incorrect NOX Sensor CAN Message #2 frame not received after the specified number of limes U029D Engine out NOX sensor CAN counts up when message is not received in the base time interval Error count for engine out NOX linear lambda signal message group Counts when message is not received in the base time interval Frame not received after the specified number of limes U029D Engine out NOX sensor CAN counts up when message is not received serviced after the specified number of limes Counts up when message is not received serviced serviced serviced after the specified in the base time interval	Detects a failure when a certain number of Engine Out NOx sensor CAN Message 2 and defined messages within a defined message suithin a defined mes	Detects a failure when a certain number of Engine Out Nox sensor CAN Message 2 Enabled and Nor rolling count or protection value errors, (aliding window errors) and until on our protection value errors, (aliding window errors) and until on our protection value errors, (aliding window errors) and until on our protection value errors, (aliding window errors) and until one message group one-of-sum or rolling count or rolling c	Detects a failure when a certain number of times Criteria Logic and Value Parameters Conditions TRUE Engine out NOx sensor CAN Message 2 TRUE Enabled and No rolling count or protection value errors, (aliding window errors) TRUE Enabled and No rolling count or protection value errors, (aliding window errors) TRUE Enabled and No rolling count or protection value errors, (aliding window errors) TRUE Enabled and No rolling count or protection value errors, (aliding window errors) TRUE Enabled and enables at error count for engine out NOx illeast error count for engine out NOx illeast error count for engine out NOx sensor CAN Message 2 TRUE Enabled and enables at error count for engine out NOx sensor CAN Message 2 TRUE TRUE Enabled errors, (aliding window errors) Engine out NOx sensor CAN Message 2 TRUE Enabled errors, (aliding window errors) TRUE Enabled errors, (aliding window errors) TRUE Enabled errors, (aliding window errors) TRUE Enabled errors, (aliding window errors) TRUE Enabled errors, (aliding window errors) TRUE Enabled errors, (aliding window errors) TRUE Enabled errors, (aliding window errors) Engine out NOx sensor CAN Message 2 TRUE Enabled errors, (aliding window errors) Engine out NOx sensor CAN Message 2 TRUE Enabled errors, (aliding window errors) Engine out NOx sensor CAN Message 2 TRUE Enabled errors, (aliding window errors) Engine out NOx sensor CAN Message 2 TRUE Enabled errors, (aliding window errors) Engine out NOx sensor CAN Message 2 TRUE Enabled errors, (aliding window errors) Engine out NOx sensor CAN Message 2 TRUE Enabled errors, (aliding window errors) Engine out NOx sensor CAN Message 2 TRUE Enabled errors, (aliding window errors) Engine out NOx sensor CAN Message 2 Enabled errors, (aliding window errors) Engine out NOx sensor CAN Message 2 Enabled errors, (aliding window errors) Engine out NOx sensor CAN Message 2 Enabled errors, (aliding window errors) E	Detects a failure when a contain number of Engine out NOs sensor CAN Message 2 TRUE - Control of Engine out NOs sensor CAN Message 2 TRUE - Control of Engine out NOs sensor CAN Message 2 TRUE - Control of Engine out NOs sensor CAN Message 2 TRUE - Control of Engine out NOs sensor CAN Message 2 TRUE - Control of Engine out NOs sensor CAN Message 2 TRUE - Control of Engine out NOs sensor CAN Message 2 TRUE - Control of Engine out NOs sensor CAN Message 2 TRUE - Control of Engine out NOs sensor CAN Message 2 TRUE - Control of Engine out NOs sensor CAN Message 2 TRUE - Control of Engine out NOs sensor CAN Message 2 TRUE - Control of Engine out NOs sensor CAN Message 2 TRUE - Control of Engine out NOs sensor CAN Message 2 TRUE - Control of Engine out NOs sensor CAN Message 2 TRUE - Control of Engine out NOs sensor CAN Message 2 TRUE - Control of Engine out NOs sensor CAN Message 2 TRUE - Control of Engine out NOs sensor CAN Message 2 TRUE - Control of Engine out NOS sensor CAN Message 2 TRUE - Control of Engine out NOS sensor CAN Message 2 TRUE - Control of Engine out NOS sensor CAN Message 2 TRUE - 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Component /	Fault	Monitor Strategy	Primary Malfunction	Threshold	Secondary	Enable	Time	M
System	Code	Description	Criteria	Logic and Value	time battery voltage battery voltage	> 3 > 9.8 < 18.1	sec enable conditions V are met.	
		Detects a failure when a certain number of Engine Out NOx sensor oxygen concentration messages within a defined message	Error count for engine out NOx oxygen concentration signal message group	>= 8.00 counts	Engine out NOx sensor CAN Message 3 Received	= TRUE	- fault exists for 1 message group; monitor run	ıs
		group checksum or rolling count values are incorrect			and Inhibit Status (no inhibiting faults) (No pending or stored DTC) and Engine out NOx sensor CAN Message 3 Enabled and No rolling count or protection value	= FALSE = TRUE TRUE	whenever enable conditions are met.	
		Detects a failure when a	Error count for engine out NOx binary	>= 8.00 counts	errors. (sliding window errors) and ignition on	= TRUE = TRUE	- fault exists	3
		certain number of Engine Out NOx sensor binary lambda messages within a defined message group checksum or rolling count values are incorrect	lambda signal message group		Received and Inhibit Status (no inhibiting faults)	= FALSE	for 1 message group; monitor run whenever enable conditions - are met.	IS
					(No pending or stored DTC) and Engine out NOx sensor CAN Message 3 Enabled and No rolling count or protection value errors. (sliding window errors) and	= TRUE	-	
ine out Nox sor CAN ssage #4	U029D	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	> 25.00 counts	ignition on	= TRUE	fault exists for more than 20 seconds;	

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 for time battery voltage battery voltage	= TRUE > 3 > 9.8 < 18.1		monitor runs every 5 ms whenever enable conditions are met.	
		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 incorrect	Error count for engine out NOx heater resistance signal message group	>= 8.00 counts	and Inhibit Status (no inhibiting faults) (No pending or stored DTC) and Engine out NOx sensor CAN Message 3 Enabled and No rolling count or protection value errors. (sliding window errors) and ignition on	= TRUE = FALSE = TRUE TRUE TRUE		fault exists for 1 message group; monitor runs whenever enable conditions are met.	
Engine out Nox Sensor CAN Message #5	U029D	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	> 25.00 counts	Can Bus Initialized (CAN Bus is Active) consisting of: ignition for time battery voltage battery voltage	= TRUE > 3 > 9.8 < 18.1	sec V V	fault exists for more than 20 seconds; monitor runs every 100 ms whenever enable conditions are met.	

Component / System	Fault Code	Monitor Strategy Description	Primary Malfunction Criteria	1.	Threshold ogic and Value		Secondary Parameters		Enable Conditions		Time Required	MIL Illum
Post Catalyst 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	>=	8.00		Post Catalyst NOx sensor CAN Message 1 Received	=	TRUE		fault exists for 1 message group; monitor runs whenever enable conditions	A
							and Inhibit Status (no inhibiting faults) (No pending or stored DTC) and	=	FALSE	-	are met.	
							NOx sensor CAN Message 1 Enabled and	=	TRUE	-		
				No rolling count or protection value = TRUE - errors. (sliding window errors) and	-							
							ignition on	=	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	>=	8.00	counts	Post Catalyst NOx sensor CAN Message 1 Received	=	TRUE		fault exists for 1 message group; monitor runs whenever enable conditions	
							Inhibit Status (no inhibiting faults) (No pending or stored DTC) and	=	FALSE	-	are met.	
							NOx sensor CAN Message 1 Enabled and	=	TRUE	-		
							No rolling count or protection value errors. (sliding window errors) and	=	TRUE	-		
							ignition on	=	TRUE	-		
		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	>	5.00	counts	Can Bus Initialized (CAN Bus is Active) consisting of: ignition for time battery voltage battery voltage	= > > <	TRUE 3 9.8 18.1	sec V V	fault exists for more than 21 seconds; monitor runs every 5 ms whenever enable conditions are met.	

Component /	Fault	Monitor Strategy	Primary Malfunction	Threshold	Secondary	Enable	Time
System	Code	Description	Criteria	Logic and Value	Parameters	Conditions	Required
Post Catalyst NOx Sensor CAN Message #2	U029E	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	>= 8.00 counts	Post Catalyst NOx sensor CAN Message 2 Received	= TRUE -	fault exists for 1 message group; monitor runs whenever enable
					and Inhibit Status (no inhibiting faults) (No pending or stored DTC) and	= FALSE -	conditions are met.
					NOx sensor CAN Message 2 Enabled and	= TRUE -	
					No rolling count or protection value errors. (sliding window errors)	= TRUE -	
					and ignition on	= 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 linear lambda signal message group	>= 8.00 counts	Post Catalyst NOx sensor CAN Message 2 Received and Inhibit Status (no inhibiting faults) (No pending or stored DTC) and NOx sensor CAN Message 2 Enabled and No rolling count or protection value errors. (sliding window errors) and	= TRUE - = FALSE - = TRUE - TRUE -	fault exists for 1 message group; monitor runs whenever enable conditions are met.
		NOx Sensor CAN Message	counts up when message is not received	> 5.00 counts	ignition on Can Bus Initialized (CAN Bus is Active)	= TRUE -	fault exists
		#2 frame not received after the specified number of times	in the base time interval		consisting of: ignition for time battery voltage battery voltage	= TRUE - > 3 sec > 9.8 V < 18.1 V	for more than 21seconds; monitor runs every 5 ms whenever enable conditions are met.

Component / System	Fault Code	Monitor Strategy Description	Primary Malfunction Criteria	L	Threshold ogic and Val		Secondary Parameters		Enable Conditions		Time Required
Post Catalyst Nox Sensor CAN Message #3	U029E	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	>	5.00	counts	Can Bus Initialized (CAN Bus is Active) consisting of: ignition for time battery voltage battery voltage	= >>>><	TRUE 3 9.8 18.1	sec V V	fault exists for more than 21 seconds; monitor runs every 5 ms whenever enable conditions are met.
		Detects a failure when a certain number of Post Catalyst NOx sensor oxygen	Error count for post catalyst NOx sensor oxygen concentration signal message group	>=	8.00	counts	Post Catalyst NOx sensor CAN Message 3 Received	=	TRUE	-	fault exists for 1 message
	concentration within a defin group checks	concentration messages within a defined message group checksum or rolling count values are incorrect					and				group; monitor runs whenever enable conditions
							Inhibit Status (no inhibiting faults) (No pending or stored DTC) and	=	FALSE	-	are met.
							NOx sensor CAN Message 3 Enabled and	=	TRUE	-	
							No rolling count or protection value errors. (sliding window errors)	=	TRUE	-	
							and ignition on	=	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	>=	8.00	counts	Post Catalyst NOx sensor CAN Message 3 Received	=	TRUE	-	fault exists for 1 message group; monitor runs whenever enable
							and Inhibit Status (no inhibiting faults) (No pending or stored DTC) and	=	FALSE	-	conditions are met.
							NOx sensor CAN Message 3 Enabled and	=	TRUE	-	
							No rolling count or protection value errors. (sliding window errors) and	=	TRUE	-	
							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.
Post Catalyst Nox Sensor CAN Message #4	U029E	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	> 25.00 cc	unts	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	fault exists for more than x seconds; monitor runs every 5 ms whenever enable conditions are met.	
		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	>= 8.00 cc		Post Catalyst NOx sensor CAN Message 4 Received and Inhibit Status (no inhibiting faults) (No pending or stored DTC) and NOx sensor CAN Message 4 Enabled and No rolling count or protection value errors. (sliding window errors) and ignition on	= = =	TRUE FALSE TRUE TRUE TRUE		fault exists for 1 message group; monitor runs whenever enable conditions are met.	
Post Catalyst Nox Sensor CAN Message #5	U029E	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	> 25.00 ca	unts	Can Bus Initialized (CAN Bus is Active) consisting of: ignition for time battery voltage battery voltage	= > > <	TRUE 3 9.8 18.1	- sec V	fault exists for more than 21 seconds; monitor runs every 100 ms whenever enable conditions are met.	

Component / System	Fault Code	Monitor Strategy Description	Malfunction Criteria		Threshold Value		Secondary Parameters		Enable Conditions		Time Required	MIL Illum.
Glow Plug switch defect and open		Electronic circuitry determines fault with GP switch		< = =	6.6 On	A	glow plugs are commanded on DTCs P163E, P163C, P0671-P0678	=	True Not set		500ms (Internal) + 75% failure rate over 4 seconds. (Same as x out of y 75% failure out of 4 sec of sample time ie out of 8 samples 6 must fail to log a	В
ROM error		Checksum error between calculated and stored values are compared Compariarson of read write values	Checksums match Read write values match	=	NO NO		Module power Module power	=	On		failure) 1.5 seconds (internal)+7 5% failure rate over 4 seconds. 200ms (internal) +	В
EEPROM error		Checksum error between calculated and stored values	Checksums match	=	NO	-	Module power	-	On	_	75% failure rate over 4 seconds. 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 v at GPCM + 7	olts	Battery voltage at GPCM	>	6	volts	130ms (internal) + 75% failure rate over 4 seconds.	В
Charge Pump Over Voltage		measured voltage of charge pump is determined to be out of tolerance	Charge Pump Voltage	>=	Battery voltage v at GPCM + 18	olts	Battery	<	19.9	volts	160ms (internal) + 75% failure rate over 4 seconds.	

Component / System	Fault Code	Monitor Strategy Description	Malfunction Criteria		Threshold Value		Secondary Parameters		Enable Conditions		Time Required	MIL Illum.
GPCM reverse polarity switch "high voltage drop"		Electronic circuitry determines that the reverse polarity protection voltage drop is in range	Path 1 [Battery voltage at GPCM - mean glow plug voltage value] Path 2 (Battery voltage at GPCM - mean glow plug voltage value with charge pump off) - (Battery - mean glow plug voltage value with charge pump on) ie. delta from charge pump on to charge p	>	2.3	volts	glow plugs are commanded Battery voltage at GPCM GP current GP current P0671,P0672, P0675, P0676 Battery voltage at GPCM stable for 30ms	=	On 6 6 60 Not set 2	volts amps amps volts	path1 6000ms, path2 10 seconds + 75% failure rate over 4 seconds.	В
GPCM running reset		Internal and external Watchdogs are monitored for interuption Monitor for undefined instruction code interupt Monitor for osolation stop detection	number of running resets or undefined instruction code detected or Osolation stop detection	>	9 events in 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
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	> > >	25 640 > 60 amps by hardware protection (time varies with temperature)	amps msec amps volts	Battery voltage at the GPCM	>	6	volts	6 seconds (internal) + 75% failure rate over 4 seconds.	В
			battery voltage)	=	0 ±3	volts	Battery voltage at the GPCM	=	8 to 14	volts		

Component / System	Fault Code	Monitor Strategy Description	Malfunction Criteria		Thresho Value	ld	Secondary Parameters		Enable Conditions		Time Required	MIL Illum.
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
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	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 A	Ignition glow plug command over temperature condition over voltage condition abs[Battery supply at GPCM - IGN voltage at GPCM]	= = = = <	on on false false 6.0	Volts	Condition 1 : 130ms, Condition 2: 260ms (internal) + 66%failure over 1.5 seconds.	В
glow plug high resistance		Electronic circuitry determines a fault exists on GP circuit	Glow Plug Resistance AND Glow Plug Current	>=	1.0 4.25	Ohm A	Ignition on Battery voltage at GPCM glow plugs are commanded on over temperature condition over voltage condition abs[Battery supply at GPCM - IGN voltage at GPCM]	= > = = <	on 7.0 on false false 7.0	volts	160ms (internal) + 66% failure over 1.5 seconds.	В
Glow plug low resistance		Electronic circuitry determines a fault exists on GP circuit	Glow Plug Resistance	<	250	mOhm	glow plugs are commanded on over temperature condition over voltage condition- abs[Battery supply at GPCM - IGN voltage at GPCM]	= = = <	on false false 7.0	volts	160ms (internal) + 66% failure over 1.5 seconds.	В
Engine Calibration Information Not Programmed – GPCM		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.	А
Intake Air (IA) Heater Feedback Circuit	P154A	Electronic GPCM circuitry determines if faults related to the IA heater feedback circuit exist.	PATH1: IAH indicates its state is AND IAH current OR PATH2: IAH indicates its state is	>	OFF 20 ON	А	DTCs not active Path1 IAH Commanded and Battery Voltage at IAH OR	= >	P0640, P154B, P154D, P154C, P166B ON 8.6	volts	650ms (internal) + 75% failure over 4 seconds.	В
			TATTIZ. TATT ITIUICATES ITS STATE IS		ON		Path2 IAH Commanded	=	OFF			

Component /	Fault	Monitor Strategy	Malfunction		Threshold	t	Secondary		Enable		Time	MIL
System	Code	Description (Control of the Control	Criteria		Value) / I	Parameters		Conditions		Required	Illum.
Intake Air (IA) Heater Voltage Signal Circuit	P154B	Electronic GPCM circuitry determines if faults related to the voltage level present at the IA heater exist.	PATH1: IAH Battery voltage AND GPCM Battery Voltage GPCM Battery Voltage	> <	9.5 14.0	Volt volts Volt	DTCs not active Path 1 IAH Commanded	=	P0640, P154D, P154C, P166B ON		1s (internal) + 75% failure over 4 seconds.	
			OR PATH2: Voltage signal line IAH Battery voltage	>	1.5	Volt	Path 2 IAH Commanded	=	OFF for more then 65 msec			
			OR PATH3: IAH Battery voltage AND GPCM IGN voltage AND GPCM Battery Voltage IAH Battery voltage	< > < > < > < > < > < > < > < > < > < >	6.9 6.9 16.0 9.5	Volt Volt Volt	Path 3 DTCs not active IAH Commanded	=	P064C, P154D, P154C, P166B ON			
Intake Air (IA) Heater Current Signal Circuit	P154C	Electronic GPCM circuitry determines if faults related to the IA heater current signal circuit or heater grid exist.	PATH1: IAH current IAH voltage signal feedback to GPCM	< >	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.	
			PATH2: IAH current IAH voltage signal feedback to GPCM or PATH3:IAH current signal feedback to GPCM	< < <	20 0.9 4.96	Amps Volts	DTC's are not set IAH Commanded Battery Voltage at IAH GPCM Ignition voltage or IAH Command	= > >=	P154B, P154D, P0640, P0154A ON 6.9 6.9	Volt Volt		
			or PATH 4:IAH grid current IAH heater grid calculated resistance	> >	20 500	A mOhm	or DTC's are not set IAH Commanded Battery Voltage at IAH	= >	P154B, P154D, P0640, P0154A ON 8.0	Volt		

Component / System	Fault Code	Monitor Strategy Description	Malfunction Criteria		Threshold Value		Secondary Parameters		Enable Conditions		Time Required	MIL Illum.
Intake Air (IA) Heater Temperature Signal Circuit	P154D	Electronic GPCM circuitry determines if faults related to the temperature feedback circuit of the IA heater exist.	PATH1: IAH temperature signal feedback line	<	0.156	Volt	DTC's are not set IAH Commanded Battery Voltage at IAH PWM IAH IAH running time	= > > >	P154B, P0640, P0154A, P154C, P166B ON 11.0 90.0 2	Volts % minutes	650ms (internal) + 75% failure over 4 seconds.	В
			or PATH2: IAH temperature AND GMLAN signal "IntakeAirTemperature"	>	-20 +20	°C	Or DTC's are not set IAH Commanded Battery Voltage at IAH Engine General Status (engine sensor info) IntakeAirtemperature message from ECM	= > = =	P154B, P0640, P0154A, P154C, P166B ON 11.0 valid valid	Volts		
			or PATH3:IAH temperature signal feedback line or	= >	Open 4.96	Volt	or IAH Commanded act	=	OFF ON P154B, P0640,			
Intake Air (IA) Heater Switch/Control Circuit	P0640	Electronic GPCM circuitry determines if faults related to the control circuit of the IA heater exist.	Activation Reply signal (digital response) from IAH	=	high when heartbeat signal is activated		DTC's are not set	=	P154A OFF		2000ms (internal) + 75% failure over 4 seconds.	В
Intake Air (IA) Heater Over Temperature	P166B	ECM monitors serial data from GPCM for P166B Error Message indicating GPCM detects IAH overtemperature	Internal Temperature of IAH module	>	80	°C	DTC's are not set IAH Commanded engine run time Battery Voltage at IAH	= > <	P154B,P154C, P0640, P154D ON 40 sec 6.9 Volt	sec Volt	650ms (internal) + 75% failure over 4 seconds.	В
Glow Plug Control Module Not Programed	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

Component / System	Fault Code	Monitor Strategy Description	Malfunction Criteria		Threshold Value	d	Secondary Parameters		Enable Conditions		Time Required	MIL Illum.
	P163C	Electronic GPCM circuitry determines the voltage supply to GPCM is out of range	PATH 1: Voltage supply to the GPCM or	>	16.5	Volt	GPCM Ignition voltage or	> <	9.0 14	Volts Volts	1000ms (internal) + 75% failure over 4.0	В
			PATH 2: Voltage supply to GPCM or	<	6.0	volts	GPCM Ignition voltage	> <	9.0 16	Volts Volts	seconds.	
			PATH 3: (IGN - Voltage supply to GPCM)	>	+/-5	volts	or GPCM Voltage supply GPCM Ignition Voltage	> >	6.0 4.0	Volt Volt		
			or PATH 4: (ECM reported voltage via CAN - Voltage supply to GPCM)	>	+/-3	volts	or GPCM supply voltage Engine speed	>	6 10< rpm >400	volts		
Glow Plug Module Secondary Circuit	P163D	Electronic GPCM circuitry determines serveral signal voltage levels to GPCM	Path 1 glow plug activation request from ECM	=	ON		Path 1: Key state (Ign 1)	=	OFF		1000ms (internal) +	В
Socondary Should		are out of range	or				or		or		75% failure over 4.0	
			Path 2: Electronic circuitry determines voltage at glow plug pin	>	6.0	Volt	Path 2 GP commanded	=	Off		seconds.	
			or				or		or			
			Path 3: [GPCM ground - GP ground]	>	1.5	Volts	Path 3 GP commanded DTCs not set IAH dutycycle	=	ON P0671,P0675 0 or 100	%		
Glow Plug Module Overtemperature	P163E	ECM monitors serial data from GPCM for P163E Error Message indicating GPCM detects GPCM overtemperature	GPCM Temperature	>	85	°C	GMLAN signal "coolant temperature"	<	60	°C	650ms (internal) + 75% failure over 4.0 seconds.	В
Reductant Heater 1 Control Circuit	P20B9	ECM monitors serial data from GPCM for P20B9 Error Message indicating GPCM detects reductant heater not connected to GPCM or an interruption	Active test function; Connected heater must discharge internal capicitor. Voltage at capacitor checked by GPCM				DTCs not set: reductan heater commanded: GPCM temperature GPCM battery supply voltage and	= < >	P220B ON 123 7.0	°C Volts	3440ms (internal) + 50% failure over 1.0 seconds.	В

Component / System	Fault Code	Monitor Strategy Description	Malfunction Criteria		Threshold Value	d	Secondary Parameters		Enable Conditions		Time Required	MIL Illum.
Reductant Heater 1 Control Circuit Low Voltage		ECM monitors serial data from GPCM for P20BB Error Message indicating GPCM detects reductant heater output shorted to ground or an overload condition	Path 1: Glow Plug Current or	>	25 or	A	reductan heater commanded: GPCM temperature GPCM Battery supply voltage or	=	ON 123 7.0 16.5	°C Volts Volts or	1000ms (internal) + 50% failure over 1.0 seconds.	
			Path 2: Hardware over current	>	80	A	reductan heater commanded: GPCM temperature GPCM Battery supply voltage	=	ON 123 7.0 16.5	°C Volts Volts		
Reductant Heater 1 Control Circuit High Voltage		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:	П	OFF		2000ms (internal) + 50% failure over 1.0 seconds.	В
Reductant Heater 2 Control Circuit			Active test function; Connected heater must discharge internal capicitor. Voltage at capacitor checked by GPCM				DTCs not set: reductan heater commanded: GPCM temperature GPCM battery supply voltage and	=	P20BF ON 123 7.0	°C Volts Volts	3440ms (internal) + 50% failure over 1.0 seconds.	В
Reductant Heater 2 Control Circuit Low Voltage		ECM monitors serial data from GPCM for P20BF Error Message indicating GPCM detects reductant heater output shorted to ground or an overload condition	Path 1: Reductant Heater Plug Current or	>	25 or	А	reductan heater commanded: GPCM temperature GPCM supply voltage KL30	=	ON 123 7.0 16.5	°C Volts Volts or	1000ms (internal) + 50% failure over 1.0 seconds.	В
			Path 2: Hardware over current	>	80	Α	reductan heater commanded: GPCM temperature GPCM supply voltage KL30	=	ON 123 7.0 16.5	°C Volts Volts		
Reductant Heater 2 Control Circuit High Voltage		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

Component /	Fault	Monitor Strategy	Malfunction		Threshol	d	Secondary		Enable		Time	MIL
Reductant Heater 3 Control Circuit		for P20C1	Criteria Active test function; Connected heater must discharge internal capicitor. Voltage at capacitor checked by GPCM		Value		Parameters DTCs not set: reductan heater commanded: GPCM temperature GPCM battery supply voltage and	=	P20C3 ON 123 7.0 16.0	°C Volts Volts	Required 3440ms (internal) + 50% failure over 1.0 seconds.	B B
Reductant Heater 3 Control Circuit Low Voltage		ECM monitors serial data from GPCM for P20C3 Error Message indicating GPCM detects reductant heater output shorted to ground or an overload condition	Path 1: Glow Plug Current or	>	25 or	A	reductan heater commanded: GPCM temperature GPCM supply voltage KL30	= < > < or	ON 123 7.0 16.5	°C Volts Volts	1000ms (internal) + 50% failure over 1.0 seconds.	В
			Path 2: Hardware over current	>	80	Α	reductan heater commanded: GPCM temperature GPCM supply voltage KL30	=	ON 123 7.0 16.5	°C Volts Volts		
Reductant Heater 3 Control Circuit High Voltage		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			PATH 1:GPCM Electronic circuitry determines voltage at DC/DC booster output pin or	>	5.0	Volt	status DC/DC booster	=	OFF, power up procedure has started after reset		5000ms (internal) + 50% failure over 1.0 seconds.	В
			PATH 2: DC/DC booster output current duration	> >	5.0 10	A ms	status DC/DC booster	=	ON			
			PATH 3: DC/DC booster output current duration	> >	37.5 20	A µs	status Dc/DC booster	=	ON			

Component / System	Fault Code	Monitor Strategy Description	Malfunction Criteria		Threshold Value		Secondary Parameters	Enable Conditions	Time Required	MIL Illum.
Nox Sensor Supply Voltage Circuit Bank 1 Sensor 2			PATH 1:Electronic circuitry determines voltage at DC/DC booster output pin or	>	5.0	Volt	status DC/DC booster	= OFF, power up procedure has started after reset	5000ms (internal) + 50% failure over 1.0 seconds.	
			PATH 2: DC/DC booster output current duration	> >	5.0 10	A ms	status DC/DC booster	= ON		
			Or PATH 3: DC/DC booster output current duration	> >	37.5 20	A µs	or status Dc/DC booster	or = ON		

Component /	State or Status	Description of State or Status	Defined by:	Enable	Enable	Enable Units
System	Sub-Grouping	found in 120BDG09		Logic	Values	
Battery Voltage		Battery Voltage Correction Factor	battery voltage correction factor = Nominal Declared Battery Voltage divided by measured battery voltage	=	13.6	V
Engine Cooling System States		Status of the Block Heater	active under following conditions			
			engine speed	>	500	rpm
			for time and	>	60	sec
			(a) - (b) with	>	1.8	°C
			(a) reference temperature (engine coolant temperature) captured during start and with	=	measured parameter	-
			(b) engine coolant temperature	=	measured parameter	-
		status of Block Heater monitor time	getivo un der fellouire e conditione			
		status of block neater monitor time	active under following conditions (
			engine speed	>	500	rpm
			for time	>	60	sec
		Status of Sun Load Detection	active under following condition			
		(high thermal input from the sun which influences system behavior)	Vehicle speed for	>	14.92	mph
			time and	>	300	sec
			engine speed (see Look-Up-Table #14) for	>	600 to 850	rpm
		1	time	>	600	sec

Component /	State or Status	Description of State or Status	Defined by:	Enable	Enable	Enable Units
System	Sub-Grouping	found in 12OBDG09	Defined by.	Logic	Values	
			and (a) - (b) with	>	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 for	>	14.92	mph
			time and	>	300	sec
			engine speed (see Look-Up-Table #14) for	>	600 to 850	rpm
			time	>	600	sec
ECM Operating States		Engine Pre-Drive	processor operating normally ignition processor powerup boot initialization	= = =	TRUE OFF complete	:
			or key off bookkeeping cleanup (accessory, post-wake-up, pre-sleep)	=	complete	-
		Engine Running (see Look-Up table #70)	ignition engine speed engine speed was at start	= >= >	ON 100 850	rpm rpm
		Engine Post-Drive/ Afterun	processor operating normally	=	TRUE	-

Component / System	State or Status Sub-Grouping	Description of State or Status found in 120BDG09	Defined by:	Enable Logic	Enable Values	Enable Units
Oyacem	ous-crouping	also includes "engine stopping" during engine spin down	ignition key off bookkeeping cleanup	= = =	OFF in process	-
Engine Operating Modes	Exhaust Operating Mode focus	Normal Mode Particulate Filter Regeneration Mode		=		
		Particulate Filter Regen Service Mode Exhaust Gas Temperature (Active)		=	Warm Up or	
		Management Mode also known as Engine Operating Mode		=	Maintain Temperature Exhaust Warm-	
					up	
Exhaust Gas Recirculation (EGR)		Exhaust Gas Recirculation (EGR)	EGR controller is active			
		Control is enabled	continuously with exceptions for failures detected EGR controller is active Overrun Long Idle Transmission Gear Shift Cold Start extreme temperature or pressure Critical Regeneration Modes			
			Overrun			
			Gear Shifting			
			Overlong Idle			
			permanent control deviation			
			Demand of the drift compensation			
			System error			

	State or Status	Description of State or Status	Defined by:	Enable	Enable	Enable Units
System	Sub-Grouping	found in 120BDG09		Logic	Values	
			Error exhaust gas recirculation valve			
			Error throttle valve			
			Engine Brake Status			
			Atmospheric pressure too low			
			Battery voltage too low			
			Switch-off coordinator			
			Environmental temperature too low			
			Environmental temperature too high			
			Engine temperature too low			
			Engine temperature too high			
			Cold start			
			Injection quantity too large			
			Operating-mode coordinator			
			Rich Idle			
			External control intervention			
			Rich Idle Regen			
			Environmental Temperature too low in Regeneration			
			EGR Stroking			
			EGR controller is active in Overrun (warm exhaust system)			
			EGR controller is active in Overrun (Cold exhaust system)			
			AFS Faults			
			Request via SCR monitoring (NOx sensor plausibility check)			
			Atmospheric Pressure too low in Regeneration			
			Engine Temperature too low in Regeneration			

Component /	State or Status	Description of State or Status	Defined by:	Enable	Enable	Enable Units
System	Sub-Grouping	found in 12OBDG09	Defined by:	Logic	Values	
			Engine Temperature too high in Regeneration			
Engine Position Management		Engine Position Sync Complete	synchronization completed consisting of: crankshaft sensor pulses received camshaft sensor pulse received and aligned properly or sync via crank only invoked then crankshaft rotations	>=	4	counts
Fuel System		Fuel System is in Fuel Shut Off also known as Decel Fuel Shut Off or Over-Run	engine running required actual engine torque -	= < -	TRUE 1 -	- Nm -
		Status of Diesel Fuel Refill Detection	((Filtered total fuel volume available (a) Amount of fuel volume change that indicates a refueling event occurred (b) captured remaining diesel fuel volume under the following conditions	> = =	(a) + (b) 25.26 measured parameter	- % -
			(Vehicle speed time) and	<= >	1.24 4	mph sec
			(Vehicle speed time)) or	<= >	1.24 30	mph sec
			at initialization of Diesel fuel level	=	TRUE	-
Idle Speed Control		Idle Speed Controller Active "normal" low idle speed governor	no overrides for: Gear-Shift Harmonization			

Component /	State or Status	Description of State or Status	Defined by:	Enable	Enable	Enable Units
System	Sub-Grouping	found in 120BDG09		Logic	Values	
			Intrusive Diagnosis Action Power Take Off			
			or other working load handling			
		Engine Idling Time Ratio	= (time accumulated at idle			
			divided by time since engine start)			
NOx Sensor		Status of NOx signal of upstream NOx				
		sensor	(
			following condition met for time:	>	30	sec
			(Integrated heat quantity (see Look-Up-Table #1)	_	275 to 500	le I
			integrated heat quantity (see Look-op-Table #1)	>=	375 to 500	kJ
			NOx status signal received via CAN message	=	TRUE	-
			(Please see the definition)		0.5	
			for time calculated lambda value based on air mass flow	> >	0.5 0.9	sec -
			and injection quantity		0.0	
			for time	>	0.5	sec
			engine speed for time	> >	100 20	rpm sec
			NO Pending or Confirmed DTCs:	=	see sheet	-
					inhibit tables	
))			
		Harton Na Oana Ciarlo	College Service Property of the		00	
		Upstream Nox Sensor Signal Ready or	following condition met for time:	>	30	sec
		Upstream Nox SensorDewpoint Reached	(
		or				
		Lambda signal from NOx sensor ready	Integrated heat quantity (see Look-Up-Table #1)	>=	375 to 500	kJ
			,			
			1			

Component /	State or Status	Description of State or Status	Defined by:	Enable	Enable	Enable Units
System	Sub-Grouping	found in 12OBDG09	Defined by.	Logic	Values	
		Status of NOx signal of downstream NOx sensor				
			following condition met for time:	>	30	sec
			Integrated heat quantity (see Look-Up-Table #2)	>=	0 to 350	kJ
			NOx status signal received via CAN message (Please see the definition)	=	TRUE	-
			for time	>	0.5	sec
			calculated lambda value based on air mass flow and injection quantity	>	0.9	-
			for time	>	0.5	sec
			engine speed	>	100	rpm
			for time NO Pending or Confirmed DTCs:	> =	20 see sheet	sec
			140 Ferfalling of Committee D103.	_	inhibit tables	
))			
		Upstream Nox Sensor Signal Ready	following condition met for time:	>	30	sec
		or Upstream Nox SensorDewpoint	(Integrated heat quantity (see Look-Up-Table #2)		0 to 350	kJ
		Reached	integrated fleat quantity (see Look-Op-Table #2)	>=	0 10 350	KJ
		or				
		Lambda signal from NOx sensor ready				
		Frankling Downston and NOV consort				
		Enabling Downstream NOx sensor heater diagnosis				
			SCR Catalyst downstream temperature	>=	94.96	°C
			SCR Catalyst downstream temperature	<=	3003.56	°C
			battery voltage	>=	11	V
			battery voltage	<=	655.34	V
			and Integrated heat quantity (see Look-Up-Table #2)	>=	0 to 350	kJ

Component /	State or Status	Description of State or Status	Defined by:	Enable	Enable	Enable Units
System	Sub-Grouping	found in 120BDG09		Logic	Values	
			for time) and for time NO Pending or Confirmed DTCs:	> =	30 1 see sheet inhibit tables	sec sec -
		Enabling Downstream NOx sensor heater diagnosis		_	_	
			SCR Catalyst upstream temperature SCR Catalyst upstream temperature battery voltage battery voltage	>= <= >= <=	94.96 3003.56 11 655.34	°C °C V
			and Integrated heat quantity (see Look-Up-Table #1)	>=	375 to 500	kJ
			for time	>	30	sec
			and for time NO Pending or Confirmed DTCs:	> =	1 see sheet inhibit tables	sec -
Rail Pressure Control System Operating States		Rail Control at ECM Start	reset condition or	=	TRUE	
			NO Pending or Confirmed DTCs:	=	see sheet inhibit tables	-
		Rail Pre-Control (Just after start)	Rail Control at ECU Start	=	TRUE	
			and engine speed and (<=	300	rpm

Component /	State or Status	Description of State or Status	Defined by:	Enable	Enable	Enable Units
System	Sub-Grouping	found in 12OBDG09	Defined by.	Logic	Values	
			rail pressure	>=	15000	kPa
			or (a) - (b)	<	5000	kPa
			(a)Fuel Rail Pressure Setpoint	=	measured	-
			()M : B ! B		paramter	
			(b)Maximum Rail Pressure for last 10ms	=	measured paramter	-
)		paramor	
		Rail Control - PCV Closed Loop Control	(
		Only	Rail Pressure Precontrol (Just after start)		TRUE	
		PCV = Pressure Control Valve	Rail Pressure Precontrol (Just after start) and	=	IRUE	-
			Number of Crankshaft revolutions since entering	>=	10	revs
			Rail Pressure Precontrol			
			or			
			(
			state machine rail pressure control transitioning pressure control valve mode	=	TRUE	-
			and			
			setpoint volume flow of the metering unit out of rail	>	60000 to	mm^3/rev
			pressure control (see Look-Up-Table #6)		224000	
			or			
			(
			Fuel system pressure and high pressure pump outlet	<	0	kPa
			and			
			engine status	=	RUNNING	-
)			
		Dail Control Motoring Unit Classeller	otata mashina vail pragaura santal anna		TDUE	
		Rail Control - Metering Unit Closed Loop Control	state machine rail pressure control equal transitioning to metering unit pressure control	=	TRUE	-
			mode			
			and		TRUE	
			Controller for PCV not wound-up (large corrective control)	=	IKUE	-
	l	1				

Component /	State or Status	Description of State or Status	Defined by:	Enable	Enable	Enable Units
System	Sub-Grouping	found in 120BDG09	Defined by.	Logic	Values	
		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-Torque generating fuel injection quantity	=	calculated parametet	-
				_	_	
		Switchover Between Metering Unit + PCV Closed Loop Control to Metering Unit Closed Loop Control only	(
			state machine rail pressure control equal to pressure control valve or			
			state machine rail pressure control transitioning pressure control valve mode			
			and			
			(a) + (b) (a)Torque Generating fuel injection quantity	< =	(c) + (d) calculated	-
			(b)Non-Torque generating fuel injection quantity	=	parametet calculated parametet	-
			(c) (see Look-Up-Table #7)	=	12 to 400	mm^3/rev
			(d)	=	12	mm^3/rev
			and NO Pending or Confirmed DTCs: or	=	see sheet inhibit tables	-

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

Component /	State or Status	Description of State or Status	Defined by:	Enable	Enable	Enable Units
System	Sub-Grouping	found in 12OBDG09	Domica by.	Logic	Values	
			(((exhaust gas system regeneration mode) and NO Pending or Confirmed DTCs:	!= =	REGEN see sheet inhibit tables	-
				_	_	
		Switchover Between Metering Unit + PCV Closed Loop Control to PCV Closed Loop Control only	state machine rail pressure control equals coupled pressure control (rail pressure is controlled by metering unit and pressure control valve)	=	TRUE	
			or state machine rail pressure control transitioning to coupled pressure control mode (rail pressure is controlled by metering unit and pressure control valve)	=	TRUE	-
			and (a) + (b) (see Look-Up-Table #7) where	<	12 to 400	mm^3/rev
			(a)Torque Generating fuel injection quantity	=	calculated	-
			(b)Non-Torque generating fuel injection quantity	=	parametet calculated parametet	-
Regeneration of the Diesel Particulate Filter		Status thermal regeneration active				
			Reduced particle mass flow in simulation by thermal regeneration (a) * (b) * (c) (a) Correction factor for thermal soot burn-out dependent on lambda and oxygen mass flow (see Look-Up-Table #4) (b) Effect of temperature on regenerated particle mass (see Look-Up-Table #5)	> =	0 0 to 4.0 0 to 2.97	- factor -

Component /	State or Status	Description of State or Status	Defined by:	Enable	Enable	Enable Units
System	Sub-Grouping	found in 120BDG09	Defined by:	Logic	Values	
			(c) Basis value of produced soot mass flow dependent on actual soot mass (see Look-Up- Table #3)	=	0.02 to 0.29	g/sec
SCR System	NOx Control System Reductant Dosing Strategy Active State	Release of dosing of the dosing strategy	status of SCR control state (please see the definition) Reductant dosing is released Deactivation of dosing to execute the NOx Offset test (Please see the definition) since start for time gradient of exhaust gas temperature since start for time Average temperature inside the SCR catalyst: SCR catalyst wall temperature Vehicle speed engine speed NO Pending or Confirmed DTCs:	= =	Metering Control TRUE FALSE 0.02 300 0.01 179.96 89.96 -0.62 400 see sheet inhibit tables	- sec °C/sec sec °C °C mph rpm -
	NOx Control System Reductant Dosing Pressure Control System States	State of Reductant Pressure Control System: Standby	ignition Dwell time in the state of standby NO Pending or Confirmed DTCs:	= < =	on 5 see sheet inhibit tables	- sec -
		State of Reductant Pressure Control System: No Pressure control	Old SCR control state (please see the definition) ignition Dwell time in the state of standby Dwell time in the state of no pressure control NO Pending or Confirmed DTCs:	= = >= < =	Stand by on 5 2 see sheet inhibit tables	- sec sec -

Component /	State or Status	Description of State or Status	Defined by:	Enable	Enable	Enable Units
System	Sub-Grouping	found in 12OBDG09	Defined by:	Logic	Values	
		State of Reductant Pressure Control System: Pressure control	Old SCR control state (please see the definition)	=	NO Pressure Control	-
			ignition	=	on	
			engine speed	>	550	rpm
			Dwell time in the state of no pressure control exhaust gas temperature Upstream SCR	>=	2 169.96	sec °C
			(>=	TRUE	
			Reductant Defrost check (please see the definition) or	=	TRUE	-
			The component protection release of the heater control (please see the definition)	=	TRUE	-
			or Preliminary release of the heater control for the main state machine (please see the definition)	=	TRUE	-
) NO Pending or Confirmed DTCs:	=	see sheet inhibit tables	-
		State of Reductant Pressure Control	SCR control state (please see the definition)	=	Pressure	
		System: Refilling Reductant in pressure line (substate of Pressure control)	SON CONTROL State (please see the definition)	-	Control	
			(Reductant filling state in the pressure line	<	50	%
			and Reductant Pump Module Pressure	<	200	kPa
			Set-point duty cycle for Reductant dosing valve	=	100	%
			Set-point duty cycle for the Reductant Pump	=	40.00	%
			pressure Motor actuator NO Pending or Confirmed DTCs:	=	see sheet inhibit tables	-
		State of Reductant Pressure Control System: Pressure build up (substate of Pressure control)	SCR control state (please see the definition)	=	Pressure Control	-
			(Reductant filling state in the pressure line	>=	50	%

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

Component /	State or Status	Description of State or Status	Defined by:	Enable	Enable	Enable Units
System	Sub-Grouping	found in 12OBDG09		Logic	Values	
			Set-point duty cycle for Reductant dosing valve Set-point duty cycle for the Reductant Pump pressure Motor actuator	=	0 15.00	% %
			NO Pending or Confirmed DTCs:	=	see sheet inhibit tables	·
	SCR Engine State required for operation	SCR Engine State	Ignition on	=	TRUE	-
			engine speed	>	550	rpm
	Reductant Dosing Strategy based on DPF Fload	Status fill level decrease (please see the definition)				
			Particulate Filter Regeneration demand on	=	TRUE	-
			or Reductant fill level of the SCR catalyst lowed to the target value under Particle filter Regeneration request			
			(a) - (b) (a) Nominal value of Reductant fill level in the catalyst	>=	0	-
			(b) Estimated current Reductant load (c) Reductant Dosing quantity limitation	=	100	factor
			or SCR catalyst temperature too high to convert Reductant under Particle filter Regeneration request			
			Average temperature inside the SCR catalyst:	>	999.96	°C
	Reductant Heater and Defrost System Control States and Status					
		Reductant Defrost check	status of reductant tank heater temperature (please see the definition)	=	TRUE	-

Component /	State or Status	Description of State or Status	Defined by:	Enable	Enable	Enable Units
System	Sub-Grouping	found in 12OBDG09	Defined by:	Logic	Values	
			State of the defrosting check of pressure line (please see the definition)	=	TRUE	-
			State of the defrosting check of supply module (please see the definition)	=	TRUE	-
			duration, for which the conditions for a hydraulic release reset of pressure line heater circuit are satisfied	<=	1200	sec
			ambient temperature	>	-4.04	°C
			Release heater pressure line and	=	FALSE	-
			duration, for which the conditions for a hydraulic release reset of supply module heater circuit are satisfied	<=	1200	sec
			ambient temperature Release heater supply module)	> =	-4.04 FALSE	°C -
		Status of reductant tank heater temperature	status of reductant tank heater temperature (please see the definition) Reductant tank heat temperature at Standby state	>	-0.04	°C
			or .			
			Engine off Time Reductant tank heat temperature at Standby state	>	2147483647 -9.04	sec °C
		State of the defrosting check of pressure line	State of the defrosting check of pressure line (please see the definition)			
			time since pressure line heating on under pressure line defrost mode or	>=	0 to 3276.7	sec
			status of SCR control state (please see the definition)	=	No Pressure Control	-
			Pressure line defrost timer or	=	0	sec
			ignition	=	on	sec
1	I	l I	engine speed	>	550	rpm

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

Component /	State or Status	Description of State or Status	Defined by:	Enable	Enable	Enable Units
System	Sub-Grouping	found in 12OBDG09	Defined by.	Logic	Values	
			status of reductant tank heater temperature	=	FALSE	-
			(please see the definition) State of the defrosting check of pressure line (please see the definition)	=	TRUE	-
			State of the defrosting check of supply module (please see the definition)	=	TRUE	-
) or (
			ignition	=	on	sec
			engine speed	>	550	rpm
			Engine off Time	<=	0	sec
			State of the defrosting check of pressure line (please see the definition)	=	TRUE	-
			State of the defrosting check of supply module (please see the definition) 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	=	TRUE	-
			(please see the definition) State of the defrosting check of supply module	=	TRUE	-
			(please see the definition)))			
		Release of tank heater circuit	(Requested defrosting time for Reductant tank heater (see Look-Up-Table #16)	>=	0 to 14400	sec
			or Requested heating time for Reductant tank heater (see Look-Up-Table #17)	>=	0 to 3277	sec
			or (/			
			(() Requested defrosting time for Reductant tank heater (see Look-Up-Table #16)	>=	0 to 14400	sec

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

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

Component /	State or Status	Description of State or Status	Defined by:	Enable	Enable	Enable Units
System	Sub-Grouping	found in 12OBDG09	2004 27.	Logic	Values	
			and NO Pending or Confirmed DTCs:	=	see sheet inhibit tables	-
		Release of tank heater circuit	(Requested defrosting time for supply module heater (see Look-Up-Table #19)	>=	0 to 3276.7	sec
			or Requested heating time for supply module heater (see Look-Up-Table #21)	>=	0 to 3276.7	sec
			or ((
			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)	>=	0 to 3276.7	sec
			or Requested heating time for pressure line heater (see Look-Up-Table #20)	>=	0 to 3276.7	sec
			and			
			Requested defrosting time for supply module heater (see Look-Up-Table #19)	>=	0 to 3276.7	sec

Component /	State or Status	Description of State or Status	Defined by:	Enable	Enable	Enable Units
System	Sub-Grouping	found in 120BDG09	·	Logic	Values	
			or Requested heating time for supply module heater (see Look-Up-Table #21)	>=	0 to 3276.7	sec
			or ((Requested defrosting time for Reductant tank	>=	0 to 14400	sec
			heater (see Look-Up-Table #16) or			
			Requested heating time for Reductant tank heater (see Look-Up-Table #17)	>=	0 to 3277	sec
			and (
			Requested defrosting time for pressure line heater (see Look-Up-Table #18) or	>=	0 to 3276.7	sec
			Requested heating time for pressure line heater (see Look-Up-Table #20)	>=	0 to 3276.7	sec
			and (
			Requested defrosting time for supply module heater (see Look-Up-Table #19) or	>=	0 to 3276.7	sec
			Requested heating time for supply module heater (see Look-Up-Table #21)	>=	0 to 3276.7	sec
			and NO Pending or Confirmed DTCs:	=	see sheet inhibit tables	-
		Status of the battery voltage being in the valid working range for Reductant tank heater	battery voltage	<	100	V
			battery voltage for time	> >	11 2	V

Component /	State or Status	Description of State or Status	Defined hou	Enable	Enable	Enable Units
System	Sub-Grouping	found in 12OBDG09	Defined by:	Logic	Values	
		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)	=	TRUE	-
			Waiting time after tank heater release expired)	>	0	sec
			Or ((32767	
			Waiting time before tank heater released started with	<	32/0/	sec
			status of reductant tank heater temperature (please see the definition)	=	FALSE	-
			and (
			status of reductant tank heater temperature (please see the definition)	=	TRUE	-
			Waiting time after tank heater release expired))	>	0	sec
			or ((
			Waiting time before tank heater released started with	>	32767	sec
			status of reductant tank heater temperature (please see the definition)) and	=	FALSE	-
			status of reductant tank heater temperature (please see the definition)	=	TRUE	-

Component /	State or Status	Description of State or Status	Defined by:	Enable	Enable	Enable Units
System	Sub-Grouping	found in 12OBDG09	Definied by.	Logic	Values	
			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	-
	Cystem states and states		Warning (66.67%) < tank level < full (100%) Restriction (33.33%) < tank level < Warning	= =	OK Warning	-
			(66.67%) Empty < tank level < Restriction (33.33%) Tank level < = 0.1%	= =	Restriction Empty	-
		Status of Reductant tank level reset when refilling is detected (please see the definition)	(
			time since potential Reductant refill detection is set	>=	12	sec
			and with			
			Derivation of the PT1 filtered level signal (DT1)	>=	1.00 TRUE	%/sec
			ignition on engine speed	= >	550	- rpm
			Vehicle speed	>=	6.22	mph
			time since engine started	<=	(a) * (b)	
			(a) Time period for a positive slope to detect refueling	=	12	sec
			(b) Factor for the extension of the detection time for refueling	=	20	factor
			since the following conditions met:	=	TRUE	-
			Falling edge of ignition or	=	TRUE	-
			Reductant Refill enabling conditions reset timers	=	TRUE	-
))) or			
			time since potential Reductant refill detection is set	>=	8	sec

Component /	State or Status	Description of State or Status	Defined by:	Enable	Enable	Enable Units
System	Sub-Grouping	found in 12OBDG09	Defined by.	Logic	Values	
			and with			
			Derivation of the PT1 filtered level signal (DT1) filter release for Reductant tank level calculation at ignition on on (Please see the definition)	>= =	1.00 TRUE	%/sec -
			and with			
			Frozen state is active during a certain warning level (please see the definition) and with	=	TRUE	-
			Reductant tank Temperature or	>=	-100.04	°C
			Reductant low warning level (Please see the definition)	>=	0	level
			.,,			
		Status of Reductant Tank Level Release	status of reductant tank level release (please see			
			the definition) Status of Filter release for reductant tank level calculation (please see the definition) and	=	TRUE	-
			(() ambient temperature	>=	-100.04	°C
			status of reductant tank heater temperature (please see the definition)	=	FALSE	-
			Waiting time before tank heater released and	<	32767	sec
			status of reductant tank heater temperature (please see the definition)	=	TRUE	-
			Waiting time after tank heater release expired	>	0	sec
			or (
			status of reductant tank heater temperature (please see the definition)	=	FALSE	-
			Waiting time before tank heater released and	>=	32767	sec

Component /	State or Status	Description of State or Status	Defined by:	Enable	Enable	Enable Units
System	Sub-Grouping	found in 12OBDG09	Defined by.	Logic	Values	
			status of reductant tank heater temperature	=	TRUE	-
			(please see the definition) Waiting time after tank heater release expired	>=	0	sec
)) or			
			Frozen state is active during a certain warning level	=	TRUE	-
			(please see the definition)			
			Vehicle speed	>=	6.22	mph
) or			
			filter release for Reductant tank level calculation at	=	TRUE	-
			ignition on on (Please see the definition)			
		Status of Filter release for reductant tank level calculation				
		level calculation	Reductant tank Temperature	>=	-100.04	°C
			or Reductant low warning level (Please see the	>=	0	_
			definition)	<i>></i> -		
			NO Pending or Confirmed DTCs: or	=	TRUE	-
			Frozen state is active during a certain warning level	=	TRUE	-
			(please see the definition)			
		Filter release for Reductant tank level	ignition	=	on	-
		calculation at Ignition on	Engine on timer is expired (please see the	=	FALSE	_
			definition)			
			Vehicle speed Reductant low warning level (Please see the	>= >=	0.62 49	mph level
			definition) and with	<i>7</i> -	43	ievei
			Raw Reductant tank level and with	>=	33.3	%
			Remaining Reductant quantity (a) - (b):	<	(a) - (b)	

Component /	State or Status	Description of State or Status	Defined by:	Enable	Enable	Enable Units
System	Sub-Grouping	found in 12OBDG09		Logic	Values	
			(a) Tank level for reserve mode (Restriction level)	=	2614	g
			in [g] (b) Tank level threshold range below Restriction threshold for ignition on refill detection release	=	1015	g
			or Raw Reductant tank level and with	>=	66.7	%
			(Remaining Reductant quantity (a) - (b):	<	(a) - (b)	
			(a) Tank level for reserve mode (Warning level) in	=	5279	g
			[g] (b) Tank level threshold range below WARNING threshold for ignition on refill detection release	=	1617	g
) or			
			Raw Reductant tank level and with (>=	100	%
			Remaining Reductant quantity (a) - (b): (a) Tank level for reserve mode (Warning level) in [g]	>= =	(a) - (b) 5279	g
			(b) Tank level threshold range below WARNING threshold for ignition on refill detection release	=	1617	g
))			
		Status of Refill detection of Reductant	Status of Refill detection of Reductant tank (please			
		tank	see the definition) Reductant tank level changed (/	=	TRUE	-
			Captured Reductant tank level at last tank level change or	=	Empty	-
			Captured Reductant tank level at last tank level change	=	Restriction	-

Component /	State or Status	Description of State or Status	Defined by:	Enable	Enable	Enable Units
System	Sub-Grouping	found in 120BDG09	Defined by.	Logic	Values	
			and			
			(
			one or more of following conditions are met status of Reductant tank level (please see the definition)	=	Warning	-
			or status of Reductant tank level (please see the definition)	=	OK	-
			or status of Reductant tank level (please see the definition)	=	Full	-
)) or ((
			Captured Reductant tank level at last tank level change or	=	Warning	-
			Captured Reductant tank level at last tank level change	=	OK	-
			and			
			() status of Reductant tank level (please see the definition)	=	Full	-
			or			
			Captured Reductant tank level at last tank level	=	OK	-
			change status of Reductant tank level (please see the definition)	=	Full	-
))			
		Engine on timer is expired	time since engine started	>=	(a) * (b) 12 20	sec sec
			and with ((20	-
			ignition	=	on	sec

Component /	State or Status	Description of State or Status	Defined by:	Enable	Enable	Enable Units
System	Sub-Grouping	found in 12OBDG09		Logic	Values	
			engine speed Vehicle speed	> >=	550 6.22	rpm mph
			verlicie speed)	>=	0.22	прп
			or (
			Vehicle speed	>=	6.22	mph
			NO Pending or Confirmed DTCs: for time	= >	TRUE 1	sec
))			
			and with timer reset conditions			
			Falling edge of ignition or	=	TRUE	-
			Reductant Refill enabling conditions reset timers	=	TRUE	-
)			
	Reducant Tank Level Low	Normal_Operation_OK: 0 decimal,	Reductant tank level	=	Full	
	Warning States	normal operation	and with			
			() Warning level or	<=	49	-
			(
			Previous warning level vehicle speed	> <=	49 98.75	- mph
))	ν_	30.70	Прп
			or			
			Reductant Quality state	>	0	-
		Warning_Leve1: 1 decimal, Warning level 1	Reductant tank level	<	Full	-
		level 1	Remaining mileage and with	>	1558.75	miles
			() Warning level or	<=	49	Warning level

Component /	State or Status	Description of State or Status	Defined by:	Enable	Enable	Enable Units
System	Sub-Grouping	found in 12OBDG09	Defined by.	Logic	Values	
			(Previous warning level vehicle speed))	> <=	49 98.75	Warning level mph
			and with Reductant Quality state	=	0	-
		Warning_Level2: 2 decimal, Warning level 2	Reductant tank level	<	Full	-
			Remaining mileage and with /	<=	1558.75	miles
			Warning level or	<=	49	Warning level
			(Previous warning level vehicle speed	> <=	49 98.75	Warning level mph
)) and with Reductant Quality state	=	0	-
		Warning_Level3: 16 decimal, Warning	Reductant tank level	<	Full	-
		level 3	Remaining mileage and with	>	855	miles
			(Warning level	=	2	Warning level
			or Warning level \	=	16	Warning level
			and with initialization phase after Reductant refill event is active	=	TRUE	-
			Reductant Quality state	=	0	-
		Warning_Level4: 32 decimal, Warning level 4	Reductant tank level	<	Full	-

Component /	State or Status	Description of State or Status	Defined by:	Enable	Enable	Enable Units
System	Sub-Grouping	found in 12OBDG09		Logic	Values	
			Remaining mileage and with (<=	855	miles
			Warning level or (<=	49	Warning level
			Previous warning level vehicle speed	> <=	49 98.75	Warning level mph
			and with Reductant Quality state	=	0	-
		Warning_Level5: 48 decimal, Warning	((
		level 5	Reductant tank level		Full	
			Reductant tank level Remaining mileage and with	< <=	628.75	- miles
			Warning level or	<=	49	Warning level
			Previous warning level vehicle speed)))) or	> <=	49 98.75	Warning level mph
			(Warning level initialization phase after Reductant refill event is active))	= =	48 TRUE	Warning level -
			and with Reductant Quality state	=	0	-
		Warning Lovels: 40 decimal Warning				
		Warning_Level6: 49 decimal, Warning level 6	((Warning level initialization phase after Reductant refill event is active	= =	49 TRUE	Warning level -

Component /	State or Status	Description of State or Status	Defined by:	Enable	Enable	Enable Units
System	Sub-Grouping	found in 12OBDG09	Dominou Sy.	Logic	Values	
) or (Warning level	<	49	Warning level
			Failed Reductant system pressure build up	=	1	-
			and with Reductant Quality state	=	0	-
	Warning_Level8: 80 decimal,Vehicle speed restriction mild	Warning level	=	80	Warning level	
			initialization phase after Reductant refill event is active	=	TRUE	
			and with Reductant Quality state	=	0	
		Warning_Level10: 112 decimal, Vehicle speed restriction aggressive	Warning level	=	112	Warning level
			initialization phase after Reductant refill event is active and with	=	TRUE	-
			Reductant Quality state	=	0	-
		Warning_Level12: 144 decimal, Vehicle speed restriction severe	Warning level	=	144	Warning level
		Special 100111011 001010	initialization phase after Reductant refill event is active and with	=	TRUE	-
			Reductant Quality state	=	0	-
		Warning_Level14: 176 decimal, Vehicle	Warning level	=	176	Warning level
		speed restriction final	initialization phase after Reductant refill event is active	=	TRUE	-

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

Component /	State or Status	Description of State or Status	Defined by:	Enable	Enable	Enable Units
System	Sub-Grouping	found in 12OBDG09	Defined by:	Logic	Values	
			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)	< > >= =	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)	=	TRUE	-
			OR overdosing detected (please see the definition)	=	TRUE	-
		Underdosing detected	Difference between the NOx mass of the sensor and of the model during first functional evaluation	>=	10	g
			OR Difference between the NOx mass of the sensor and of the model during second functional evaluation	>=	10	g
			OR Difference between the NOx mass of the sensor and of the model during third functional evaluation	>=	-0.25	g
		Overdosing detected	Difference between the NOx mass of the sensor and of the model during first functional evaluation	<=	-6	g
			OR			

Component /	State or Status	Description of State or Status	Defined by:	Enable	Enable	Enable Units
System	Sub-Grouping	found in 12OBDG09	Defined by:	Logic	Values	
			Difference between the NOx mass of the sensor and of the model during second functional evaluation OR	<=	-6	g
			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
			or Time since when the Reductant load level adaptation and the plausibility have been locked	>=	50	sec
			Integrated NOx mass since Reductant load level adaptation and plausibility have been locked	>=	2	g
)			
			Difference between nominal and estimated Reductant	<	0.125	g
			Difference between nominal and estimated Reductant	>=	-0.5	g

Component /	State or Status	Description of State or Status	Defined by:	Enable	Enable	Enable Units
System	Sub-Grouping	found in 12OBDG09	Defined by.	Logic	Values	
			Filtered Upstream NOx mass flow	>=	10	mg/sec
			Filtered Upstream NOx mass flow	<=	500	mg/sec
			Upstream Nox mass flow difference : (a) - (b)	>=	0	mg/sec
			Upstream Nox mass flow difference : (a) - (b)	<=	500	mg/sec
			and with (a) Filtered Upstream NOx mass flow			
			(b) Filtered actual upstream NOx mass flow			
)			
			Status of pre controlled dosing (please see the definition)	=	FALSE	-
			Difference between nominal and estimated Reductant	<	0.125	g
			Difference between nominal and estimated Reductant	>=	-0.5	g
			for time	>	5	sec
			HC load in SCR catalyst	<=	10	factor
			overall aging factor of the SCR catalyst	>=	0	factor
			for time	>	1	sec
			Temperature gradient of SCR	>=	-1	°C/sec
			Temperature gradient of SCR	<=	1	°C/sec
			for time	>	18	sec
			Integrated NOx mass flow after engine start	>=	5	g
			Release of Reductant dosing	=	active	-
			engine operating condition based on engine speed and injection quantity (see Look-Up-Table #10)	>	0 to 1	factor
			(Difference between nominal and estimated Reductant	>	-0.05	g
			Reductant mass flow (see Look-Up-Table #8)	>	0 to 0.04	g
			Elapsed time of the fill level timer)	>	20	sec
I						

Component /	State or Status	Description of State or Status	Defined by:	Enable	Enable	Enable Units
System	Sub-Grouping	found in 120BDG09	Defined by:	Logic	Values	
		State of the NH3 (Ammonia) slip				
		detection	Reductant concentration downstream SCR	_	32767	nnm
			Reductant concentration downstream SCR	<	32/0/	ppm
			and			
			(a) - (b)	<	0	g/sec
			(a) Filtered NOx mass flow downstream SCR measured by the sensor	=	measured parameter	-
			(b) Filtered and delayed NOx raw emission mass	=	measured	-
			flow upstream of SCR		parameter	
		Deactivation of dosing to execute the				
		NOx Offset test	SCR catalyst temperature	>	400.06	°C
			SCR catalyst temperature	<	999.96	°C
			time	>	60	sec
			and			
			Currently dosed Reductant mass flow	<=	0.005	g/sec
			time	>	30	sec
			and			
			Feed ratio			
			(a) / ((b) * (c))	<=	0.1	ratio
			(a) Currently dosed Reductant mass flow	=	measured	-
			(b) NOx raw emission mass flow	=	parameter measured	_
					parameter	
			(c) Stoichiometric conversion factor NOx to	=	calculated	-
			Reductant time	>	parameter 10	sec
				-		
			and		0.0	
			Estimated current Reductant load time	<= >	0.3 10	g sec
			ume		10	300
		Release plausibility of Reductant Load				
		places, or resultant Loud				
1		I	Release plausibility timer active	>=	600	sec

Component /	State or Status	Description of State or Status	Defined by:	Enable	Enable	Enable Units
System	Sub-Grouping	found in 12OBDG09	Defined by:	Logic	Values	
			or (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 (b) Upper hysteresis threshold for filtered exhaust- gas mass flow, dependent on thermal ageing	> = =	(a) * (b) 1 5040.00	- factor g/sec
			and Filtered NOx mass flow upstream SCR	>	(a) * (b)	-

Component /	State or Status	Description of State or Status	Defined by	Enable	Enable	Enable Units
System	Sub-Grouping	found in 12OBDG09	Defined by:	Logic	Values	
			(a) Correction factor for the upper hysteresis threshold for filtered exhaust-gas mass flow, dependent on HC- contamination SCR	=	1	factor
			(b) Upper hysteresis threshold for filtered exhaust- gas mass flow, dependent on thermal ageing SCR	=	0.25	g/s
			and Engine coolant temperature	_	(a) + (b)	-
			(a) Lower hysteresis threshold for engine	< =	105.06	°C
			temperature (b) Offset for lower hysteresis switch on threshold for engine temperature	=	50	K
			Engine coolant temperature	>	108.06	°C
			and			
			ambient pressure	>	(a) + (b) 74.5	- kPa
			(a) Upper hysteresis threshold for environment pressure	=	74.5	кга
			(b) Offset for upper hysteresis switch on threshold for environment pressure	=	65.0	kPa
			or ambient pressure	<	74.0	kPa
			and			
			Intake air temperature	>	(a) + (b)	- °C
			(a) Lower hysteresis switch on threshold for inlet air temperature	=	-6.54	٠.
			(b) Offset for upper hysteresis switch on threshold for inlet air temperature	=	49.5	°C
			or Intake air temperature	<	-8.04	°C
)			
			and (
			ambient temperature	>=	-7.04	°C
			ambient pressure	>=	74.8	kPa
			Selected temperature used for locking pre controlled mode	>=	209.96	°C
			Selected temperature used for locking pre controlled mode	<=	309.96	°C

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

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

Component /	State or Status	Description of State or Status	Defined by:	Enable	Enable	Enable Units
System	Sub-Grouping	found in 12OBDG09	Defined by.	Logic	Values	
			(b) filtered current tank temperature	=	measured	-
			temperature difference: (a) - (b)	>=	paramter 0	°C
			(a) tank temperature of the previous driving cycle	=	measured	-
					paramter	
			start tank temperature of current monitoring cycle	=	measured	-
			from EEPROM (see definition) Engine off Time		paramter 2000	sec
			This monitor was complete in the last driving cycle	<= =	FALSE	SEC
			The monitor was complete in the last arriving system			
			ice detection by tank temperature difference:			
			(a) - (b)	>	-0.14	°C
			(a) filtered current tank temperature	=	measured paramter	-
			(b) tank temperature captured at the beginning of	=	measured	_
			current monitoring cycle		paramter	
		State of Reductant injection valve	((
		Component Protection				
			status of SCR control sub state (please see the definition)	=	Metering control	-
			and with		CONTROL	
			drid William			
			PM Filter Regeneration	=	not active	-
			Modeled Reductant injection valve tip temperature		100.96 to	°C
			based on its coil temperature (see Look-Up-Table	>	114.96	C
			#15)			
)			
			or ′			
			PM Filter Regeneration	=	active	
			Reluctant dosing valve modeled temperature	>	19.96	°C
))			
			or (
			status of SCR control sub state (please see the	≠	Metering	_
		1	" definition)		control	

Component /	State or Status	Description of State or Status	Defined by:	Enable	Enable	Enable Units
System	Sub-Grouping	found in 12OBDG09	Defined by.	Logic	Values	
			and with (PM Filter Regeneration Modeled Reductant injection valve tip temperature based on its coil temperature (see Look-Up-Table #15) or (= >	not active 100.96 to 114.96	°C
			PM Filter Regeneration Modeled Reductant injection valve tip temperature based on its coil temperature)))	>	active 19.96	°C
Turbo Charger			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	Manufa	acturer Re	eference)												-
1	P0101	AFS_rAirThres0	Cor_CU	R													
	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	0										
2	P2199	Air_tDiffMaxHiT	AFS_C	UR													
	Engine Off Time (sec)	600	700	800	900	1000	2000	3000	4000	5000	8000	17999	18000	28799	28800	30000	32000
	Delta Temperature (°C)	999	999	999	999	999	999	999	999	999	999	999	999	999	100	100	100
3	P10CF	Air_tDiffMaxHiT	CACDs	_CUR													
	Engine Off Time (sec)	600	700	800	900	1000	2000	3000	4000	5000	8000	17999	18000	28799	28800	30000	32000
	Delta Temperature (°C)	999	999	999	999	999	999	999	999	999	999	999	999	999	100	100	100
4	P040F	Air_tDiffMaxHiT	EGRCI	r2Ds_CUF	1												
	Engine Off Time (sec)	600	700	800	900	1000	2000	3000	4000	5000	8000	10000	18000	28799	28800	30000	32000
	Delta Temperature (°C)	999	999	999	999	999	999	999	999	999	999	999	999	999	100	100	100
5	P2199	Air_tDiffMaxLo1	AFS_C	UR													
	Engine Off Time (sec)	600	700	800	900	1000	2000	3000	4000	5000	8000	17999	18000	28799	28800	30000	32000
	Delta Temperature (°C)	999	999	999	999	999	999	999	999	999	999	999	999	999	20	20	20
6	P10CF	Air_tDiffMaxLo1	CACD	s_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
7	P040F	Air_tDiffMaxLo7	EGRCI	r2Ds_CUF	₹												
	Engine Off Time (sec)	600	700	800	900	1000	2000	3000	4000	5000	8000	17999	18000	28799	28800	30000	32000
	Delta Temperature (°C)	999	999	999	999	999	999	999	999	999	999	999	999	999	20	20	20
8	P0401	AirCtl_facEnvPr	esMinD	vt_CUR													
	Ambient Pressure (kPa)	65	70	75	80	85	90	95	110								
	Correction Factor (-)	0.71	0.71	0.71	0.85	0.85	0.92	- 4	4								

P0401

AirCtl_mEGRMinDvtLim_CUR

Table no. Fault Codes	Label (Intern	al Manuf	acturer R	eference)				-	-	-	
Ambient Pressure (kPa)	67	70	73	76	79	82	85	88	91	94	97	100
Air Mass Flow (g/rev)	0.8	0.8	0.8	0.8	0.85	0.9	0.95	1	1.05	1.1	1.15	1.2

10 P0402

$AirCtl_mMaxDvt_MAP$

Injection Qty (mm^3/rev) / Engine Speed (rpm)	550	1000	1200	1300	1400	1500	2000	3000
20	0.6	0.5	0.5	0.4	0.4	0.4	0.6	0.6
40	0.6	0.5	0.5	0.4	0.4	0.4	0.6	0.6
60	0.6	0.5	0.5	0.4	0.4	0.4	0.6	0.6
80	0.6	0.5	0.5	0.4	0.4	0.4	0.6	0.6
100	0.6	0.5	0.5	0.4	0.4	0.4	0.6	0.6
120	0.6	0.6	0.5	0.5	0.5	0.5	0.6	0.6
160	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6
200	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6

11 P0400

AirCtl_mMaxDvtPwr_MAP

Injection Qty (mm^3/rev) / Engine Speed (rpm)	0	500	1000	1500	2000	2500	3000	3750
0	2	2	2	2	2	2	2	2
20	2	2	2	2	2	2	2	2
40	2	2	2	2	2	2	2	2
60	2	2	2	2	2	2	2	2
80	2	2	1.8	1.8	1.8	1.8	2	2
160	2	2	1.8	1.6	1.6	1.6	2	2
320	2	2	1.8	1.6	1.6	1.6	2	2
380	2	2	2	2	2	2	2	2

12 P0401

AirCtl_mMinDvt_MAP

Injection Qty (mm^3/rev) / Engine Speed (rpm)	550	1000	1400	1800	2200	2600	3000	3750
0	-0.56	-0.56	-1	-1	-1	-1	-1.2	-1.2
20	-0.56	-0.56	-1	-1	-1	-1	-1.2	-1.2
40	-0.56	-0.56	-1	-1	-1	-1	-1.2	-1.2
60	-0.56	-0.56	-1	-1	-1	-1	-1.2	-1.2
80	-0.56	-0.56	-1	-1	-1	-1	-1.2	-1.2
100	-0.9	-0.9	-0.9	-0.9	-0.9	-0.9	-1.2	-1.2
120	-1	-1	-1	-1	-1	-1	-1.2	-1.2
150	-1	-1	-1	-1	-1	-1	-1.2	-1.2

13 P2138

APP_uSync_CUR

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

14 P057B

Brk_facEWMASlowTest_CUR

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

-																	
Table no.	Fault Codes	Label (Internal						. 1									
	factor (-)	0	0	0	0	0	0	1	1								
15	P008F	CEngDsT_tDiff	MaxHi_C	UR													
	Engine Off Time (sec)	600	700	800	900	1000	2000	3000	4000	5000		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
16	P008F	CEngDsT_tDiff	MaxLo_C	CUR													
	Engine Off Time (sec)	600	700	800	900	1000	2000	3000	4000	5000	8000	17999	18000	28799	28800	30000	32767
	Delta Temperature (°C)	999	999	999	999	999	999	999	999	999	999	999	999	999	20	20	20
							•		•	•		•	•			•	
17	P0336	EpmCrS_facGa	apPlausHi	igh_CA													
		1		1													
	-	8	5.8125	3.375	3.375												
18	P0336	EpmCrS_facInd	:PlausHio	nh CA													
			oa.aog	,0, .													
	-	2	1.8125	1.5	1.5												
19	P02CD, P02CF, P02D1, P02D3, P02D5, P02D7, P02D9, P02DB	ETClb_pRailSe															
	Rail Pressure Setpoint (kPa)	30000	70000	90000													
20	P02CD, P02CF, P02D1, P02D3, P02D5, P02D7, P02D9, P02DB	ETClb_tiET_M/	AX_CA														
	Injector Energizing Time (usec)	670.8	384.4	353.2													
	Injector Energizing Time (4000)	070.0	00 1.1	000.2													
21	P01CD, P01CF, P01D1, P01D3, P01D5, P01D7, P01D9, P01DB	ETClb_tiETFbC	OfsMax_C	CA													
	Injector Energizing Time (usec)	16	12	10													
22	P01CD, P01CF, P01D1, P01D3, P01D5, P01D7, P01D9, P01DB	ETClb_tiETFbC	OfsMin_C	A													
	Injector Energizing Time (usec)	16	12	10													

Γable no.	Fault Codes	Label (Internal Manufacturer Reference)
23	P144B	ETCtl_stPOpCtVILopMax_MAP
	Injection Qty (mm^3/rev) / Engine Speed (rpm)	750 900 2250 3000 0 0 1 1 0 40 0 1 1 0 160 0 1 1 0
		200 0 0 0 0
24	P144C	ETCtl_stPOpCtVILopMin_MAP
	Injection Qty (mm^3/rev) / Engine Speed (rpm)	750 900 2250 3000 0 0 1 1 0 40 0 1 1 0 160 0 1 1 0 200 0 0 0 0
25	P24A0	ETCtlHCl_stPOpCtVHClLopMaxInjMs_MAP
	Injection Qty (mm^3/rev) / Engine Speed (rpm)	700 900 2250 3000 0 0 1 1 1 40 0 1 1 1 160 0 1 1 1 200 0 1 1 1
26	P24A1	ETCtlHCl_stPOpCtVHClLopMinInjMs_MAP
	Injection Qty (mm^3/rev) / Engine Speed (rpm)	700 900 2250 3000 0 0 1 1 1 40 0 1 1 1 160 0 1 1 1 200 0 1 1 1
27	P11DC	Exh_facLamStatNoCat2Ds_CUR
	-	1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 0.2 0.4 0.6 0.8 1 1.2 1.4 1.6 1.8 2 2.2 2.4 2.6 2.8 3 3.2
28	P11DB	Exh_facLamStatNSCDs_CUR
	-	0 3 4 5 6 7 8 9 10 15 16 0.1 0.1 1.25 1.5 3.848 3.889 4 6.484 10 10 10

P2080, P2084, P242B, P246F Exh_stPOpModPlausTMon_MAP

e no.	Fault Codes	Label (Interna	I Manufa	cturer Re	ference)												-
	Injection Qty (mm^3/rev) / Engine Speed (rpm)	700	1000	1500	2000	3000	3300										
	0		0	0	0	0	0										
	20		255	255	255	255	0										
	40		255	255	255	255	0										
	100		255	255	255	255	0										
	200	0	255	255	255	255	0										
	320	0	0	0	0	0	0										
0	P20E2	Exh_tDiffMaxH	liTOxiCat	Ds_CUR													
I	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
1	P20E2	Exh_tDiffMaxL	.oTOxiCat	:Ds_CUR													
	Engine Off Time (sec)	600	700	800	900	1000	2000	3000	4000	5000	8000	17999	18000	28799	28800	30000	32000
ļ	Delta Temperature (°C)	999	999	999	999	999	999	999	999	999	999	999	999	999	30	30	30
2	P0483	FanCtl_facDia	DrvSpd_C	CUR													
	Fan Speed (rpm)	400	1679	1680	1800	2000	2400	2800	3200	3600	4000	4400	4800	5200	5600	6000	6400
	factor (-)	0	0	1	1	1	1	1	1	0.9	0.8	0.7	0.6	0.4	0.2	0	0
3	P0483	FanCtl_facDia	DrvStab_0	CUR													
1	Fan Speed (rpm)	-1600	-1200	-700	-400	0	400	700	1200	1600							
	factor (-)	0	0	0.6	1	1	1	0.6	0	0							
4	P0483	FanCtl_facDia	ECT_CUF	₹													
I	Engine Coolant Temperature (°C)	-20.04	-7.04	19.96	68.96	69.96	79.96	99.96	104.96	124.96							
	factor (-)	0	0	0	0	0.6	0.95	1	0.95	0.9							
5	P0483	FanCtl_facDia	IAT_CUR														
	Intake Air Temperature (°C)	-8.04	-7.04	-0.04	9.96	14.96	19.96	44.96	69.96	99.96							
	factor (-)	0	0.6	0.62	0.7	8.0	1	1	1	0.9							
6	P0495	FanCtl_nDiaHi	Spd_CUF	₹													
	Fan Drive Speed (rpm)	400	1200	1500	1600	1800	2000	2400	2800	3200	3600	4000	4400	4800	5200	5600	6000
	Fan Speed (rpm)	400	1200	1450	1500	1500	1500	1500	1500	1500	1500	1500	1500	1500	1500	1500	1500

7 P0495 FanCtl_volClthDia_CUR

Table no.	Fault Codes	Label (Intern	al Manufa	cturer Re	eference)											-	
	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	0.011	0.011	0.011	0.011	0.011	0.011	0.0105	0.0105	0.0105	0.0105	0.0115	0.011	0.011	0.0105

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

ECT (°C) / Inj. Qty (mm^3/rev)	0	8	52	76	448	464	472	480
-40.04	. 0	0	-12	-17	-17	-17	-17	-17
103.96	0	0	-12	-17	-17	-17	-17	-17
104.96	0	0	-12	-17	-17	-17	-17	-17
105.96	0	0	-12	-17	-17	-17	-17	-17
106.96	0	0	-12	-17	-17	-17	-17	-17
107.96	0	0	-12	-17	-17	-17	-17	-17
109.96	0	0	-12	-17	-17	-17	-17	-17
134.96	0	0	-12	-17	-17	-17	-17	-17

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

ECT (°C) / Inj. Qty (mm^3/rev)	0	8	52	76	448	464	472	480
-40.04	0	0	12	17	17	17	17	17
103.96	0	0	12	17	17	17	17	17
104.96	0	0	12	17	17	17	17	17
105.96	0	0	12	17	17	17	17	17
106.96	0	0	12	17	17	17	17	17
107.96	0	0	12	17	17	17	17	17
109.96	0	0	12	17	17	17	17	17
134.96	0	0	12	17	17	17	17	17

41 P111F FIPmpT_tDiffMaxHi_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

\$2 P111F FIPmpT_tDiffMaxLo_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

43 P0171, P0172, P026C, P026D FMO_facObsvrCmpnProtnRels_MAP

Injection Qty (mm^3/rev) / Engine Speed (rpm)	500	600	1200	1600	2200	2400	3000	3200
0	0	1	1	1	1	1	1	1
28	0	1	1	1	1	1	1	1
280	0	1	1	1	1	1	1	1
300	0	0	0	1	1	1	1	1
320	0	0	0	1	1	1	0	0

Table no.	Fault Codes		Label (Intern	al Manuf	acturer F	Reference)			
		340	0	0	0	1	1	1	0	0
		360	0	0	0	0	1	1	0	0
		380	0	0	0	0	0	0	0	0

14 P026D

FMO_qFlSysThresMax_MAP

Injection Qty (mm^3/rev) / Engine Speed (rpm)	400	450	500	550	700	750	800	850
12	19.6	19.6	19.6	19.6	22.4	22.4	25.6	24
16	16	19.2	19.2	19.2	23.2	23.2	26	24
24	23.2	23.2	25.2	25.2	25.2	25.2	26	28
40	23.2	23.2	25.2	25.2	25.2	25.2	26	28
56	23.2	23.2	25.2	25.2	25.2	25.2	26	28
72	23.2	23.2	25.2	25.2	25.2	25.2	26	28
84	34.8	34.8	34.8	34.8	34.8	34.8	34.8	34.8
100	34.8	34.8	34.8	34.8	34.8	34.8	34.8	34.8

45 P026C

FMO_qFlSysThresMin_MAP

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

46 P0172

${\sf FMO_qOBDMax_MAP}$

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

17 P0171

FMO_qOBDMin_MAP

Injection Qty (mm^3/rev) / Engine Speed (rpm)	500	700	900	1000	1100	1200	1300	1500
40	-46.12	-52.44	-58.72	-65.04	-68.16	-71.32	-77.64	-109.12
80	-54.04	-60.36	-66.64	-72.96	-76.12	-79.24	-85.56	-117.04
120	-62	-68.28	-74.6	-80.88	-84.04	-87.2	-93.48	-125
160	-65.96	-72.24	-78.56	-84.84	-88	-91.16	-97.44	-128.96
180	-69.92	-76.2	-82.52	-88.8	-91.96	-95.12	-101.4	-132.92

Table no.	Fault Codes	Label (Interr	al Manuf	acturer R	eference	!)			
	20	-73.88	-80.16	-86.48	-92.76	-95.92	-99.08	-105.36	-136.88
	24	-77.84	-84.12	-90.44	-96.72	-99.88	-103.04	-109.32	-140.84
	28	-101.64	-107.92	-114.24	-120.52	-123.68	-126.84	-133.12	-164.64

48 P0171, P0172, P026C, P026D

FMO_stOutObsvr_MAP

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

49 P11B4, P11B5

Hegn_facLamDiaFdbk_CUR

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

50 P054F

InjCtl_qDesGearMonMax_MAP

ECT (°C) / Engine Speed (rpm)	0	400	600	800	1000	5000
-20.04	57.7	57.7	57.7	57.7	57.7	57.7
-10.04	50	50	50	50	50	50
-0.04	44.2	44.2	44.2	44.2	44.2	44.2
19.96	38.7	38.7	38.7	38.7	38.7	38.7
39.96	33.8	33.8	33.8	33.8	33.8	33.8
69.96	31.7	31.7	31.7	35.1	35.1	35.1

54 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

5 P0606

 $MoFInjQnt_tiZFCETMax_CUR$

ahle no	Fault Codes	Label (Interna	al Manufa	cturer Re	ference	`			
abic no.	Rail Pressure (kPa)	20000	30400	70400			120800		
	Energizing Time (us)	500	500	300	256	50	50		
56	P0606	MoFInjQnt_tiZ	ZFCETMin	_CUR					
	Deil Dressure (I-De)	20000	20400	70400	00400	120000	100000		
	Rail Pressure (kPa) Energizing Time (us)	20000 -500	30400 -500	70400 -300	90400	-50	120800 -50		
	Energizing Time (us)	300	300	3001	200	50	30		
57	P0606	MoFOvR_nEn	gStrtThres	s_CUR					
	ECT (°C)	-40	-30.4	-16	-10.4	9.6	20	29.6	40
	Engine Speed (rpm)	1080	1040	960	960	960	960	920	840
58	P0606	MoFOvR_tiLin	nET_CUR						
	Engine Speed (rpm)	0	2000	2040	4000				
	Energizing Time (us)	6000	6000	200	200				
59	P2263 Environmental Pressure (kPa) factor (-)	PCR_facMaxU 70 0.67004395	JndrBstDv 75 0.67	80 0.67	85 0.67	90	95 1	100	112.5 1
60	P0234	PCR_facPresI	DvtCorMin	_CUR					
	Environmental Pressure (kPa)	70	75	80	85	90	95	100	112.5
	factor (-)	0.65002441	0.65	0.75	0.75	1	1	1	1
61	P0299	PCR_pMaxDv	rt_MAP						
	Injection Qty (mm^3/rev) / Engine Speed (rpm)	550	1000	1600	1800	2000	2500	3000	4500
	0		15	15	15	17.5	20	20	40
	160	20	15	20	20	20	30	35	40
	200 240	20 25	17.5 20	25 30	25 30	25 30	30 35	35 40	40 40
	280	25	25	25	25	30	35	40	40
	320	25	25	25	25	30	30	40	40
	360	30	30	30	30	30	30	40	40
	440		40	40	40	40	40	40	40
62	P0234	PCR_pMinDvt	t_MAP						
		550	4000	4700	0000	2500	3000	2500	EEOO
	Injection Qty (mm^3/rev) / Engine Speed (rpm)	550	1200	1700	2000	2500		3500	5500
	Injection Qty (mm^3/rev) / Engine Speed (rpm) 4 14	-12.5 -12.5	-12.5 -12.5	-12.5 -12.5	-15 -15	-20 -20	-25 -25	-40 -40	-40 -40

Table no.	Fault Codes	Label (Intern	al Manufa	acturer R	eference)			
	26	-12.5	-12.5	-12.5	-15	-20	-25	-40	-40
	40	-12.5	-12.5	-12.5	-15	-20	-25	-40	-40
	60	-12.5	-12.5	-12.5	-15	-20	-25	-40	-40
	80	-12.5	-12.5	-12.5	-15	-20	-25	-40	-40
	100	-12.5	-12.5	-12.5	-15	-20	-25	-40	-40
	120	-12.5	-12.5	-12.5	-15	-20	-25	-40	-40

3 P2263

PCR_pOvrBstDvt_MAP

Injection Qty (mm^3/rev) / Engine Speed (rpm)	500	750	1000	1500	2000	2500	3000	3500
	-50	-50	-50	-50	-50	-50	-50	-50
60	-50	-50	-50	-50	-50	-50	-50	-50
120	-50	-50	-50	-50	-50	-50	-50	-50
180	-50	-50	-50	-50	-50	-50	-50	-50
240	-50	-50	-50	-50	-50	-50	-50	-50
300	-50	-50	-50	-50	-50	-50	-50	-50
360	-50	-50	-50	-50	-50	-50	-40	-40
480	-50	-50	-50	-50	-50	-40	-40	-40

64 P2263

PCR_pUndrBstDvt_MAP

Injection Qty (mm^3/rev) / Engine Speed (rpm)	500	750	1000	1500	2000	2500	3000	3500
	100	100	100	100	100	100	100	100
6	100	100	100	100	100	100	100	100
12	100	100	100	100	100	100	100	100
18	100	100	100	100	100	100	100	100
24	100	100	100	100	100	80	80	80
30	100	100	100	100	80	80	80	80
36	100	100	100	100	80	80	80	80
48	100	100	100	100	80	80	80	80

65 P2459

PFlt_mSotThresRgnFreq_CUR

g	0	5	10	20	30	45
Soot Mass (g)	0	50	100	200	300	450

67 P128E

Rail_pCPCFltMin_CUR

Engine Speed (rpm)	580	630
Rail Pressure (kPa)	0	15000

68 P0087

Rail_pMeUnDvtMax_CUR

Engine Speed (rpm)	580	630
Rail Pressure (kPa)	80000	11000

Table no	Fault Codes	Label (Internal Manufacturer Reference
69	P0088	Rail pMeUnDvtMin CUR
09	F0000	Kall_pivieOfiDvtiviii1_COK
	Frainc Croad (mm)	500 000
	Engine Speed (rpm)	580 630
	Rail Pressure (kPa)	-80000 -10000
	D.C.C.	D. T. M. H. EMM. OHD
70	P128E	Rail_pMeUnFltMin_CUR
	- · · · · · ·	
	Engine Speed (rpm)	580 630
	Rail Pressure (kPa)	0 15000
71	P0087	Rail_pPCVDvtMax_CUR
	Engine Speed (rpm)	580 630
	Rail Pressure (kPa)	80000 11000
72	P128E	Rail_pPCVFltMin_CUR
	Engine Speed (rpm)	580 630
	Rail Pressure (kPa)	0 15000
		
73		SCRChk_facNOxUsDynMax_CUR

Nox Concentration (ppm)	0	400
factor (-)	0.51257324	1.025

P11CB SCRChk_idcPOpMaxNOxUsPlaus_GMAP

Injection Qty (mm^3/rev) / Engine Speed (rpm)	500	600	700	800	900	1000	1100	1200	1400	1600	1800	2000	2001	2500	2600	3000
40	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
60	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
80	0	0	0	0	0	0	0	1	1	1	1	1	0	0	0	0
120	0	0	0	0	0	0	0	1	1	1	1	1	0	0	0	0
160	0	0	0	0	0	0	0	1	1	1	1	1	0	0	0	0
200	0	0	0	0	0	0	0	1	1	1	1	1	0	0	0	0
200.4	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
260	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

P11CC SCRChk_idcPOpMinNOxUsPlaus_GMAP

Injection Qty (mm^3/rev) / Engine Speed (rpm)	500	600	700	800	900	1000	1100	1200	1400	1600	1800	2000	2001	2500	2600	3000
40	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
60	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
80	0	0	0	0	0	0	0	1	1	1	1	1	0	0	0	0
120	0	0	0	0	0	0	0	1	1	1	1	1	0	0	0	0

Table no.	Fault Codes	Label (Interna	al Manufa	cturer F	Reference)											
	160	0	0	0	0	0	0	0	1	1	1	1	0	0	0	0
	200	0	0	0	0	0	0	0	1	1 1	1	1	0	0	0	0
	200.4	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
	260	0	0	0	0	0	0	0	0 (0	0	0	0	0	0	0

76 P20EE

SCRChk_mEstNH3LdMax_CUR

SCR Temperature (°C)	199.96	249.96	274.96	299.96	324.96	349.96	399.96	439.96
Ammonia Load (g)	2.7	2.7	2.7	1.65	1.45	1.35	0.53	0.2

77 P20EE

SCRChk_mEstNH3LdMin_CUR

SCR Temperature (°C)	199.96	249.96	274.96	299.96	324.96	349.96	399.96	439.96
Ammonia Load (g)	1.3	1.15	1.05	0.75	0.6	0.16	0.1	0.06

78 P20EE

SCRChk_mNH3LdDvtMax_CUR

SCR Temperature (°C)	199.96	248.96	274.96	299.96	324.96	349.96	399.96	439.96
Ammonia Load (g)	0.2	0.2	0.2	0.18	0.15	0.15	0.08	0.05

79 P20EE

 ${\sf SCRChk_mNH3LdDvtMin_CUR}$

SCR Temperature (°C)	199.96	249.96	274.96	299.96	324.96	349.96	399.96	439.96
Ammonia Load (g)	-0.35	-0.35	-0.35	-0.25	-0.15	-0.125	-0.1	-0.05

80 P11CC

 ${\sf SCRChk_rNOxDiffThresBasMinUs_GMAP}$

Injection Qty (mm^3/rev) / Engine Speed (rpm)	800	900	1000	1200	1400	1600	1800	2000	2001	2400
40	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1
60	-1	-1	-1	-0.4924	-0.4916	-0.4932	-0.4795	-0.4905	-0.4905	-1
80	-1	-1	-1	-0.4924	-0.4916	-0.4932	-0.4795	-0.4905	-0.4905	-1
120	-1	-1	-1	-0.4862	-0.4645	-0.4934	-0.4974	-0.4832	-0.4832	-1
160	-1	-1	-1	-0.4923	-0.5088	-0.4922	-0.4971	-0.4718	-0.4718	-1
200	-1	-1	-1	-0.5188	-0.4822	-0.4965	-0.507	-0.4894	-0.4894	-1
200.4	-1	-1	-1	-0.5188	-0.4822	-0.4965	-0.507	-0.4894	-0.4894	-1
220	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1
240	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1
260	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1

81 P11CB, P11CC

SCRChk_stExhTempRlsUsPlaus_CUR

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

 Table no.
 Fault Codes
 Label (Internal Manufacturer Reference)

 82
 P11CB, P11CC
 SCRChk_stlnjCharNOxUsPlaus_CA

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

83 P20EE

SCRChk_stPOpSelEta1_MAP

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

84 P2BAD

SCRChk_stPOpSelEta2_MAP

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

5 P20EE

SCRChk_tDeltaTempSCRMax_CUR

Filtered SCR Temp (°C) -50.0	4	199.96	249.96	299.96	349.96	399.96	499.96	999.96
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abla na	Fault Codes	Label (Inte	rnal Manus	ooturer B	oforonoo				
	Delta SCR Temp (°C)	69.9			55.16	47.96	29.96	23.96	23.96
L	Delia SCR Temp (C)	09.8	74.90	05.90	55.16	47.90	29.90	23.90	23.90
86	P20EE, P2BAD	SCRChk_tl	DiffSCRCat	Max_CUR	1				
_									
	Filtered SCR Temp (°C)	-0.0	99.96	149.96	199.96	239.96	259.96	264.96	399.96
	Delta SCR Temp (°C)	74.9	74.96	74.96	74.96	74.96	74.96	74.96	74.96
87	P20EE, P2BAD	SCRChk_tl	DiffSCRCat	Min_CUR					
Г	Filtered 000 Terre (00)	1 0	1 00 00	440.00	400.00	0.40.00	050.00	0.40.00	000.00
F	Filtered SCR Temp (°C) Delta SCR Temp (°C)	-0.0			199.96 -0.04	249.96 -40.04	259.96 -40.04	349.96 -40.04	399.96 -40.04
L	Delia SCK Tellip (C)	-0.0	14 -0.04	-0.04	-0.04	-40.04]	-40.04	-40.04	-40.04
88	P20EE, P2BAD	SCRChk ti	AddDisbl M	1AP					
	•	_	_						
	Nox Peak Duration (s) / Nox Mass Flow (g/s)		0.04	0.08	0.12	0.16	0.2	0.24	0.3
		0	0 0	0	0.5	1	4	20	40
		1	0 0		0.8	1.5	15	30	47
		3	1 1.5		2	3	20	40	55
		4	2 3		5	10	40	55	60
		6	5 7.5		20	25	60	65	70
			8 25	35	35	45	65	70	75
			25 40		50	60	70	75	80
L		60 4	10 45	50	55	65	75	80	85
89	P229F	SCRChk_ti	PookMovDI	v CLID					
09	F229F	SCRCIK_II	reakiviaxDi	y_COR					
Г	Exhaust Mass Flow (g/sec)	83.3	3 111.11	125.00	138.89	152.78	166.67	194.44	277.78
	Delay Time (sec)		.5 5		4.5	4.5	4.5	4.5	4.5
	200) 71110 (000)								
90	P10D0	SCRPOD_	MaxDiff_Cl	JR					
.=									
	Engine Off Time (sec)		0 299	300	28799	28800	32000	32500	32767
L	Delta Temperature (°C)	3276	.7 3276.7	3276.7	3276.7	30	30	30	30
		0.0							
91	Engine Running	StSys_nStr	tCutOut_M	AP					
			14 20 04	10.04	-10.04	0.00	40.00	29.96	39.96
Г	DADO D	40.4				9.96	19.96	29.961	39.961
Ī	BARO Pressure (kPa) / ECT at Start (°C)	-40.0		-16.04					
		65 85	800	735	735	735	735	675	600
		65 85 70 85	800 800 800	735 735	735 735	735 735	735 735	675 675	600 600
		65 85 70 85 75 85	800 800 800 800 800	735 735 735	735 735 735	735 735 735	735 735 735	675 675 675	600 600
		65 85 70 85 75 85 80 85	60 800 60 800 60 800 60 800 60 800	735 735 735 735	735 735 735 735	735 735 735 735	735 735 735 735	675 675 675 675	600 600 600
-		65 85 70 85 75 86 80 85 85 85	800 800 </th <th>735 735 735 735 735</th> <th>735 735 735 735 735</th> <th>735 735 735 735 735</th> <th>735 735 735 735 735</th> <th>675 675 675 675 675</th> <th>600 600 600 600</th>	735 735 735 735 735	735 735 735 735 735	735 735 735 735 735	735 735 735 735 735	675 675 675 675 675	600 600 600 600
		65 89 70 89 75 89 80 89 85 89 90 83	60 800 60 800 60 800 60 800 60 800 60 800 34 790	735 735 735 735 735 735 720	735 735 735 735 735 735 720	735 735 735 735 735 735 720	735 735 735 735 735 735 720	675 675 675 675 675 675	600 600 600 600 600
		65 85 70 85 75 86 80 85 85 85	60 800 60 800 60 800 60 800 60 800 60 800 84 790 34 790	735 735 735 735 735 735 720 720	735 735 735 735 735	735 735 735 735 735	735 735 735 735 735	675 675 675 675 675	600 600 600 600

·													
							ference)	cturer Re	Manufa	Label (Internal	It Codes	ble no. Fau	Table
								R	olDly_CU	TrbCh_tiDiaEnt	98, P2599	92 P25	92
				59.96 30	39.96 50	19.96 60	9.96 100	-0.04 120	-20.04 210	-30.04 327.67	Γ (°C) ay Time (sec)		
									s_CA	ZFC_stGearRls	CB, P01CD, P01D7, P01D9, P01D1, P01D3, P01D5, CF, P01CC, P01CE, P01D8, P01DA, P01D2, P01D4, D6, P01D0	P01	93
	8	7 8	7	6	5	4	3	2	1	0	ar (-)	Gea	
	0)] 0]	0	1]	1]	1]	1	0	0	0		<u> -</u>	
									n_CUR	ZFC_tiCldCham	CB, P01CD, P01D7, P01D9, P01D1, P01D3, P01D5, CF, P01CC, P01CE, P01D8, P01DA, P01D2, P01D4, D6, P01D0	P01	94
	6.86 86.86 96.86 106.86	76.86	66.86	56.86	46.86	36.86	26.86	16.86	9.96	0.06	Γ (°C)	EC	
	30 30 30 30	30	30	30	30	30	27	20	15	5	e (sec)	Tim	
											3A	95 P11	95
				32500	32000	28800	28799	300	299	0	ine Off Time (sec)		
)	30	30	30	30	3276.7	3276.7	3276.7	3276.7	a Temperature (°C)	Delt	
		76.86	30	56.86	30	30	26.86	16.86 20	9.96 15	ZFC_tiCldCham	D6, P01D0 CB, P01CD, P01D7, P01D9, P01D1, P01D3, P01D5, CF, P01CC, P01CE, P01D8, P01DA, P01D2, P01D4, D6, P01D0 F (°C) e (sec)	94 P01 P01 P01 ECT Tim	

96 P054E

InjCtl_qDesGearMonMin_MAP

ECT (°C) / Engine Speed (rpm	0	400	600	800	1000	5000
-20.04	148	148	148	148	148	148
-10.04	117.2	117.2	117.2	117.2	117.2	117.2
-0.04	94	94	94	94	94	94
19.96	72	72	72	72	72	72
39.96	52.4	52.4	52.4	52.4	52.4	52.4
69.96	44	44	44	57.6	57.6	57.6

end S1-14OBDG10 - Calibration Tables

Calibration Parameter Definition - Calibration Tables

Table no. Fault Codes

Label (Internal Manufacturer Reference)

Status and State Calibration Tables

Table no. Status or State

Label (Internal Manufacturer Reference)

1 Status of NOx signal of upstream NOx sensor

DewDet_wThresLSU0_MAP

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

2 Status of NOx signal of downstream NOx sensor

DewDet_wThresLSU1_MAP

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

3 Status thermal regeneration active

PFltLd_dmSotSimRgnBas_CUR

DPF Soot Mass (g)	0	10	20	30	40	50	55	60	65	70	75	80
Mass Flow (g/s)	0.01	0.03	0.05	0.09	0.12	0.13	0.14	0.15	0.16	0.18	0.19	0.20

4 Status thermal regeneration active

PFltLd_facO2SimRgn_MAP

Exhaust Mass Flow (g/s) / Lambda (-)	1	1.2	1.35	1.5	2	2.5	3	25
0.00	0	0.53	0.83	1.07	1.62	1.96	2.19	3.21
2.78	0	0.55	0.87	1.12	1.70	2.05	2.29	3.37
5.56	0	0.55	0.87	1.12	1.70	2.05	2.29	3.37
8.33	0	0.55	0.87	1.12	1.70	2.05	2.29	3.37
11.11	0	0.58	0.91	1.18	1.79	2.16	2.41	3.40
13.89	0	0.58	0.91	1.18	1.79	2.16	2.41	3.40

Table no.	Fault Codes	Label	(Interna	al Manufa	acturer R	eference)			
	25	00	0	0.58	0.91	1.18	1.79	2.16	2.41	3.40
	36	11	0	0.62	0.97	1.26	1.91	2.30	2.57	3.40

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	0.05	0.10	0.20	0.34	0.60	1.03	1.72	2.81

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

Rail Control - Metering Unit + PCV Closed Loop Control Rail_qMeUnCtlType_CUR

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

Status of the SCR adaptation plausibility check active 8

SCRAd_mNH3MinTrg_MAP

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

Overdosing detected

SCRAd_mNOxOvrMetPh3_CUR

SCR Avg. Temp (°C)	249.96	299.96	349.96	424.96
Nox Mass (g)	-0.7	-0.6	-0.6	-0.6

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

ble no.	Fault Codes	Label (Intern		acturer Re	ference)								
	180		1	1	1	1	1	1	1	1	1	1	
	200		1	1	1	1	1	1	1	1	1	1	
	2200			1	1	1	1	1	1	1	1	1	
	2400		1	1	1	1	1	1	1	1	1	1	
	2800		1	1	1	1	1	1	1	1	1	1	
	310	' '		- 1			- 1	- 1	- 1	- '	- ' '	- 1	
11	Request for pre controlled dosing	SCRFFC_stN 104	IQntCurrH 136	i_MAP 160	192	216	256	320	408	480	720	800	80
	Engine Speed (rpm) / Injection Qty. (mm^3/rev)	26		40	48	54	64	80	102	120	180	200	20
	800	+		7	7	7	7	7	7	7	7	7	
	120			7	7	7	7	7	7	7	7	7	
	140	7	7	7	7	7	7	7	7	7	7	7	
	147			7	7	7	7	7	7	7	7	7	
	170			7	7	7	7	7	7	7	7	7	
	200			7	7	7	7	7	7	7	7	7	
	2200			7	7	7	7	7	7	7	7	7	
	2400			7	7	7	7	7	7	7	7	7	
	2600			7	7	7	7	7	7	7	7	7	
	2800			7	7	7	7	7	7	7	7	7	
	300			7	7	7	7	7	7	7	7	7	
12	Request for pre controlled dosing	SCRFFC_stN		7	7	7	7	7	7	7	7	7	
12	Request for pre controlled dosing	SCRFFC_stN	IQntCurrM	lid_MAP	•				7	•		•	20
12		SCRFFC_stN	IQntCurrM		48	54	64	80 10		7 120 10	7 180 10	200	20
12	Request for pre controlled dosing Engine Speed (rpm) / Injection Qty. (mm/3/rev)	SCRFFC_stN 26	IQntCurrM 34 2	lid_MAP	48	54	64	80	102	120	180	200	20
12	Request for pre controlled dosing Engine Speed (rpm) / Injection Qty. (mm^3/rev)	SCRFFC_stN 26 0 2 10	IQntCurrM 34 2 10	lid_MAP 40 2	48	54	64	80 10	7 102 10	120 10	180 10	200	20
12	Request for pre controlled dosing Engine Speed (rpm) / Injection Qty. (mm^3/rev) 800 1200 1400 1479	SCRFFC_stN 26 26 10 20 10 10 10	34 2 10 10	40 2 10 10 10 10	48 2 10 10 8	54 3 10 10	64 10 10 10 4	80 10 10 10 4	102 10 10 10 2	120 10 10 10 2	180 10 10 10 2	200 10 10 10 2	20
12	Request for pre controlled dosing Engine Speed (rpm) / Injection Qty. (mm^3/rev) 800 1200 1400 1470	SCRFFC_stN 26 2 10 10 10 10 10 10 10	34 2 10 10 10	40 2 10 10 10	48 2 10 10 8 8	54 3 10 10 7 7	64 10 10 10 4 4	80 10 10 10 4 2	102 10 10 10 2 2	120 10 10 10 2 2	180 10 10 10 2 2	200 10 10 10 2 2	20
12	Request for pre controlled dosing Engine Speed (rpm) / Injection Qty. (mm^3/rev) 800 1200 1400 1470 2000	SCRFFC_stN 26 20 10 10 10 10 10 10 10 10 10	34 2 10 10 10 10	40 2 10 10 10 10	48 2 10 10 8 8 8	54 3 10 10 7 7	64 10 10 10 4 4 4	80 10 10 10 4 2	102 10 10 10 2 2 2	120 10 10 10 2 2 2	180 10 10 10 2 2 2	200 10 10 10 2 2 2	20
12	Request for pre controlled dosing Engine Speed (rpm) / Injection Qty. (mm^3/rev) 80 1200 1400 1473 1770 2000 2200 2200 2200 1400 1400 1473 1770	SCRFFC_stN	34 2 10 10 10 10 10	40 2 10 10 10 10 10	48 2 10 10 8 8 8	54 3 10 10 7 7 7	64 10 10 10 4 4 4 2	80 10 10 10 4 2 2	102 10 10 10 2 2 2 2	120 10 10 10 2 2 2 2	180 10 10 10 2 2 2 2	200 10 10 10 2 2 2 2	20
12	Request for pre controlled dosing Engine Speed (rpm) / Injection Qty. (mm^3/rev) 80 1200 1400 147: 1700 2000 2200 2400	SCRFFC_stN 26 27 10 10 10 10 10 10 10 10 10 1	34 2 10 10 10 10 10 10	40 2 10 10 10 10 10 8 8	48 2 10 10 8 8 8 8 6 6	54 3 10 10 7 7 7 7 4	64 10 10 10 4 4 4 2	80 10 10 10 4 2 2 2 2	102 10 10 10 2 2 2 2 2	120 10 10 10 2 2 2 2	180 10 10 10 2 2 2 2 2 2	200 10 10 10 2 2 2 2 2	
12	Request for pre controlled dosing Engine Speed (rpm) / Injection Qty. (mm^3/rev) 800 1200 1400 1470 2000 2200 2200 2400	SCRFFC_stN 26 0 2 10 10 10 10 10 10 10 10 10 1	34 2 10 10 10 10 10 10 10 10 10 8	40 40 2 10 10 10 10 8 8	48 2 10 10 8 8 8 8 6 6	54 3 10 10 7 7 7 7 4 4	64 10 10 10 4 4 4 2 2	80 10 10 10 4 2 2 2 2 2 2	102 10 10 10 2 2 2 2 2 2 2	120 10 10 10 2 2 2 2 2 2	180 10 10 10 2 2 2 2 2 2	200 10 10 10 2 2 2 2 2 2 2	
12	Request for pre controlled dosing Engine Speed (rpm) / Injection Qty. (mm^3/rev) 800 1200 1400 1470 2000 2200 2240 2600 2800	SCRFFC_stN 26 0 2 0 10 0 10 0 10 0 10 0 10 0 10 0 10	34 2 10 10 10 10 10 10 10 8 8	40 40 2 10 10 10 10 10 8 8	48 2 10 10 8 8 8 6 6 4	54 3 10 10 7 7 7 7 4 4 3 3	64 10 10 10 4 4 4 2 2 2	80 10 10 10 4 2 2 2 2 2 2 2	102 10 10 10 2 2 2 2 2 2 2	120 10 10 10 2 2 2 2 2 2 2	180 10 10 10 2 2 2 2 2 2 2	200 10 10 10 2 2 2 2 2 2 2 2 2	
12	Request for pre controlled dosing Engine Speed (rpm) / Injection Qty. (mm^3/rev) 800 1200 1400 1470 2000 2200 2200 2400	SCRFFC_stN 26 10 20 10 10 10 10 10 10 10 10	34 34 10 10 10 10 10 10 10 10 8 8	40 40 2 10 10 10 10 8 8	48 2 10 10 8 8 8 8 6 6	54 3 10 10 7 7 7 7 4 4	64 10 10 10 4 4 4 2 2	80 10 10 10 4 2 2 2 2 2 2	102 10 10 10 2 2 2 2 2 2 2	120 10 10 10 2 2 2 2 2 2	180 10 10 10 2 2 2 2 2 2	200 10 10 10 2 2 2 2 2 2 2	2
12	Request for pre controlled dosing Engine Speed (rpm) / Injection Qty. (mm^3/rev) 80 1200 1400 147: 1770 2000 2200 2200 2400 2600 2800 3000 3200 Request for pre controlled dosing Engine Speed (rpm) / Injection Qty. (mm^3/rev) 80 1200	SCRFFC_stN	34 2 10 10 10 10 10 10 10 10 10 8 8 8 8 8	40	48 22 10 10 8 8 8 8 6 6 6 4 4 4 4 5	54 3 10 10 7 7 4 4 3 3 3 4	64 10 10 10 4 4 4 2 2 2 2 2 4	80 10 10 10 4 2 2 2 2 2 2 2 2 4	102 10 10 10 2 2 2 2 2 2 2 2 4	120 10 10 10 2 2 2 2 2 2 2 2 4	180 10 10 10 2 2 2 2 2 2 2 2 4	200 10 10 10 2 2 2 2 2 2 2 2 5	
	Request for pre controlled dosing Engine Speed (rpm) / Injection Qty. (mm^3/rev) 80 1200 1400 147: 1700 2000 2200 2400 2800 2800 3000 3200 Request for pre controlled dosing Engine Speed (rpm) / Injection Qty. (mm^3/rev) 800 1200 1400	SCRFFC_stN	34 2 10 10 10 10 10 10 10	40	48 22 10 10 8 8 8 6 6 4 4 4 5	54 3 10 10 7 7 7 4 4 4 3 3 3 4	64 10 10 10 4 4 2 2 2 2 2 2 4	80 10 10 10 4 2 2 2 2 2 2 2 2 4	102 10 10 10 2 2 2 2 2 2 2 2 4	120 10 10 10 2 2 2 2 2 2 2 2 2 4	180 10 10 10 2 2 2 2 2 2 2 2 2 4	200 10 10 10 2 2 2 2 2 2 2 2 5	
	Request for pre controlled dosing Engine Speed (rpm) / Injection Qty. (mm^3/rev) 800 1200 1400 1470 1700	SCRFFC_stN	34 2 10 10 10 10 10 10 10 10 10 10 10 38 8 8 8 10 10 10 10 10 10 10 10 10 10 10 10 10	40	48 2 10 10 10 8 8 8 6 6 4 4 4 5	54 3 10 10 7 7 7 4 4 4 3 3 3 4 54 3 10 10 7 7 7 7 7 7 7 4 4 4 4 3 3 3 4 1 1 1 1 1 1 1 1 1 1 1 1 1	64 10 10 10 4 4 2 2 2 2 2 2 4	80 10 10 10 4 2 2 2 2 2 2 2 2 2 4 4 80 10 10 10 4 4 2 2 2 2 2 2 1 2 1 1 1 1 1 1 1 1 1 1	102 10 10 10 2 2 2 2 2 2 2 2 2 4	120 10 10 10 2 2 2 2 2 2 2 2 4	180 10 10 10 2 2 2 2 2 2 2 4 180 10 10 10 10 10 10 10 10 10 1	200 10 10 10 2 2 2 2 2 2 2 2 5	200
	Request for pre controlled dosing Engine Speed (rpm) / Injection Qty. (mm^3/rev) 80 1200 1400 147: 1700 2000 2200 2400 2800 2800 3000 3200 Request for pre controlled dosing Engine Speed (rpm) / Injection Qty. (mm^3/rev) 800 1200 1400	SCRFFC_stN	34 2 10 10 10 10 10 10 10 10 10 10 10 38 8 8 8 9 10 10 10 10 10 10 10 10 10 10 10 10 10	40	48 22 10 10 8 8 8 6 6 4 4 4 5	54 3 10 10 7 7 7 4 4 4 3 3 3 4	64 10 10 10 4 4 2 2 2 2 2 2 4	80 10 10 10 4 2 2 2 2 2 2 2 2 4	102 10 10 10 2 2 2 2 2 2 2 2 4	120 10 10 10 2 2 2 2 2 2 2 2 2 4	180 10 10 10 2 2 2 2 2 2 2 2 2 4	200 10 10 10 2 2 2 2 2 2 2 2 5	

Table no.	Fault Codes	Label (Intern	ıal Manuf	acturer R	eference))							
	220	0 10	10	8	6	4	2	0	0	0	0	0	3
	240	0 10	10	8	6	4	2	0	0	0	0	0	3
	260	0 10	8	6	4	3	0	0	0	0	0	0	3
	280	0 10	8	5	4	3	0	0	0	0	0	0	3
	300	0 10	8	5	4	3	0	0	0	0	0	0	3
	320	0 10	8	7	5	4	4	4	4	4	4	4	4

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	95.46	89.96
20	109.96	109.96	109.96	107.96	100.26	94.96
50	109.96	109.96	109.96	108.96	107.96	103.96
60	109.96	109.96	109.96	109.96	109.96	105.96
100	109.96	109.96	109.96	109.96	109.96	107.96
150	109.96	109.96	109.96	109.96	109.96	109.96

16 Release of tank heater circuit

UHC_tiC1Dfrst_CUR

Reductant Tank Temp. (°C)	-30.04	-18.04	-15.04	-11.04	-8.04	-0.04	4.96	5.06
Reductant Heater Time (sec)	3277	3277	3277	3277	300	300	300	0

7 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	-10.04	-8.04	-5.04	-0.14	-0.04
Reductant Heater Time (sec)	3276.7	3276.7	3000	600	300	300	200	0

Table no.	Fault Codes	Label (Internal Manufacturer Reference)		
19	Release of tank heater circuit	UHC_tiDfrstC3_CUR		
	[a]			1
	Reductant Tank Temp. (°C)		.04 -0.14	-0.04
	Reductant Heater Time (sec)	3276.7 3276.7 3000 600 300	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 90	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 90	0

end Calibration Parameter Definition - Calibration Tables

Active DTC P0016 - Crankshaft to Camshaft	P0191 - Fuel Rail Pressure Sensor	P0315 - Crankshaft Position System	l e	Inhibited DTCs										
Correlation P0045 - Turbocharger Boost	Performance P0234 - Turbocharger Engine	Variation Not Learned P0299 - Turbocharger Engine	P0401 - Exhaust Gas Recirculation	P0402 - Exhaust Gas Recirculation	1									
Control Circuit P0047 - Turbocharger Boost	Overboost P0234 - Turbocharger Engine	Underboost P0299 - Turbocharger Engine	Flow Insufficient P0401 - Exhaust Gas Recirculation	Flow Excessive P0402 - Exhaust Gas Recirculation										
Control Circuit Low Voltage P0048 - Turbocharger Boost	Overboost P0234 - Turbocharger Engine	Underboost P0299 - Turbocharger Engine	Flow Insufficient P0401 - Exhaust Gas Recirculation	Flow Excessive P0402 - Exhaust Gas Recirculation										
Control Circuit High Voltage PROSE - Turbocharger Boost High	Overboost P0234 - Turbocharger Engine	Underboost P0299 - Turbocharger Engine	Flow Insufficient P0401 - Exhaust Gas Recirculation	Flow Excessive P0402 - Exhaust Gas Recirculation	1									
Control Circuit Low Voltage P006F - Turbocharger Boost High	Overboost P0234 - Turbocharger Engine	Underboost P0299 - Turbocharger Engine	Flow Insufficient P0401 - Exhaust Gas Recirculation	Flow Excessive P0402 - Exhaust Gas Recirculation	P2510 - ECM Power Relay Circuit	ì								
Control Circuit High Voltage	Overboost	Underboost	Flow Insufficient	Flow Excessive	Performance				_					
P007C - CAC Temperature Sensor Circuit Low Voltage P007D - CAC Temperature	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						
	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						
P008F - Engine Coolant Temperature (ECT)-Fuel Temperature Not Plausible	P0101 - Mass Air Flow Sensor Performance													
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]									
P0098 - Intake Air Temperature Sensor 2 Circuit 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									
P00CA - Fuel Pressure Regulator 1 High Control Circuit High Voltage	P2510 - ECM Power Relay Circuit				='									
P0101 - Mass Air Flow Sensor		P0402 - Exhaust Gas Recirculation	P11CB - NOx Sensor Performance -	P11CC - NOv Sensor Performance -	P2002 - Diesel Particulate Filter	P2080 - Exhaust Temperature	P2084 - Exhaust Temperature	P242B - Exhaust Temperature	P2453 - Diesel Particulate Filter Differential Pressure Sensor	P2459 - Diesel Particulate Filter	P246F - Exhaust Temperature	P249D - Closed Loop Reductant Injection Control At Limit - Flow Too	P249E - Closed Loop Reductant Injection Control At Limit - Flow Too	1
Performance P0102 - Mass Air Flow Sensor	P0401 - Exhaust Gas Recirculation Flow Insufficient P0101 - Mass Air Flow Sensor	P0402 - Exhaust Gas Recirculation Flow Excessive P0234 - Turbocharger Engine	P11CB - NOx Sensor Performance - Signal High Bank 1 Sensor 1 P0299 - Turbocharger Engine	P11CC - NOx Sensor Performance - Signal Low Bank 1 Sensor 1 P0401 - Exhaust Gas Recirculation	P2002 - Diesel Particulate Filter (DPF) Low Efficiency P0402 - Exhaust Gas Recirculation	P2080 - Exhaust Temperature Sensor 1 Performance P2080 - Exhaust Temperature	P2084 - Exhaust Temperature Sensor 2 Performance P2084 - Exhaust Temperature	P242B - Exhaust Temperature Sensor 3 Performance P242B - Exhaust Temperature	Differential Pressure Sensor Performance P246F - Exhaust Temperature	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	
P0102 - Mass Air Flow Sensor Circuit Low P0103 - Mass Air Flow Sensor	P0101 - Mass Air Flow Sensor Performance P0101 - Mass Air Flow Sensor	Overboost P0234 - Turbocharger Engine P0234 - Turbocharger Engine	Underboost P0299 - Turbocharger Engine P0299 - Turbocharger Engine	Flow Insufficient P0401 - Exhaust Gas Recirculation P0401 - Exhaust Gas Recirculation	Flow Excessive P0402 - Exhaust Gas Recirculation	Sensor 1 Performance P2080 - Exhaust Temperature	Sensor 2 Performance P2084 - Exhaust Temperature P2084 - Exhaust Temperature	Sensor 3 Performance P242B - Exhaust Temperature P242B - Exhaust Temperature	Sensor 4 Performance P246F - Exhaust Temperature					
PO106 - Manifold Abrobite	Performance Portol - Mass Air Flow Sensor P0101 - Mass Air Flow Sensor	Overboost P0234 - Turbocharger Engine P0234 - Turbocharger Engine	Underboost P0299 - Turbocharger Engine	Flow Insufficient P0401 - Exhaust Gas Recirculation	Flow Excessive P0402 - Exhaust Gas Recirculation	Sensor 1 Performance	Sensor 2 Performance	Sensor 3 Performance	Sensor 4 Performance					
Pressure Sensor Performance P0107 - Manifold Absolute Pressure (MAP) Sensor Circuit	Performance	Overboost	Underboost	Flow Insufficient	Flow Excessive		F	I	1			1		
Pressure (MAP) Sensor Circuit Low Voltage P0108 - Manifold Absolute	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	P242B - Exhaust Temperature Sensor 3 Performance	P246F - Exhaust Temperature Sensor 4 Performance]		
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	P242B - Exhaust Temperature Sensor 3 Performance	P246F - Exhaust Temperature Sensor 4 Performance			
High Voltage P0112 - Intake Air Temperature	P0101 - Mass Air Flow Sensor	P0401 - Exhaust Gas Recirculation	P0402 - Exhaust Gas Recirculation	P040F - Exhaust Gas Recirculation	P2080 - Exhaust Temperature	P2084 - Exhaust Temperature	P20E2 - Exhaust Gas Temperature	P242B - Exhaust Temperature	P246F - Exhaust Temperature	anner a - unumana	and a second	1		
Sensor 1 Circuit Low	Performance	Flow Insufficient	Flow Excessive	(EGR) Temperature Sensor 1-2 Correlation P040F - Exhaust Gas Recirculation	Sensor 1 Performance	Sensor 2 Performance	(EGT) Sensors 1-2 not plausible	Sensor 3 Performance	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	(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					
P0117 - Engine Coolant	P0106 - Manifold Absolute Pressure	P0191 - Fuel Rail Pressure Sensor	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	P0281 - Cly 7 Balance System	P0284 - Cly 8 Balance System	P0299 - Turbocharger Engine	P0300 - Engine Misfire Detected	P0301 - Cylinder 1 Misfire Detected
P0117 - Engine Coolant	Sensor Performance	Performance	Overboost					P0401 - Exhaust Gas Recirculation	P0402 - Exhaust Gas Recirculation			P2080 - Exhaust Temperature	P2084 - Exhaust Temperature	P242B - Exhaust Temperature
Temperature Sensor Circuit Low	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	Flow Insufficient	Flow Excessive	P0506 - Idle Speed Low	P0507 - Idle Speed High	Sensor 1 Performance	Sensor 2 Performance	Sensor 3 Performance
P0117 - Engine Coolant Temperature Sensor Circuit Low	P246F - Exhaust Temperature Sensor 4 Performance													
P0118 - Engine Coolant	P0106 - Manifold Absolute Pressure	P0191 - Fuel Rail Pressure Sensor	P0234 - Turbocharger Engine Overhoost	P0263 - Clv 1 Balance System	P0266 - Clv 2 Balance System	P0269 - Clv 3 Balance System	P0272 - Clv 4 Balance System	P0275 - Clv 5 Balance System	P0278 - Clv 6 Balance System	P0281 - Clv 7 Balance System	P0284 - Clv 8 Balance System	P0299 - Turbocharger Engine	P0300 - Engine Misfire Detected	P0301 - Cylinder 1 Mistire Detected
remperature outland circuit riight	Sensor Performance	Performance			,	, ,	10212 - Oy 4 Dalla Ed Oyskill			10201 - Oly 7 Datable Oyselli				
P0118 - Engine Coolant 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
P0118 - Engine Coolant Temperature Sensor Circuit High	P246F - Exhaust Temperature Sensor 4 Performance													
P0128 - Engine Coolant	P0101 - Mass Air Flow Sensor	1												
Regulating Temperature	Performance			1			7							
P014C - HO2S Slow Response Rich to Lean Sensor 1	P0171 - Fuel Trim System Lean	P0172 - Fuel Trim System Rich	P026C - Injection Quantity Too Low	P026D - Injection Quantity Too High	P11CB - NOx Sensor Performance - Signal High Bank 1 Sensor 1	P11CC - NOx Sensor Performance - Signal Low Bank 1 Sensor 1								
P0171 - Fuel Trim System Lean	P11CB - NOx Sensor Performance - Signal High Bank 1 Sensor 1	P11CC - NOx Sensor Performance - Signal Low Bank 1 Sensor 1					=							
P0172 - Fuel Trim System Rich	P11CB - NOx Sensor Performance -	P11CC - NOx Sensor Performance -												
P0172 - Fuel Trim System Rich P0182 - Fuel Temperature Sensor	Signal High Bank 1 Sensor 1 P01CB - Cylinder 1 Injection Timing	Signal Low Bank 1 Sensor 1 P01CC - Cylinder 1 Injection Timing	P01CD - Cylinder 2 Injection Timing	Terror or a series and							I need and a second second			
1 Circuit Low P0182 - Fuel Temperature Sensor	Retarded P01D9 - Cylinder 8 Injection Timing Retarded	Advanced P01DA - Cylinder 8 Injection Timing	Retarded Retarded	P01CE - Cylinder 2 Injection Timing Advanced	P01CF - Cylinder 3 Injection Timing Retarded	P01D0 - Cylinder 3 Injection Timing Advanced	P01D1 - Cylinder 4 Injection Timing Retarded	P01D2 - Cylinder 4 Injection Timing Advanced	P01D3 - Cylinder 5 Injection Timing Retarded	P01D4 - Cylinder 5 Injection Timing Advanced	P01D5 - Cylinder 6 Injection Timing Retarded	P01D6 - Cylinder 6 Injection Timing Advanced	P01D7 - Cylinder 7 Injection Timing Retarded	P01D8 - Cylinder 7 Injection Timing Advanced
1 Circuit Low P0183 - Fuel Temperature Sensor	Retarded	Advanced P01CC - Cylinder 1 Injection Timing	PO1CD - Cylinder 2 Injection Timing	P01CE - Cylinder 2 Injection Timing	POTCE - Cylinder 3 Injection Timing	P01D0 - Cylinder 3 Injection Timing	P01D1 - Cylinder 4 Injection Timing	P01D2 - Cylinder 4 Injection Timing	P01D3 - Cylinder 5 Injection Timing	P01D4 - Cylinder 5 Injection Timing	P01D5 - Cylinder 6 Injection Timing	P01D6 - Cylinder 6 Injection Timing	P01D7 - Cylinder 7 Injection Timing	P01D8 - Cylinder 7 Injection Timing
1 Circuit High P0183 - Fuel Temperature Sensor	Retarded	Advanced P01DA - Cylinder 8 Injection Timing	Retarded	Advanced	Retarded	Advanced	Retarded	Advanced	Retarded	Advanced	Retarded	Advanced	Retarded	Advanced
1 Circuit High P0192 - Fuel Rail Pressure	Retarded P0191 - Fuel Rail Pressure Sensor	Advanced	J											
Sensor Circuit Low P0193 - Fuel Rail Pressure	Performance P0191 - Fuel Rail Pressure Sensor	1												
Sensor Circuit High P01F0 - Coolant Temperature Dropped Below Diagnostic	Performance P2181 - Engine Thermostat stuck	1												
Monitoring Temperature	open		P01CB - Cylinder 1 Injection Timing	P01CC - Cylinder 1 Injection Timing	P01CD - Cylinder 2 Injection Timing	P01CE - Cylinder 2 Injection Timing	P01CF - Cylinder 3 Injection Timina	P01D0 - Cylinder 3 Injection Timing	P01D1 - Cylinder 4 Injection Timing	P01D2 - Cylinder 4 Injection Timing	P01D3 - Cylinder 5 Injection Timina	P01D4 - Cylinder 5 Injection Timina	P01D5 - Cylinder 6 Injection Timing	P01D6 - Cylinder 6 Injection Timina
P0201 - Injector 1 Control Circuit	P0171 - Fuel Trim System Lean P01D7 - Cylinder 7 Injection Timing	P0172 - Fuel Trim System Rich P01D8 - Cylinder 7 Injection Timing	Retarded P01D9 - Cylinder 8 Injection Timing	Advanced P01DA - Cylinder 8 Injection Timing	Retarded	Advanced	Retarded	Advanced	Retarded	Advanced	Retarded	Advanced	Retarded	Advanced
P0201 - Injector 1 Control Circuit P0202 - Injector 2 Control Circuit	Retarded P0171 - Fuel Trim System Lean	Advanced P0172 - Fuel Trim System Rich	Retarded P01CB - Cylinder 1 Injection Timing	Advanced P01CC - Cylinder 1 Injection Timing	P026C - Injection Quantity Too Low P01CD - Cylinder 2 Injection Timing	P026D - Injection Quantity Too High P01CE - Cylinder 2 Injection Timing	P01CF - Cylinder 3 Injection Timing Retarded	P01D0 - Cylinder 3 Injection Timing	P01D1 - Cylinder 4 Injection Timing Retarried	P01D2 - Cylinder 4 Injection Timing Advanced	P01D3 - Cylinder 5 Injection Timing Retarded	P01D4 - Cylinder 5 Injection Timing Advanced	P01D5 - Cylinder 6 Injection Timing Retarried	P01D6 - Cylinder 6 Injection Timing Advanced
P0202 - Injector 2 Control Circuit P0202 - Injector 2 Control Circuit	P0171 - Fuel Trim System Lean P01D7 - Cylinder 7 Injection Timing	P01D8 - Cylinder 7 Injection Timing	Retarded P01D9 - Cylinder 8 Injection Timing	Advanced P01DA - Cylinder 8 Injection Timing	Retarded P026C - Injection Quantity Too Low	Advanced P026D - Injection Quantity Too High	110101000	Advanced	Retarded	Advanced	Retarded	Advanced	Retarded	Advanced
P0203 - Injector 3 Control Circuit	Retarded P0171 - Fuel Trim System Lean	Advanced P0172 - Fuel Trim System Rich	Retarded P01CB - Cylinder 1 Injection Timing	Advanced P01CC - Cylinder 1 Injection Timing		P01CE - Cylinder 2 Injection Timing		P01D0 - Cylinder 3 Injection Timing	P01D1 - Cylinder 4 Injection Timing	P01D2 - Cylinder 4 Injection Timing	P01D3 - Cylinder 5 Injection Timing	P01D4 - Cylinder 5 Injection Timing	P01D5 - Cylinder 6 Injection Timing	P01D6 - Cylinder 6 Injection Timing
P0203 - Injector 3 Control Circuit	P01D7 - Cylinder 7 Injection Timing		Retarded P01D9 - Cylinder 8 Injection Timing	P01DA - Cylinder 8 Injection Timing	P026C - Injection Quantity Too Low	Advanced P026D - Injection Quantity Too High	Ketarded	Advanced	Resarded	Advanced	Retarded	Advanced	Kesarded	Advanced
P0204 - Injector 4 Control Circuit	P0171 - Fuel Trim System Lean	P0172 - Fuel Trim System Rich	P01CB - Cylinder 1 Injection Timing Retarded	Advanced	P01CD - Cylinder 2 Injection Timing Retarded	P01CE - Cylinder 2 Injection Timing Advanced	P01CF - Cylinder 3 Injection Timing Retarded	P01D0 - Cylinder 3 Injection Timing Advanced	P01D1 - Cylinder 4 Injection Timing Retarded	P01D2 - Cylinder 4 Injection Timing Advanced	P01D3 - Cylinder 5 Injection Timing Retarded	P01D4 - Cylinder 5 Injection Timing Advanced	P01D5 - Cylinder 6 Injection Timing Retarded	P01D6 - Cylinder 6 Injection Timing Advanced
P0204 - Injector 4 Control Circuit		P01D8 - Cylinder 7 Injection Timing	P01D9 - Cylinder 8 Injection Timing Retarded	P01DA - Cylinder 8 Injection Timing Advanced	P026C - Injection Quantity Too Low	P026D - Injection Quantity Too High								
- 0234 - Ilijedidi 4 Control Circuit	P01D7 - Cylinder 7 Injection Timing Retarded	Advanced												P01D6 - Cylinder 6 Injection Timing
P0205 - Injector 5 Control Circuit	Retarded P0171 - Fuel Trim System Lean	Advanced P0172 - Fuel Trim System Rich	Retarded	P01CC - Cylinder 1 Injection Timing Advanced	P01CD - Cylinder 2 Injection Timing Retarded	P01CE - Cylinder 2 Injection Timing Advanced	P01CF - Cylinder 3 Injection Timing Retarded	P01D0 - Cylinder 3 Injection Timing Advanced	P01D1 - Cylinder 4 Injection Timing Retarded	P01D2 - Cylinder 4 Injection Timing Advanced	P01D3 - Cylinder 5 Injection Timing Retarded	P01D4 - Cylinder 5 Injection Timing Advanced	P01D5 - Cylinder 6 Injection Timing Retarded	Advanced
	Retarded	Advanced	Retarded P01D9 - Cylinder 8 Injection Timing Retarded	P01CC - Cylinder 1 Injection Timing Advanced P01DA - Cylinder 8 Injection Timing Advanced	P01CD - Cylinder 2 Injection Timing Retarded P026C - Injection Quantity Too Low	P01CE - Cylinder 2 Injection Timing Advanced P026D - Injection Quantity Too High	Retarded	Advanced	Retarded	Advanced	Retarded	Advanced	Retarded	Advanced
P0205 - Injector 5 Control Circuit P0205 - Injector 5 Control Circuit P0206 - Injector 6 Control Circuit	Retarded P0171 - Fuel Trim System Lean P01D7 - Cylinder 7 Injection Timing Retarded P0171 - Fuel Trim System Lean	Advanced P0172 - Fuel Trim System Rich P01D8 - Cylinder 7 Injection Timing Advanced P0172 - Fuel Trim System Rich	Retarded P01D9 - Cylinder 8 Injection Timing Retarded P01CB - Cylinder 1 Injection Timing Retarded	P01CC - Cylinder 1 Injection Timing Advanced P01DA - Cylinder 8 Injection Timing Advanced P01CC - Cylinder 1 Injection Timing	P01CD - Cylinder 2 Injection Timing Retarded P026C - Injection Quantity Too Low P01CD - Cylinder 2 Injection Timing Retarded	P01CE - Cylinder 2 Injection Timing Advanced P026D - Injection Quantity Too High P01CE - Cylinder 2 Injection Timing Advanced	Retarded P01CF - Cylinder 3 Injection Timing Retarded	P01D0 - Cylinder 3 Injection Timing Advanced P01D0 - Cylinder 3 Injection Timing Advanced	P01D1 - Cylinder 4 Injection Timing Retarded P01D1 - Cylinder 4 Injection Timing Retarded	P01D2 - Cylinder 4 Injection Timing Advanced P01D2 - Cylinder 4 Injection Timing Advanced	P01D3 - Cylinder 5 Injection Timing Retarded P01D3 - Cylinder 5 Injection Timing Retarded	Advanced	P01D5 - Cylinder 6 Injection Timing Retarded P01D5 - Cylinder 6 Injection Timing Retarded	Advanced
P0205 - Injector 5 Control Circuit P0205 - Injector 5 Control Circuit P0206 - Injector 6 Control Circuit P0206 - Injector 6 Control Circuit	Retarried P0171 - Fuel Trim System Lean P01D7 - Cylinder 7 hipothon Timing Retarded P0171 - Fuel Trim System Lean P01D7 - Cylinder 7 hipothon Timing Retarded	Advanced P0172 - Fuel Trim System Rich P0108 - Cylinder 7 Injection Timing Advanced P0172 - Fuel Trim System Rich P0108 - Cylinder 7 Injection Timing Advanced	Relarded P01D9 - Cylinder 8 Injection Timing Relarded P01CB - Cylinder 1 Injection Timing Relarded P01D9 - Cylinder 8 Injection Timing Relarded Relarded	P01CC - Cylinder 1 Injection Timing Advanced P01DA - Cylinder 8 Injection Timing Advanced P01CC - Cylinder 1 Injection Timing Advanced P01DA - Cylinder 8 Injection Timing Advanced Advanced	P01CD - Cylinder 2 Injection Timing Rotarded P026C - Injection Quantity Too Low P01CD - Cylinder 2 Injection Timing Retarded P026C - Injection Quantity Too Low	P01CE - Cylinder 2 Injection Timing Advanced P026D - Injection Quantity Too High P01CE - Cylinder 2 Injection Timing Advanced P026D - Injection Quantity Too High	Retarded P01CF - Cylinder 3 Injection Timing Retarded	Advanced P01D0 - Cylinder 3 Injection Timing Advanced	Retarded P01D1 - Cylinder 4 Injection Timing Retarded	Advanced P01D2 - Cylinder 4 Injection Timing Advanced	Retarded P01D3 - Cylinder 5 Injection Timing Retarded	Advanced P01D4 - Cylinder 5 Injection Timing Advanced	Retarded P01D5 - Cylinder 6 Injection Timing Retarded	Advanced P01D6 - Cylinder 6 Injection Timing Advanced
P0205 - Injector 5 Control Circuit P0205 - Injector 5 Control Circuit P0206 - Injector 6 Control Circuit P0206 - Injector 6 Control Circuit P0206 - Injector 6 Control Circuit	Retarded P0171 - Fuel Trim System Lean P01D7 - Cylinder 7 Injection Tilming Retarded P0171 - Fuel Trim System Lean P01D7 - Cylinder 7 Injection Tilming Retarded P0171 - Fuel Trim System Lean	Advanced P0172 - Fuel Trim System Rich P01D8 - Cylinder 7 liqection Timing Advanced P0172 - Fuel Trim System Rich P01D8 - Cylinder 7 liqection Timing Advanced P0172 - Fuel Trim System Rich	Retarded P01D9 - Cylinder 8 Injection Timing Retarded P01C8 - Cylinder 1 Injection Timing Retarded P01C8 - Cylinder 8 Injection Timing Retarded P01D9 - Cylinder 8 Injection Timing Retarded P01C8 - Cylinder 1 Injection Timing Retarded	P01CC - Cylinder 1 Injection Timing Advanced P01DA - Cylinder 8 Injection Timing Advanced P01CC - Cylinder 1 Injection Timing Advanced P01CC - Cylinder 8 Injection Timing Advanced P01DA - Cylinder 8 Injection Timing Advanced P01CC - Cylinder 1 Injection Timing Advanced	PO1CD - Cylinder 2 Injection Timing Retarded P026C - Injection Quantily Too Low PO1CD - Cylinder 2 Injection Timing Retarded P026C - Injection Quantily Too Low PO1CD - Cylinder 2 Injection Timing Retarded	P01CE - Cylinder 2 Injection Timing Advanced P026D - Injection Quantity Too High P01CE - Cylinder 2 Injection Timing Advanced P026D - Injection Quantity Too High P01CE - Cylinder 2 Injection Timing Advanced	Retarded P01CF - Cylinder 3 Injection Timing Retarded	Advanced P01D0 - Cylinder 3 Injection Timing Advanced	Retarded	Advanced P01D2 - Cylinder 4 Injection Timing Advanced	Retarded P01D3 - Cylinder 5 Injection Timing Retarded	Advanced P01D4 - Cylinder 5 Injection Timing Advanced	Retarded P01D5 - Cylinder 6 Injection Timing Retarded	Advanced P01D6 - Cylinder 6 Injection Timing Advanced
P0205 - Injector 5 Control Circuit P0205 - Injector 5 Control Circuit P0206 - Injector 6 Control Circuit P0206 - Injector 6 Control Circuit P0206 - Injector 7 Control Circuit P0207 - Injector 7 Control Circuit	Retainded P0111- Fuel Trim System Lean P0107 - Cylinder 7 Injection Timing Retainded P0110 - Leu Trim System Lean P0107 - Cylinder 7 Injection Timing Retainded P0171 - Fuel Trim System Lean P0171 - Fuel Trim System Lean P0177 - Oylinder 7 Injection Timing Retainded	Advanced P0172 - Fuel Trim System Rich P0108 - Cylinder 7 lejection Timing Advanced P0172 - Fuel Trim System Rich P0108 - Cylinder 7 lejection Timing Advanced P0172 - Fuel Trim System Rich P0108 - Cylinder 7 lejection Timing Advanced P0172 - Fuel Trim System Rich P0108 - Cylinder 7 lejection Timing Advanced	Retarded P0109 - Cylinder 8 Injection Timing Retarded P0108 - Cylinder 1 Injection Timing Retarded P0109 - Cylinder 1 Injection Timing Retarded P0109 - Cylinder 8 Injection Timing Retarded P0109 - Cylinder 1 Injection Timing Retarded P0109 - Cylinder 8 Injection Timing Retarded	POTCC: Cylinder 1 Injection Timing Advanced POTDA: Cylinder 8 Injection Timing Advanced POTDA: Cylinder 8 Injection Timing Advanced POTCC: Cylinder 1 Injection Timing Advanced POTDA: Cylinder 8 Injection Timing Advanced POTDA: Cylinder 8 Injection Timing Advanced POTDA: Cylinder 8 Injection Timing Advanced POTDA: Cylinder 8 Injection Timing Advanced	POTCD - Cylinder 2 Injection Timing Retarded POZ6C - Injection Quantily Too Low POTCD - Cylinder 2 Injection Timing Retarded POZ6C - Injection Quantily Too Low POTCD - Cylinder 2 Injection Quantily Too Low POTCD - Cylinder 2 Injection Timing Retarded POZ6C - Injection Quantily Too Low	POTCE - Cylinder 2 Injection Timing Advanced POZED - Injection Quantily Too High POTCE - Cylinder 2 Injection Timing Advanced POZED - Injection Quantily Too High POTCE - Cylinder 2 Injection Quantily Too High POTCE - Cylinder 2 Injection Timing Advanced POZED - Injection Quantily Too High	Retarded P01CF - Cylinder 3 Injection Timing Retarded P01CF - Cylinder 3 Injection Timing Retarded	Advanced P01D0 - Cylinder 3 Injection Timing Advanced P01D0 - Cylinder 3 Injection Timing Advanced	Retarded P01D1 - Cylinder 4 Injection Timing Retarded P01D1 - Cylinder 4 Injection Timing Retarded	Advanced P01D2 - Cylinder 4 Injection Timing Advanced P01D2 - Cylinder 4 Injection Timing Advanced	Relarded P01D3 - Cylinder 5 Injection Timing Retarded P01D3 - Cylinder 5 Injection Timing Retarded	Advanced P01D4 - Cylinder 5 Injection Timing Advanced P01D4 - Cylinder 5 Injection Timing Advanced	Retarded P01D5 - Cylinder 6 Injection Timing Retarded P01D5 - Cylinder 6 Injection Timing Retarded	P01D6 - Cylinder 6 Injection Timing Advanced P01D6 - Cylinder 6 Injection Timing Advanced
P0205 - Injector 5 Control Circuit P0205 - Injector 5 Control Circuit P0205 - Injector 6 Control Circuit P0205 - Injector 6 Control Circuit P0205 - Injector 6 Control Circuit P0207 - Injector 7 Control Circuit P0207 - Injector 7 Control Circuit P0208 - Injector 8 Control Circuit	Retarded P0171 - Fuel Trim System Lean P01D7 - Cylinder 7 Injection Tilming Retarded P0171 - Fuel Trim System Lean P01D7 - Cylinder 7 Injection Tilming Retarded P0171 - Fuel Trim System Lean	Advanced P0172 - Fuel Trim System Rich P0188 - Gyinder 7 lipiction Timing Advanced P0172 - Leaf Trim System Rich P0180 - Cylinder 7 lipiction Timing Advanced P0172 - Leaf Tim System Rich P0172 - Leaf Tim System Rich P0172 - Leaf Tim System Rich P0173 - Visual Tim System Rich P0173 - Fuel Tim System Rich P0173 - Fuel Tim System Rich	Retarded PO1D9 - Cylinder 8 Injection Timing Retarded PO1C8 - Cylinder 1 Injection Timing Retarded PO1D9 - Cylinder 8 Injection Timing Retarded PO1D9 - Cylinder 8 Injection Timing Retarded PO1C8 - Cylinder 1 Injection Timing Retarded PO1D9 - Cylinder 8 Injection Timing Retarded PO1C8 - Cylinder 8 Injection Timing Retarded PO1C8 - Cylinder 1 Injection Timing	POICC: -Cylinder I Injection Timing Advanced POIDA - Cylinder 8 Injection Timing POIDA - Cylinder 8 Injection Timing POIDA: -Cylinder 1 Injection Timing POIDA - Cylinder 8 Injection Timing Advanced POICC: -Cylinder 1 Injection Timing Advanced POIDA - Cylinder 8 Injection Timing Advanced POIDA - Cylinder 8 Injection Timing Advanced POIDA - Cylinder 8 Injection Timing	POTCD - Cylender 2 bijection Timing Retainfeld P026C - Injection Quantity Too Low P0TCD - Cylender 2 bijection Timing Retainfeld P026C - Injection Quantity Too Low P0TCD - Cylender 2 bijection Timing Retainfeld P026C - Injection Quantity Too Low P0TCD - Cylender 2 bijection Timing Retainfeld P026C - Injection Quantity Too Low P0TCD - Cylender 2 bijection Timing Retainfeld	POTCE - Cylinder 2 Injection Timing Adminisation POZED: Impection Quantity Too High POZED: Impection Quantity Too High POTCE - Cylinder 2 Injection Timing Adminisation Quantity Too High POTCE - Cylinder 2 Injection Timing Advanced POZED: Injection Quantity Too High POTCE - Cylinder 2 Injection Timing Adminisation POTCE - Cylinder 2 Injection Timing Adminisation Timing Admi	Retarded P01CF - Cylinder 3 Injection Timing Retarded P01CF - Cylinder 3 Injection Timing Retarded	Advanced P01D0 - Cylinder 3 Injection Timing Advanced P01D0 - Cylinder 3 Injection Timing Advanced	Retarded P01D1 - Cylinder 4 Injection Timing Retarded	Advanced P01D2 - Cylinder 4 Injection Timing Advanced P01D2 - Cylinder 4 Injection Timing Advanced	Relarded P01D3 - Cylinder 5 Injection Timing Retarded P01D3 - Cylinder 5 Injection Timing Retarded	Advanced P01D4 - Cylinder 5 Injection Timing Advanced P01D4 - Cylinder 5 Injection Timing Advanced	Retarded P01D5 - Cylinder 6 Injection Timing Retarded P01D5 - Cylinder 6 Injection Timing Retarded	P01D6 - Cylinder 6 Injection Timing Advanced P01D6 - Cylinder 6 Injection Timing Advanced
P0205 - Injector 5 Control Circuit P0205 - Injector 5 Control Circuit P0206 - Injector 6 Control Circuit P0206 - Injector 6 Control Circuit P0206 - Injector 7 Control Circuit P0207 - Injector 7 Control Circuit	Restanded PO117 - Fuel Trim System Lean PO107 - Cylridor 7 Ingestor Trimps PO107 - Cylridor 7 Ingestor Trimps PO107 - Cylridor 7 Ingestor Trimps PO107 - Cylridor 7 Ingestor Trimps Restanded PO107 - System 1 Trim System Lean PO107 - Cylridor 7 Ingestor Trimps PO107 - Cylridor 7 Ingestor Trimps PO107 - Cylridor 7 Ingestor Trimps PO107 - Cylridor 7 Ingestor Trimps PO107 - Cylridor 7 Ingestor Trimps PO107 - Cylridor 7 Ingestor Trimps PO107 - Cylridor 7 Ingestor Trimps PO107 - Cylridor 7 Ingestor Po107 - Cylridor 7 Ingestor Po107 - Cylridor 7 Ingestor Po107 - Cylridor 7 Ingestor Po107 - Cylridor 7 Ingestor Po107 - Cylridor 7 Ingestor Po107 - Cylridor 7 Ingestor Po107 - Cylridor 7 Ingestor Po107 - Cylridor 7 Ingestor Po107 - Cylridor 7 Ingestor Po107 - Cylridor 7 Ingestor Po107 - Cylridor 7 Ingestor Po107 - Cylridor 7 Ingestor Po107 - Cylridor 7 Ingestor Po107 - Cylridor 7 Ingestor Po107 - Cylridor 7 Ingestor Po107 - Cylridor 7 Ingestor Po107 - Cylridor 7 Ingestor Po107 - Cylridor 7 Ingestor Po107 - Cylridor 7 Ingestor 7 Ing	Advanced P0172 - Fuel Trim System Rich P0108 - Cytrider 7 lejection Times Advanced P0108 - Cytrider 7 lejection Times Advanced P0108 - Cytrider 7 lejection Times Advanced P0108 - Cytrider 7 lejection Times Advanced P0108 - Cytrider 7 lejection Timins P0108 - Cytrider 7 lejection Timins P0108 - Cytrider 7 lejection Timins P0108 - Cytrider 7 lejection Timins P0108 - Cytrider 7 lejection Timins P0108 - Cytrider 7 lejection Timins P0108 - Cytrider 7 lejection Timins P0108 - Cytrider 7 lejection Timins P0108 - Cytrider 7 lejection Timins P0108 - Cytrider 7 lejection Timins	Retarded P0109 - Cylinder 8 Injection Timing Retarded P0108 - Cylinder 1 Injection Timing Retarded P0109 - Cylinder 1 Injection Timing Retarded P0109 - Cylinder 8 Injection Timing Retarded P0109 - Cylinder 1 Injection Timing Retarded P0109 - Cylinder 8 Injection Timing Retarded	POICC: -Cylinder I Injection Timing Advanced POIDA - Cylinder 8 Injection Timing POIDA - Cylinder 8 Injection Timing POIDA: -Cylinder 1 Injection Timing POIDA - Cylinder 8 Injection Timing Advanced POICC: -Cylinder 1 Injection Timing Advanced POIDA - Cylinder 8 Injection Timing Advanced POIDA - Cylinder 8 Injection Timing Advanced POIDA - Cylinder 8 Injection Timing	POTCD - Cylinder 2 Injection Timing Retarded POZ6C - Injection Quantily Too Low POTCD - Cylinder 2 Injection Timing Retarded POZ6C - Injection Quantily Too Low POTCD - Cylinder 2 Injection Quantily Too Low POTCD - Cylinder 2 Injection Timing Retarded POZ6C - Injection Quantily Too Low	POTCE - Cylinder 2 Injection Timing Adminisor P026D - Injection Quantity Too High POTCE - Cylinder 2 Injection Timing Adminisor P026D - Injection Quantity Too High POTCE - Cylinder 2 Injection Timing Advanced P026D - Injection Quantity Too High P070E - Cylinder 2 Injection Timing Adminisor P070E - Cylinder 2 Injection Timing Adminisor P070E - Cylinder 2 Injection Timing Adminisor P070E - Cylinder 2 Injection Timing Adminisor P070E - Cylinder 2 Injection Timing Adminisor P070E - Cylinder 2 Injection Timing Adminisor P070E - Cylinder 2 Injection Timing Adminisor P070E - Cylinder 2 Injection Timing P070E - Cylinder 2 Injection Pining P070E - Cylinder 2 Injection P070E - P0	Retarded P01CF - Cylinder 3 Injection Timing Retarded P01CF - Cylinder 3 Injection Timing Retarded	Advanced P01D0 - Cylinder 3 Injection Timing Advanced P01D0 - Cylinder 3 Injection Timing Advanced	Retarded P01D1 - Cylinder 4 Injection Timing Retarded P01D1 - Cylinder 4 Injection Timing Retarded	Advanced P01D2 - Cylinder 4 Injection Timing Advanced P01D2 - Cylinder 4 Injection Timing Advanced	Relarded P01D3 - Cylinder 5 Injection Timing Retarded P01D3 - Cylinder 5 Injection Timing Retarded	Advanced P01D4 - Cylinder 5 Injection Timing Advanced P01D4 - Cylinder 5 Injection Timing Advanced	Retarded P01D5 - Cylinder 6 Injection Timing Retarded P01D5 - Cylinder 6 Injection Timing Retarded	P01D6 - Cylinder 6 Injection Timing Advanced P01D6 - Cylinder 6 Injection Timing Advanced
P0205 - Injector 5 Control Circuit P0205 - Injector 5 Control Circuit P0205 - Injector 6 Control Circuit P0206 - Injector 6 Control Circuit P0207 - Injector 7 Control Circuit P0207 - Injector 7 Control Circuit P0207 - Injector 7 Control Circuit P0208 - Injector 8 Control Circuit P0208 - Injector 8 Control Circuit	Retarded PO117 - Fall Tim System Lean PO107 - Cylinder 7 legactor Timer Retarded PO117 - Fall Time System Lean PO107 - Cylinder 7 legactor Timer Retarded PO117 - Cylinder 7 legactor Timer PO107 - Cylinder 7 leg	Advanced P012 - Leaf Tim System Rich P0108 - Cytrider 7 lipector Timing Advanced P0172 - Fuel Trim System Rich P0108 - Cytrider 7 lipector Timing Advanced P0172 - Fuel Trim System Rich P0108 - Cytrider 7 lipector Timing Advanced P0172 - Leaf Trim System Rich P0108 - Cytrider 7 lipector Timing Advanced P0172 - Leaf Timin System Rich P0108 - Cytrider 7 lipector Timing Advanced P0172 - Leaf Timin System Rich P0108 - Cytrider 7 lipector Timing Advanced P110C - NOX Sensor Performance - Sizeral Los Repir 1 Sensor 1	Retarded PO1D9 - Cylinder 8 Injection Timing Retarded PO1C8 - Cylinder 1 Injection Timing Retarded PO1D9 - Cylinder 8 Injection Timing Retarded PO1D9 - Cylinder 8 Injection Timing Retarded PO1C8 - Cylinder 1 Injection Timing Retarded PO1D9 - Cylinder 8 Injection Timing Retarded PO1C8 - Cylinder 8 Injection Timing Retarded PO1C8 - Cylinder 1 Injection Timing	POICC: -Cylinder I Injection Timing Advanced POIDA - Cylinder 8 Injection Timing POIDA - Cylinder 8 Injection Timing POIDA: -Cylinder 1 Injection Timing POIDA - Cylinder 8 Injection Timing Advanced POICC: -Cylinder 1 Injection Timing Advanced POIDA - Cylinder 8 Injection Timing Advanced POIDA - Cylinder 8 Injection Timing Advanced POIDA - Cylinder 8 Injection Timing	POTCD - Cylender 2 bijection Timing Retainfeld P026C - Injection Quantity Too Low P0TCD - Cylender 2 bijection Timing Retainfeld P026C - Injection Quantity Too Low P0TCD - Cylender 2 bijection Timing Retainfeld P026C - Injection Quantity Too Low P0TCD - Cylender 2 bijection Timing Retainfeld P026C - Injection Quantity Too Low P0TCD - Cylender 2 bijection Timing Retainfeld	POTCE - Cylinder 2 Injection Timing Adminisor P026D - Injection Quantity Too High POTCE - Cylinder 2 Injection Timing Adminisor P026D - Injection Quantity Too High POTCE - Cylinder 2 Injection Timing Advanced P026D - Injection Quantity Too High P070E - Cylinder 2 Injection Timing Adminisor P070E - Cylinder 2 Injection Timing Adminisor P070E - Cylinder 2 Injection Timing Adminisor P070E - Cylinder 2 Injection Timing Adminisor P070E - Cylinder 2 Injection Timing Adminisor P070E - Cylinder 2 Injection Timing Adminisor P070E - Cylinder 2 Injection Timing Adminisor P070E - Cylinder 2 Injection Timing P070E - Cylinder 2 Injection Pining P070E - Cylinder 2 Injection P070E - P0	Retarded P01CF - Cylinder 3 Injection Timing Retarded P01CF - Cylinder 3 Injection Timing Retarded	Advanced P01D0 - Cylinder 3 Injection Timing Advanced P01D0 - Cylinder 3 Injection Timing Advanced	Retarded P01D1 - Cylinder 4 Injection Timing Retarded P01D1 - Cylinder 4 Injection Timing Retarded	Advanced P01D2 - Cylinder 4 Injection Timing Advanced P01D2 - Cylinder 4 Injection Timing Advanced	Relarded P01D3 - Cylinder 5 Injection Timing Retarded P01D3 - Cylinder 5 Injection Timing Retarded	Advanced P01D4 - Cylinder 5 Injection Timing Advanced P01D4 - Cylinder 5 Injection Timing Advanced	Retarded P01D5 - Cylinder 6 Injection Timing Retarded P01D5 - Cylinder 6 Injection Timing Retarded	P01D6 - Cylinder 6 Injection Timing Advanced P01D6 - Cylinder 6 Injection Timing Advanced
P0205 - Injector S Control Circuit P0205 - Injector S Control Circuit P0206 - Injector S Control Circuit P0206 - Injector S Control Circuit P0206 - Injector S Control Circuit P0207 - Injector T Control Circuit P0207 - Injector T Control Circuit P0208 - Injector S Control Circuit P0208 - Injector S Control Circuit P0208 - Injector S Control Circuit P0208 - Injector S Control Circuit P0208 - Injector S Control Circuit	Restanded PO117 - Fall Tim System Lean PO107 - Cylrider 7 Ingeston Timeg Beatanded PO117 - Fall Time System Lean PO107 - Cylrider 7 Ingeston Timeg Restanded PO117 - Fall Time System Lean PO107 - Cylrider 7 Ingeston Timeg PO107 - Cylrider 7 Inge	Adjanced POTZ - Feel Tim System Rich POTZ -	Retarded PO1D9 - Cylinder 8 Injection Timing Retarded PO1C8 - Cylinder 1 Injection Timing Retarded PO1D9 - Cylinder 8 Injection Timing Retarded PO1D9 - Cylinder 8 Injection Timing Retarded PO1C8 - Cylinder 1 Injection Timing Retarded PO1D9 - Cylinder 8 Injection Timing Retarded PO1C8 - Cylinder 8 Injection Timing Retarded PO1C8 - Cylinder 1 Injection Timing	POICC: -Cylinder I Injection Timing Advanced POIDA - Cylinder 8 Injection Timing POIDA - Cylinder 8 Injection Timing POIDA: -Cylinder 1 Injection Timing POIDA - Cylinder 8 Injection Timing Advanced POICC: -Cylinder 1 Injection Timing Advanced POIDA - Cylinder 8 Injection Timing Advanced POIDA - Cylinder 8 Injection Timing Advanced POIDA - Cylinder 8 Injection Timing	POTCD - Cylender 2 bijection Timing Retainfeld P026C - Injection Quantity Too Low P0TCD - Cylender 2 bijection Timing Retainfeld P026C - Injection Quantity Too Low P0TCD - Cylender 2 bijection Timing Retainfeld P026C - Injection Quantity Too Low P0TCD - Cylender 2 bijection Timing Retainfeld P026C - Injection Quantity Too Low P0TCD - Cylender 2 bijection Timing Retainfeld	POTCE - Cylinder 2 Injection Timing Adminisor P026D - Injection Quantity Too High POTCE - Cylinder 2 Injection Timing Adminisor P026D - Injection Quantity Too High POTCE - Cylinder 2 Injection Timing Advanced P026D - Injection Quantity Too High P070E - Cylinder 2 Injection Timing Adminisor P070E - Cylinder 2 Injection Timing Adminisor P070E - Cylinder 2 Injection Timing Adminisor P070E - Cylinder 2 Injection Timing Adminisor P070E - Cylinder 2 Injection Timing Adminisor P070E - Cylinder 2 Injection Timing Adminisor P070E - Cylinder 2 Injection Timing Adminisor P070E - Cylinder 2 Injection Timing P070E - Cylinder 2 Injection Pining P070E - Cylinder 2 Injection P070E - P0	Retarded P01CF - Cylinder 3 Injection Timing Retarded P01CF - Cylinder 3 Injection Timing Retarded	Advanced P01D0 - Cylinder 3 Injection Timing Advanced P01D0 - Cylinder 3 Injection Timing Advanced	Retarded P01D1 - Cylinder 4 Injection Timing Retarded P01D1 - Cylinder 4 Injection Timing Retarded	Advanced P01D2 - Cylinder 4 Injection Timing Advanced P01D2 - Cylinder 4 Injection Timing Advanced	Relarded P01D3 - Cylinder 5 Injection Timing Retarded P01D3 - Cylinder 5 Injection Timing Retarded	Advanced P01D4 - Cylinder 5 Injection Timing Advanced P01D4 - Cylinder 5 Injection Timing Advanced	Retarded P01D5 - Cylinder 6 Injection Timing Retarded P01D5 - Cylinder 6 Injection Timing Retarded	P01D6 - Cylinder 6 Injection Timing Advanced P01D6 - Cylinder 6 Injection Timing Advanced

Active DTC				Inhibited DTCs					
P02E7 - Diesel Intake Air Flow Position Sensor Circuit Range	P0401 - Exhaust Gas Recirculation	P0402 - Exhaust Gas Recirculation	1	minbled DTCs					
Performance P02E8 - Diesel Intake Air Flow Position Sensor Circuit Low	Flow Insufficient P0234 - Turbocharger Engine Overboost	Flow Excessive 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
P02E9 - Diesel Intake Air Flow	P0234 - Turbocharger Engine	P0299 - Turbocharger Engine	P0401 - Exhaust Gas Recirculation Flow Insufficient	P0402 - Exhaust Gas Recirculation	Limit 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
Position Sensor Circuit High P02EB - Intake Air Flow Valve Control Motor Current	Overboost P0234 - Turbocharger Engine	Underboost P0299 - Turbocharger Engine	P0401 - Exhaust Gas Recirculation	P0402 - Exhaust Gas Recirculation	Limit P122D - Diesel Intake Air Flow Position Sensor Exceeded Learning	Sensor 1 Performance	Sensor 2 Performance	Sensor 3 Performance	Sensor 4 Performance
Performance P0335 - Crankshaft Position	Overboost P0102 - Mass Air Flow Sensor	Underboost P0103 - Mass Air Flow Sensor Circuit	Flow Insufficient P0191 - Fuel Rail Pressure Sensor	Flow Excessive P0315 - Crankshaft Position System	Limit P0506 - Idle Speed Low	P0507 - Idle Soeed High	1		
Sensor Circuit P0336 - Crankshaft Position Sensor Performance	Circuit Low P0102 - Mass Air Flow Sensor Circuit Low	High P0103 - Mass Air Flow Sensor Circuit High	Performance P0191 - Fuel Rail Pressure Sensor Performance	Variation Not Learned P0315 - Crankshaft Position System Variation Not Learned	P0506 - Idle Speed Low	P0507 - Idle Speed High	j		
P0340 - Carrishaft Position Sensor Circuit P0341 - Carrishaft Position	P0191 - Fuel Rail Pressure Sensor Performance P0191 - Fuel Rail Pressure Sensor	P0315 - Crankshaft Position System Variation Not Learned P0315 - Crankshaft Position System							
Sensor Performance P0400 - Exhaust Gas Recirculation (EGR) Flow	Performance P11CB - NOx Sensor Performance - Signal High Bank 1 Sensor 1	Variation Not Learned P11CC - NOx Sensor Performance - Signal Low Bank 1 Sensor 1	P249D - Closed Loop Reductant Injection Control At Limit - Flow Too	P249E - Closed Loop Reductant Injection Control At Limit - Flow Too					
Incorrect P0401 - Exhaust Gas	Signal High Bank 1 Sensor 1 P11CB - NOx Sensor Performance -	P11CC - NOv Sensor Performance -	Low P2080 - Exhaust Temperature	High P2084 - Exhaust Temperature	P242B - Exhaust Temperature	P2459 - Diesel Particulate Filter	P246F - Exhaust Temperature	P249D - Closed Loop Reductant	P249E - Closed Loop Reductant
Recirculation Flow Insufficient P0402 - Exhaust Gas	Signal High Bank 1 Sensor 1 P11CB - NOx Sensor Performance -	Signal Low Bank 1 Sensor 1 P11CC - NOv Sensor Performance -	Sensor 1 Performance P2080 - Exhaust Temperature	Sensor 2 Performance P2084 - Exhaust Temperature	Sensor 3 Performance P242B - Exhaust Temperature	Regeneration Frequency P2459 - Diesel Particulate Filter	Sensor 4 Performance P246F - Exhaust Temperature	Injection Control At Limit - Flow Too Low P249D - Closed Loop Reductant Injection Control At Limit - Flow Too	Injection Control At Limit - Flow Too High P249E - Closed Loop Reductant Injection Control At Limit - Flow Too
Recirculation Flow Excessive P0405 - Exhaust Gas	Signal High Bank 1 Sensor 1 P0401 - Exhaust Gas Recirculation	P11CC - NOx Sensor Performance - Signal Low Bank 1 Sensor 1 P0402 - Exhaust Gas Recirculation	Sensor 1 Performance P049D - EGR Control Position Not	Sensor 2 Performance P2080 - Exhaust Temperature	Sensor 3 Performance P2084 - Exhaust Temperature	Regeneration Frequency P242B - Exhaust Temperature	Sensor 4 Performance P246F - Exhaust Temperature	Injection Control At Limit - Flow Too Low	Injection Control At Limit - Flow Too High
Recirculation Position Sensor Circuit Low P0406 - Exhaust Gas	Flow Insufficient	Flow Excessive	Learned	Sensor 1 Performance	Sensor 2 Performance	Sensor 3 Performance	Sensor 4 Performance		
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 P0575 - Cruise Control Input	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 P057C - Brake Pedal Position	P0567 - Cruise Control Resume Switch Circuit P057D - Brake Pedal Position	P0568 - Cruise Control Set Switch Circuit							
Sensor Circuit High Voltage P057D - Brake Pedal Position Sensor Circuit Low Voltage	Sensor Circuit Low Voltage P057C - Brake Pedal Position Sensor Circuit High Voltage								
P0606 - Control Module Internal Performance	P2146 - Injector Positive Voltage Control Circuit Group 1	P2149 - Injector Positive Voltage Control Circuit Group 2	P2152 - Injector Positive Voltage Control Circuit Group 3	P2155 - Injector Positive Voltage Control Circuit Group 4					
P064C - Glow Plug Control Module Performance	P11DB - NOx Sensor Current Performance Bank 1 Sensor 1 P2127 - Accelerator Pedal Position	P2209 - N0x Heater Performance Bank 1 Sensor 1							
P0651 - 5 Volt Reference 2 Circuit P0697 - 5 Volt Reference 3 Circuit	Sensor 2 Circuit Low P2122 - Accelerator Pedal Position	(APP) Sensor 2 Circuit High Voltage P2123 - Accelerator Pedal Position							
P0851 - Park/Neutral Position (PNP) Switch Circuit Low Voltage	Sensor 1 Circuit Low P0852 - Park/Neutral Position (PNP) Switch Circuit High Voltage	Sensor 1 Circuit High	J						
P0852 - Park/Neutral Position (PNP) Switch Circuit High Voltage	P0851 - Park/Neutral Position (PNP) Switch Circuit Low Voltage								
P1048 - Reductant Injector High Control Circuit Low Voltage	P202E - Reductant Injector								
P1049 - Reductant Injector High Control Circuit High Voltage	P202E - Reductant Injector Performance	P2510 - ECM Power Relay Circuit 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 P1227 - Injector 2 Control Circuit	P0201 - Injector 1 Control Circuit	P0606 - Control Module Internal Performance P0606 - Control Module Internal	P2146 - Injector Positive Voltage Control Circuit Group 1 P2152 - Injector Positive Voltage	-					
Shorted P122A - Injector 3 Control Circuit Shorted	P0202 - Injector 2 Control Circuit P0203 - Injector 3 Control Circuit	Performance P0606 - Control Module Internal Performance	Control Circuit Group 3 P2155 - Injector Positive Voltage Control Circuit Group 4	1					
P122D - Diesel Intake Air Flow Position Sensor Exceeded	P0234 - Turbocharger Engine Overboost	P0299 - Turbocharger Engine Underboost	P0401 - Exhaust Gas Recirculation Flow Insufficient	P0402 - Exhaust Gas Recirculation Flow Excessive					
Learning Limit P1233 - Injector 4 Control Circuit Shorted P1236 - Injector 5 Control Circuit	P0204 - Injector 4 Control Circuit	P0606 - Control Module Internal Performance P0606 - Control Module Internal	P2146 - Injector Positive Voltage Control Circuit Group 1 P2152 - Injector Positive Voltage		-				
P1236 - Injector's Control Circuit Shorted P1239 - Injector 6 Control Circuit	P0205 - Injector 5 Control Circuit P0206 - Injector 6 Control Circuit	Public - Control Module Internal Performance P0606 - Control Module Internal Performance	P2152 - Injector Positive Voltage Control Circuit Group 3 P2149 - Injector Positive Voltage Control Circuit Group 2	1					
Shorted P1242 - Injector 7 Control Circuit Shorted	P0207 - Injector 7 Control Circuit	P0606 - Control Module Internal Performance	P2149 - Injector Positive Voltage Control Circuit Group 2]					
P1247 - Injector 8 Control Circuit Shorted P1258 - Fuel Pressure Regulator	P0208 - Injector 8 Control Circuit	P0606 - Control Module Internal Performance	P2155 - Injector Positive Voltage Control Circuit Group 4	J					
2 High Control Circuit High Voltage	P2510 - ECM Power Relay Circuit Performance		P249D - Closed Loop Reviews	P249E - Closed Loop Reviews	İ				
P140B - Exhaust Gas Recirculation Slow Response- Increasing Flow P140C - Exhaust Gas	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 P249D - Closed Loop Reductant	P249E - Closed Loop Reductant Injection Control At Limit - Flow Too High P249E - Closed Loop Reductant					
P140C - Exhaust Gas Recirculation Slow Response- Decreasing Flow P140F - Exhaust Gas Recirculation (EGR) Motor	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		ī	1		
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 P2002 - Diesel Particulate Filter	P11DB - NOx Sensor Current Performance Bank 1 Sensor 1 P2459 - Diesel Particulate Filter	P2209 - N0x Heater Performance Bank 1 Sensor 1							
(DPF) Low Efficiency	Regeneration Frequency	J							

Active DTC				Inhibited DTCs		
P2032 - Exhaust Gas Temperature (EGT) Sensor 2	P2080 - Exhaust Temperature Sensor 1 Performance	P2084 - Exhaust Temperature Sensor 2 Performance	P20E2 - Exhaust Gas Temperature (EGT) Sensors 1-2 not plausible	P2428 - Exhaust Gas High Temperature	P242B - Exhaust Temperature Sensor 3 Performance	
Circuit Low Voltage P2033 - Exhaust Gas Temperature (EGT) Sensor 2	P2080 - Exhaust Temperature	P2084 - Exhaust Temperature	P20E2 - Exhaust Gas Temperature (EGT) Sensors 1-2 not plausible	P2428 - Exhaust Gas High	P242B - Exhaust Temperature	
Circuit High Voltage P2047 - Reductant Injector Control	Sensor 1 Performance P202E - Reductant Injector	Sensor 2 Performance	(EGT) Sensors 1-2 not plausible	Temperature	Sensor 3 Performance	
Circuit P2048 - Reductant Injector Control Circuit Low Voltage	Performance P202E - Reductant Injector Performance		_			
Circuit Low Voltage P2049 - Reductant Injector Control Circuit High Voltage	P202E - Reductant Injector	P2510 - ECM Power Relay Circuit Performance	1	1		
P204B - Reductant Pump Pressure Sensor Performance	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	P20A1 - Reductant Purge Valve Performance		-		
Pressure Sensor Circuit Low P204D - Reductant Pump Pressure Sensor Circuit High P205C - Reductant Tank	Sensor Performance P204B - Reductant Pump Pressure Sensor Performance P20BA - Reductant Heater 1	Performance P20A1 - Reductant Purge Valve Performance	J			
Temperature Sensor Circuit Low P205D - Reductant Tank	P2058 - Reductant Heater 1 Performance P2058 - Reductant Tank	P20BA - Reductant Heater 1	1			
Temperature Sensor Circuit High	P205B - Reductant Tank Temperature Sensor Performance P204F - Reductant System	Performance	1	1	1	
P208A - Reductant Pump Control Circuit	Performance Bank 1 (cannot build	P20A1 - Reductant Purge Valve Performance	P20E8 - Reductant Pressure Too Low	P20E9 - Reductant Pressure Too High		
P208D - Reductant Pump Control Circuit High Voltage	P204F - Reductant System Performance Bank 1 (cannot build	P20A1 - Reductant Purge Valve Performance	P20E8 - Reductant Pressure Too Low	P20E9 - Reductant Pressure Too High	P2510 - ECM Power Relay Circuit Performance	
P20A0 - Reductant Purge Valve Control Circuit	P204F - Reductant System Performance Bank 1 (cannot build	P20A1 - Reductant Purge Valve	P20E8 - Reductant Pressure Too Low	P20E9 - Reductant Pressure Too High		
P20A2 - Reductant Purge Valve	P204F - Reductant System	P20A1 - Reductant Purge Valve	P20E8 - Reductant Pressure Too	P20E9 - Reductant Pressure Too		
Control Circuit Low Voltage	Performance Bank 1 (cannot build pump pressure) P204F - Reductant System	Performance P20A1 - Reductant Purge Valve	Low P20E8 - Reductant Pressure Too	High P20E9 - Reductant Pressure Too	P2510 - ECM Power Relay Circuit	
P20A3 - Reductant Purge Valve Control Circuit High Voltage P20CB - Exhaust Aftertreatment	Performance Bank 1 (cannot build pump pressure) P2510 - ECM Power Relay Circuit	Parformance	P20E8 - Reductant Pressure 100 Low	P2UE9 - Reductant Pressure 100 High	P2510 - EGM Power Relay Circuit Performance	
Fuel Injector Control Circuit	Performance					
Fuel Injector Control Circuit High Voltage P20E2 - Exhaust Gas	P2510 - ECM Power Relay Circuit Performance			1		
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	(APP) Sensor 1-2 Correlation P2138 - Accelerator Pedal Position					
Position (APP) Sensor 2 Circuit High Voltage P2146 - Injector Positive Voltage Control Circuit Group 1	(APP) Sensor 1-2 Correlation					
P2149 - Injector Positive Voltage	P0606 - Control Module Internal Performance P0606 - Control Module Internal					
Control Circuit Group 2 P2152 - Injector Positive Voltage	Performance P0606 - Control Module Internal					
Control Circuit Group 3 P2155 - Injector Positive Voltage Control Circuit Group 4	Performance P0606 - Control Module Internal Performance	P2146 - Injector Positive Voltage Control Circuit Group 1	P2149 - Injector Positive Voltage Control Circuit Group 2	P2152 - Injector Positive Voltage Control Circuit Group 3]	
P2200 - N0x Sensor Circuit Bank 1 Sensor 1	P11DB - NOx Sensor Current Performance Bank 1 Sensor 1	P2209 - N0x Heater Performance Bank 1 Sensor 1	P249D - Closed Loop Reductant Injection Control At Limit - Flow Too	P249E - Closed Loop Reductant Injection Control At Limit - Flow Too		
P2202 - N0x Sensor Circuit Low Bank 1 Sensor 1	P249D - Closed Loop Reductant Injection Control At Limit - Flow Too	P249E - Closed Loop Reductant Injection Control At Limit - Flow Too	Low	High	1	
P2203 - N0x Sensor Circuit High	Low P249D - Closed Loop Reductant Injection Control At Limit - Flow Too	High P249E - Closed Loop Reductant Injection Control At Limit - Flow Too	1			
Bank 1 Sensor 1 P2205 - N0x Heater Control	P11DB - NOx Sensor Current	Injection Control At Limit - Flow Too High P2209 - N0x Heater Performance	P249D - Closed Loop Reductant	P249E - Closed Loop Reductant Injection Control At Limit - Flow Too	1	
Circuit Bank 1 Sensor 1	Performance Bank 1 Sensor 1	Bank 1 Sensor 1	Injection Control At Limit - Flow Too Low	Injection Control At Limit - Flow Too High		
P2209 - N0x Heater Performance Bank 1 Sensor 1	P249D - Closed Loop Reductant Injection Control At Limit - Flow Too Low	P249E - Closed Loop Reductant Injection Control At Limit - Flow Too High]			
P220A - N0x Sensor Supply Voltage Out Of Range Bank 1	P11DB - NOx Sensor Current Performance Bank 1 Sensor 1	P2209 - N0x Heater Performance Bank 1 Sensor 1				
Sensor 1 P220B - N0x Sensor Supply Voltage Out Of Range Bank 1	P11DB - NOx Sensor Current Performance Bank 1 Sensor 1	P2209 - N0x Heater Performance Bank 1 Sensor 1	1			
Sensor 2 P2228 - Barometric Pressure	P0106 - Manifold Absolute Pressure	P0234 - Turbocharger Engine	P0299 - Turbocharger Engine	P0401 - Exhaust Gas Recirculation	P0402 - Exhaust Gas Recirculation Flow Excessive	F
Sensor Circuit Low P2229 - Barometric Pressure Sensor Circuit High	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	P
P2263 - Turbo Boost System Performance		P0106 - Manifold Absolute Pressure Sensor Performance	P0234 - Turbocharger Engine Overboost	P0299 - Turbocharger Engine Underboost	P0401 - Exhaust Gas Recirculation Flow Insufficient	F
P229E - NOx Sensor Circuit Bank 1 Sensor 2	P11AF - HO2S Performance - Signal High During Moderate Load Bank 1 Sensor 2	Low During Moderate Load Bank 1 Sensor 2	P249D - Closed Loop Reductant Injection Control At Limit - Flow Too Low	Injection Control At Limit - Flow Too High		
P229F - NOx Sensor Performance Bank 1 Sensor 2	Sensor 2 P249D - Closed Loop Reductant Injection Control At Limit - Flow Too Low	Sensor 2 P249E - Closed Loop Reductant Injection Control At Limit - Flow Too High				
P22A3 - NOx Heater Control Circuit Bank 1 Sensor 2	P11AF - HO2S Performance - Signal High During Moderate Load Bank 1	High P11B2 - HO2S Performance - Signal Low During Moderate Load Bank 1	P249D - Closed Loop Reductant Injection Control At Limit - Flow Too	P249E - Closed Loop Reductant Injection Control At Limit - Flow Too		
P22A7 - NOx Heater Performance	Sensor 2 P249D - Closed Loop Reductant Injection Control At Limit - Flow Too	Sensor 2 P249E - Closed Loop Reductant Injection Control At Limit - Flow Too	Low	High.	1	
Bank 1 Sensor 2 P2413 - Exhaust Gas Recirculation (EGR) System	Low P11CB - NOx Sensor Performance -	High P11CC - NOx Sensor Performance -	P249D - Closed Loop Reductant Injection Control At Limit - Flow Too	P249E - Closed Loop Reductant Injection Control At Limit - Flow Too	1	
Performance P242C - Exhaust Gas	Signal High Bank 1 Sensor 1	Signal Low Bank 1 Sensor 1	Low	Injection Control At Limit - Flow Too High	l	
Temperature (EGT) Sensor 3	P2428 - Exhaust Gas High Temperature	P242B - Exhaust Temperature Sensor 3 Performance	P246F - Exhaust Temperature Sensor 4 Performance]		
Circuit Low Voltage 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	P0234 - Turbocharger Engine	P0299 - Turbocharger Engine	P0401 - Exhaust Gas Recirculation	P0402 - Exhaust Gas Recirculation	P2002 - Diesel Particulate Filter	
Performance P2454 - Diesel Particulate Filter Differential Pressure Sensor	P2002 - Diesel Particulate Filter	P2453 - Diesel Particulate Filter Differential Pressure Sensor	Flow insufficient P2455 - Diesel Particulate Filter Differential Pressure Sensor Circuit	P2459 - Diesel Particulate Filter	(UPP) LOW Efficiency	
Circuit Low Voltage P2455 - Diesel Particulate Filter	(DPF) Low Efficiency	Performance P2453 - Diesel Particulate Filter	High Voltage P2454 - Diesel Particulate Filter	Regeneration Frequency		
Differential Pressure Sensor Circuit High Voltage P245A - Exhaust Gas	(DPF) Low Efficiency	Differential Pressure Sensor Performance	Differential Pressure Sensor Circuit Low Voltage P140A - EGR Cooler BY Pass	P2459 - Diesel Particulate Filter Regeneration Frequency		_
Recirculation (EGR) Cooler	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	
Bypass Valve Control Circuit P2463 - Diesel Particulate Filter - Soot Accumulation P2470 - Exhaust Gas	P2002 - Diesel Particulate Filter (DPF) Low Efficiency		,			
P2470 - Exhaust Gas Temperature (EGT) Sensor 4 Circuit Low Voltage	P2428 - Exhaust Gas High Temperature	P246F - Exhaust Temperature Sensor 4 Performance				
Circuit Low Voltage			4			

Active DTC				Inhibited DTCs										
P2471 - Exhaust Gas Temperature (EGT) Sensor 4 Circuit High Voltage	P2428 - Exhaust Gas High Temperature	P246F - Exhaust Temperature Sensor 4 Performance												
P2493 - EGR Cooler BY Pass Position Sensor Performance	P0401 - Exhaust Gas Recirculation Flow Insufficient	P0402 - Exhaust Gas Recirculation Flow Excessive												
P2494 - EGR Cooler BY Pass Position Sensor Circuit Low	P0234 - Turbocharger Engine Overboost	P0299 - Turbocharger Engine Underboost	P0401 - Exhaust Gas Recirculation Flow Insufficient	P0402 - Exhaust Gas Recirculation Flow Excessive	P140A - EGR Cooler BY Pass Position Sensor Exceded Learning Limit	P2080 - Exhaust Temperature Sensor 1 Performance	P2084 - Exhaust Temperature Sensor 2 Performance	P242B - Exhaust Temperature Sensor 3 Performance	P246F - Exhaust Temperature Sensor 4 Performance					
P2495 - EGR Cooler BY Pass Position Sensor Circuit High	P0234 - Turbocharger Engine Overboost	P0299 - Turbocharger Engine Underboost	P0401 - Exhaust Gas Recirculation Flow Insufficient	P0402 - Exhaust Gas Recirculation Flow Excessive	P140A - EGR Cooler BY Pass Position Sensor Exceded Learning Limit	P2080 - Exhaust Temperature Sensor 1 Performance	P2084 - Exhaust Temperature Sensor 2 Performance	P242B - Exhaust Temperature Sensor 3 Performance	P246F - Exhaust Temperature Sensor 4 Performance					
P249D - Closed loop Reductant Injection Control at Limit-Flow too high	P20EE - SCR Nox Catalyst Efficiency Below Threshold Bank 1									-				
P249E - Closed loop Reductant Injection Control at Limit-Flow too low	P20EE - SCR Nox Catalyst Efficiency Below Threshold Bank 1				_									
P2564 - Turbocharger Boost Control Position Sensor Circuit Low	P0234 - 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											
Fuel Level less than 15%	P0087 - Fuel Rail Pressure Too Low	P0088 - Fuel Rail Pressure Too High	P0191 - Fuel Rail Pressure Sensor Performance	P0263 - Cly 1 Balance System	P0266 - Cly 2 Balance System	P0269 - Cly 3 Balance System	P0272 - Cly 4 Balance System	P0275 - Cly 5 Balance System	P0278 - Cly 6 Balance System	P0281 - Cly 7 Balance System	P0284 - Cly 8 Balance System	P0300 - Engine Misfire Detected	P0301 - Cylinder 1 Misfire Detected	P0302 - Cylinder 2 Misfire Detected
Fuel Level less than 15%	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		P11B2 - HO2S Performance - Signal Low During Moderate Load Bank 1 Sensor 2	P128E - Fuel Rail Pressure Performance					

DTC			Additional Basic Fnable Conditions							
P0016 - Crankshaft to Camshaft	Engine not in afterrun mode (defined as	engine is not in standby state (standby state occurs after ECM initialization or	Engine is running which means the engine	engine is not in ready state (which is						
Correlation P003A - Turbocharger Boost Control Position Not Learned	engine speed greater than 0 rpm) Engine not in afterrun mode (defined as	state occurs after ECM initialization or following after-run) Engine speed greater than 600 to 850 rpm	speed is greater than 600 to 850 rpm engine is not in standby state (standby state occurs after ECM initialization or	a stall of the engine) 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				
P0045 - Turbocharger Boost	engine speed greater than 0 rpm) Engine not in afterrun mode (defined as	engine is not 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	a stall of the engine)				
Control Circuit	engine speed greater than 0 rpm)	following after-run)	3s	speed is greater than 600 to 850 rpm	-					
P0047 - Turbocharger Boost Control Circuit Low Voltage	Engine not in afterrun mode (defined as engine speed greater than 0 rpm)	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 3s	Engine is running which means the engine speed is greater than 600 to 850 rpm						
P0048 - Turbocharger Boost Control Circuit High Voltage	Engine not in afterrun mode (defined as engine speed greater than 0 rpm)	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 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)	ngine is running which means the engine speed is greater than 600 to 850 rpm	engine is not in ready state (which is active when the ignition is on or following a stall of the engine)			
P007D - CAC Temperature Sensor Circuit High Voltage	Engine not in afterrun mode (defined as engine speed greater than 0 rpm)	Engine speed greater than 600 to 850 rpm	engine is not 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)	ngine is running which means the engine speed is greater than 600 to 850 rpm	engine is not in ready state (which is active when the ignition is on or following a stall of the engine)			
P0087 - Fuel Rail Pressure Too Low	ambient air temperature is above -7 deg C	ambient pressure is above 74.8kPa	engine is not in ready state (which is active when the ignition is on or following a stall of the engine)							
P0088 - Fuel Rail Pressure Too High	ambient air temperature is above -7 deg C	ambient pressure is above 74.8kPa	engine is not in ready state (which is active when the ignition is on or following a stall of the engine)							
P008F - Engine Coolant Temperature (ECT)-Fuel Temperature Not Plausible	Engine not in afterrun mode (defined as engine speed greater than 0 rpm)	Engine speed greater than 600 to 850 rpm	engine is not in standby state (standby state 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)					
P0090 - Fuel Pressure Regulator 1 Control Circuit/Open	Engine not in afterrun mode (defined as engine speed greater than 0 rpm)	engine is not in standby state (standby state occurs after ECM initialization or following after-run)	battery voltage is above 11 V for at least 3s	Engine is running which means the engine speed is greater than 600 to 850 rpm						
P0091 - Fuel Pressure Regulator 1 Control Circuit Low	Engine not in afterrun mode (defined as engine speed greater than 0 rpm)	engine is not in standby state (standby state occurs after ECM initialization or following after-run)	battery voltage is above 11 V for at least 3s	Engine is running which means the engine speed is greater than 600 to 850 rpm	1					
P0092 - Fuel Pressure Regulator 1 Control Circuit High	Engine not in afterrun mode (defined as engine speed greater than 0 rpm)	engine is not in standby state (standby state occurs after ECM initialization or following after-run)	battery voltage is above 11 V for at least 3s	Engine is running which means the engine speed is greater than 600 to 850 rpm	1					
P0097 - Intake Air Temperature Sensor 2 Circuit Low	Engine not in afterrun mode (defined as engine speed greater than 0 rpm)	Engine speed greater than 600 to 850 rpm	engine is not in standby state (standby state occurs after ECM initialization or following after-run)	battery voltage is above 11 V for at least 3s	Engine Run Time greater than 10 seconds (engine speed greater than 600 to 850 rpm to indicate the engine is running)	ngine is running which means the engine speed is greater than 600 to 850 rpm	engine is not in ready state (which is active when the ignition is on or following a stall of the engine)			
P0098 - Intake Air Temperature Sensor 2 Circuit High	Engine not in afterrun mode (defined as engine speed greater than 0 rpm)	Engine speed greater than 600 to 850 rpm	engine is not in standby state (standby state occurs after ECM initialization or following after-run)	battery voltage is above 11 V for at least 3s	Engine Run Time greater than 10 seconds (engine speed greater than 600 to 850 rpm to indicate the engine is running)	ngine is running which means the engine speed is greater than 600 to 850 rpm	engine is not in ready state (which is active when the ignition is on or following a stall of the engine)			
P00C9 - Fuel Pressure Regulator 1 High Control Circuit Low Voltage	Engine not in afterrun mode (defined as engine speed greater than 0 rpm)	engine is not in standby state (standby state occurs after ECM initialization or following after-run)	battery voltage is above 11 V for at least 3s	Engine is running which means the engine speed is greater than 600 to 850 rpm						
P00CA - Fuel Pressure Regulator 1 High Control Circuit High Voltage	engine is not in standby state (standby state occurs after ECM initialization or	ionowing and runy								
P00EA - Intake Air Temperature IAT) Sensor 3 Circuit Low Voltage	Engine not in afterrun mode (defined as engine speed greater than 0 rpm)	Engine speed greater than 600 to 850 rpm	engine is not in standby state (standby state occurs after ECM initialization or following after-run)	battery voltage is above 11 V for at least 3s	Engine Run Time is greater than 10 seconds (engine speed greater than 600 to 850 rpm to indicate the engine is	ngine is running which means the engine speed is greater than 600 to 850 rpm	engine is not in ready state (which is active when the ignition is on or following a stall of the engine)			
P00EB - Intake Air Temperature (IAT) Sensor 3 Circuit High Voltage	Engine not in afterrun mode (defined as engine speed greater than 0 rpm)	Engine speed greater than 600 to 850 rpm	engine is not in standby state (standby state occurs after ECM initialization or following after-run)	battery voltage is above 11 V for at least 3s	Engine Run Time is greater than 10 seconds (engine speed greater than 600 Er to 850 rpm to indicate the engine is running)	ngine is running which means the engine speed is greater than 600 to 850 rpm	engine is not in ready state (which is active when the ignition is on or following a stall of the engine)			
P00F4 - Humidity Sensor Circuit Low	Engine not in afterrun mode (defined as engine speed greater than 0 rpm)	Engine speed greater than 600 to 850 rpm	engine is not in standby state (standby state occurs after ECM initialization or following after-run)	battery voltage is above 11 V for at least 3s	Engine Run Time is greater than 10 seconds (engine speed greater than 600 Er to 850 rpm to indicate the engine is running)	ngine is running which means the engine speed is greater than 600 to 850 rpm	engine is not in ready state (which is active when the ignition is on or following a stall of the engine)			
P00F5 - Humidity Sensor Circuit High	Engine not in afterrun mode (defined as engine speed greater than 0 rpm)	Engine speed greater than 600 to 850 rpm	engine is not in standby state (standby state occurs after ECM initialization or following after-run)	battery voltage is above 11 V for at least 3s	Engine Run Time is greater than 10 seconds (engine speed greater than 600 to 850 rpm to indicate the engine is running)	ngine is running which means the engine speed is greater than 600 to 850 rpm	engine is not in ready state (which is active when the ignition is on or following a stall of the engine)			
P00F6 - Humidity Sensor Circuit Intermittent/Erratic	Engine not in afterrun mode (defined as engine speed greater than 0 rpm)	Engine speed greater than 600 to 850 rpm	engine is not in standby state (standby state occurs after ECM initialization or following after-run)	battery voltage is above 11 V for at least 3s	Engine Run Time is greater than 10 seconds (engine speed greater than 600 to 850 rpm to indicate the engine is running)	ngine is running which means the engine speed is greater than 600 to 850 rpm	engine is not in ready state (which is active when the ignition is on or following a stall of the engine)			
P0101 - Mass Air Flow Sensor Performance	Engine not in afterrun mode (defined as engine speed greater than 0 rpm)	Engine speed greater than 600 to 850 rpm	engine is not in standby state (standby state occurs after ECM initialization or following after-run)	ambient air temperature is above -7 deg C	ambient pressure is above 74.8kPa	cattery 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)	
P0102 - Mass Air Flow Sensor Circuit Low	Engine not in afterrun mode (defined as engine speed greater than 0 rpm)	Engine speed greater than 600 to 850 rpm	engine is not in standby state (standby state occurs after ECM initialization or following after-run)	battery voltage is above 11 V for at least 3s	(engine speed greater than 600 to 850 rpm to indicate the engine is running)	ngine is running which means the engine speed is greater than 600 to 850 rpm	engine is not in ready state (which is active when the ignition is on or following a stall of the engine)			
P0103 - Mass Air Flow Sensor Circuit High	Engine not in afterrun mode (defined as engine speed greater than 0 rpm)	Engine speed greater than 600 to 850 rpm	engine is not in standby state (standby state occurs after ECM initialization or following after-run)	battery voltage is above 11 V for at least 3s	Engine Run Time greater than 10 seconds (engine speed greater than 600 to 850 rpm to indicate the engine is running) engine is not in ready state (which is	ngine is running which means the engine speed is greater than 600 to 850 rpm	engine is not in ready state (which is active when the ignition is on or following a stall of the engine)			
P0106 - Manifold Absolute Pressure Sensor Performance	Engine speed greater than 600 to 850 rpm	engine is not in standby state (standby state occurs after ECM initialization or following after-run)	battery voltage is above 11 V for at least 3s	Engine is running which means the engine speed is greater than 600 to 850 rpm	engine is not in ready state (which is active when the ignition is on or following a stall of the engine)					
P0107 - Manifold Absolute ressure (MAP) Sensor Circuit Low Voltage	Engine not in afterrun mode (defined as engine speed greater than 0 rpm)	Engine speed greater than 600 to 850 rpm	engine is not in standby state (standby state occurs after ECM initialization or following after-run)	battery voltage is above 11 V for at least 3s	Engine Run Time greater than 10 seconds (engine speed greater than 600 to 850 rpm to indicate the engine is running)	ngine is running which means the engine speed is greater than 600 to 850 rpm	engine is not in ready state (which is active when the ignition is on or following a stall of the engine)			
P0108 - Manifold Absolute Pressure (MAP) Sensor Circuit High Voltage	Engine not in afterrun mode (defined as engine speed greater than 0 rpm)	Engine speed greater than 600 to 850 rpm	engine is not in standby state (standby state occurs after ECM initialization or following after-run)	battery voltage is above 11 V for at least 3s		ngine is running which means the engine speed is greater than 600 to 850 rpm	engine is not in ready state (which is active when the ignition is on or following a stall of the engine)			
P0112 - Intake Air Temperature Sensor 1 Circuit Low	Engine not in afterrun mode (defined as engine speed greater than 0 rpm)	Engine speed greater than 600 to 850 rpm	engine is not in standby state (standby state occurs after ECM initialization or following after-run)	battery voltage is above 11 V for at least 3s	Engine Run Time greater than 10 seconds (engine speed greater than 600 to 850 rpm to indicate the engine is running)	ngine is running which means the engine speed is greater than 600 to 850 rpm	engine is not in ready state (which is active when the ignition is on or following a stall of the engine)			
P0113 - Intake Air Temperature Sensor 1 Circuit High	Engine not in afterrun mode (defined as engine speed greater than 0 rpm)	Engine speed greater than 600 to 850 rpm	engine is not in standby state (standby state occurs after ECM initialization or following after-run)	battery voltage is above 11 V for at least 3s	Engine Run Time greater than 10 seconds (engine speed greater than 600 to 850 rpm to indicate the engine is running)	ngine is running which means the engine speed is greater than 600 to 850 rpm	engine is not in ready state (which is active when the ignition is on or following a stall of the engine)			
P0117 - Engine Coolant Temperature Sensor Circuit Low	engine is not in standby state (standby state occurs after ECM initialization or following after-run) engine is not in standby state (standby	battery voltage is above 11 V for at least 3s								
P0118 - Engine Coolant Temperature Sensor Circuit High	state occurs after ECM initialization or following after-run)	battery voltage is above 11 V for at least 3s								
P0128 - Engine Coolant Temperature Below Thermostat	Engine not in afterrun mode (defined as engine speed greater than 0 rpm)	Engine speed greater than 600 to 850 rpm	engine is not in standby state (standby state occurs after ECM initialization or following after-run)	Engine is running which means the engine speed is greater than 600 to 850 rpm	engine is not in ready state (which is active when the ignition is on or following a stall of the engine)					

DTC			Additional Basic Enable Conditions						
			engine is not in standby state (standby	Manufacturer Enable Counter is zero		Engine Run Time greater than 10 seconds		engine is not in ready state (which is	
P0131 - HO2S Bank 1 Sensor 1 circuit low	Engine not in afterrun mode (defined as engine speed greater than 0 rpm)	Engine speed greater than 600 to 850 rpm	state occurs after ECM initialization or following after-run)	(value of 0 means ECM is locked and out of assembly plant mode)	battery voltage is above 11 V for at least 3s	(engine speed greater than 600 to 850 rpm to indicate the engine is running)	Engine is running which means the engine speed is greater than 600 to 850 rpm	active when the ignition is on or following a stall of the engine)	
P0132 - HO2S Bank 1 Sensor 1 circuit high	Engine not in afterrun mode (defined as engine speed greater than 0 rpm)	Engine speed greater than 600 to 850 rpm	engine is not in standby state (standby state occurs after ECM initialization or following after-run)	Manufacturer Enable Counter is zero (value of 0 means ECM is locked and out of assembly plant mode)	battery voltage is above 11 V for at least 3s	Engine Run Time greater than 10 seconds (engine speed greater than 600 to 850 rpm to indicate the engine is running)	Engine is running which means the engine speed is greater than 600 to 850 rpm	engine is not in ready state (which is active when the ignition is on or following a stall of the engine)	
P0137 - HO2S Bank 1 Sensor 2 circuit low	Engine not in afterrun mode (defined as engine speed greater than 0 rpm)	Engine speed greater than 600 to 850 rpm	engine is not in standby state (standby state occurs after ECM initialization or following after-run)	Manufacturer Enable Counter is zero (value of 0 means ECM is locked and out of assembly plant mode)	battery voltage is above 11 V for at least 3s	Engine Run Time greater than 10 seconds (engine speed greater than 600 to 850 rpm to indicate the engine is running)	Engine is running which means the engine speed is greater than 600 to 850 rpm	engine is not in ready state (which is active when the ignition is on or following a stall of the engine)	
P0138 - HO2S Bank 1 Sensor 2 circuit high	Engine not in afterrun mode (defined as engine speed greater than 0 rpm)	Engine speed greater than 600 to 850 rpm	engine is not in standby state (standby state occurs after ECM initialization or following after-run)	Manufacturer Enable Counter is zero (value of 0 means ECM is locked and out of assembly plant mode)	battery voltage is above 11 V for at least 3s	Engine Run Time greater than 10 seconds (engine speed greater than 600 to 850 rpm to indicate the engine is running)	Engine is running which means the engine speed is greater than 600 to 850 rpm	engine is not in ready state (which is active when the ignition is on or following a stall of the engine)	
P014C - HO2S Slow Response Rich to Lean Sensor 1	Engine not in afterrun mode (defined as engine speed greater than 0 rpm)	Engine speed greater than 600 to 850 rpm	engine is not in standby state (standby state occurs after ECM initialization or following after-run)	Manufacturer Enable Counter is zero (value of 0 means ECM is locked and out of assembly plant mode)	battery voltage is above 11 V for at least 3s	Engine Run Time is greater than 10 seconds (engine speed greater than 600 to 850 rpm to indicate the engine is running)	System is not in active regeneration mode	Engine is running which means the engine speed is greater than 600 to 850 rpm	engine is not in ready state (which is active when the ignition is on or following a stall of the engine)
P0171 - Fuel Trim System Lean	System is not in active regeneration mode		Į.		Į.	turning)	Į.		
P0172 - Fuel Trim System Rich	System is not in active regeneration mode	İ							
P0182 - Fuel Temperature Sensor 1 Circuit Low	Engine not in afterrun mode (defined as engine speed greater than 0 rpm)	Engine speed greater than 600 to 850 rpm	engine is not in standby state (standby state occurs after ECM initialization or following after-run)	battery voltage is above 11 V for at least 3s	Engine Run Time greater than 10 seconds (engine speed greater than 600 to 850 rpm to indicate the engine is running)	Engine is running which means the engine speed is greater than 600 to 850 rpm	engine is not in ready state (which is active when the ignition is on or following a stall of the engine)		
P0183 - Fuel Temperature Sensor 1 Circuit High	Engine not in afterrun mode (defined as engine speed greater than 0 rpm)	Engine speed greater than 600 to 850 rpm	engine is not in standby state (standby state occurs after ECM initialization or following after-run)	battery voltage is above 11 V for at least 3s	Engine Run Time greater than 10 seconds (engine speed greater than 600 to 850 rpm to indicate the engine is running)	Engine is running which means the engine speed is greater than 600 to 850 rpm	engine is not in ready state (which is active when the ignition is on or following a stall of the engine)		
P0191 - Fuel Rail Pressure Sensor Performance	engine is not in ready state (which is active when the ignition is on or following a stall of the engine)			l		l	3 and 2 and 2 and 2	l	
P0192 - Fuel Rail Pressure Sensor Circuit Low	engine is not in standby state (standby state occurs after ECM initialization or following after-run)	battery voltage is above 11 V for at least 3s							
P0193 - Fuel Rail Pressure Sensor Circuit High	engine is not in standby state (standby state occurs after ECM initialization or following after-run)	battery voltage is above 11 V for at least 3s							
P01CB - Cylinder 1 Injection Timing Retarded	ambient air temperature is above -7 deg C		engine is not in ready state (which is active when the ignition is on or following a stall of the engine)						
P01CC - Cylinder 1 Injection Timing Advanced	ambient air temperature is above -7 deg C	ambient pressure is above 74.8kPa	engine is not in ready state (which is active when the ignition is on or following a stall of the engine)						
P01CD - Cylinder 2 Injection Timing Retarded	ambient air temperature is above -7 deg C	ambient pressure is above 74.8kPa	engine is not in ready state (which is active when the ignition is on or following a stall of the engine)						
P01CE - Cylinder 2 Injection Timing Advanced	ambient air temperature is above -7 deg C	ambient pressure is above 74.8kPa	engine is not in ready state (which is active when the ignition is on or following a stall of the engine)						
P01CF - Cylinder 3 Injection Timing Retarded	ambient air temperature is above -7 deg C	ambient pressure is above 74.8kPa	engine is not in ready state (which is active when the ignition is on or following a stall of the engine)						
P01D0 - Cylinder 3 Injection Timing Advanced	ambient air temperature is above -7 deg C	ambient pressure is above 74.8kPa	engine is not in ready state (which is active when the ignition is on or following a stall of the engine)						
P01D1 - Cylinder 4 Injection Timing Retarded	ambient air temperature is above -7 deg C	ambient pressure is above 74.8kPa	engine is not in ready state (which is active when the ignition is on or following a stall of the engine)						
P01D2 - Cylinder 4 Injection Timing Advanced	ambient air temperature is above -7 deg C	ambient pressure is above 74.8kPa	engine is not in ready state (which is active when the ignition is on or following a stall of the engine)						
P01D3 - Cylinder 5 Injection Timing Retarded	ambient air temperature is above -7 deg C	ambient pressure is above 74.8kPa	engine is not in ready state (which is active when the ignition is on or following a stall of the engine) engine is not in ready state (which is						
P01D4 - Cylinder 5 Injection Timing Advanced	ambient air temperature is above -7 deg C	ambient pressure is above 74.8kPa	active when the ignition is on or following a stall of the engine)						
P01D5 - Cylinder 6 Injection Timing Retarded	ambient air temperature is above -7 deg C	ambient pressure is above 74.8kPa	engine is not in ready state (which is active when the ignition is on or following a stall of the engine)						
P01D6 - Cylinder 6 Injection Timing Advanced	ambient air temperature is above -7 deg C	ambient pressure is above 74.8kPa	engine is not in ready state (which is active when the ignition is on or following a stall of the engine)						
P01D7 - Cylinder 7 Injection Timing Retarded	ambient air temperature is above -7 deg C	ambient pressure is above 74.8kPa	engine is not in ready state (which is active when the ignition is on or following a stall of the engine) engine is not in ready state (which is						
P01D8 - Cylinder 7 Injection Timing Advanced	ambient air temperature is above -7 deg C	ambient pressure is above 74.8kPa	active when the ignition is on or following a stall of the engine) engine is not in ready state (which is						
P01D9 - Cylinder 8 Injection Timing Retarded	ambient air temperature is above -7 deg C	ambient pressure is above 74.8kPa	active when the ignition is on or following a stall of the engine) engine is not in ready state (which is						
P01DA - Cylinder 8 Injection Timing Advanced P01F0 - Coolant Temperature	ambient air temperature is above -7 deg C	ambient pressure is above 74.8kPa	active when the ignition is on or following a stall of the engine)		I and a section of the section of th	1			
Dropped Below Diagnostic Monitoring Temperature	Engine not in afterrun mode (defined as engine speed greater than 0 rpm)	Engine speed greater than 600 to 850 rpm	engine is not in standby state (standby state occurs after ECM initialization or following after-run)	Engine is running which means the engine speed is greater than 600 to 850 rpm	engine is not in ready state (which is active when the ignition is on or following a stall of the engine)		Engine Run Time greater than 10 seconds		
P0234 - Turbocharger Engine Overboost	Engine not in afterrun mode (defined as engine speed greater than 0 rpm)	Engine speed greater than 600 to 850 rpm	engine is not in standby state (standby state occurs after ECM initialization or following after-run)	ambient air temperature is above -7 deg C	ambient pressure is above 74.8kPa	battery voltage is above 11 V for at least 3s	Engine Run Time greater than 10 seconds (engine speed greater than 600 to 850 rpm to indicate the engine is running)	Engine is running which means the engine speed is greater than 600 to 850 rpm	engine is not in ready state (which is active when the ignition is on or following a stall of the engine)
P0263 - Clv 1 Balance System P0266 - Cly 2 Balance System P0269 - Cly 3 Balance System	Power Take-Off (PTO) is not engaged Power Take-Off (PTO) is not engaged Power Take-Off (PTO) is not engaged								
P026A - CAC Efficientcy Below Threshold	Engine not in afterrun mode (defined as engine speed greater than 0 rpm)	Engine speed greater than 600 to 850 rpm	engine is not in standby state (standby state occurs after ECM initialization or following after-run)	ambient air temperature is above -7 deg C	ambient pressure is above 74.8kPa	battery voltage is above 11 V for at least 3s	Engine Run Time greater than 10 seconds (engine speed greater than 600 to 850 rpm to indicate the engine is running)	Engine is running which means the engine speed is greater than 600 to 850 rpm	engine is not in ready state (which is active when the ignition is on or following a stall of the engine)
P026C - Injection Quantity Too Low	ambient air temperature is above -7 deg C	ambient pressure is above 74.8kPa	Power Take-Off (PTO) is not engaged	System is not in active regeneration mode		ı			
P026D - Injection Quantity Too High	ambient air temperature is above -7 deg C	ambient pressure is above 74.8kPa	Power Take-Off (PTO) is not engaged	System is not in active regeneration mode	J				
P0272 - Cly 4 Balance System P0275 - Cly 5 Balance System P0278 - Cly 6 Balance System P0281 - Cly 7 Balance System	Power Take-Off (PTO) is not engaged Power Take-Off (PTO) is not engaged Power Take-Off (PTO) is not engaged Power Take-Off (PTO) is not engaged								
P0284 - Cly 8 Balance System P0299 - Turbocharger Engine	Power Take-Off (PTO) is not engaged 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 Run Time greater than 10 seconds	Engine is running which means the engine	engine is not in ready state (which is
Underboost P02E0 - Intake Air Flow Valve	engine speed greater than 0 rpm)	Engine speed greater than 600 to 850 rpm battery voltage is above 11 V for at least	state occurs after ECM initialization or following after-run)	ambient air temperature is above -7 deg C	ambient pressure is above 74.8kPa	3s 3s	Engine Run Time greater than 10 seconds (engine speed greater than 600 to 850 rpm to indicate the engine is running)	speed is greater than 600 to 850 rpm	active when the ignition is on or following a stall of the engine)
Control Circuit	state occurs after ECM initialization or following after-nun)	3s							
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							

			Additional Basic Enable Conditions								
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	ngine not in afterrun mode (defined as engine speed greater than 0 rpm)	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)				
	ngine not in afterrun mode (defined as engine speed greater than 0 rpm)	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)				
Position Sensor Circuit High	ngine not in afterrun mode (defined as engine speed greater than 0 rpm)	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)				
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 acti	engine is not in ready state (which is tive when the ignition is on or following a stall of the engine) engine is not in ready state (which is										
P0301 - Cylinder 1 Misfire Detected acti	tive when the ignition is on or following a stall of the engine) engine is not in ready state (which is										
P0302 - Cylinder 2 Misfire Detected activ	tive when the ignition is on or following a stall of the engine) engine is not in ready state (which is										
P0303 - Cylinder 3 Misfire Detected active	tive when the ignition is on or following a stall of the engine) engine is not in ready state (which is										
P0304 - Cylinder 4 Misfire Detected active	tive when the ignition is on or following a stall of the engine) engine is not in ready state (which is										
P0305 - Cylinder 5 Misfire Detected active	tive when the ignition is on or following a stall of the engine) engine is not in ready state (which is										
P0306 - Cylinder 6 Misfire Detected acti	engine is not in ready state (which is tive when the ignition is on or following a stall of the engine) engine is not in ready state (which is										
P0307 - Cylinder 7 Misfire Detected acti	engline is not in ready state (which is tive when the ignition is on or following a stall of the engine) engine is not in ready state (which is										
P0308 - Cylinder 8 Misfire Detected acti	tive when the ignition is on or following a stall of the engine)	engine is not in standby state (standby		engine is not in ready state (which is	1						
Sensor Circuit	ngine 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	active when the ignition is on or following a stall of the engine)							
P0336 - Crankshaft Position En	ngine 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)							
P0340 - Camshaft Position Sensor Circuit	ngine 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)							
P0341 - Camshaft Position Sensor Performance	ngine 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)							
P0381 - Wait to Start Lamp Control En Circuit	ngine 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							
	ingine not in afterrun mode (defined as engine speed greater than 0 rpm)	Engine speed greater than 600 to 850 rpm	engine is not in standby state (standby state occurs after ECM initialization or following after-run)	ambient air temperature is above -7 deg C	ambient pressure is above 74.8kPa	battery voltage is above 11 V for at least 3s	Engine Run Time greater than 10 seconds (engine speed greater than 600 to 850 rpm to indicate the engine is running)	Engine is running which means the engine speed is greater than 600 to 850 rpm	engine is not in ready state (which is active when the ignition is on or following a stall of the engine)		_
P0401 - Exhaust Gas Recirculation Flow Insufficient	ngine not in afterrun mode (defined as engine speed greater than 0 rpm)	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)	
Flow Excessive	ngine not in afterrun mode (defined as engine speed greater than 0 rpm)	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)	
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	ngine not in afterrun mode (defined as engine speed greater than 0 rpm)	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)				
Position Sensor Circuit High	ngine not in afterrun mode (defined as engine speed greater than 0 rpm)	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)				
Circuit Low Voltage	ngine not in afterrun mode (defined as engine speed greater than 0 rpm)	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)				
(EGR) Temperature Sensor 2 Circuit High Voltage	ngine not in afterrun mode (defined as engine speed greater than 0 rpm)	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)				
Conclusion	ngine not in afterrun mode (defined as engine speed greater than 0 rpm)	Engine speed greater than 600 to 850 rpm	engine is not in standby state (standby state occurs after ECM initialization or following after-run)	Engine is running which means the engine speed is greater than 600 to 850 rpm	engine is not in ready state (which is active when the ignition is on or following a stall of the engine)			1			
	ngine not in afterrun mode (defined as engine speed greater than 0 rpm)	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)				
P041D - Exhaust Gas Recirculation (EGR) Temperature Sensor 1 Circuit High Voltage	ngine not in afterrun mode (defined as engine speed greater than 0 rpm)	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)		1		
P0420 - NMHC Catalyst Efficiency Below Threshold Bank 1	ngine not in afterrun mode (defined as engine speed greater than 0 rpm)	Engine speed greater than 600 to 850 rpm	engine is not in standby state (standby state occurs after ECM initialization or following after-run)	ambient air temperature is above -7 deg C	ambient pressure is above 74.8kPa	Engine Run Time greater than 10 seconds (engine speed greater than 600 to 850 rpm to indicate the engine is running)	Engine is running which means the engine speed is greater than 600 to 850 rpm	engine is not in ready state (which is active when the ignition is on or following a stall of the engine)			
P0461 - Fuel Level Sensor Performance	ngine not in afterrun mode (defined as engine speed greater than 0 rpm)	Engine speed greater than 600 to 850 rpm	engine is not in standby state (standby state occurs after ECM initialization or following after-run)	battery voltage is above 11 V for at least 3s	Engine Run Time greater than 10 seconds (engine speed greater than 600 to 850 rpm to indicate the engine is running)	Engine is running which means the engine speed is greater than 600 to 850 rpm	engine is not in ready state (which is active when the ignition is on or following a stall of the engine)				
P0462 - Fuel Level Sensor Circuit Low	ngine not in afterrun mode (defined as engine speed greater than 0 rpm)	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)				
High	ngine not in afterrun mode (defined as engine speed greater than 0 rpm)	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	engine is not in ready state (which is active when the ignition is on or following a stall of the engine)				
	ngine not in afterrun mode (defined as engine speed greater than 0 rpm)	Engine speed greater than 600 to 850 rpm	engine is not in standby state (standby state occurs after ECM initialization or following after-run)	battery voltage is above 11 V for at least 3s	Engine is running which means the engine speed is greater than 600 to 850 rpm	engine is not in ready state (which is active when the ignition is on or following a stall of the engine)					

DTC			Additional Basic Enable Conditions					
P0480 - Cooling Fan Speed Output Circuit	Engine not in afterrun mode (defined as engine speed greater than 0 rpm)	engine is not in standby state (standby state occurs after ECM initialization or following after-run)	battery voltage is above 11 V for at least 3s	Engine is running which means the engine speed is greater than 600 to 850 rpm	1			
P0483 - Cooling Fan System Performance	Engine not in afterrun mode (defined as engine speed greater than 0 rpm)	Engine speed greater than 600 to 850 rpm	engine is not in standby state (standby state occurs after ECM initialization or following after-run)	Manufacturer Enable Counter is zero (value of 0 means ECM is locked and out of assembly plant mode)	ambient pressure is above 74.8kPa	Engine Run Time greater than 10 seconds (engine speed greater than 600 to 850 rpm to indicate the engine is running)	Engine is running which means the engine speed is greater than 600 to 850 rpm	engine is not in ready state (which is active when the ignition is on or following a stall of the engine)
P0489 - Exhaust Gas Recirculation (EGR) Motor Control Circuit 1 Low	engine is not in standby state (standby state occurs after ECM initialization or following after-run)	battery voltage is above 11 V for at least 3s			ı		II.	
P0490 - Exhaust Gas Recirculation (EGR) Motor Control Circuit 1 High Voltage	engine is not in standby state (standby state occurs after ECM initialization or following after-run)	battery voltage is above 11 V for at least 3s						
P0495 - Cooling Fan Speed High	Engine not in afterrun mode (defined as engine speed greater than 0 rpm)	Engine speed greater than 600 to 850 rpm	engine is not in standby state (standby state occurs after ECM initialization or following after-run)	Manufacturer Enable Counter is zero (value of 0 means ECM is locked and out of assembly plant mode)	Engine Run Time greater than 10 seconds (engine speed greater than 600 to 850 rpm to indicate the engine is running)	Engine is running which means the engine speed is greater than 600 to 850 rpm	engine is not in ready state (which is active when the ignition is on or following a stall of the engine)	
P049D - EGR Control Position Not Learned	engine is not in standby state (standby state occurs after ECM initialization or following after-run)	battery voltage is above 11 V for at least 3s						
P0508 - Idle Speed Low	Engine Run Time greater than 10 seconds (engine speed greater than 600 to 850 rpm to indicate the engine is running)	engine is not in ready state (which is active when the ignition is on or following a stall of the engine)						
P0507 - Idle Speed High	Engine Run Time greater than 10 seconds (engine speed greater than 600 to 850 rpm to indicate the engine is running)	engine is not in ready state (which is active when the ignition is on or following a stall of the engine)						
P0526 - Cooling Fan Speed Sensor Circuit	Engine not in afterrun mode (defined as engine speed greater than 0 rpm)	Engine speed greater than 600 to 850 rpm	engine is not in standby state (standby state occurs after ECM initialization or following after-run)	battery voltage is above 11 V for at least 3s	Engine Run Time greater than 10 seconds (engine speed greater than 600 to 850 rpm to indicate the engine is running)	Engine is running which means the engine speed is greater than 600 to 850 rpm	engine is not in ready state (which is active when the ignition is on or following a stall of the engine)	
P0545 - Exhaust Gas Temperature (EGT) Sensor 1 Circuit Low Voltage	Engine not in afterrun mode (defined as engine speed greater than 0 rpm)	Engine speed greater than 600 to 850 rpm	engine is not in standby state (standby state occurs after ECM initialization or following after-run)	battery voltage is above 11 V for at least 3s	Engine is running which means the engine speed is greater than 600 to 850 rpm			
P0546 - Exhaust Gas Temperature (EGT) Sensor 1 Circuit High Voltage	Engine not in afterrun mode (defined as engine speed greater than 0 rpm)	Engine speed greater than 600 to 850 rpm	engine is not in standby state (standby state occurs after ECM initialization or following after-run)	battery voltage is above 11 V for at least 3s	Engine is running which means the engine speed is greater than 600 to 850 rpm			
P0567 - Cruise Control Resume Switch Circuit	Engine not in afterrun mode (defined as engine speed greater than 0 rpm)	Engine speed greater than 600 to 850 rpm	engine is not in standby state (standby state occurs after ECM initialization or following after-run)	Manufacturer Enable Counter is zero (value of 0 means ECM is locked and out of assembly plant mode)	battery voltage is above 11 V for at least 3s	Engine Run Time greater than 10 seconds (engine speed greater than 600 to 850 rpm to indicate the engine is running)	Engine is running which means the engine speed is greater than 600 to 850 rpm	engine is not in ready state (which is active when the ignition is on or following a stall of the engine)
P0568 - Cruise Control Set Switch Circuit	Engine not in afterrun mode (defined as engine speed greater than 0 rpm)	Engine speed greater than 600 to 850 rpm	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)
P0575 - Cruise Control Input Circuit	Engine not in afterrun mode (defined as engine speed greater than 0 rpm)	Engine speed greater than 600 to 850 rpm	engine is not in standby state (standby state occurs after ECM initialization or following after-run)	Manufacturer Enable Counter is zero (value of 0 means ECM is locked and out of assembly plant mode)	battery voltage is above 11 V for at least 3s	Engine is running which means the engine speed is greater than 600 to 850 rpm	engine is not in ready state (which is active when the ignition is on or following a stall of the engine)	
P057C - Brake Pedal Position Sensor Circuit High Voltage	engine is not in standby state (standby state occurs after ECM initialization or following after-run)							
P057D - Brake Pedal Position Sensor Circuit Low Voltage	engine is not in standby state (standby state occurs after ECM initialization or following after-run)							
P0808 - Control Module Internal Performance	Engine not in afterrun mode (defined as engine speed greater than 0 rpm)	Engine speed greater than 600 to 850 rpm	engine is not in standby state (standby state occurs after ECM initialization or following after-run)	Engine Run Time greater than 10 seconds (engine speed greater than 600 to 850 rpm to indicate the engine is running)	Engine is running which means the engine speed is greater than 600 to 850 rpm	engine is not in ready state (which is active when the ignition is on or following a stall of the engine)		
P0627 - Fuel Pump Relay Control Circuit	battery voltage is above 11 V for at least 3s						•	
P0628 - Fuel Pump Relay Control Circuit Low P0629 - Fuel Pump Relay Control Circuit High	battery voltage is above 11 V for at least 3s battery voltage is above 11 V for at least							
Circuit High P062F - Control Module Long Term Memory Performance	3s engine is not in standby state (standby state occurs after ECM initialization or							
P0640 - Intake Air (IA) Heater Switch/Control Circuit	following after-run) engine is not in standby state (standby state occurs after ECM initialization or	battery voltage is above 11 V for at least						
P0641 - 5 Volt Reference 1 Circuit	following after-run) engine is not in standby state (standby state occurs after ECM initialization or	battery voltage is above 11 V for at least 3s						
P064C - Glow Plug Control Module Performance	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 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 after-run)	battery voltage is above 11 V for at least 3s	Engine is running which means the engine speed is greater than 600 to 850 rpm]			
P0651 - 5 Volt Reference 2 Circuit	engine is not in standby state (standby state occurs after ECM initialization or	battery voltage is above 11 V for at least 3s		I.	1			
P0671 - Glow Plug 1 Control Circuit	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 3s						
P0672 - Glow Plug 2 Control Circuit	engine is not in standby state (standby state occurs after ECM initialization or following after-run)	battery voltage is above 11 V for at least 3s						
P0673 - Glow Plug 3 Control Circuit	engine is not in standby state (standby state occurs after ECM initialization or following after-run)	battery voltage is above 11 V for at least 3s						
P0674 - Glow Plug 4 Control Circuit	engine is not in standby state (standby state occurs after ECM initialization or following after-run)	battery voltage is above 11 V for at least 3s						
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-run)	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-nin)	battery voltage is above 11 V for at least 3s						
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						
P06D2 - 5 Volt Reference 5 Circuit	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						
P0700 - Transmission Control Module Requested Malfunction Indicator Lamp Illumination	engine is not in standby state (standby state occurs after ECM initialization or following after-run)							
P0851 - Park/Neutral Position (PNP) Switch Circuit Low Voltage	engine is not in standby state (standby state occurs after ECM initialization or following after-run)							

Post Post	DTC			Additional Basic Enable Conditions								
See Control Assessment Control Control Assessment Control Contro		state occurs after ECM initialization or										•
Part Continue	P1043 - Reductant Pump High Control Circuit Low Voltage		Engine speed greater than 600 to 850 rpm	state occurs after ECM initialization or	(engine speed greater than 600 to 850 rpm		active when the ignition is on or following					
March Control Contro	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)						
Control Cont			Engine speed greater than 600 to 850 rpm	state occurs after ECM initialization or		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)				
Part Control	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	state occurs after ECM initialization or	battery voltage is above 11 V for at least 3s	(engine speed greater than 600 to 850 rpm	Engine is running which means the engine speed is greater than 600 to 850 rpm	active when the ignition is on or following				
Section of the content of the cont		Engine not in afterrun mode (defined as engine speed greater than 0 rpm)	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				•			
Part Control Part Part Control Part Part Control Part Control Part Control Part Control Part Control Part Control Part Control Part Part Control Part Control Part Control Part Control Part Control Part Control Part Control Part Control Part Control Part Control Part Control Part Part Control Part Control Part Control Part Control Part Control Part Control Part Control Part Part Control Part Control Part Control Part Control Part Control Part Control Part Control Part Control Part Control Part Control Part Control Part Part Control Part P	Fuel Injector High 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	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						
Part Control	P10CF - Exhaust Aftertreatment	Engine not in afterrun mode (defined as	engine is not in standby state (standby	battery voltage is above 11 V for at least 3s								
Part Company	Temperature - Exhaust Gas	Engine not in afterrun mode (defined as	Engine speed greater than 600 to 850 rpm	state occurs after ECM initialization or		active when the ignition is on or following]					
Part Continue Co		Engine not in afternin mode (defined as	Engine sheet greater than 800 to 850 mm	annina je not in etandhu etata (etandhu	Engine is running which means the engine	a stall of the engine)	1					
Part Continue Co	Plausible	engine speed greater than 0 rpm)		engine is not in standby state (standby			-					
This Color Col		engine speed greater than 0 rpm)	Engine speed greater than 600 to 850 rpm	following after-run)		active when the ignition is on or following a stall of the engine)		T	Г	7		
Page Conting	Signal High During Moderate Load Sensor 1		Engine speed greater than 600 to 850 rpm	state occurs after ECM initialization or following after-run)	(value of 0 means ECM is locked and out of assembly plant mode)	battery voltage is above 11 V for at least 3s	(engine speed greater than 600 to 850 rpm to indicate the engine is running)		active when the ignition is on or following a stall of the engine)			
Part of Statement of the Control of Statement of the Control of Statement of Stat	Signal Low During Moderate Load Sensor 1	Engine not in afterrun mode (defined as engine speed greater than 0 rpm)	Engine speed greater than 600 to 850 rpm	state occurs after ECM initialization or following after-run)	(value of 0 means ECM is locked and out of assembly plant mode)	battery voltage is above 11 V for at least 3s	(engine speed greater than 600 to 850 rpm to indicate the engine is running)	Engine is running which means the engine speed is greater than 600 to 850 rpm	active when the ignition is on or following a stall of the engine)			
Specific to the Specific Control Control Con	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		(value of 0 means ECM is locked and out of assembly plant mode)	battery voltage is above 11 V for at least 3s	(engine speed greater than 600 to 850 rpm to indicate the engine is running)	Engine is running which means the engine speed is greater than 600 to 850 rpm	active when the ignition is on or following a stall of the engine)	_		
Print Action State 1 To prove years print the Company of the Compa	Signal Low During Moderate Load		Engine speed greater than 600 to 850 rpm	state occurs after ECM initialization or	(value of 0 means ECM is locked and out	battery voltage is above 11 V for at least 3s	(engine speed greater than 600 to 850 rpm		active when the ignition is on or following			
First, No. Search Members 1997. In the Cold Antique of the Cold An	P11B4 - HO2S Current Performance Sensor 1	Engine not in afterrun mode (defined as engine speed greater than 0 rpm)	Engine speed greater than 600 to 850 rpm	state occurs after ECM initialization or	(value of 0 means ECM is locked and out	battery voltage is above 11 V for at least 3s	(engine speed greater than 600 to 850 rpm	Engine is running which means the engine speed is greater than 600 to 850 rpm	active when the ignition is on or following			
Profit P	P11B5 - HO2S Current Performance Bank 1 Sensor 2		Engine speed greater than 600 to 850 rpm	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 not in ready state (which is active when the ignition is on or following a stall of the engine)			
Significant Rain Flavors P100-150 Earned Comment Performance Bildering Significant Country P100-150 Earned Comment Performance Bildering Significant Country P100-150 Earned Comment Performance Bildering Significant Country P100-150 Earned Comment Performance Bildering Significant Country P100-150 Earned Comment Performance Bildering Significant Country P100-150 Earned Comment Performance Bildering Significant Country P100-150 Earned Comment P100-150 Earned	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	state occurs after ECM initialization or	(value of 0 means ECM is locked and out	ambient air temperature is above -7 deg C	ambient pressure is above 74.8kPa	battery voltage is above 11 V for at least 3s	(engine speed greater than 600 to 850 rpn 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)
Figure 1 and a support of a material control control of the control control of the control of th	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	state occurs after ECM initialization or	(value of 0 means ECM is locked and out	ambient air temperature is above -7 deg C	ambient pressure is above 74.8kPa	battery voltage is above 11 V for at least 3s	(engine speed greater than 600 to 850 rpm	System is not in active regeneration mode	Engine is running which means the engine speed is greater than 600 to 850 rpm	engine is not in ready state (which is active when the ignition is on or following a stall of the engine)
PICE - Name and Fire Wide Control Control Engages (See See See See See See See See See Se			Engine speed greater than 600 to 850 rpm	state occurs after ECM initialization or following after-run)	(value of 0 means ECM is locked and out of assembly plant mode)	battery voltage is above 11 V for at least 3s	(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	active when the ignition is on or following a stall of the engine)		
Service States of The Processor States of The Processo	P11DC - NOx Sensor Current Performance Bank 1 Sensor 2	engine speed greater than 0 rpm)	Engine speed greater than 600 to 850 rpm	state occurs after ECM initialization or	(value of 0 means ECM is locked and out	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	active when the ignition is on or following		
February Central CECA indicatation or 1922. Heads occurs after CECA	P122C - Intake Air Flow Valve Control Circuit Shorted	engine is not in standby state (standby state occurs after ECM initialization or following after-run)	battery voltage is above 11 V for at least 3s									
Experience Climaria Clam Visings P12FF - Haak Air Pipe Vision Chorand Climaria Clam Visings P12FF - Haak Air Pipe Vision Chorand Climaria Clam Visings P12FF - Haak Air Pipe Vision Chorand Climaria Clam Visings P12FF - Haak Air Pipe Vision Chorand Climaria Clam Visings P12FF - Haak Air Pipe Vision Chorand Climaria Clam Visings P12FF - Haak Air Pipe Vision Chorand Climaria Clam Visings P12FF - Haak Air Pipe Vision Chorand Climaria Climaria P12FF - Haak Air Pipe Vision Chorand Climaria Climaria P12FF - Haak Air Pipe Vision Chorand Climaria Climaria P12FF - Haak Air Pipe Vision Chorand Climaria Climaria P12FF - Haak Air Pipe Vision Chorand Climaria Climaria P12FF - Haak Air Pipe Vision Chorand Climaria Climaria P12FF - Haak Air Pipe Vision Chorand Climaria Climaria P12FF - Haak Air Pipe Vision Chorand Climaria Climaria P12FF - Haak Air Pipe Vision Chorand Climaria Climaria P12FF - Haak Air Pipe Vision Chorand Climaria Climaria P12FF - Haak Air Pipe Vision Chorand Climaria Climaria P12FF - Haak Air Pipe Vision Chorand Climaria Climaria P12FF - Haak Air Pipe Vision Chorand Climaria Climaria P12FF - Haak Air Pipe Vision Chorand Climaria Climaria P12FF - Haak Air Pipe Vision Chorand Climaria Climaria P12FF - Haak Air Pipe Vision Chorand Climaria Climaria P12FF - Haak Air Pipe Vision Chorand Climaria Climaria Climaria P12FF - Haak Air Pipe Vision Chorand Climaria Climaria Climaria P12FF - Haak Air Pipe Vision Chorand Climaria Climaria P12FF - Haak Air Pipe Vision Chorand Climaria Climaria P12FF - Haak Air Pipe Vision Chorand Climaria Climaria Climaria Climaria P12FF - Haak Air Pipe Vision Chorand Climaria	P122D - Diesel Intake Air Flow Position Sensor Exceeded Learning Limit	state occurs after ECM initialization or	battery voltage is above 11 V for at least 3s									
Cord Circuit C Figh V Circuits P126A - Fault Pressurue Regulator 2 P14CB - Fault Correct Circuit C Figh V Circuits P14CB - Fault Correct Circuit C Figh V Circuits P14CB - Fault Correct Circuit C Figh V Circuits P14CB - Fault Correct Circuit C Figh V Circuits P14CB - Fault Correct Circuits Description of in standby state (standby state (standby state) (standb	P122E - Intake Air Flow Valve Control Circuit 2 Low Voltage	state occurs after ECM initialization or	battery voltage is above 11 V for at least 3s									
P1256 - Fault Pressure Regulator 2 P1256 - Fault Regulator 2 P1256 - Fault Regulator	P122F - Intake Air Flow Valve Control Circuit 2 High Voltage	engine is not in standby state (standby state occurs after FCM initialization or	battery voltage is above 11 V for at least 3s			_						
Fig. Cannot Control High Channel Channel	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							
P1407 - Education Reconstrations (CRR) Monor Control Circles Reconstration (Circles Reconstration (Circles	P125B - Fuel Pressure Regulator 2 High Control Circuit High Voltage	state occurs after ECM initialization or										
PLGC Flavour Control Circuit Section (Circuit Section Circuit	P128E - Fuel Rail Pressure Performance	engine is not in ready state (which is active when the ignition is on or following										
P408 - Enhance Gas Recordation Slow Response to framework (defined as Gas Recordation Slow) (defined as Gas Recordation Slow) (defined as Gas Recordation Slow) (defined as Gas Recordation Slow) (defined as Gas Recordation Slow) (defined as Gas Recordation Slow) (defined as Gas Recordation Slow) (defined as Gas Recordation Slow) (defined as Gas Recordation Slow) (defined as Gas Recordation Slow) (defined as Gas Recordation Slow) (defined as Gas Recordation Slow) (defined as Gas Recordation Slow) (defined as Gas Recordation Slow) (defined as Gas Recordation Slow) (defined as Gas Recordation Slow) (defined as Gas Recordation Slow) (defined as Gas Recordation Slow) (defined as Gas Recordation Slow) (defined as Gas Record	P1407 - Exhaust Gas Recirculation (EGR) Motor Control Circuit Shorted	engine is not in standby state (standby state occurs after ECM initialization or	battery voltage is above 11 V for at least 3s									
Get in the engine is currently attentional to indicate the engine is running) 19400 - Enhance Case Recincitation (EGR) More Control Circuit 2 Low Voltage is an extension of the engine is currently attentional to indicate the engine is running) 19400 - Enhance Case Recincitation (EGR) More Control Circuit 2 Low Voltage is above 11 V for at least 50 more in control circuit 2 Low (following after-curr) 19400 - Enhance Case Recincitation (EGR) More Control Circuit 2 Low (following after-currently attent currentl	P140B - Exhaust Gas Recirculation Slow Response-Increasing Flow	Engine not in afterrun mode (defined as	Engine speed greater than 600 to 850 rpm	state occurs after ECM initialization or	ambient air temperature is above -7 deg C	ambient pressure is above 74.8kPa	battery voltage is above 11 V for at least 3s	(engine speed greater than 600 to 850 rpm	System is not in active regeneration mode	Engine is running which means the engine speed is greater than 600 to 850 rpm	active when the ignition is on or following	
(ECR) Motor Control Circuit 2 Low Volume and the CDM initialization or following affect or sub- following affect or following	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 speed greater than 600 to 850 rpm	System is not in active regeneration mode	Engine is running which means the engine speed is greater than 600 to 850 rpm	active when the ignition is on or following	
P140E - Edward Class Redicitations (ECR) Monte Committee (Initial State of the Class Committee (Initial Stat	(EGR) Motor Control Circuit 2 Low Voltage	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 - Evitavest Gas Recirculation (EGR) Motor Current Performance state occurs sher Collaboration following after-dun) battery voltage is above 11 V for at least state occurs sher Collaboration following after-dun) battery voltage is above 11 V for at least state occurs sher Collaboration following after-dun) battery voltage is above 11 V for at least state occurs sher Collaboration following after-dun)	(EGR) Motor Current Performance	engine is not in standby state (standby state occurs after ECM initialization or following after-run)	battery voltage is above 11 V for at least 3s					1				
P148-1-Coosed Loop Deside Pariculate File (DPF) Regeneration Control At Limit - Stage 1 frequent from 0 to 1850 pm In Time 1 greater than 10 seconds engine speed greater than 00 to 850 pm In Time 1 frequent from 0 to 1850 pm In Time	P144B - Closed Loop Diesel Particulate Filter (DPF) Regeneration Control At Limit - Stage 1 Temperature Too Low		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						

DY.			Additional Basic Enable Conditions					
P144C - Closed Loop Diesel Particulate Filter (DPF)			engine is not in standby state (standby	Engine Pun Time greater than 10 accords		engine is not in ready state (which is	1	
Particulate Filter (DPF) Regeneration Control At Limit - Stage 1 Temperature Too High	Engine not in afterrun mode (defined as engine speed greater than 0 rpm)	Engine speed greater than 600 to 850 rpm	engine is not in standby state (standby state occurs after ECM initialization or following after-run)	(engine Run Time greater than 10 seconds (engine speed greater than 600 to 850 rpm to indicate the engine is running)	Engine is running which means the engine speed is greater than 600 to 850 rpm	engine is not in ready state (which is active when the ignition is on or following a stall of the engine)		
P154A - Intake Air (IA) Heater Feedback Circuit	engine is not in standby state (standby state occurs after ECM initialization or following after-run)	battery voltage is above 11 V for at least 3s				•	-	
P154B - Intake Air (IA) Heater Voltage Signal Circuit	engine is not in standby state (standby state occurs after ECM initialization or following after-run)	battery voltage is above 11 V for at least 3s						
P154C - Intake Air (IA) Heater Current Signal 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 3s						
P154D - Intake Air (IA) Heater Temperature Signal Circuit	state occurs after ECM initialization or following after-run)	battery voltage is above 11 V for at least 3s						
P160C - Engine Calibration Information Not Programed In The Control Module	Manufacturer Enable Counter is zero (value of 0 means ECM is locked and out of assembly plant mode)	battery voltage is above 11 V for at least 3s						
P161A - Glow Plug Control Module Not Programed	engine is not in standby state (standby state occurs after ECM initialization or following after-run)	battery voltage is above 11 V for at least 3s		-				
P1631 - Theft Deterrent Fuel Enable Signal Not Correct	Engine not in afterrun mode (defined as engine speed greater than 0 rpm)	engine is not in standby state (standby state occurs after ECM initialization or following after-run)	Manufacturer Enable Counter is zero (value of 0 means ECM is locked and out of assembly plant mode)					
P163C - Glow Plug Control Module Primary Circuit	engine is not in standby state (standby state occurs after ECM initialization or following after-run)	battery voltage is above 11 V for at least 3s		-				
P163D - Glow Plug Control Module Secondary Circuit	Engine not in afterrun mode (defined as engine speed greater than 0 rpm)	following after-run)	battery voltage is above 11 V for at least 3s]				
P163E - Glow Plug Control ModuleOvertemperature	engine is not in standby state (standby state occurs after ECM initialization or following after-run)	battery voltage is above 11 V for at least 3s						
P166B - Intake Air (IA) Heater Over Temperature	engine is not in standby state (standby state occurs after ECM initialization or following after-run)	battery voltage is above 11 V for at least 3s						
P2002 - Diesel Particulate Filter (DPF) Low Efficiency	Engine not in afterrun mode (defined as engine speed greater than 0 rpm)	Engine speed greater than 600 to 850 rpm	engine is not in standby state (standby state occurs after ECM initialization or following after-run)	ambient air temperature is above -7 deg C	ambient pressure is above 74.8kPa	Engine Run Time greater than 10 seconds (engine speed greater than 600 to 850 rpm to indicate the engine is running)	Engine is running which means the engine speed is greater than 600 to 850 rpm	engine is not in ready state (which is active when the ignition is on or following a stall of the engine)
P202E - Reductant Injector Performance	SCR Reductant Level not in restriction or empty level state (see reductant level warning definition)	Engine not in afterrun mode (defined as engine speed greater than 0 rpm)	Engine speed greater than 600 to 850 rpm	engine is not in standby state (standby state occurs after ECM initialization or following after-run)	battery voltage is above 11 V for at least 3s	Engine Run Time greater than 10 seconds (engine speed greater than 600 to 850 rpm to indicate the engine is running)	Engine is running which means the engine speed is greater than 600 to 850 rpm	engine is not in ready state (which is active when the ignition is on or following a stall of the engine)
P2032 - Exhaust Gas Temperature (EGT) Sensor 2 Circuit Low Voltage	Engine not in afterrun mode (defined as engine speed greater than 0 rpm)	Engine speed greater than 600 to 850 rpm	engine is not in standby state (standby state occurs after ECM initialization or following after-run)	battery voltage is above 11 V for at least 3s	Engine is running which means the engine speed is greater than 600 to 850 rpm			
P2033 - Exhaust Gas Temperature (EGT) Sensor 2 Circuit High Voltage	Engine not in afterrun mode (defined as engine speed greater than 0 rpm)	Engine speed greater than 600 to 850 rpm	engine is not in standby state (standby state occurs after ECM initialization or following after-run)	battery voltage is above 11 V for at least 3s	Engine is running which means the engine speed is greater than 600 to 850 rpm			
P203B - Reductant Level Sensor 1 Performance	Engine not in afterrun mode (defined as engine speed greater than 0 rpm)	Engine speed greater than 600 to 850 rpm	engine is not in standby state (standby state occurs after ECM initialization or following after-run)	battery voltage is above 11 V for at least 3s	Status of the Reductant Tank is not Frozer which means ambient air temperature is >= -7°C and the reductatn tank temperature is >= -7°C	Engine Run Time greater than 10 seconds (engine speed greater than 600 to 850 rpm to indicate the engine is running)	Engine is running which means the engine speed is greater than 600 to 850 rpm	engine is not in ready state (which is active when the ignition is on or following a stall of the engine)
P203C - Reductant Level Sensor 1 Circuit Low	Engine not in afterrun mode (defined as engine speed greater than 0 rpm)	Engine speed greater than 600 to 850 rpm	engine is not in standby state (standby state occurs after ECM initialization or following after-run)	battery voltage is above 11 V for at least 3s	Engine Run Time greater than 10 seconds (engine speed greater than 600 to 850 rpm to indicate the engine is running)	Engine is running which means the engine speed is greater than 600 to 850 rpm	engine is not in ready state (which is active when the ignition is on or following a stall of the engine)	
P203D - Reductant Level Sensor 1 Circuit High	Engine not in afterrun mode (defined as engine speed greater than 0 rpm)	Engine speed greater than 600 to 850 rpm	engine is not in standby state (standby state occurs after ECM initialization or following after-run)	battery voltage is above 11 V for at least 3s	Engine Run Time greater than 10 seconds (engine speed greater than 600 to 850 rpm to indicate the engine is running)	Engine is running which means the engine speed is greater than 600 to 850 rpm	engine is not in ready state (which is active when the ignition is on or following a stall of the engine)	
P2047 - Reductant Injector Control Circuit	Engine not in afterrun mode (defined as engine speed greater than 0 rpm)	Engine speed greater than 600 to 850 rpm	engine is not in standby state (standby state occurs after ECM initialization or following after-run)	battery voltage is above 11 V for at least 3s	Engine Run Time greater than 10 seconds (engine speed greater than 600 to 850 rpm to indicate the engine is running)	Engine is running which means the engine speed is greater than 600 to 850 rpm	engine is not in ready state (which is active when the ignition is on or following a stall of the engine)	
P2048 - Reductant Injector Control Circuit Low Voltage	Engine not in afterrun mode (defined as engine speed greater than 0 rpm)	Engine speed greater than 600 to 850 rpm	engine is not in standby state (standby state occurs after ECM initialization or following after-run)	battery voltage is above 11 V for at least 3s	Engine Run Time greater than 10 seconds (engine speed greater than 600 to 850 rpm to indicate the engine is running)	Engine is running which means the engine speed is greater than 600 to 850 rpm	engine is not in ready state (which is active when the ignition is on or following a stall of the engine)	
P2049 - Reductant Injector Control Circuit High Voltage	Engine not in afterrun mode (defined as engine speed greater than 0 rpm)	Engine speed greater than 600 to 850 rpm	engine is not in standby state (standby state occurs after ECM initialization or following after-run)	battery voltage is above 11 V for at least 3s	Engine Run Time greater than 10 seconds (engine speed greater than 600 to 850 rpm to indicate the engine is running)	Engine is running which means the engine speed is greater than 600 to 850 rpm	engine is not in ready state (which is active when the ignition is on or following a stall of the engine)	
P204B - Reductant Pump Pressure Sensor Performance	engine is not in standby state (standby state occurs after ECM initialization or following after-run)							•
P204C - Reductant Pump Pressure Sensor Circuit Low	Engine not in afterrun mode (defined as engine speed greater than 0 rpm)	Engine speed greater than 600 to 850 rpm	engine is not in standby state (standby state occurs after ECM initialization or following after-run)	battery voltage is above 11 V for at least 3s	Engine Run Time greater than 10 seconds (engine speed greater than 600 to 850 rpm to indicate the engine is running)	Engine is running which means the engine speed is greater than 600 to 850 rpm	engine is not in ready state (which is active when the ignition is on or following a stall of the engine)	
P204D - Reductant Pump Pressure Sensor Circuit High	engine is not in standby state (standby state occurs after ECM initialization or following after-run)							.
P204F - Reductant System Performance Bank 1 (cannot build pump pressure)	SCR Reductant Level not in restriction or empty level state (see reductant level warning definition)	Engine not in afterrun mode (defined as engine speed greater than 0 rpm)	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)
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 engine speed is greater than 600 to 850 rpm	engine is not in ready state (which is active when the ignition is on or following a stall of the engine)	
P205C - Reductant Tank Temperature Sensor Circuit Low	Engine not in afterrun mode (defined as engine speed greater than 0 rpm)	Engine speed greater than 600 to 850 rpm	engine is not in standby state (standby state occurs after ECM initialization or following after-run)	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)	
P205D - Reductant Tank Temperature Sensor Circuit High	Engine not in afterrun mode (defined as engine speed greater than 0 rpm)	Engine speed greater than 600 to 850 rpm	engine is not in standby state (standby state occurs after ECM initialization or following after-run)	battery voltage is above 11 V for at least 3s	Engine Run Time greater than 10 seconds (engine speed greater than 600 to 850 rpm to indicate the engine is running)	Engine is running which means the engine speed is greater than 600 to 850 rpm	engine is not in ready state (which is active when the ignition is on or following a stall of the engine)	
P2080 - Exhaust Temperature Sensor 1 Performance	Engine speed greater than 600 to 850 rpm	Manufacturer Enable Counter is zero (value of 0 means ECM is locked and out of assembly plant mode)	Engine Run Time greater than 10 seconds (engine speed greater than 600 to 850 rpm to indicate the engine is running)	Engine is running which means the engine speed is greater than 600 to 850 rpm	engine is not in ready state (which is active when the ignition is on or following a stall of the engine)			
P2084 - Exhaust Temperature Sensor 2 Performance	Engine speed greater than 600 to 850 rpn	Manufacturer Enable Counter is zero (value of 0 means ECM is locked and out of assembly plant mode)	Engine Run Time greater than 10 seconds (engine speed greater than 600 to 850 rpm to indicate the engine is running)	Engine is running which means the engine speed is greater than 600 to 850 rpm	engine is not in ready state (which is active when the ignition is on or following a stall of the engine)			
P208A - Reductant Pump Control Circuit	Engine not in afterrun mode (defined as engine speed greater than 0 rpm)	Engine speed greater than 600 to 850 rpm	engine is not in standby state (standby state occurs after ECM initialization or following after-run)	battery voltage is above 11 V for at least 3s	Engine Run Time greater than 10 seconds (engine speed greater than 600 to 850 rpm to indicate the engine is running)	Engine is running which means the engine speed is greater than 600 to 850 rpm	engine is not in ready state (which is active when the ignition is on or following a stall of the engine)	
P208B - Reductant Pump Performance	engine is not in standby state (standby state occurs after ECM initialization or following after-run)	Manufacturer Enable Counter is zero (value of 0 means ECM is locked and out of assembly plant mode)	battery voltage is above 11 V for at least 3s	Status of the Reductant Tank is not Frozen which means ambient air temperature is >= -7°C and the reductant tank temperature is >= -7°C				
P208D - Reductant Pump Control Circuit High Voltage	Engine not in afterrun mode (defined as engine speed greater than 0 rpm)		engine is not in standby state (standby state occurs after ECM initialization or following after-run)	Engine Run Time greater than 10 seconds (engine speed greater than 600 to 850 rpm to indicate the engine is running)	Engine is running which means the engine speed is greater than 600 to 850 rpm	engine is not in ready state (which is active when the ignition is on or following a stall of the engine)		
		•					•	

DTC			Additional Basic Enable Conditions								
P20A0 - Reductant Purge Valve	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	Engine Run Time greater than 10 seconds (engine speed greater than 600 to 850 rpm		engine is not in ready state (which is active when the ignition is on or following					
Control Circuit	engine speed greater than 0 rpm)		state occurs after ECM initialization or following after-run)	(engine speed greater than 600 to 850 rpm to indicate the engine is running)	speed is greater than 600 to 850 rpm	a stall of the engine)					
P20A1 - Reductant Purge Valve Performance	engine is not in standby state (standby state occurs after ECM initialization or following after-run)	battery voltage is above 11 V for at least 3s		In the second second			1				
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 active when the ignition is on or following a stall of the engine)					
P20A3 - Reductant Purge Valve Control Circuit High Voltage	Engine not in afterrun mode (defined as engine speed greater than 0 rpm)	Engine speed greater than 600 to 850 rpm	engine is not in standby state (standby state occurs after ECM initialization or following after-run)	Engine is running which means the engine speed is greater than 600 to 850 rpm	engine is not in ready state (which is active when the ignition is on or following a stall of the engine)						
P20B9 - Reductant Heater 1 Control Circuit	engine is not in standby state (standby state occurs after ECM initialization or following after-run)	battery voltage is above 11 V for at least 3s				•					
P20BA - Reductant Heater 1 Performance	SCR Reductant Level not in restriction or empty level state (see reductant level warning definition)	Engine not in afterrun mode (defined as engine speed greater than 0 rpm)	engine is not in standby state (standby state occurs after ECM initialization or following after-run)	Manufacturer Enable Counter is zero (value of 0 means ECM is locked and out	battery voltage is above 11 V for at least 3s	Engine is running which means the engine speed is greater than 600 to 850 rpm					
P20BB - Reductant Heater 1 Control Circuit Low	engine is not in standby state (standby state occurs after ECM initialization or following after-run)	battery voltage is above 11 V for at least 3s	tolowing arendin	or assembly draw model		II.	!				
P20BC - Reductant Heater 1 Control Circuit High	engine is not in standby state (standby state occurs after ECM initialization or following after-run)	battery voltage is above 11 V for at least 3s									
P20BD - Reductant Heater 2 Control Circuit	engine is not in standby state (standby state occurs after ECM initialization or following after-run)	battery voltage is above 11 V for at least 3s									
P20BF - Reductant Heater 2 Control Circuit Low	engine is not in standby state (standby state occurs after ECM initialization or following after-run)	battery voltage is above 11 V for at least 3s									
P20C0 - Reductant Heater 2 Control Circuit High	engine is not in standby state (standby state occurs after ECM initialization or following after-run)	battery voltage is above 11 V for at least 3s									
P20C1 - Reductant Heater 3 Control Circuit	engine is not in standby state (standby state occurs after ECM initialization or following after-run)	battery voltage is above 11 V for at least 3s									
P20C3 - Reductant Heater 3 Control Circuit Low	engine is not in standby state (standby state occurs after ECM initialization or following after-run)	battery voltage is above 11 V for at least 3s									
P20C4 - Reductant Heater 3 Control Circuit High	engine is not in standby state (standby state occurs after ECM initialization or following after-run)	battery voltage is above 11 V for at least 3s									
P20CB - Exhaust Aftertreatment Fuel Injector Control Circuit	Engine not in afterrun mode (defined as engine speed greater than 0 rpm)	engine is not in standby state (standby state occurs after ECM initialization or following after-run)	battery voltage is above 11 V for at least 3s	Engine is running which means the engine speed is greater than 600 to 850 rpm		_					
P20CC - Exhaust Aftertreatment Fuel Injector Performance	Engine not in afterrun mode (defined as engine speed greater than 0 rpm)	Engine speed greater than 600 to 850 rpm	engine is not in standby state (standby state occurs after ECM initialization or following after-run)	Engine is running which means the engine speed is greater than 600 to 850 rpm	engine is not in ready state (which is active when the ignition is on or following a stall of the engine)						
P20CD - Exhaust Aftertreatment Fuel Injector Control Circuit Low Voltage	Engine not in afterrun mode (defined as engine speed greater than 0 rpm)	engine is not in standby state (standby state occurs after ECM initialization or following after-run)	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-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					
P20E2 - Exhaust Gas Temperature (EGT) Sensors 1-2 not plausible	Engine not in afterrun mode (defined as engine speed greater than 0 rpm) SCR Reductant Level not in restriction or	Engine speed greater than 600 to 850 rpm	engine is not in standby state (standby state occurs after ECM initialization or following after-run)	Engine is running which means the engine speed is greater than 600 to 850 rpm	engine is not in ready state (which is active when the ignition is on or following a stall of the engine)					1	
P20E8 - Reductant Pressure Too Low	empty level state (see parameter definitions for reductant level warning definition)	Engine not in afterrun mode (defined as engine speed greater than 0 rpm)	Engine speed greater than 600 to 850 rpm	engine is not in standby state (standby state occurs after ECM initialization or following after-run)	battery voltage is above 11 V for at least 3s	Engine Run Time is greater than 10 seconds (engine speed greater than 600 to 850 rpm to indicate the engine is running)	Engine is running which means the engine speed is greater than 600 to 850 rpm	engine is not in ready state (which is active when the ignition is on or following a stall of the engine)			
P20E9 - Reductant Pressure Too High	SCR Reductant Level not in restriction or empty level state (see parameter definitions for reductant level warning definition)	Engine not in afterrun mode (defined as engine speed greater than 0 rpm)	Engine speed greater than 600 to 850 rpm	engine is not in standby state (standby state occurs after ECM initialization or following after-run)	battery voltage is above 11 V for at least 3s	Engine Run Time is greater than 10 seconds (engine speed greater than 600 to 850 rpm to indicate the engine is running)	Engine is running which means the engine speed is greater than 600 to 850 rpm	engine is not in ready state (which is active when the ignition is on or following a stall of the engine)			
P20EE - SCR Nox Catalyst Efficiency Below Threshold Bank 1	SCR Reductant Level not in restriction or empty level state (see reductant level warning definition)	Engine not in afterrun mode (defined as engine speed greater than 0 rpm)	Engine speed greater than 600 to 850 rpm	engine is not in standby state (standby state occurs after ECM initialization or following after-run)	Manufacturer Enable Counter is zero (value of 0 means ECM is locked and out of assembly plant mode)	battery voltage is above 11 V for at least 3s	Status of the Reductant Tank is not Frozen which means ambient air temperature is >= -7°C and the 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)	
P214F - Reductant Heater 1 Current Too High	SCR Reductant Level not in restriction or empty level state (see parameter definitions for reductant level warning definition)	Engine not in afterrun mode (defined as engine speed greater than 0 rpm)	Engine speed greater than 600 to 850 rpm	engine is not in standby state (standby state occurs after ECM initialization or following after-run)	battery voltage is above 11 V for at least 3s	Engine Run Time is greater than 10 seconds (engine speed greater than 600 to 850 rpm to indicate the engine is running)	Engine is running which means the engine speed is greater than 600 to 850 rpm	engine is not in ready state (which is active when the ignition is on or following a stall of the engine)			•
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 rpm to indicate the engine is running)	Engine is running which means the engine speed is greater than 600 to 850 rpm	engine is not in ready state (which is active when the ignition is on or following a stall of the engine)		•		
P21AB - Reductant Level Sensor 2 Circuit High	Engine not in afterrun mode (defined as engine speed greater than 0 rpm)	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)				
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	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	engine is not in ready state (which is active when the ignition is on or following a stall of the engine)				
P21DD - Reductant Heater 1 Current Too Low	SCR Reductant Level not in restriction or empty level state (see parameter definitions for reductant level warning definition)	Engine not in afterrun mode (defined as engine speed greater than 0 rpm)	Engine speed greater than 600 to 850 rpm	engine is not in standby state (standby state occurs after ECM initialization or following after-run)	battery voltage is above 11 V for at least 3s	Engine Run Time is greater than 10 seconds (engine speed greater than 600 to 850 rpm to indicate the engine is	Engine is running which means the engine speed is greater than 600 to 850 rpm	engine is not in ready state (which is active when the ignition is on or following a stall of the engine)			
P2200 - N0x Sensor Circuit Bank 1 Sensor 1	Engine not in afterrun mode (defined as engine speed greater than 0 rpm)	Engine speed greater than 600 to 850 rpm	engine is not in standby state (standby state occurs after ECM initialization or following after-run)	Manufacturer Enable Counter 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)			
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)	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)			
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)	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)			
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)	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)			
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)	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)			
P220A - N0x Sensor Supply Voltage Out Of Range Bank 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	engine is not in standby state (standby state occurs after ECM initialization or following after-run)	battery voltage is above 11 V for at least									

DTC			Additional Basic Enable Conditions								
P221C - Reductant Heater 2	SCR Reductant Level not in restriction or empty level state (see parameter	Engine not in afterrun mode (defined as		engine is not in standby state (standby	battery voltage is above 11 V for at least	Engine Run Time is greater than 10 seconds (engine speed greater than 600	Engine is running which means the engine	engine is not in ready state (which is			
Current Too Low	definitions for reductant level warning definition) SCR Reductant Level not in restriction or	engine not in afterful 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)	3s	seconds (engine speed greater than 600 to 850 rpm to indicate the engine is running) Engine Run Time is greater than 10	speed is greater than 600 to 850 rpm	active when the ignition is on or following a stall of the engine)			
P221D - Reductant Heater 2 Current Too High	empty level not in restriction or empty level state (see parameter definitions for reductant level warning definition) SCR Reductant Level not in restriction or	Engine not in afterrun mode (defined as engine speed greater than 0 rpm)	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	seconds (engine speed greater than 600 to 850 rpm to indicate the engine is running) Engine Run Time is greater than 10	Engine is running which means the engine speed is greater than 600 to 850 rpm	engine is not in ready state (which is active when the ignition is on or following a stall of the engine)			
P221E - Reductant Heater 3 Current Too Low	empty level state (see parameter definitions for reductant level warning definition)	Engine not in afterrun mode (defined as engine speed greater than 0 rpm)	Engine speed greater than 600 to 850 rpm	engine is not in standby state (standby state occurs after ECM initialization or following after-run)	battery voltage is above 11 V for at least 3s	seconds (engine speed greater than 600 to 850 rpm to indicate the engine is running)	Engine is running which means the engine speed is greater than 600 to 850 rpm	engine is not in ready state (which is active when the ignition is on or following a stall of the engine)			
P221F - Reductant Heater 3 Current Too High	SCR Reductant Level not in restriction or empty level state (see parameter definitions for reductant level warning definition)	Engine not in afterrun mode (defined as engine speed greater than 0 rpm)	Engine speed greater than 600 to 850 rpm	engine is not in standby state (standby state occurs after ECM initialization or following after-run)	battery voltage is above 11 V for at least 3s	Engine Run Time is greater than 10 seconds (engine speed greater than 600 to 850 rpm to indicate the engine is running)	Engine is running which means the engine speed is greater than 600 to 850 rpm	engine is not in ready state (which is active when the ignition is on or following a stall of the engine)			
P2228 - Barometric Pressure Sensor Circuit Low	Engine not in afterrun mode (defined as engine speed greater than 0 rpm)	Engine speed greater than 600 to 850 rpm	engine is not in standby state (standby state occurs after ECM initialization or following after-run)	battery voltage is above 11 V 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)				
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 rpm to indicate the engine is running)	Engine is running which means the engine speed is greater than 600 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	engine is not in ready state (which is active when the ignition is on or following a stall of the engine)				
P2295 - Fuel Pressure Regulator 2 Control Circuit Low Voltage	Engine not in afterrun mode (defined as engine speed greater than 0 rpm)	engine is not in standby state (standby state occurs after ECM initialization or following after-run)	battery voltage is above 11 V for at least 3s	Engine is running which means the engine speed is greater than 600 to 850 rpm	1						
P2296 - Fuel Pressure Regulator 2 Control Circuit High Voltage	Engine not in afterrun mode (defined as engine speed greater than 0 rpm)	engine is not in standby state (standby state occurs after ECM initialization or following after-run)	battery voltage is above 11 V for at least 3s	Engine is running which means the engine speed is greater than 600 to 850 rpm							
P229E - NOx Sensor Circuit Bank 1 Sensor 2	Engine not in afterrun mode (defined as engine speed greater than 0 rpm)	Engine speed greater than 600 to 850 rpm	engine is not in standby state (standby state occurs after ECM initialization or following after-run)	Manufacturer Enable Counter is zero (value of 0 means ECM is locked and out of assembly plant mode)	battery voltage is above 11 V for at least 3s	Engine Run Time greater than 10 seconds (engine speed greater than 600 to 850 rpm to indicate the engine is running)	Engine is running which means the engine speed is greater than 600 to 850 rpm	engine is not in ready state (which is active when the ignition is on or following a stall of the engine)			
P229F - NOx Sensor Performance Bank 1 Sensor 2	Engine not in afterrun mode (defined as engine speed greater than 0 rpm)	Engine speed greater than 600 to 850 rpm	engine is not in standby state (standby state occurs after ECM initialization or following after-run)	Manufacturer Enable Counter is zero (value of 0 means ECM is locked and out of assembly plant mode)	ambient air temperature is above -7 deg C	ambient pressure is above 74.8kPa	battery voltage is above 11 V for at least 3s	Engine Run Time greater than 10 seconds (engine speed greater than 600 to 850 rpm to indicate the engine is running)	Engine is running which means the engine speed is greater than 600 to 850 rpm	engine is not in ready state (which is active when the ignition is on or following a stall of the engine)	
P22A0 - NOx Sensor Circuit Low Bank 1 Sensor 2	Engine not in afterrun mode (defined as engine speed greater than 0 rpm)	Engine speed greater than 600 to 850 rpm	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)			
P22A1 - NOx Sensor Circuit High Bank 1 Sensor 2	Engine not in afterrun mode (defined as engine speed greater than 0 rpm)	Engine speed greater than 600 to 850 rpm	engine is not in standby state (standby state occurs after ECM initialization or following after-run)	Manufacturer Enable Counter is zero (value of 0 means ECM is locked and out of assembly plant mode)	battery voltage is above 11 V for at least 3s	Engine Run Time greater than 10 seconds (engine speed greater than 600 to 850 rpm to indicate the engine is running)	Engine is running which means the engine speed is greater than 600 to 850 rpm	engine is not in ready state (which is active when the ignition is on or following a stall of the engine)			
P22A3 - NOx Heater Control Circuit Bank 1 Sensor 2	Engine not in afterrun mode (defined as engine speed greater than 0 rpm)	Engine speed greater than 600 to 850 rpm	engine is not in standby state (standby state occurs after ECM initialization or following after-run)	Manufacturer Enable Counter is zero (value of 0 means ECM is locked and out of assembly plant mode)	battery voltage is above 11 V for at least 3s	Engine Run Time greater than 10 seconds (engine speed greater than 600 to 850 rpm to indicate the engine is running)	Engine is running which means the engine speed is greater than 600 to 850 rpm	engine is not in ready state (which is active when the ignition is on or following a stall of the engine)			
P22A7 - NOx Heater Performance Bank 1 Sensor 2	Engine not in afterrun mode (defined as engine speed greater than 0 rpm)	Engine speed greater than 600 to 850 rpm	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)			
P22FA - NOx Sensor 1 Performance - Slow Response High to Low	Engine not in afterrun mode (defined as engine speed greater than 0 rpm)	Engine speed greater than 600 to 850 rpm	engine is not in standby state (standby state occurs after ECM initialization or following after-run)	Manufacturer Enable Counter is zero (value of 0 means ECM is locked and out of assembly plant mode)	battery voltage is above 11 V for at least 3s	Engine Run Time is greater than 10 seconds (engine speed greater than 600 to 850 rpm to indicate the engine is running)	System is not in active regeneration mode	Engine is running which means the engine speed is greater than 600 to 850 rpm	engine is not in ready state (which is active when the ignition is on or following a stall of the engine)		
P2428 - Exhaust Gas High Temperature	Engine not in afterrun mode (defined as engine speed greater than 0 rpm)	Engine speed greater than 600 to 850 rpm	engine is not in standby state (standby state occurs after ECM initialization or following after-run)	Engine is running which means the engine speed is greater than 600 to 850 rpm	engine is not in ready state (which is active when the ignition is on or following a stall of the engine)						
P242B - Exhaust Temperature Sensor 3 Performance	Engine speed greater than 600 to 850 rpm	Manufacturer Enable Counter is zero (value of 0 means ECM is locked and out of assembly plant mode)	Engine 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)						
P242C - Exhaust Gas Temperature	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	1					
(EGT) Sensor 3 Circuit Low Voltage P242D - Exhaust Gas Temperature (EGT) Sensor 3 Circuit High	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	following after-run) engine is not in standby state (standby state occurs after ECM initialization or	3s battery voltage is above 11 V for at least 3s	speed is greater than 600 to 850 rpm Engine is running which means the engine speed is greater than 600 to 850 rpm						
Voltage 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	following after-run) engine is not in standby state (standby state occurs after ECM initialization or following after-run)	Manufacturer Enable Counter is zero (value of 0 means ECM is locked and out of assembly plant mode)	battery voltage is above 11 V for at least 3s	Engine Run Time greater than 10 seconds (engine speed greater than 600 to 850 rpm to indicate the engine is running)	Engine is running which means the engine speed is greater than 600 to 850 rpm	engine is not in ready state (which is active when the ignition is on or following a stall of the engine)			
P2454 - Diesel Particulate Filter Differential Pressure Sensor Circuit Low Voltage	Engine not in afterrun mode (defined as engine speed greater than 0 rpm)	Engine speed greater than 600 to 850 rpm	engine is not in standby state (standby state occurs after ECM initialization or following after-run)	battery voltage is above 11 V for at least 3s	Engine Run Time greater than 10 seconds (engine speed greater than 600 to 850 rpm to indicate the engine is running)	Engine is running which means the engine speed is greater than 600 to 850 rpm	engine is not in ready state (which is active when the ignition is on or following a stall of the engine)		!		
P2455 - Diesel Particulate Filter Differential Pressure Sensor Circuit High Voltage	Engine not in afterrun mode (defined as engine speed greater than 0 rpm)	Engine speed greater than 600 to 850 rpm	engine is not in standby state (standby state occurs after ECM initialization or following after-run)	battery voltage is above 11 V for at least 3s	Engine Run Time greater than 10 seconds (engine speed greater than 600 to 850 rpm to indicate the engine is running)	Engine is running which means the engine speed is greater than 600 to 850 rpm	engine is not in ready state (which is active when the ignition is on or following a stall of the engine)				
P2457 - Exhaust Gas (EGR) Cooler Performance	Engine not in afterrun mode (defined as engine speed greater than 0 rpm)	Engine speed greater than 600 to 850 rpm	engine is not in standby state (standby state occurs after ECM initialization or following after-run)	ambient air temperature is above -7 deg C	ambient pressure is above 74.8kPa	battery voltage is above 11 V for at least 3s	Engine Run Time greater than 10 seconds (engine speed greater than 600 to 850 rpm to indicate the engine is running)	Engine is running which means the engine speed is greater than 600 to 850 rpm	engine is not in ready state (which is active when the ignition is on or following a stall of the engine)		
P2459 - Diesel Particulate Filter Regeneration Frequency	ambient air temperature is above -7 deg C	ambient pressure is above 74.8kPa									
P245A - Exhaust Gas Recirculation (EGR) Cooler Bypass Valve Control Circuit	engine is not in standby state (standby state occurs after ECM initialization or following after-run)	battery voltage is above 11 V for at least 3s									
P245C - Exhaust Gas Recirculation (EGR) Cooler Bypass Valve Control Circuit 1 Low Voltage	engine is not in standby state (standby state occurs after ECM initialization or following after-run)	battery voltage is above 11 V for at least 3s									
P245D - Exhaust Gas Recirculation (EGR) Cooler Bypass Valve Control Circuit 1 High Voltage	engine is not in standby state (standby state occurs after ECM initialization or following after-run)	battery voltage is above 11 V for at least 3s									
P2459 - Diesel Particulate Filter Regeneration Frequency	ambient air temperature is above -7 deg C	ambient pressure is above 74.8kPa					•				
P2463 - Diesel Particulate Filter - Soot Accumulation	Engine not in afterrun mode (defined as engine speed greater than 0 rpm)	Engine speed greater than 600 to 850 rpm	engine is not in standby state (standby state occurs after ECM initialization or following after-run)	Engine Run Time greater than 10 seconds (engine speed greater than 600 to 850 rpm to indicate the engine is running)	Engine is running which means the engine speed is greater than 600 to 850 rpm	engine is not in ready state (which is active when the ignition is on or following a stall of the engine)					
P246F - Exhaust Temperature Sensor 4 Performance	Engine speed greater than 600 to 850 rpm	Manufacturer Enable Counter is zero (value of 0 means ECM is locked and out of assembly plant mode)	Engine Run Time greater than 10 seconds (engine speed greater than 600 to 850 rpm to indicate the engine is running)	Engine is running which means the engine speed is greater than 600 to 850 rpm	engine is not in ready state (which is active when the ignition is on or following a stall of the engine)		-				
P2470 - Exhaust Gas Temperature (EGT) Sensor 4 Circuit Low Voltage	Engine not in afterrun mode (defined as engine speed greater than 0 rpm)	Engine speed greater than 600 to 850 rpm	engine is not in standby state (standby state occurs after ECM initialization or following after-run)	battery voltage is above 11 V for at least 3s	Engine is running which means the engine speed is greater than 600 to 850 rpm						
P2471 - Exhaust Gas Temperature (EGT) Sensor 4 Circuit High	Engine not in afterrun mode (defined as engine speed greater 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	1					
Voltage		II.	following after-run)			1					

DTC			Additional Basic Enable Conditions					
P249D - Closed Loop Reductant Injection Control At Limit - Flow Too Low	SCR Reductant Level not in restriction or empty level state (see reductant level warning definition)	Engine not in afterrun mode (defined as engine speed greater than 0 rpm)	Engine speed greater than 600 to 850 rpm	engine is not in standby state (standby state occurs after ECM initialization or following after-run)	Manufacturer Enable Counter is zero (value of 0 means ECM is locked and out of assembly plant mode)	battery voltage is above 11 V for at least 3s	Status of the Reductant Tank is not Frozer 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 pm to indicate the engine is normal speed is greater than 600 to 850 pm speed is greater than 600 to 850 pm speed is greater than 600 to 850 pm a stall of the engine)
P249E - Closed Loop Reductant Injection Control At Limit - Flow Too High	SCR Reductant Level not in restriction or empty level state (see reductant level warning definition)	Engine not in afterrun mode (defined as engine speed greater than 0 rpm)	Engine speed greater than 600 to 850 rpm	engine is not in standby state (standby state occurs after ECM initialization or following after-run)	Manufacturer Enable Counter is zero (value of 0 means ECM is locked and out of assembly plant mode)	battery voltage is above 11 V for at least 3s	Status of the Reductant Tank is not Frozer which means ambient air temperature is >= -7°C and the reductant tank temperature is >= -7°C	Engine Run Time greater than 10 seconds (lengine) speed greater than 00 to 850 pm speed greater than 00 to 850 pm speed or greater than 00 to 850 pm speed is greater than 600 to 850 pm at 10 to 850 pm speed is greater than 600 to 850 pm at 10 to 850 pm speed is greater than 600 to 850 pm at 10 to 950
P24A0 - Closed Loop Particulate liter Regeneration Control At Limit - Temperature Too Low	Engine not in afterrun mode (defined as engine speed greater than 0 rpm)	Engine speed greater than 600 to 850 rpm	engine is not in standby state (standby state occurs after ECM initialization or following after-run)	Engine Run Time greater than 10 seconds (engine speed greater than 600 to 850 rpm to indicate the engine is running)	Engine is running which means the engine speed is greater than 600 to 850 rpm	engine is not in ready state (which is active when the ignition is on or following a stall of the engine)		
P24A1 - Closed Loop Particulate Iter Regeneration Control At Limit - Temperature Too High	Engine not in afterrun mode (defined as engine speed greater than 0 rpm)	Engine speed greater than 600 to 850 rpm	engine is not in standby state (standby state occurs after ECM initialization or following after-run)	Engine Run Time greater than 10 seconds (engine speed greater than 600 to 850 rpm to indicate the engine is running)	Engine is running which means the engine speed is greater than 600 to 850 rpm	engine is not in ready state (which is active when the ignition is on or following a stall of the engine)		
510 - ECM Power Relay Circuit Performance	battery voltage is above 11 V for at least 3s							
P2564 - Turbocharger Boost ntrol Position Sensor Circuit Low	Engine not in afterrun mode (defined as engine speed greater than 0 rpm)	Engine speed greater than 600 to 850 rpm	engine is not in standby state (standby state occurs after ECM initialization or following after-run)	battery voltage is above 11 V for at least 3s	Engine Run Time greater than 10 seconds (engine speed greater than 600 to 850 rpm to indicate the engine is running)	Engine is running which means the engine speed is greater than 600 to 850 rpm	engine is not in ready state (which is active when the ignition is on or following a stall of the engine)	
P2565 - Turbocharger Boost Control Position Sensor Circuit High	Engine not in afterrun mode (defined as engine speed greater than 0 rpm)	Engine speed greater than 600 to 850 rpm	engine is not in standby state (standby state occurs after ECM initialization or following after-run)	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 ontrol Position Sensor "A" Circuit Range/Performance - Stuck Low	Engine not in afterrun mode (defined as engine speed greater than 0 rpm)	Engine speed greater than 600 to 850 rpm	engine is not in standby state (standby state occurs after ECM initialization or following after-run)	battery voltage is above 11 V for at least 3s	Engine is running which means the engine speed is greater than 600 to 850 rpm	engine is not in ready state (which is active when the ignition is on or following a stall of the engine)		
P2599 - Turbocharger Boost control Position Sensor "A" Circuit Range/Performance - Stuck High	Engine not in afterrun mode (defined as engine speed greater than 0 rpm)	Engine speed greater than 600 to 850 rpm	engine is not in standby state (standby state occurs after ECM initialization or following after-run)	battery voltage is above 11 V for at least 3s	Engine is running which means the engine speed is greater than 600 to 850 rpm	engine is not in ready state (which is active when the ignition is on or following a stall of the engine)		
2610 - Control Module Ignition Off Timer Performance P268A - Fuel Injector Calibration	engine is not in standby state (standby state occurs after ECM initialization or following after-run) Manufacturer Enable Counter is zero	battery voltage is above 11 V for at least 3s						
Not Programmed ECM P288C - Cylinder 1 Injector Data Incorrect	(value of 0 means ECM is locked and out of assembly plant mode) Manufacturer Enable Counter is zero (value of 0 means ECM is locked and out	•						
P268D - Cylinder 2 Injector Data Incorrect	of assembly plant mode) Manufacturer Enable Counter is zero (value of 0 means ECM is locked and out of assembly plant mode)							
P268E - Cylinder 3 Injector Data Incorrect	Manufacturer Enable Counter is zero (value of 0 means ECM is locked and out of assembly plant mode)							
P268F - Cylinder 4 Injector Data Incorrect P2690 - Cylinder 5 Injector Data	Manufacturer Enable Counter is zero (value of 0 means ECM is locked and out of assembly plant mode) Manufacturer Enable Counter is zero							
P2690 - Cylinder 5 Injector Data Incorrect P2691 - Cylinder 6 Injector Data	(value of 0 means ECM is locked and out of assembly plant mode) Manufacturer Enable Counter is zero (value of 0 means ECM is locked and out							
P2692 - Cylinder 7 Injector Data	of assembly plant mode) Manufacturer Enable Counter is zero (value of 0 means ECM is locked and out							
P2693 - Cylinder 8 Injector Data Incorrect	of assembly plant mode) Manufacturer Enable Counter is zero (value of 0 means ECM is locked and out of assembly plant mode)							
P2BAD - Exhaust NOx Concentration High - Unknown Reason	SCR Reductant Level not in restriction or empty level state (see parameter definitions for reductant level warning definition)	Engine not in afterrun mode (defined as engine speed greater than 0 rpm)	Engine speed greater than 600 to 850 rpm	engine is not in standby state (standby state occurs after ECM initialization or following after-run)	Manufacturer Enable Counter is zero (value of 0 means ECM is locked and out of assembly plant mode)	battery voltage is above 11 V for at least 3s	Status of the Reductant Tank is not Frozer which means the ambient air temperature is >= -7°C and the reductant tank temperature is >= -7°C	Engine Run Time is greater than 10 seconds (engine speed greater than 600 to 850 pm to indicate the engine is speed is greater than 600 to 850 pm to indicate the engine is speed is greater than 600 to 850 pm to indicate the engine is speed is greater than 600 to 850 pm active when the ignition is on or following speed is greater than 600 to 850 pm
U0073 - CAN A BUS OFF	Engine not in afterrun mode (defined as engine speed greater than 0 rpm)	engine is not in standby state (standby state occurs after ECM initialization or following after-run)	battery voltage is above 11 V for at least 3s					
U0074 - CAN B BUS OFF	Engine not in afterrun mode (defined as engine speed greater than 0 rpm)	engine is not in standby state (standby state occurs after ECM initialization or following after-run) engine is not in standby state (standby	battery voltage is above 11 V for at least 3s					
U0101 - Lost Communications /ith Transmission Control System	Engine not in afterrun mode (defined as engine speed greater than 0 rpm)	state occurs after ECM initialization or following after-run)	battery voltage is above 11 V for at least 3s					
0106 - Lost Communication With Glow Plug Control Module	Engine not in afterrun mode (defined as engine speed greater than 0 rpm)	engine is not in standby state (standby state occurs after ECM initialization or following after-run)	battery voltage is above 11 V for at least 3s		Ti .			1
U010E - Lost Communications With Reductant Control Module	Engine not in afterrun mode (defined as engine speed greater than 0 rpm)	Engine speed greater than 600 to 850 rpm	engine is not in standby state (standby state occurs after ECM initialization or following after-run)	battery voltage is above 11 V for at least 3s	Engine Run Time greater than 10 seconds (engine speed greater than 600 to 850 rpm to indicate the engine is running)	Engine is running which means the engine speed is greater than 600 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 rpm)	Engine speed greater than 600 to 850 rpm	battery voltage is above 11 V for at least 3s	Engine is running which means the engine speed is greater than 600 to 850 rpm				
U029E - N0x 2 loss of comm	Engine not in afterrun mode (defined as engine speed greater than 0 rpm)	Engine speed greater than 600 to 850 rpm	battery voltage is above 11 V for at least 3s	Engine is running which means the engine speed is greater than 600 to 850 rpm]			